Prepared in cooperation with the U.S. Forest Service

Environmental Flow Studies of the Fort Collins Science Center—Cherry Creek, Arizona

Open-File Report 2009–1272

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Marcia K. McNutt, Director

U.S. Geological Survey, Reston, Virginia 2010

For product and ordering information:
World Wide Web: http://www.usgs.gov/pubprod
Telephone: 1-888-ASK-USGS

For more information on the USGS—the Federal source for science about the Earth,
its natural and living resources, natural hazards, and the environment:
World Wide Web: http://www.usgs.gov
Telephone: 1-888-ASK-USGS

Suggested citation:
Waddle, T.J. and Bovee, K.D., 2010, Environmental flow studies of the Fort Collins Science Center, U.S. Geological Survey—Cherry Creek, Arizona: U.S. Geological Survey Open-File Report 2009–1272, 161 p.

Contents

Figures

Appendix Figures

Tables

Appendix Tables

Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Length	
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square foot (ft^2)	0.09290	square meter (m^2)
	Volume	
cubic foot (ft^3)	0.02832	cubic meter (m^3)
	Flow rate	
foot per second (ft/s)	0.3048	meter per second (m/s)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

SI to Inch/Pound

Multiply	By	To obtain
	Length	
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
	Area	
square meter (m^2)	10.76	square foot (ft^2)
	Volume	
cubic meter (m^3)	35.31	cubic foot (ft^3)
	Flow rate	
meter per second (m/s)	3.281	foot per second (ft/s)
cubic meter per second (m^3/s)	35.31	cubic foot per second (ft^3/s)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

°F=(1.8×°C)+32

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:

°C=(°F-32)/1.8

Vertical coordinate information is referenced to the "North American Vertical Datum of 1988 (NAVD 88)."

Horizontal coordinate information is referenced to the "World Geodetic System Datum of 1984 (WGS 84)."

Altitude, as used in this report, refers to distance above the vertical datum.

Environmental Flow Studies of the Fort Collins Science Center: Cherry Creek, Arizona

By Terry J. Waddle and Ken D. Bovee

Abstract

At the request of the U.S. Forest Service, an instream flow assessment was conducted at Cherry Creek, Ariz., to investigate habitat for native and introduced fish species and to describe the beneficial use of a possible instream flow water right. The U.S. Geological Survey (USGS) Fort Collins Science Center performed an intensive field study of two sections of Cherry Creek in September 2008 to provide base data for hydrodynamic simulation of the flow conditions in the stream. The USGS Arizona Cooperative Fish and Wildlife Research Unit, at the University of Arizona School of Natural Resources, conducted a survey of the habitat requirements of the resident fish species in Cherry Creek and provided the habitat suitability criteria used in this study. The habitat suitability criteria were combined with hydrodynamic simulation results to quantify fish habitat for the full range of daily flow experienced in the creek and to produce maps of habitat occurrence for those flows. The flow record at the Cherry Creek stream gage was used to generate habitat response values over time. The long-term habitat response was incorporated into an Excel® spreadsheet to allow evaluation of habitat occurrence with and without an instream water right under different hypothetical water withdrawal scenarios. The spreadsheet displays information about the time sequence of habitat events, the duration of critical events, and habitat retention.

Introduction

The U.S. Forest Service contracted the Fort Collins Science Center of the U.S. Geological Survey, via Interagency Agreement number 08-IA-11031600-107, to assess the instream habitat of Cherry Creek, Ariz., and the benefits that might be obtained if an instream water right were implemented in Cherry Creek. This report documents the study performed under this agreement and conveys the study results and the study's principle product: a decision support model called the Cherry Creek Habitat Time Series Analysis Model (CCHTSAM).

Cherry Creek is a perennial stream that runs from the Mogollon Rim to the Salt River north of Globe, Ariz. (fig. 1). The creek runs through the Tonto National Forest from 16 km north of Paradise Valley, Ariz. (lat 34°06'04" N., long 110°58'15" W.) to its confluence with the Salt River (lat 33°40'22"N., long 110°45'57" W.). Most of the Cherry Creek watershed from Young, Ariz. to the Salt River is remote and undeveloped; it is accessible by a dirt road subject to becoming impassible when wet. These difficult logistics explain the paucity of existing data for this basin.

A stream gage, USGS 09497980 Cherry Creek Near Globe, Ariz., is located at lat 33°49'40" N., long 110°51'20" W. and contains 44 years of record. The gage is located near the southern extreme of a narrow bedrock-controlled valley about 45 km southeast of Paradise Valley. From the gage to a point 3 km down the valley from the gage, the narrow valley transitions to a broader, braided alluvial valley form. The alluvial valley then persists for approximately 20 km to the Salt River.

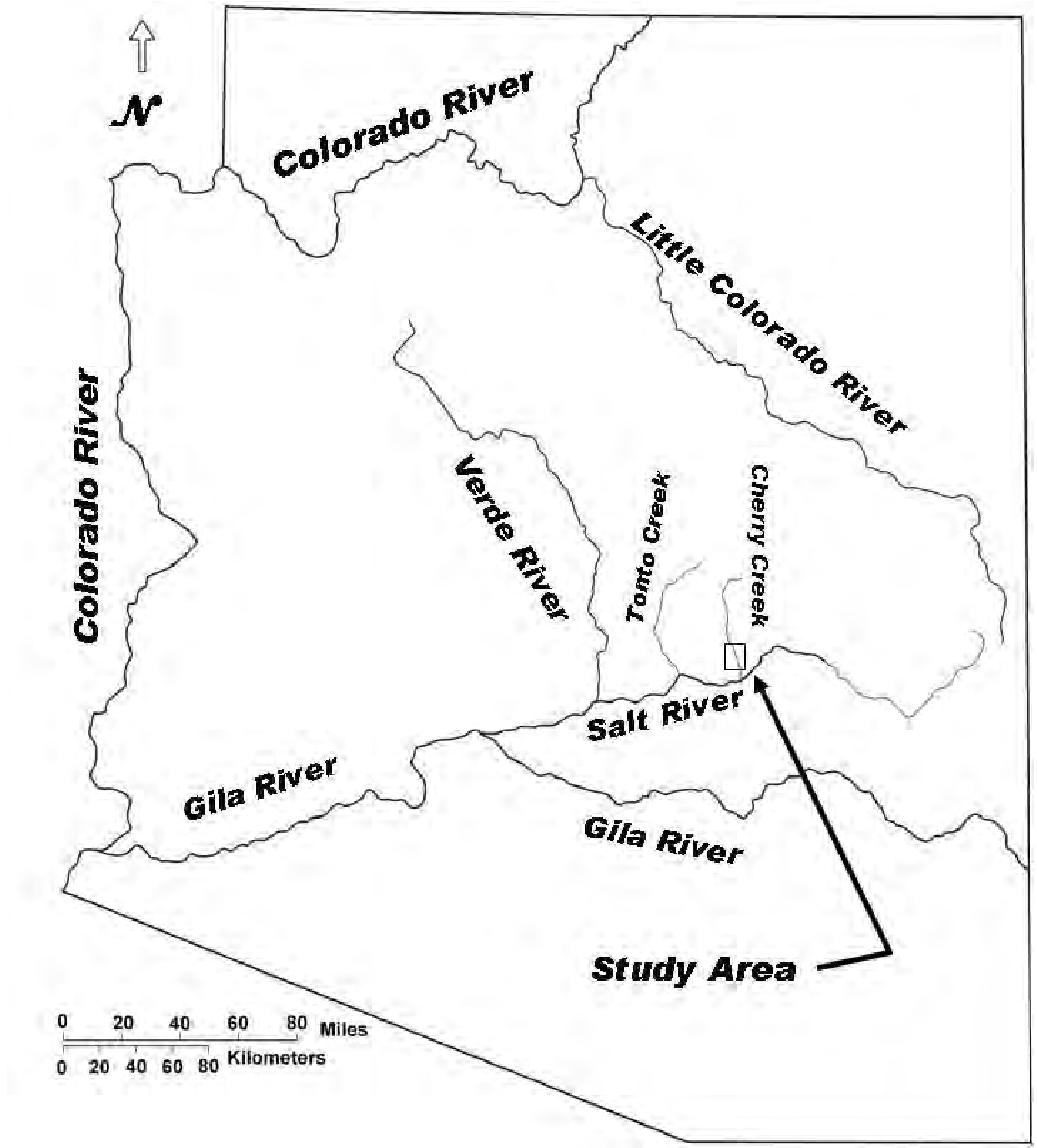


Figure 1. Major rivers of Arizona and Cherry Creek study area (rectangle)

The streamflow record exhibits high variability, with annual peak flows occurring in all months. Lower peak flows occur in summer as the result of monsoon rains and the highest peaks occur between December and March as a result of snowmelt runoff. In years when the annual peak flow occurred in summer, the whole year was generally dry. Peak flows have ranged as high as 15,400 ft^3/s (436 m^3/s). There is evidence that a flow of this magnitude can topple large trees and substantially rearrange the channel. The median annual flow is 0.215 m^3/s (7.6 ft^3/s), and the flow duration statistics (table 1) show that flows are above 1.529 m^3/s (54 ft^3/s) only 10 percent of the time.

Table 1. Probabilities that selected mean daily discharges were equaled or exceeded at USGS gage 09497980 Cherry Creek Near Globe, Ariz., May 4, 1965 to April 30, 2009.

Exceedance probability	ft^3/s	m^3/s
99%	2.6	0.074
95%	3.5	0.099
90%	4.2	0.119
80%	6.0	0.170
50%	7.6	0.215
20%	20	0.566
10%	54	1.539
5%	120	3.398
1%	491	13.90

The stream is home to numerous aquatic fauna including native and introduced species (see table 2) that could be affected by changes to water management practices in the basin. The habitat requirements of these species have been investigated in a separate study and are incorporated herein.

This study was designed to quantify the habitat available in Cherry Creek over the range and sequences of flow events occurring in the stream. This report uses both U.S. Customary Units and SI units based on customary usage or the requirements of the models being applied. Where appropriate both units are given.

Table 2. Fish species found in Cherry Creek.

Species	Native/Introduced
Agosia chrysogaster (Longfin dace)	N
Catostomus clarki (Desert Sucker)	N
Catostomus insignis (Sonora sucker)	N
Gila robusta (Roundtail chub)	N
Rhinichthys osculus (Speckled dace)	N
Ameiurus natalis (Yellow bullhead)	I
Cyprinella lutrensis (Red shiner)	I
Ictalurus punctatus (Channel catfish)	I
Lepomis cyanellus (Green sunfish)	I
Pimephales promelas (Fathead minnow)	I
Pylodictis olivaris (Flathead catfish)	I

Objectives

This study seeks to characterize aquatic habitat for native and non-native Arizona stream species over the full range of daily mean flow experienced in Cherry Creek for existing and hypothetically developed conditions where different amounts of water could be withdrawn from the stream and an instream-flow water right could be implemented. We use the historical record collected at the USGS gage described above as the existing condition and calculate streamflow and native species habitat area for assumed constant withdrawal rates of 2 and 10 ft^3/s (0.085 and 0.142 m^3/s) for the 44 years of record, with and without enforcement of a proposed U.S. Forest Service water right. We used these withdrawal rates as examples, and other withdrawals can be assessed easily with the tools developed in support of this study.

Methods

The overall process used in this analysis is summarized in figure 2. The steps in this flow chart are described in detail below.

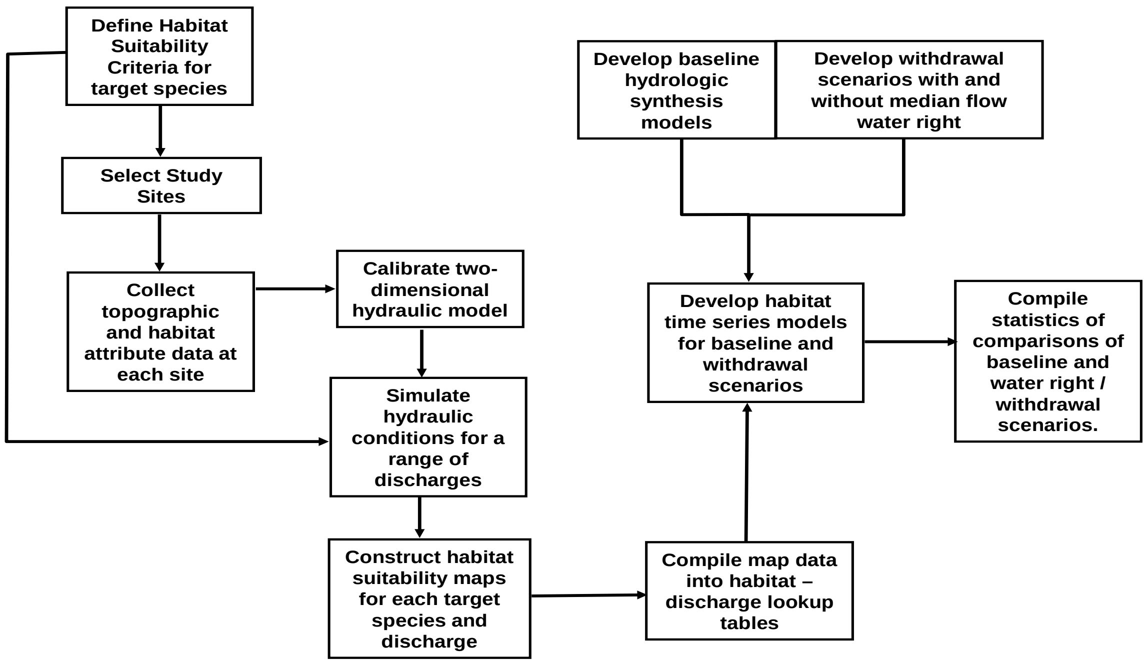


Figure 2. Analytical process flow chart.

Habitat Classification

Habitat classification was performed using habitat suitability criteria developed as part of a parallel study (Norman Mercado-Silva, USGS Arizona Cooperative Fisheries and Wildlife Unit, written commun. Feb. 9, 2009). A synopsis of this study follows:

A total of 256 randomly selected locations along the length of Cherry Creek were sampled with a pre-positioned electrofishing grid. The grid was deployed at each sampling location and allowed to reside undisturbed for 30 min. This “resting” period was designed to allow fish to resume their normal activities and habitat use following disturbance associated with installation of the grid. At the conclusion of the resting period, the grid was activated and all immobilized fish within its boundaries were netted and identified by species. Water depths and velocities were measured at the four corners and center of the grid and then averaged. In addition, information on the percent of overhead cover, substrate types, and presence of large woody debris was recorded for each sample location.

Data were compiled for each species in separate Excel® spreadsheets. Each spreadsheet contained the average water depth and velocity for all samples, a numerical index for the dominant substrate type, and indicated the presence or absence of a species in the samples. These data were analyzed using a one-sided Chi-square test (Thomas and Bovee, 1993) and graphical techniques to define hydraulic and substrate conditions that were selected or avoided by each species. A literature review was also conducted to determine the consistency of findings with studies of the same species conducted elsewhere. Results from these analyses were used to define binary criteria (tables 3 and 4), and a unique numerical code was assigned to each variable and species for subsequent use in GIS operations, as described below.

Table 3. Suitable depth and velocity ranges and corresponding reclassification codes for Cherry Creek target species (from Norman Silva-Mercado, Ariz. Cooperative Research Unit, written commun., February 9, 2009).

Target species	Suitable depth range in meters	Suitable depth reclassification code	Suitable velocity range in meters per second	Suitable velocity reclassification code	Combination code for suitable depth and velocity
Agosia chrysogaster (Longfin dace)	0.08 – 0.55	10	0.00 – 0.30	1	11
Ameirus natalis (Yellow bullhead)	0.10 – 10[1]	20	0.00 – 0.30	2	22
Catostomus clarki (Desert sucker)	0.11 – 0.45	30	0.00 – 0.35	3	33
Catostomus insignis (Sonora sucker)	0.13 – 0.60	40	0.03 – 0.50	4	44
Cyprinella lutrensis (Red shiner)	0.11 – 0.45	50	0.00 – 0.35	5	55
Gila robusta (Roundtail chub)	0.14 – 0.65	60	0.00 – 0.30	6	66
Lepomis cyanellus (Green sunfish)	0.18 –10[1]	70	0.00 – 0.20	7	77
Pimephales promelas (Fathead minnow)	0.16 – 0.65	80	0.00 – 0.20	8	88
Rhinichthys osculus (Speckled dace)	0.09 – 0.30	90	0.02 – 0.50	9	99

[1]The 10-m upper bin depicts an unlimited upper depth suitability for the target species.

Table 4. Suitable substrate types and corresponding classification codes for Cherry Creek target species (from Norman Silva-Mercado, Ariz. Cooperative Research Unit, written commun., February 9, 2009).

Target species	Suitable substrate types	Classification codes
Agosia chrysogaster (Longfin dace)	Bank materials, silt/clay, sand, gravel, cobble	1 – 5
Ameirus natalis (Yellow bullhead)	All types	1 – 7
Catostomus clarki (Desert sucker)	Sand, gravel, cobble	3 – 5
Catostomus insignis (Sonora sucker)	Sand, gravel, cobble, boulder	3 – 6
Cyprinella lutrensis (Red shiner)	Bank materials, silt/clay, sand, gravel	1 – 4
Gila robusta (Roundtail chub)	Gravel, cobble, boulder	4 – 6
Lepomis cyanellus (Green sunfish)	All types	1 – 7
Pimephales promelas (Fathead minnow)	Bank materials, silt/clay, sand, gravel, cobble	1 – 5
Rhinichthys osculus (Speckled dace)	Gravel, cobble, boulder	4 – 6

The fish sampling data proved to be inadequate to statistically test target species' selection of large woody debris (LWD) as suitable habitat in Cherry Creek largely because this habitat element was absent from most of the random samples. Nonetheless, LWD was considered a potentially important habitat component in Cherry Creek (Norman Mercado-Silva, Ariz. Cooperative Research Unit, written commun. February 19, 2009), providing hiding cover from predators and mediating local velocities. Therefore, we considered two forms of habitat in our GIS maps and subsequent analyses: one including LWD as a habitat component and one excluding it. Details regarding the use or non-use of LWD as a habitat component follow in the section on GIS operations.

Study Site Selection

Our primary criteria for selecting study sites were based on achieving the best representative description of the habitat characteristics of the stream within the constraints of safety and access. The stream can be reached by rough roads in a limited number of locations so there were at best a small number of candidate sites available due to access considerations.

We first examined the watershed using aerial photographs provided by the U.S. Forest Service to identify the overall configuration of the watershed. Using the aerial photographs, we identified 24.5 mi of incised valley and 12.6 mi of alluvial, braided valley forms within National Forest lands. The incised section had an average sinuosity of 1.58 and the alluvial section had an average sinuosity of 1.24.

We accessed four candidate locations during a reconnaissance trip in July 2008. This site visit included U.S. Forest Service and Arizona Department of Game and Fish staff members. In addition to representing the array of habitat conditions found in Cherry Creek, a primary consideration in study site selection was the ability to evacuate field crew members in case of injury.

After evaluating representativeness of the study sites and their access logistics, we selected two study site locations: a 170-m long site located 350 m upstream of the Cherry Creek stream gage (USGS 09497980 Cherry Creek Near Globe, Ariz., lat 33°49'40"N., long 110°51'20"W.) and a 610-m long site located approximately 17 kilometers downstream of the gage at lat 33°42’24”N., long 110°49’09”W. These study locations are referred to in this report as the Gage site and the Braided site, respectively. The Gage site was selected as representative of the incised valley portion of the stream and the Braided site was selected as representative of the alluvial portion.

Study site lengths were determined by the following modeling and logistical requirements:

- The sites must begin and end in a single thread channel.
- Flow must remain attached to the bed throughout the study site over the range of simulated flows; waterfalls and cascades cannot be simulated.
- The site must encompass the range of hydraulic conditions typical of habitats in the representative valley type.
- There must be adequate escape routes in case of sudden high flow.

We subsequently obtained 1-m pixel georeferenced aerial photographs for the two sites from the Arizona Regional Image Archive maintained by the University of Arizona (*http://ariadata.arid.arizona.edu/browse/doqq_2005.asp?path=/nad83/33110/f*). The following images were obtained: 33110f27.tif for the Gage site and 33110f75.tif for the Braided site.

Data Collection

Modeling of the habitat in a study site requires information about the hydraulic conditions prevailing in the site and the physical features used by target organisms. For the models used in this study, the site-specific data must be distributed in a spatially accurate manner. Three basic types of data are required: (1) topographic data describing the river channel, (2) data describing the conditions of flow, including the discharge, water-surface profile, and changes in water-surface elevation with changes in discharge, and (3) locations of inflow and outflow boundaries. This information provides the boundary conditions for simulating discharge and habitat in each study site.

We selected mid-September for the data collection field trip based on evaluation of the flow record at the Cherry Creek gage. From July to mid-September there is the threat of monsoon rains and dramatic changes in streamflow that could be hazardous to field crews walking in the river channel. From mid-September forward, the likelihood of such sudden flow events diminishes substantially, so this period was deemed to be the earliest window of opportunity to work in the stream. Data were collected at the Gage site during September 18–21, 2008, and at the Braided site during September 21–25, 2008.

Topographic data were collected using a survey-grade global positioning system (GPS) and a total station. GPS equipment consisted of Trimble® 5800 and R8 receivers using real-time kinematic positioning (RTK) and multipath reduction (Trimble Navigation, Ltd., *http://www.trimble.com*). Such survey-grade systems use carrier phase processing that enables centimeter accuracy. A Leica TC800 total station was used to collect spatial data in areas where the GPS equipment would not work due to overhead vegetation. All data were recorded in Universal Transverse Mercator (metric) coordinates, zone 12 N, using the WGS84 horizontal datum and the NAVD88 vertical datum.

We established a semi-permanent survey control benchmark on the side of the valley for each of the two study sites. The benchmarks were placed far above the valley floor where we expected good GPS reception for the base station receiver, beyond the influence of flowing water. The base station was placed at the GPS benchmark at the beginning of each field day.

We established a reference check point adjacent to the stream within each site. At the beginning and end of each field day, each GPS rover measured that point and compared the measurement with the known position to ensure loop closure for each instrument. All observations were coded using the protocol described below. Codes were added in the field as conditions dictated.

We also established a staff gage in the stream channel at each study site to record depth changes as we worked. The elevation of the staff gage was determined using the GPS equipment, which allowed the depths noted from the staff gage to be translated to water surface elevation. The staff gage reading was recorded at the beginning and end of each field day.

Coding and Point Surveying Protocol

To ensure each point observation could be uniquely identified, we needed a naming convention that would distinguish at which site the data were collected, which instrument collected the data, and a sequential point number. This example illustrates the point numbering convention employed: point number G1P0001 indicates G for Gage site, 1 for Rover unit 1, and P0001 for Point 0001. Points observed at the Braided site began with the letter B and used the same convention. Sequential point numbers were maintained for each rover throughout the data collection process for each site.

In addition to point numbering, field crew members entered descriptive codes for each site. The point coding scheme included information about the topographic feature being measured, the substrate material at that location, the presence or absence of large woody debris, and vegetation cover. Vegetation cover was subdivided into three classes: no or 0 percent cover, 1–50 percent cover, and more than 50 percent cover. Substrate coding was based on a modified Wentworth scale as shown in table 5.

To ensure the topographic survey accurately identified features found in the stream channel, data were collected along feature lines. Major longitudinal channel features such as the bottom and top of banks, thalweg, and bars were followed in sequence up the stream channel. Features were identified using the codes shown in table 6. Table 7 gives some examples of point coding using these conventions.

Table 5. Substrate coding used in Cherry Creek survey.

Code	Description	Size
7	Bedrock	consolidated outcrop
6	Boulders	> 256 mm
5	Cobble	64–256 mm
4	Gravel	4–64 mm
3	Sand	0.06–4 mm
2	Silt	< 0.06 mm in the stream channel
1	Soil	topsoil in over bank areas

Table 6. Feature codes used in Cherry Creek survey.

Code	Feature Description
Tob	Top of bank
Bob	Bottom of bank
Bar	Gravel or cobble bar
Thl	Thalweg
Chl	Secondary traces in channel to define channel profile
Bld	Major boulder defining lines, numbered with clock minutes
Bdr	Bedrock
Trc	Terrace

Table 7. Coding examples.

Code	Feature Description
Tob5v2	Top of bank, cobble, 1% –50% veg cover
Bob3	Bottom of bank, sand, no vegetation
Thl4v5	Thalweg in a back channel, gravel, with >50% veg
Bob3w	Bottom of bank, sand, with a woody debris pile
Bldmm5	Major boulder numbered by mm minutes on clock, cobble surrounding

Boulders and other large objects were surveyed by ascending circumnavigation to obtain the minimum number of points per feature needed to define the feature. The outline of the object was traced where it intersected the bed and points were collected in a counterclockwise concentric spiral to the top of the object. In the evening of each field day, survey points from all rovers were downloaded and combined into a master file that was then uploaded to each survey controller so all operators could see all previously surveyed points the next day to avoid duplication.

Flow Boundary Condition Measurements

We obtained discharge measurements at the Gage site on September 20, 2008, and at the Braided site on September 24, 2008, using a top set wading rod and Marsh McBirney® digital velocity meter. A longitudinal water surface profile was simultaneously obtained at each site using the GPS equipment. A discharge of 0.132 m^3/s (4.67 ft^3/s) was obtained at the Gage site and a discharge of 0.138 m^3/s (4.87 ft^3/s) was obtained at the Braided site.

Site Rating Curves

Gage Site Rating

On July 16 during our reconnaissance trip, a small flow event occurred while we were evaluating the Gage study site. The flow rose from approximately 0.283 m^3/s (6 ft^3/s) to 1.048 m^3/s (37 ft^3/s) in 10 min and reached a peak of 1.218 m^3/s (43 ft^3/s) in 25 min. We placed small pieces of reinforcing bar at the water's edge at several locations along the upper site to allow later survey of the water surface profile observed that day. Within an hour of the instantaneous flow peak, the rebar were placed at water's edge location with an estimated discharge of 1.133 m^3/s (40 ft^3/s) based on the provisional gage data. A second water surface profile was measured using the GPS equipment on September 20, 2008.

We extracted gage rating data for USGS 09497980 Cherry Creek Near Globe, Ariz. from the gage height records for the station. These data and a power function fit to the data are contained in figure 3. We used the fitted function to obtain a stage for the 283.16 m^3/s (10,000 ft^3/s) discharge.

We assumed that for the highest flows, the valley shape at the gage location was sufficiently similar to its shape at the study site that the rise in water surface from the low flows we observed to that at 283.16 m^3/s (10,000 ft^3/s) would be the same at the two locations. This assumption is unverified, so the higher flow portion of the site rating curve has an unknown confidence interval. Similarly, lacking high flow data, we assumed that the calibrated model adequately estimates the water surface profile for all discharges. Higher discharges, however, are minimally affected by the water withdrawals evaluated here, so the uncertainty associated with these assumptions regarding the highest flows would be the same for both our baseline and alternative scenarios and was considered acceptable.

Applying the stream gage rating curve (in terms of gage height change) to the study site, we found that the gage rating curve does not conform to both of the observed stages. If the Gage site rating curve is adjusted to match the observed elevation for the 0.132 m^3/s (4.67 ft^3/s) flow, it produces a stage that is too high at the 1.133 m^3/s (40 ft^3/s) discharge. To resolve this, we used a linear adjustment to cause the curve to fit at 0.132, 1.133, and 283.16 m^3/s (4.67, 40, and10,000 ft^3/s). See appendix 1 for a description of this adjustment.

Braided Site Rating

There were no available rating curve data near the Braided site. We measured two stage-discharge pairs at very low flow: 0.137 m^3/s (4.83 ft^3/s) and 0.110 m^3/s (3.87 ft^3/s). Though they differ

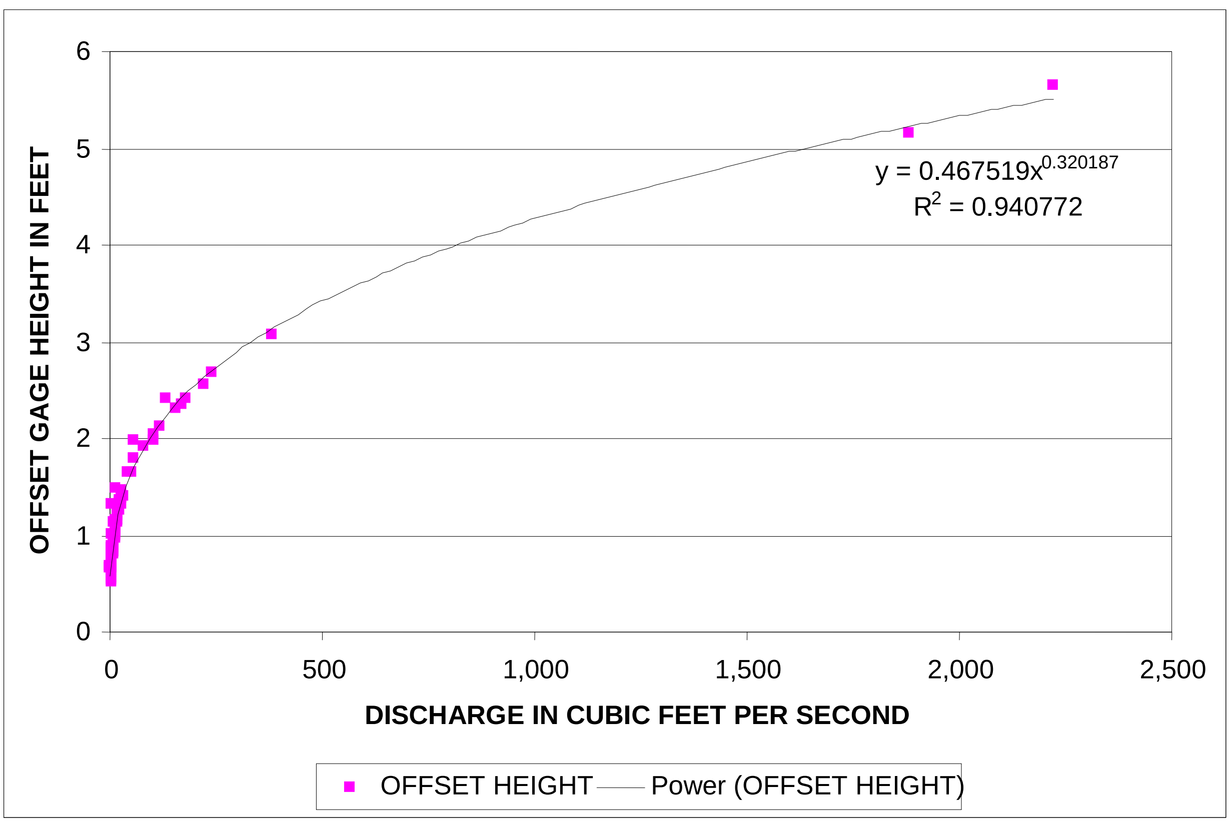


Figure 3. Observed gage height offset by -1.15 ft and power function fit.

by about 1 ft^3/s (0.028 m^3/s), or about 20 percent, they are insufficiently separated to build a rating curve. Tonto National Forest personnel measured discharge at various locations within 50 m upstream of our staff gage ten times between July 2008 and March 2009. Six of these measurements occurred prior to a channel-changing flow event that occurred on December 26, 2008. The approximate gradients between these 6 measurements and our staff gage were calculated based on the topographic survey data collected in September 2008. Those gradients were used to translate the six observed water surface elevations to the same datum as the staff gage. The six U.S.Forest Service measurements were combined with our two observations. A power function was fit to that data to produce a stage-discharge relationship encompassing the flow range from 0.110 m^3/s to 1.475 m^3/s (3.87 ft^3/s to 52.1 ft^3/s). This rating curve was then extended by simulating a flow of 283.17 m^3/s (10,000 ft^3/s) using an assumed roughness based on the 85th percentile particle size obtained from combining two Wolman pebble counts (appendix 2) performed at the site with a specific-discharge exit boundary condition (Steffler and Blackburn, 2002).

Forest Service personnel performed four discharge measurements after December 26, 2008. Owing to scour that occurred as a result of the December 26 flow, they could not be directly added to the stage-discharge relationship described above.

Hydrodynamic Model

The River2D model (Ghanem and others, 1996; Steffler and Blackburn, 2002) was used to perform all the hydraulic simulations in this study. According to the author of River2D (Steffler, P., 2002, page 1), "Accurate representation of the physical features of the river channel bed is probably the most crucial factor in successful river flow modeling. In addition to accurate and extensive field data, judgment and experience are necessary to connect the scattered data points into a digital surface representation." One of the components of the River2D suite of programs is a bed-topography editor, capable of rapid triangulation and contouring of point data (Steffler, 2002).

Elevation contours were generated from the topographic database using a linearly interpolated triangulated irregular network (TIN) process. Operating solely on the raw data, this algorithm can produce unrealistic contours in some locations. For example, two points high on a bank may connect with a point in mid-channel when, in fact, there is an intervening toe of the bank slope that is not accounted for by the initial TIN. A major task when refining the raw topographic data is to inspect the entire study area visually to identify unrealistic contours. The contours are refined by connecting known points (such as adjacent toe of bank points) with breaklines that force the TIN to follow more realistic contours. It is useful to overlay the observed data on an aerial photograph and use the photograph as a guide to the areas with erroneous contours. This process was completed for each study site and resulted in two final bed files that represented the best description of the study areas that could be derived from the collected data. The final bed files were used as the starting point for building a computational mesh used by the flow model.

Boundary condition information included the computational boundary used to limit the extent of the flow simulations, inflow discharge, and outflow water surface elevation values derived from the site rating curve. These data were incorporated in the computational mesh files before their use in the River2D model. Artificial extensions of the topography inflow and outflow boundaries were added to avoid boundary influence on the flow field at the limits of the habitat modeling areas. The River2D model (Steffler and Blackburn, 2002) uses the finite-element method to perform numerical calculation of flow conditions. This method allows an irregular computational mesh that enables areas of biological significance to be represented in greater detail than needed to represent flow characteristics alone. The computational mesh can be thought of as an overlay on the topographic data contained in the bed file that applies additional criteria regarding mesh configuration. Mesh configuration criteria include the capture of essential bed contour characteristics, gradual change in size of mesh elements, adequate mesh density to capture flow phenomena, and adequate density of inflow and outflow boundary nodes. A number of tools are provided in the R2D_Mesh program (Waddle and Steffler, 2002) to aid in building a mesh that satisfies these criteria. The input data required by the River2D model is initially produced by the R2D_Mesh program and can be later modified in the River2D model interface.

The basic equations of two-dimensional models describe mass and momentum conservation in two dimensions. In River 2D, the differential equation of mass continuity is represented as:

$$\frac{\partial H}{\partial t}+\frac{\partial (HU)}{\partial x}+\frac{\partial (HV)}{\partial y}=0 \tag{1}$$

where

H is the depth of water,

U and V are the velocity components in the x and y directions respectively and

t is time.

The conservation of x momentum equation is represented as:

$$\begin{aligned}&\frac{\partial q_x}{\partial t}+\frac{\partial}{\partial x}(Uq_x)+\frac{\partial}{\partial y}(Vq_x)+\frac{g}{2}\frac{\partial}{\partial x}H^2\\ &\quad = gH(S_{0x}-S_{fx})+\frac{1}{\rho}\left(\frac{\partial}{\partial x}(H\tau_{xx})\right)+\frac{1}{\rho}\left(\frac{\partial}{\partial y}(H\tau_{xy})\right)\end{aligned} \tag{2}$$

where

S_{0x} is bed slope in the x direction,

S_{fx} is $\tau_{bx}/(\rho gH)$ is the friction slope in x,

τ_{bx} is the bed shear in x,

ρ is density,

and

g is the gravitational constant.

A similar equation describes the y component of momentum:

$$\begin{aligned}&\frac{\partial q_y}{\partial t}+\frac{\partial}{\partial x}(Uq_y)+\frac{\partial}{\partial y}(Vq_y)+\frac{g}{2}\frac{\partial}{\partial x}H^2\\ &\quad = gH(S_{0y}-S_{fy})+\frac{1}{\rho}\left(\frac{\partial}{\partial x}(H\tau_{yx})\right)+\frac{1}{\rho}\left(\frac{\partial}{\partial y}(H\tau_{yy})\right)\end{aligned} \tag{3}$$

Relations for the bed and side shear stresses must be specified. “Since these stresses arise primarily from turbulent flow interactions, there is considerable uncertainty in their evaluation. Typically, a two-dimensional form of Manning's equation is used for the friction slope:

$$S_{fx}=\frac{n^2U\sqrt{U^2+V^2}}{H^{4/3}} \tag{4}$$

and a Bousinessq -type eddy viscosity is used for the transverse shear:

$$\tau_{xy}=v_t\left(\frac{\partial U}{\partial y}+\frac{\partial V}{\partial x}\right) \tag{5}$$

“The parameters n and ν_t are not constants or fluid properties, but depend on the flow situation. As a result they become the ‘tuning’ or calibration parameters that may be changed to bring a model prediction into agreement with measured data.” (Steffler and Blackburn, 2002, page 10) Note: ν_t is commonly called the eddy viscosity and n is usually referred to as “Manning’s n.” (Steffler and Blackburn, 2002)

Model Calibration

Once the bed file, mesh building, and boundary condition preparation steps have been completed, the River2D model is run to a steady-state solution. Calibration of the model consists of adjusting model parameters until a reasonable match is obtained between the simulated and observed water surface elevation profiles (WSP) measured at the calibration discharge. Adjustments are made to the roughness assigned to each point in the respective bed files until the simulated WSP conditions matched those observed July 16 and September 20, 2008, at the Gage site and September 24, 2008, at the Braided site.

Hydrodynamic Simulation

The computational mesh for both sites was extended beyond the domain of the collected topographic data to ensure that boundary condition simplifications did not influence the flow field in the area of interest. As noted above, the computational mesh size was varied to capture areas of hydraulic and habitat importance. Mesh element sized ranged from 0.04 m in the most demanding areas to 10 m at the periphery of the computational boundary. For both sites the following simulation protocol was implemented: select the appropriate roughness condition (not changing with discharge for the Gage site, but linearly variable with discharge for the Braided site), set inlet and outlet boundary conditions, run the model to equilibrium, and compare the simulated water surface elevation at the measurement point with the value from the site rating curve. A specific-discharge (depth–unit discharge relation of the form $q = C \times h^m$) outlet boundary condition was used for both study sites, necessitating both a trial-and-error procedure to adjust the exit boundary coefficient C and a re-run of the model until the desired rating curve elevation was obtained for each discharge. The discharges simulated at each site and the target water surface elevations (downstream water surface elevation for each simulated discharge) from the respective rating curves are summarized in table 8.

Upon completion of this simulation process, flow attributes (depth and velocity at all node points) are passed to the habitat analysis process as comma delimited files.

It should be noted that we were only able to obtain calibration data at very low discharges. As noted with regard to the rating curves, the confidence interval of the high flow simulations reported in this document cannot be determined due to a lack of data. However, the focus of this analysis is on low flow conditions where we were able to obtain data, so the uncertainty issues related to high flow simulations were deemed to have insignificant influence on the results of the analysis.

Hydrograph Synthesis

A major component in analysis of aquatic habitat is the habitat time series. Habitat time series analysis is described in a subsequent section of this document, but it is appropriate to note that a discharge time series is required for the habitat analysis. Therefore, the following steps were performed to produce a flow time series for each of the study sites.

Table 8. Discharges simulated at the two study sites and target water surface elevations.

Gage site simulation flows			Braid site simulation flows		
Q ft³/s	Q m³/s	Tgt elev	Q ft³/s	Q m³/s	Tgt elev
3	0.085	975.096	4.84	0.137	793.558
4.67	0.132	975.138	10	0.283	793.609
10	0.283	975.196	20.70	0.586	793.676
15	0.425	975.232	25	0.708	793.697
20	0.566	975.263	33.39	0.945	793.732
25	0.708	975.302	52.14	1.476	793.795
40	1.132	975.337	59.57	1.687	793.816
42	1.189	975.393	80	2.265	793.866
50	1.416	975.442	100	2.832	793.907
60	1.699	975.497	125	3.540	793.953
80	2.265	975.564	200	5.663	794.063
100	2.832	975.631	250	7.079	794.123
108	3.058	975.757	400	11.327	794.266
125	3.540	975.877	500	14.158	794.344
150	4.248	975.950	750	21.238	794.504
200	5.663	976.130	1,000	28.317	794.634
250	7.079	976.250	2,000	56.634	795.012
300	8.495	976.383	2,500	70.792	795.157
400	11.327	976.522	3,800	107.604	795.465
500	14.158	976.657	5,000	141.584	795.695
750	21.238	977.000	10,000	283.168	796.399
1,000	28.317	977.346			
2,000	56.634	977.917			
5,000	141.584	978.412			
10,000	283.168	978.491			

Stream gage data for USGS 09497980 Cherry Creek Near Globe, Ariz. were obtained from the USGS National Water Information System, *http://waterdata.usgs.gov/nwis*. Daily flow values for the period May 4, 1965, to April 30, 2009, were used in the analysis. These data required augmentation using a station regression due to a period of missing data at the Gage site and lack of recorded data at the Braided site. We undertook the following steps to produce continuous daily flow time series at the two sites.

Missing Data

The Cherry Creek gage was inoperable from February 1 to October 1, 1979. In order to provide a continuous record for this analysis, the missing period was filled by correlating the Cherry Creek gage with USGS 09499000 Tonto Creek Abv Gun Creek, Near Roosevelt, Ariz., using a power function regression. Tonto Creek is 44.5 km west of Cherry Creek and has a similar north to south drainage that also flows into the Salt River. The relation Cherry Creek Flow = 1.2683 × Tonto Creek Flow ^ 0.6512 correlates with Tonto Creek with an R^2 value of 0.8266.

Gage Site Record

As the Gage study site lies 350 m upstream of the Cherry Creek gage with no intervening tributaries, we were able to use the continuous record at the gage to generate the 44-year flow time series needed for the temporal habitat analysis without further hydrograph synthesis.

Braided Site Hydrograph

The Braided site lacks a continuous record. Spot measurements at the Braided site were obtained from Tonto National Forest personnel and documented on a spreadsheet which was updated as the measurements were made. Ideally, one would select a standard routing scheme to generate a flow record at the Braided site given the available record at the Gage site.

Most routing methods require at least a short continuous record of flow events at the location where one desires to synthesize a hydrograph so the routing scheme can be calibrated to the characteristics of the stream. Lacking such a short continuous record, we developed a simplified routing method that is described in appendix 3. The simplified method uses the available spot measurements and assumed parameters to produce estimates of daily discharge at the Braided site.

Geographic Information System Operations

General Procedures

The general procedures for converting model output data from River2D to relations between streamflow and habitat for a species were similar to those described by Bovee and others (2007, 2008a, 2008b) and are depicted as a flow chart in figure 4.

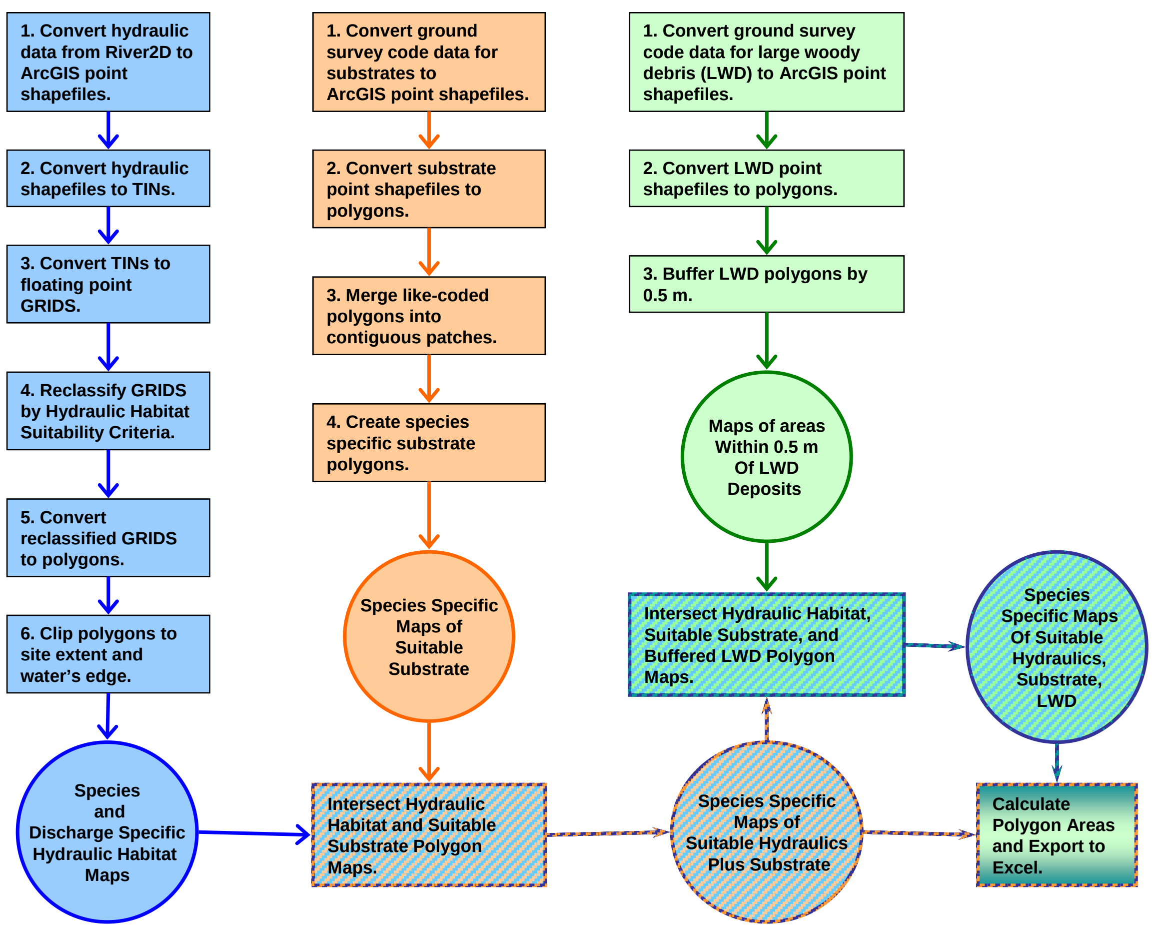


Figure 4. Flow chart of tasks performed to transform River2D and ground survey data into species-specific habitat-discharge relationships.

The Hydraulic Habitat Layer

Development of the hydraulic habitat layer followed the events described in the sequence of blue boxes in figure 4. Flow attributes from discharge-specific River2D hydraulic simulations were exported as text files containing the coordinates, depths, and velocities for each node in the computational mesh. A separate text file was generated for each simulated discharge. These data were imported to ArcGIS and converted to shapefiles containing the same information as the text file, and were then projected into the UTM coordinate system (UTM zone 12N, WGS84 horizontal datum and NAVD83 vertical datum, units in meters). Whereas the text files consisted of tabular data, the shapefiles were map layers of the nodes, with attributes of depth, velocity, substrate codes, boulder locations, and the perimeters of large woody debris (LWD) deposits. Interpolated surfaces (Triangular Irregular Networks, or TINs) were constructed for depths and velocities, using the nodal data as mass points. For each discharge, separate TINs were created for depth and for velocity, respectively (fig. 5, for example).

Each TIN was converted to a 0.25 m x 0.25 m floating point grid and reclassified according to the habitat classification criteria developed for the Cherry Creek target species (table 3). The reclassified grids were then combined to create a single grid depicting suitable water depth and velocity conditions for each target species. For example, the code for suitable depths for longfin dace was reclassified as 10,

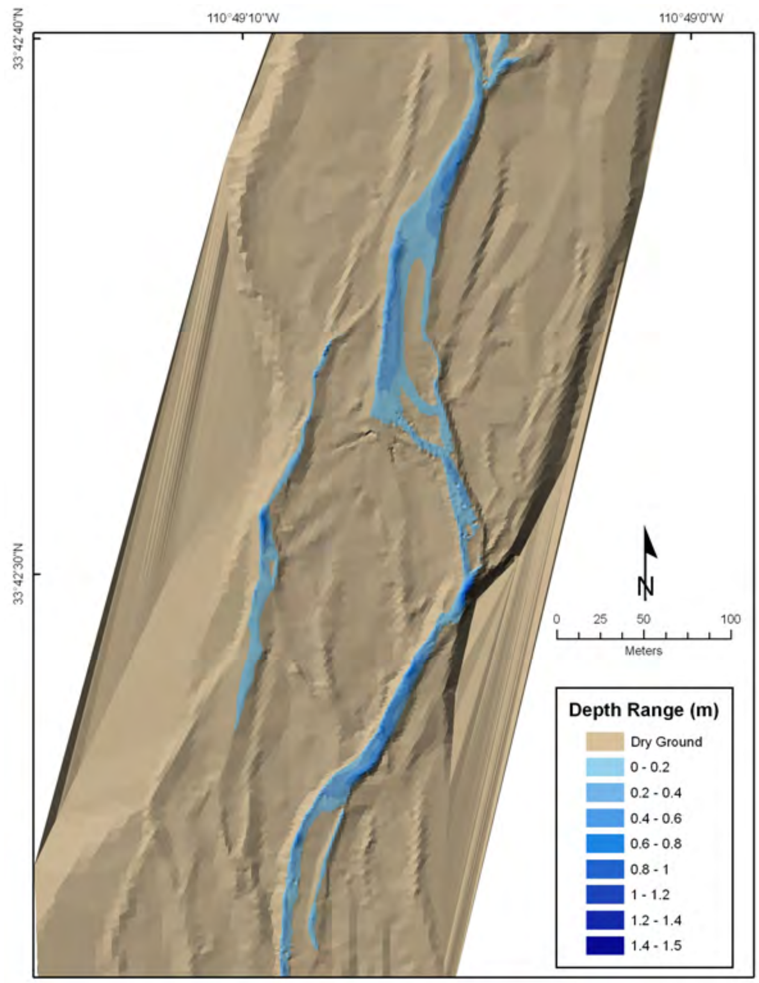


Figure 5. Depth TIN for the lower (Braided) site at Cherry Creek for a discharge of 10 ft^3/sec.

and for suitable velocities, 1. Grid cells having both suitable depths and velocities would have a combination code of 11.

The composite grids were converted to polygon format and clipped to conform to the extent of the habitat study site and the water's edge for each simulated discharge. The clipping function served primarily to eliminate the artificial inflow and outflow areas that were extended during the calibration and simulation steps with River2D (see discussion on hydraulic simulations).

The Substrate Layer

Development of the suitable substrate layer followed the events described in the sequence of tan boxes in figure 4. Raw survey data for all topographic data points were extracted to an Excel® spreadsheet and the survey codes disaggregated into component parts, one of which was a code for surficial substrate type. For example, a code of "tob5v2w" was separated as "tob" meaning a top-of-bank measurement, "5" referring to a substrate code 5 for cobble, "v2" for greater than 50 percent overhead vegetative cover, and "w" indicating the presence of large woody debris. Survey points depicting individual boulders or boulder clusters were removed and saved to a separate file. Column headings were added to the disaggregated fields, and the text file was converted to a point shapefile having the attributes of channel feature (for example, top of bank or thalweg), substrate code (table 5), and edge of large woody debris (LWD) deposits. Figure 6 is an example of a point shapefile depicting surficial substrate codes.

Polygons were constructed around each survey point using the Thiessen polygon algorithm in ArcGIS. Thiessen (Voronoi) polygons define individual areas of influence around each of a set of points. The boundaries of these polygons define the area that is closest to each point relative to all other points. The polygon boundaries are mathematically defined by the perpendicular bisectors of the lines between all points (fig. 7). Thiessen polygons are used to generalize a set of sample (or point) measurements by filling the areas nearest each point with the same value as the point attribute. This avoids the risk that interpolation might give erroneous or ambiguous results. They are analogous to the catchment area for the points, because the area inside any given polygon is closer to that polygon's point than any other. Figure 8 illustrates the substrate mosaic for the upper (Gage) study site that resulted from the proximity analysis using Thiessen polygons.

The Cherry Creek channel contained numerous very large boulders (fig. 9) that were treated as discrete features in the substrate maps. Small boulders (0.25–1.0 m in diameter) were routinely incorporated into the substrate codes for topographic survey points, and these points were included in the Thiessen polygons. Large boulders (larger than 1.0 m diameter), however, were surveyed individually. Because individual boulders were discrete features, their survey points were not appropriate for expansion by Thiessen polygons, but were placed on the maps according to their surveyed perimeters. A separate shapefile for surveyed boulders was constructed, and each boulder was assigned a unique identification number.

The convex hull algorithm in ArcGIS was used to create separate polygons defining the outline of each boulder by connecting its perimeter points (fig. 10). The boulder polygons were then used to erase portions of the Thiessen polygons underlying the boulder locations from the Thiessen polygon shapefile. This operation was analogous to using a "cookie cutter" to remove the portions of the Thiessen polygons underlying boulder locations from the base substrate shapefiles. The boulders were then added back into the base substrate shapefile by performing a union between the boulder polygon shapefile and the "cookie cutter" version of the base substrate shapefile (fig. 11). This procedure was conducted to eliminate the possibility of having two different substrate codes for the same polygon, as well as to uniquely define the outlines of individual large boulders.

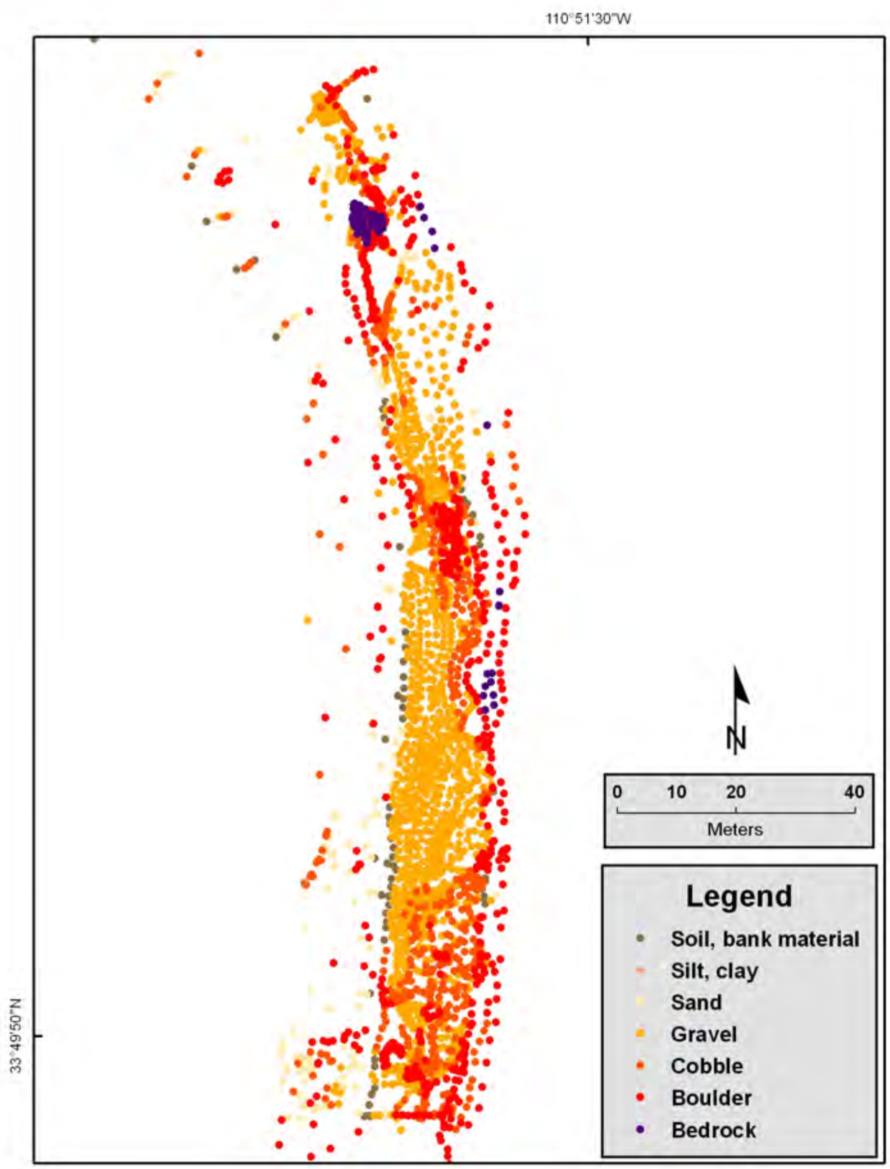


Figure 6. Map of the upper (Gage) study site showing topographic survey points and substrate codes.

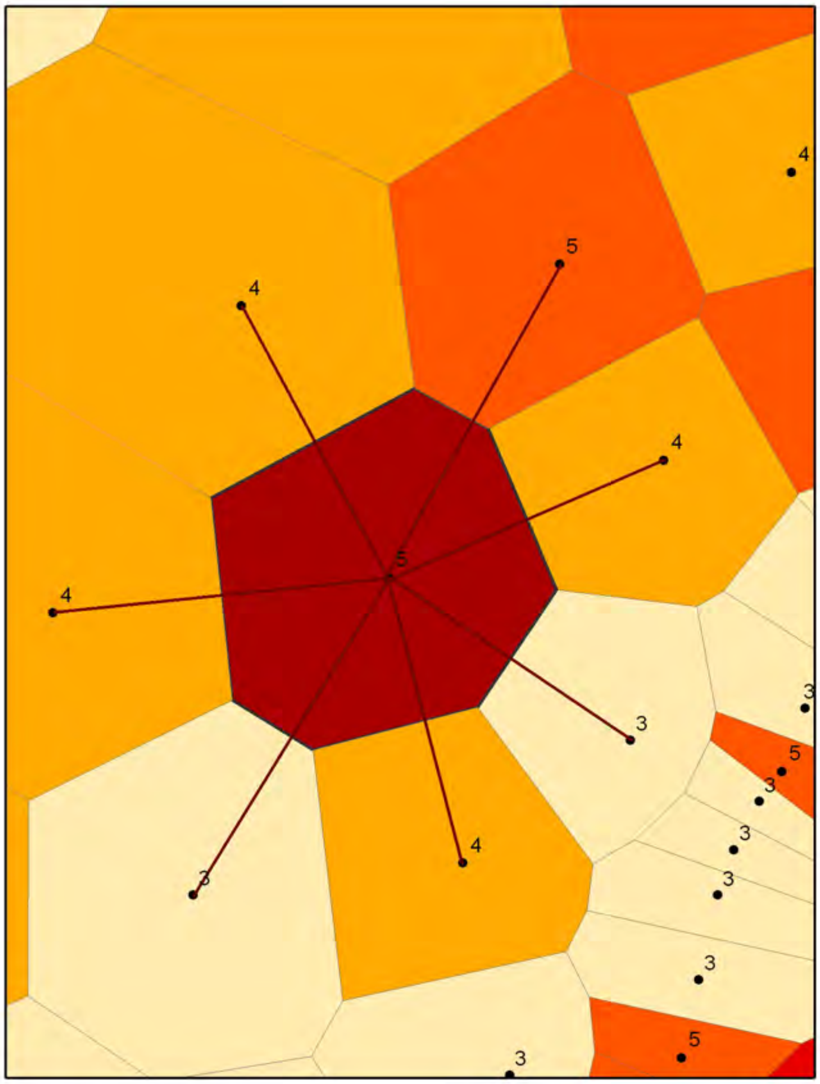


Figure 7. Radiating lines from a point to its nearest neighbors, perpendicularly bisected to form the boundaries of the Thiessen polygon shown as dark red. Here the numbers indicate substrate codes observed at the respective points.

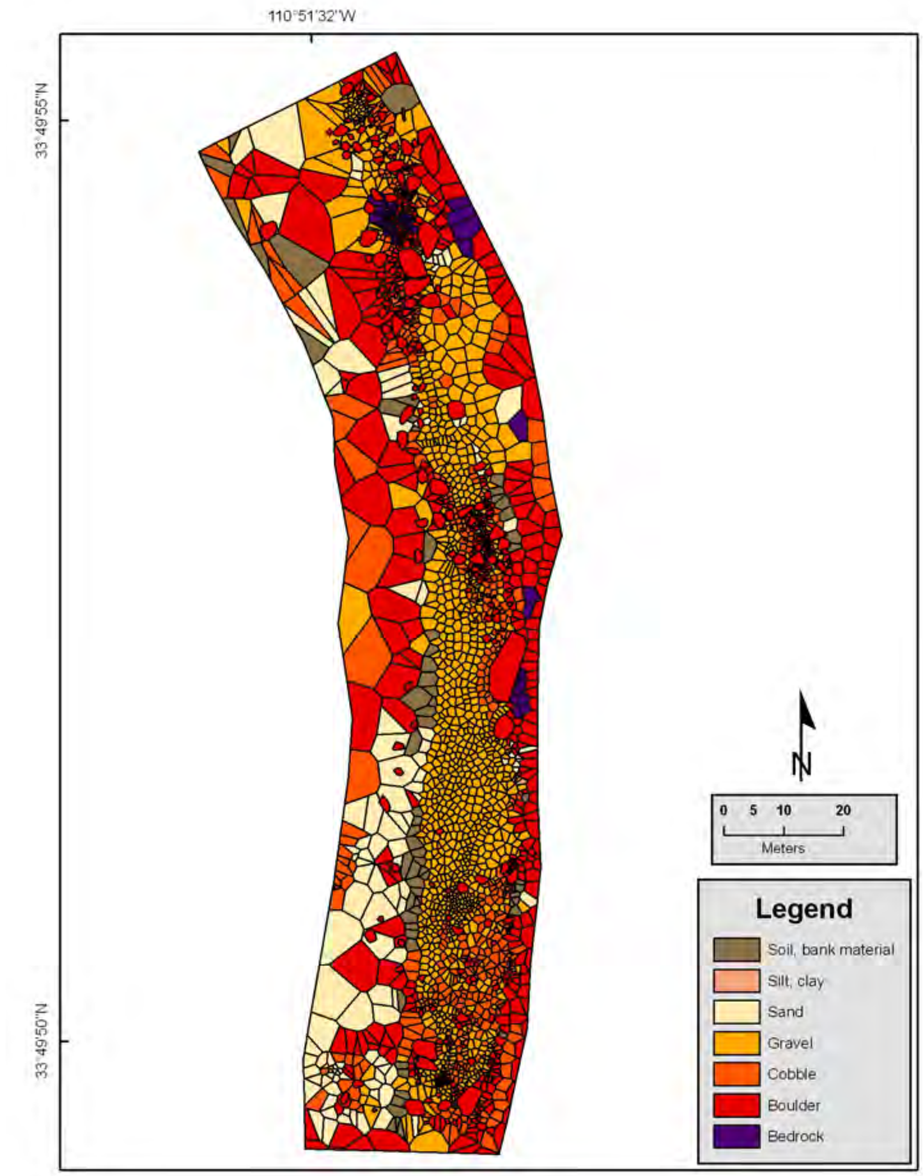


Figure 8. Substrate polygon map for the upper (Gage) study site resulting from proximity analysis using the Thiessen polygon algorithm.

Figure 9. Photograph of a portion of the upper (Gage) site, showing individually-surveyed boulders. Small cobbles were placed on top of each boulder to indicate those that had already been surveyed, in order to minimize redundant measurements by different members of the survey crew.

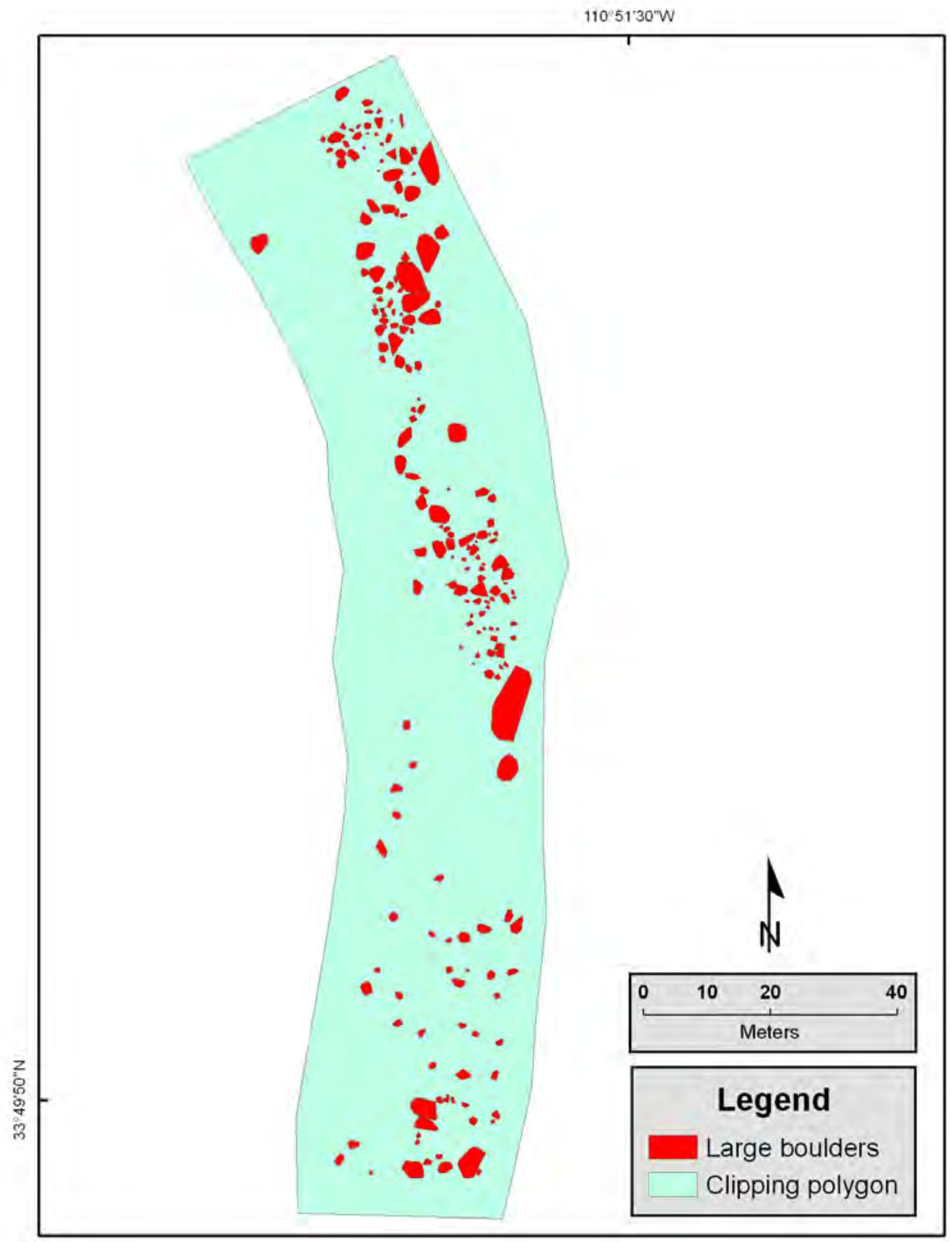


Figure 10. Shapefile for the upper (Gage) site showing polygons for individually-surveyed large boulders.

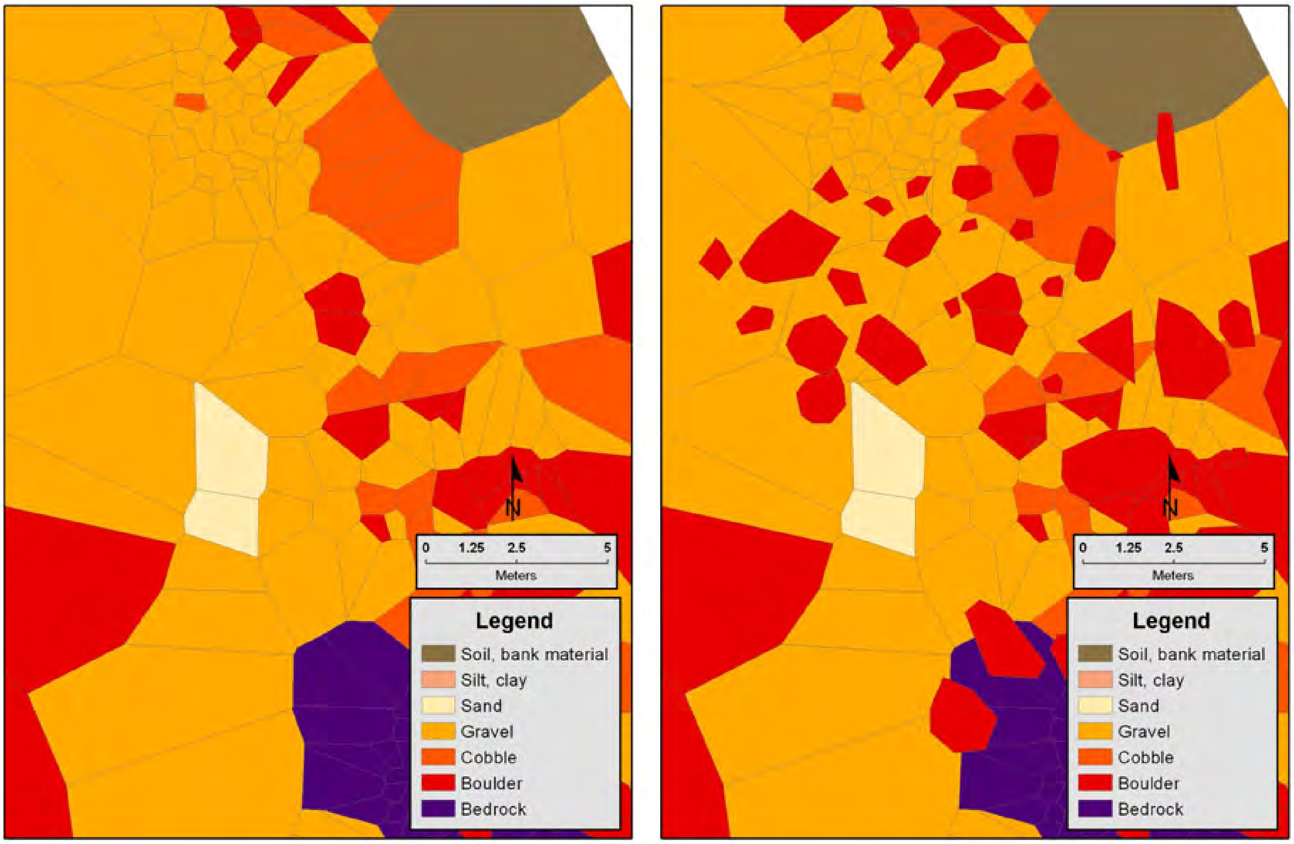


Figure 11. Close-up comparison of the base substrate map from Thiessen polygons (left) and final substrate map with replacements for large boulders (right) for the upper (Gage) site.

Substrate patches were then delineated by merging all adjacent Thiessen polygons having the same code. This step was performed to reduce the number of very small (< 0.1 m^2) habitat patches resulting from subsequent intersections with hydraulic habitat polygons. Although this procedure did not substantially alter the final calculation of total habitat areas, it was necessary to accurately calculate other patch metrics, such as mean patch size and patch density. Finally, individual substrate shapefiles were developed for each target species by selective removal of unsuitable substrate polygons (table 4) from copies of the master substrate shapefile (fig. 12).

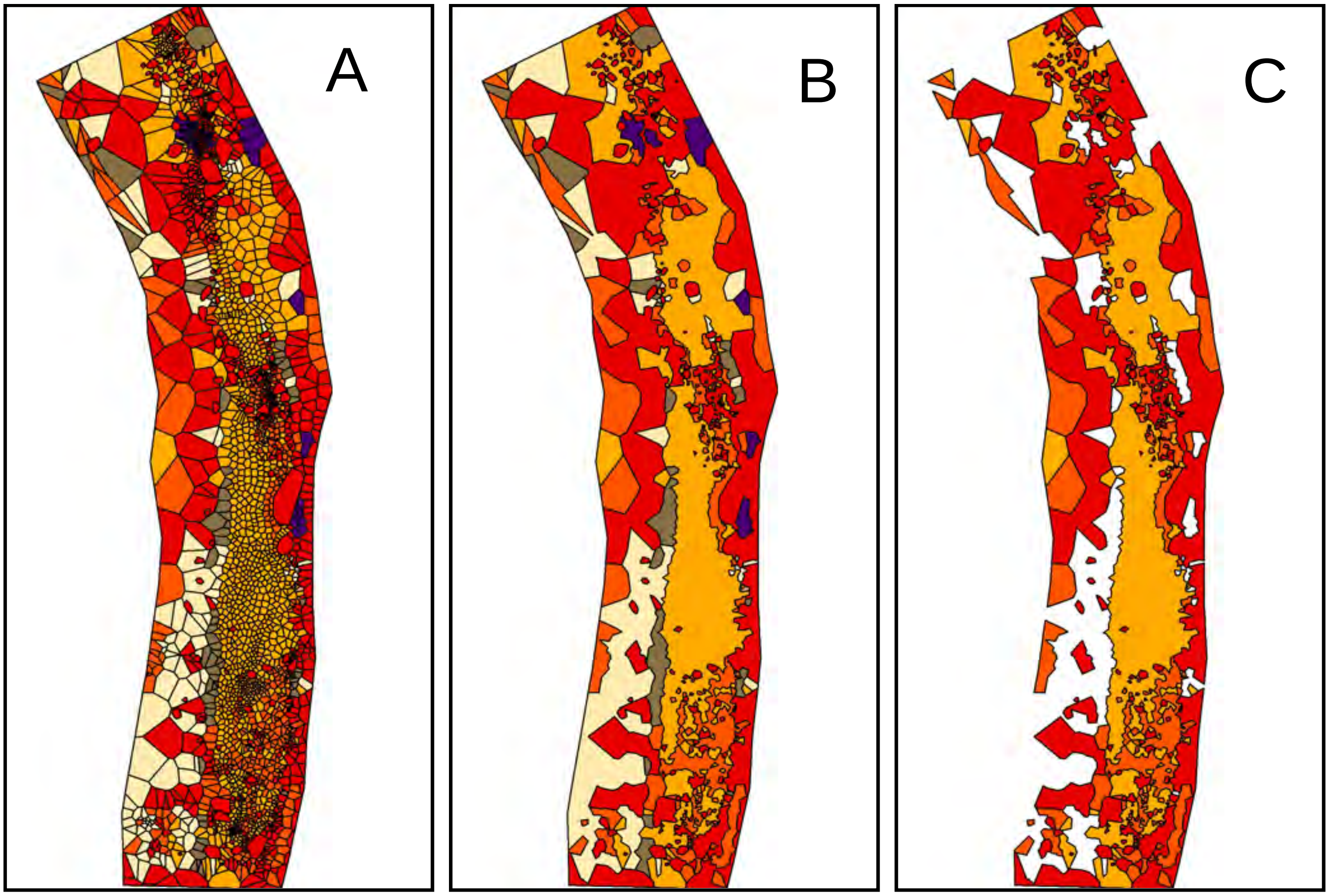


Figure 12. Comparison of original Thiessen substrate polygons with boulder inserts (*A*), merged substrate polygons (*B*), and resultant substrate polygons suitable for speckled dace (*C*).

Large Woody Debris Deposits

Large woody debris (LWD) generally occurred in two forms: root wads associated with woody riparian vegetation, and piles of driftwood that accumulated along the banks or on point bars along the stream margins (fig. 13). During data collection, the perimeters of root wads and debris deposits were surveyed and coded as containing LWD. These data were included in the original ground survey point shapefiles described in the previous section. The procedure for developing polygon shapefiles for LWD was similar to that used to develop the large boulder polygons. The survey points for each deposit or root wad were assigned unique identification numbers and the convex hull algorithm was used to outline their boundaries. Figure 14 illustrates the resulting LWD polygons for the upper (Gage) site.

Figure 13. Common forms of large woody debris deposits found in Cherry Creek: root wads (top) and driftwood piles (bottom).

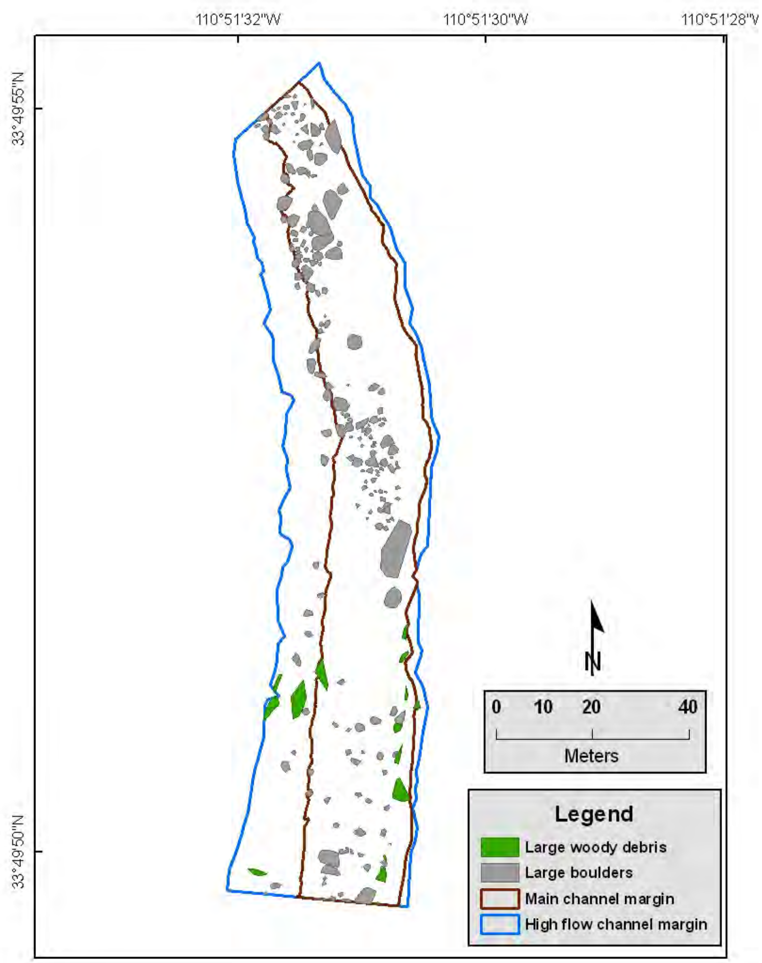


Figure 14. LWD polygons for the upper (Gage) site resulting from application of the convex hull algorithm to survey points outlining individual root wads or debris deposits.

Zero-Discharge Habitat

Simulating very low discharges with River2D or any other hydraulic simulation model is a difficult process and the accuracy of the simulations may be poor. Accordingly, we determined the amount of habitat area for the target species at zero discharge in order to more accurately interpolate values between zero and the lowest feasible simulation discharge. At zero flow, the only wetted areas of the stream occur in pools where the outflow is governed by a hydraulic control (typically the crest of a downstream riffle). We generated high resolution contour maps (contour interval = 5 cm) for each site from the bed files used in the River2D simulations. Closed contours with decreasing interior elevations indicated locations where pools of standing water would occur at zero flow (fig. 15). These closed contours were identified visually and copied to a separate shapefile, which was subsequently converted to polygon format. Each polygon was then assigned the elevation of the contour line from which it was generated. The polygon shapefiles were converted to 0.5 x 0.5-m grids. Grids of the same resolution were then developed for bed elevations throughout the site and subtracted from the zero-flow elevation grid. This procedure resulted in a grid of depths within standing water areas at zero discharge (fig. 16).

These grids were then reclassified and converted to polygons using the same techniques described for the hydraulic habitat maps.

It is noteworthy that these maps represent the maximum amount of habitat that would occur at zero discharge. The closed polygons from which they were generated show the extent of standing water when the discharge first drops to zero. They do not account for seepage or evaporation, either of which would result in a reduction in the water surface elevation over time.

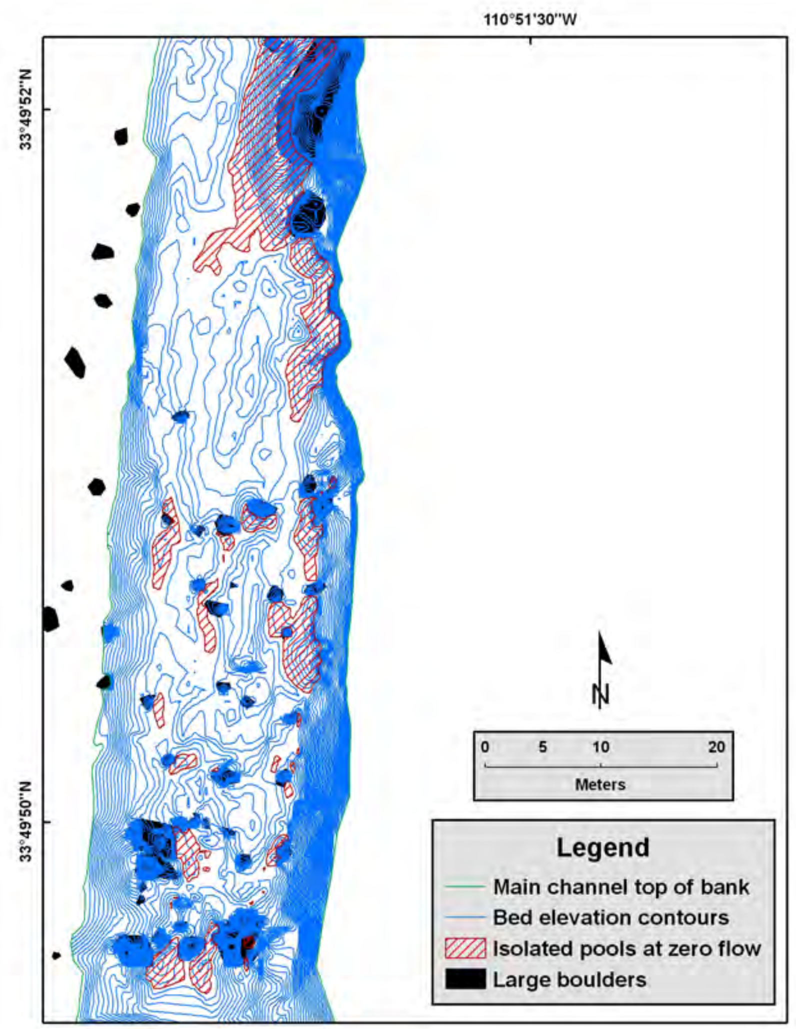


Figure 15. Map of a portion of the upper (Gage) site showing bed elevation contours and closed contours representing the stage of zero flow for isolated pools.

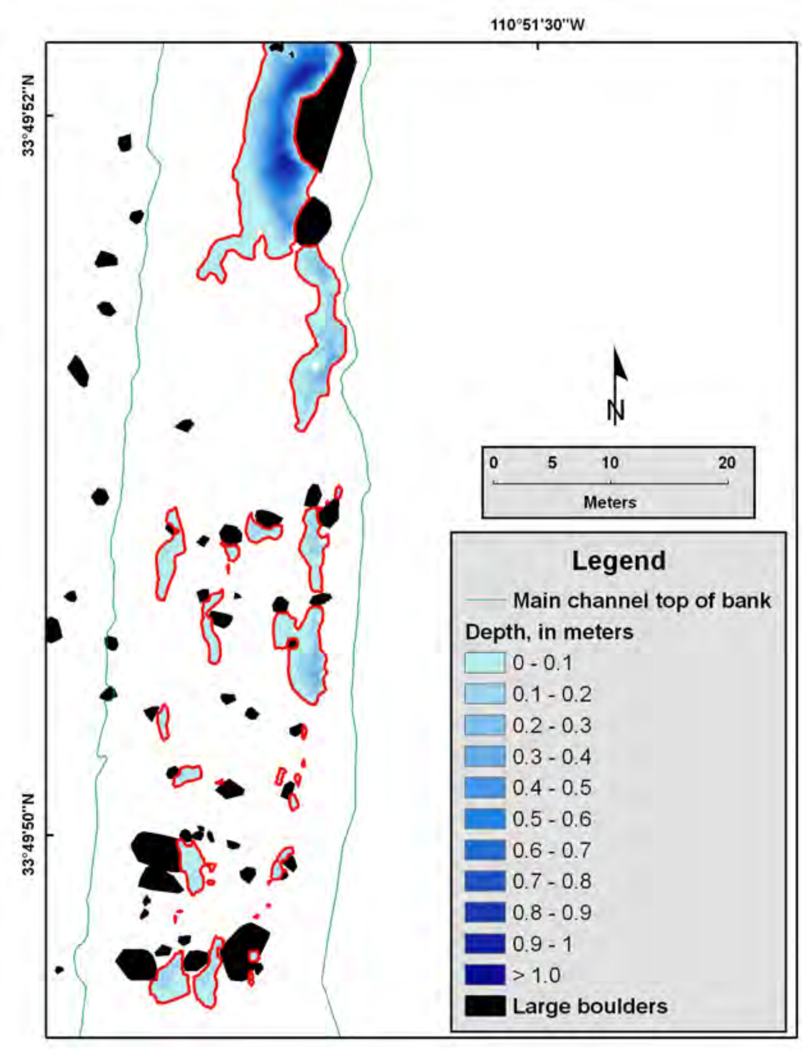


Figure 16. Map of a portion of the upper (Gage) site showing the depth distribution in isolated pools at zero discharge.

Map Overlays

Map overlays were performed to combine various types of map layers into a single map depicting multiple habitat features for a target species. The cross-hatched boxes and circles in the operations flow chart (fig. 4) illustrate this step in the process. Map overlays consisted of intersections of polygons from different habitat layers, where two types of intersections were performed. The first type intersected the hydraulic habitat layer with the substrate layer for each target species to generate polygons containing both suitable hydraulic conditions and suitable substrates (fig. 17). The second type intersected the resulting suitable hydraulic habitat-substrate layer with the buffered LWD layer to generate polygons containing suitable depths, velocities, and substrate types that were within 0.5 m of a LWD deposit.

Figure 17. Example of an intersection map of areas having suitable hydraulic and substrate conditions for speckled dace (*Rhinichthys osculus*) in a portion of the upper (Gage) site at a discharge of 100 cubic feet per second.

Map Export and Data Treatments

The attribute tables for each of the shapefiles derived from the intersection analysis were modified to add items for species name, discharge, and area. All the shapefiles for a single target species and all discharges were then appended into a single shapefile for the species. Areas for all the polygons in the aggregate shapefile were calculated and polygons having areas smaller than 0.1 m^2 were deleted. These small polygons were artifacts of the various intersection operations and were removed to reduce their effects on the calculation of mean patch size and patch density. In addition, we believe that the removal of patches smaller than 0.1 m^2 (approximately 1 ft^2) was justified on the basis of minimum area requirements for the target species. Isolated areas of this size were judged too small to be occupied for extended time periods by any of the target species, especially the larger fish. Removal of small patch fragments resulted in reductions in total habitat area of 2 percent to 36 percent, depending on the simulated discharge, target species, location, and use of LWD in the habitat simulation. However, the basic shapes of the flow—habitat functions, which are most important in subsequent analyses—were retained (fig. 18, for example). Following removal of the small patches from the map layers, the attribute files for the aggregate shapefiles were exported as text files.

Data from the attribute text files were analyzed using the pivot table function in Excel ®, to create tables arrayed by species and discharge, which contained the patch metrics of total area, mean patch size, and patch count. Total area and patch count are influenced by differences in the length of the upper and lower sites, making direct comparisons between the two sites difficult. In order to facilitate such comparisons, these two metrics were normalized to a unit length of stream. The total length of each site was measured in ArcGIS, following the approximate centerline of the active channel. The total lengths of the upper (Gage) site and lower (Braided) site were 0.17 km and 0.61 km, respectively. The normalized metrics for habitat area (in m^2/km) and patch density (in number/km) were calculated by dividing the total area and patch counts, respectively, by these site lengths. Total area, normalized area, mean patch size, patch count, and patch density were consolidated in tabular and graphical form in separate spreadsheets for each site. The tabular data were used to construct lookup tables for habitat time series analysis (description below). The charts are useful to compare habitat responses of the various species to different discharges in the two sites.

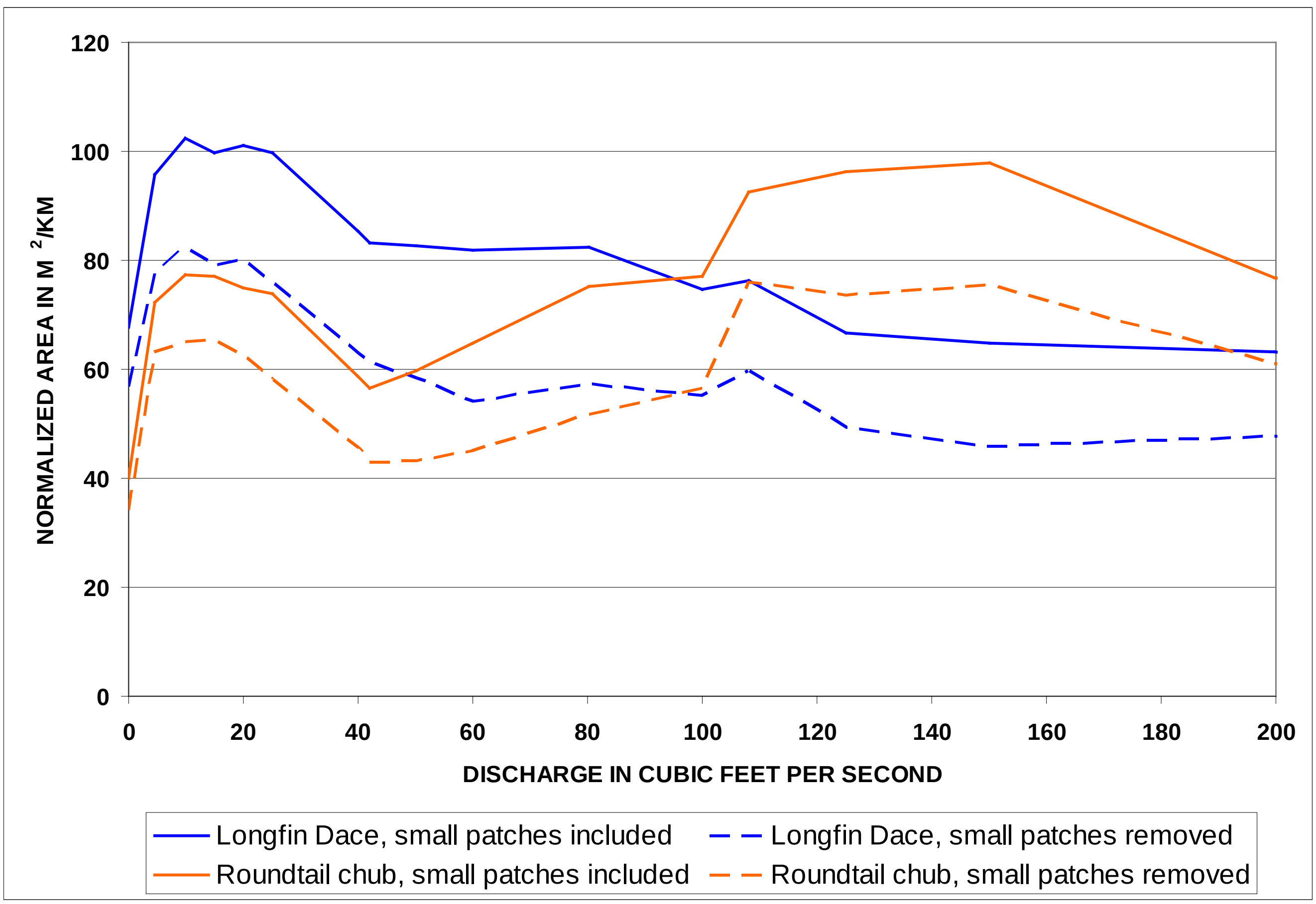


Figure 18. Effects of removing patches less than 0.1 m^2 in area on the habitat-discharge functions for two species at the Gage site, with LWD included in the habitat computations.

Habitat Time Series Analysis

The basic concept of the habitat time series has been in use since the early 1980s (Bovee, 1982; Bovee and others, 1998) and remains a powerful tool for examining the effects of altered flow regimes on riverine habitats. The habitat time series has its origins in the National Environmental Policy Act (NEPA) of 1969 [42 U.S.C. 4321], which requires the determination of the environmental consequences of a Federal action and its alternatives. This requirement applies equally to Environmental Assessments (EA) and Environmental Impact Statements (EIS). By virtue of its ability to quantify the effects of a proposed action and alternatives to that action, the habitat time series was designed to be compatible with NEPA and similar applications. In this report, we use the term "baseline" to describe the historic daily flow record and all habitat time series that are derived from the historic flow record.

The habitat time series is fundamentally simple, as illustrated in figure 19. The driving variable is a time series of discharges, representing either a baseline condition or an alternative. For every discharge in the flow time series, whether baseline or an alternative, there is a corresponding habitat area as compiled in the habitat-discharge lookup tables. The habitat time series is merely a transformation of the discharge for a time step into the corresponding habitat area for the same time step. The resulting habitat time series (fig. 19*C*) may be quite different from the hydrologic time series (fig. 19*A*) from which they were derived, however, because the habitat-discharge functions (fig 19*B*) typically are nonlinear.

Baseline and Alternative Flow Regimes

The baseline condition for the upper (Gage) site was defined as the historical daily flow record from the USGS gage (09497980) for the period of record from May 14, 1965 to April 30, 2009, including the portion of the record filled by station regression. The baseline for the lower (Braided) site was synthesized using the approach described in appendix 3. Alternative flow regimes were generated by imposing various hypothetical diversions to the historical flow regime, with and without enforcement of a proposed U.S.Forest Service water right.

The hypothetical diversion and flow routing arrangement is shown in figure 20.

Habitat Metrics and Comparisons

The routing scheme was applied to all flows passing the stream gage. These included historical undiverted flows, flows reduced by the full diversion, and flows resulting from constraining the diversion to maintain the median monthly flow (for example, enforcing the proposed U.S.Forest Service water right).

An Excel® workbook (henceforth, the Cherry Creek Habitat Time Series Analysis Model, CCHTSAM) was constructed to perform habitat time series calculations based on changes in the flow regime resulting from user-specified hypothetical withdrawals under two scenarios. Scenario 1 represents changes in the flow regime, given a constant hypothetical diversion with the proposed U.S.Forest Service water right enforced at the Cherry Creek gage. For consistency, we stipulated that the point of diversion would be just upstream from the gage (fig. 20). Scenario 2 represents changes in the flow regime, given the same hypothetical withdrawal, with no water right enforcement (the water right constraint was set to zero for all cases). For our examples, we used hypothetical diversions ranging from 2 to 10 ft^3/s (0.057 to 0.28 m^3/s).

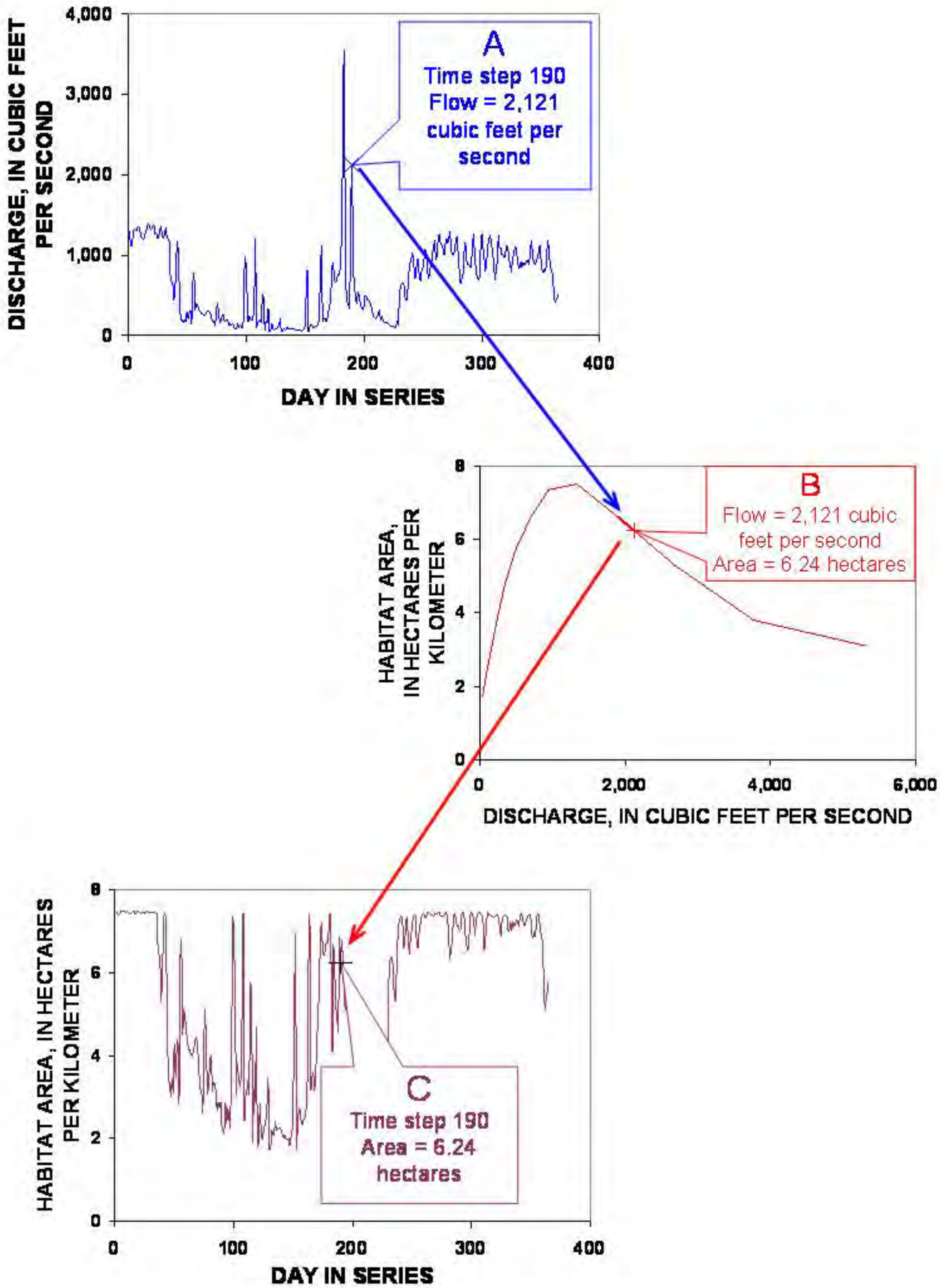


Figure 19. Elements used in the construction of a habitat time series, *A* flow time series, *B* Habitat-discharge function, and *C* the resulting habitat time series. From Bovee and others, 2008.

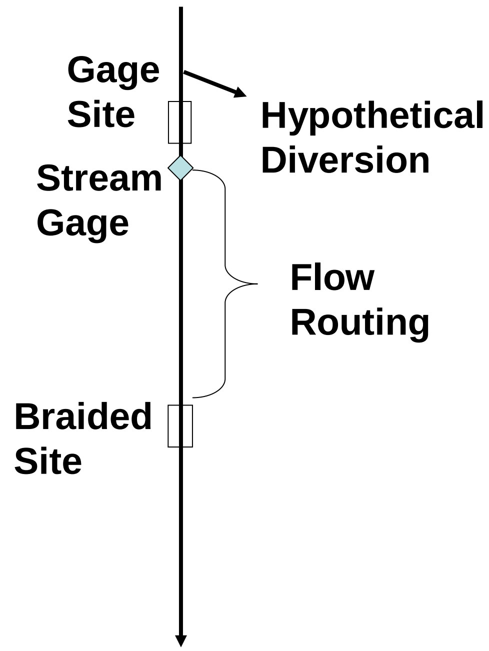


Figure 20. Configuration of stream and hypothetical diversion for water right calculations.

In addition to the basic calculations of changes to the flow regime and the habitat time series, the workbook also contains a number of habitat metrics designed to summarize the effects of the two scenarios compared to the historical baseline. The organization of the component pages of the CCHTSAM is illustrated in figure 21, and their functions are discussed in detail in the following sub-sections of this report.

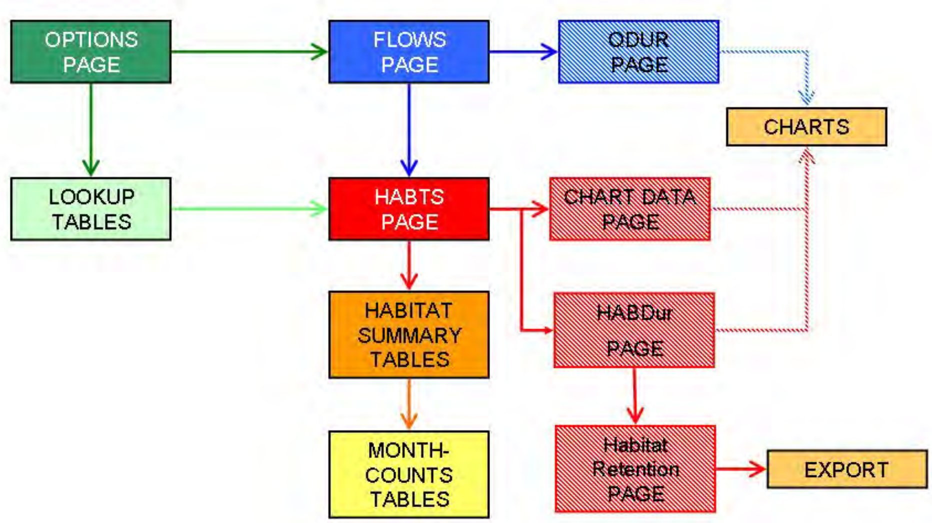


Figure 21. Component organization of the Cherry Creek Habitat Time Series Analysis Model.

The OPTIONS Page

The Options page (fig. 22) is the initial setup location for trial runs of the CCHTSAM. The first entry on this page allows the user to change the amount of a hypothetical withdrawal to be analyzed by the model and to select the target species for which the results of a run are to be calculated and displayed. This page also includes a number of selections for the type of output to be displayed. The selection buttons on the Options page are individually linked to Excel© macros that automatically update the calculations in the habitat time series, recalculate the habitat metrics, and direct the displays to a specific chart or table.

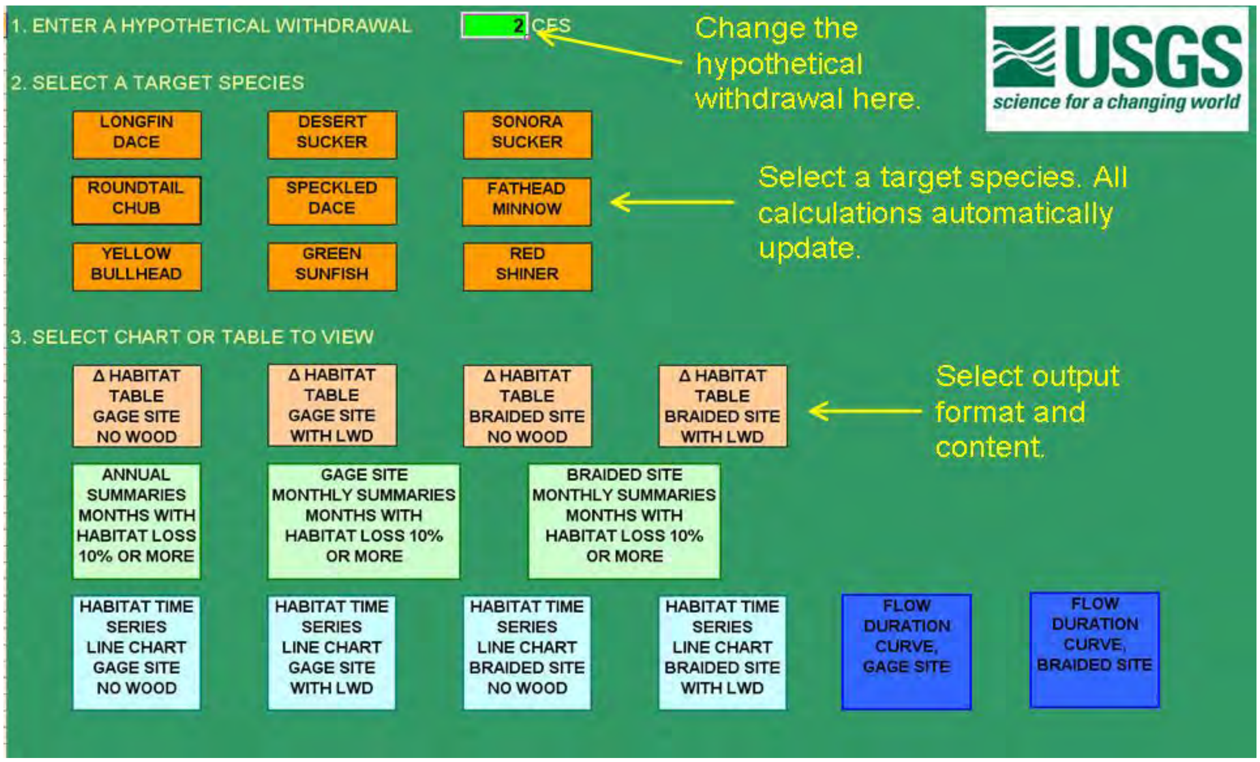


Figure 22. Layout and functions of the OPTIONS page in the CCHTSAM.

The FLOWS (Flow Time Series) page

Six different daily discharge cases are calculated and displayed on the FLOWS page (fig. 23). The simplest case is the baseline flow regime as measured at the Cherry Creek gage (highlighted in light yellow). Daily discharges in this column were recorded directly from the gage record, augmented by station regression as described earlier.

The light green column contains a synthesized record at the gage depicting the historical flows, with the hypothetical withdrawal in place but constrained by the proposed U.S.Forest Service water right. In this case, the daily discharge was calculated as the historical discharge minus the withdrawal, provided that the resulting flow remained higher than the monthly median. If the recorded historical discharge was smaller than the monthly median, the flow for the time step equaled the recorded flow. In those instances where the historical discharge was larger than the monthly median, but a reduction by the amount of the withdrawal would cause the flow to drop below the monthly median, the allowable withdrawal was reduced such that the flow for the time step equaled the monthly median.

Hypothetical withdrawal, in cubic feet per second	Water Right Application Monthly Median Flow	Baseline Q, Gage site	Gage Site Constrained to Median Monthly Flow	Gage Site Unconstrained to Median Monthly Flow	Baseline Q, Braided site	Braided Site Constrained to Median Monthly Flow	Braided Site Unconstrained to Median Monthly Flow
5		0	5	5	0	5	5
Date	Q, ft^3/s	Q, ft^3/s	Q, ft^3/s	Q, ft^3/s	Q, ft^3/s	Q, ft^3/s	Q, ft^3/s
5/4/1965	7.2	9.1	7.2	4.1	8.1	6.3	1.8
5/5/1965	7.2	8.5	7.2	3.5	7.7	6.3	1.8
5/6/1965	7.2	8.5	7.2	3.5	7.4	6.3	1.8
5/7/1965	7.2	8.5	7.2	3.5	7.2	6.3	1.8
5/8/1965	7.2	7.9	7.2	2.9	7.1	6.3	1.8
5/9/1965	7.2	7.9	7.2	2.9	6.8	6.3	1.8
5/10/1965	7.2	7.9	7.2	2.9	6.8	6.3	1.8
5/11/1965	7.2	7.4	7.2	2.4	7.0	6.3	1.8
5/12/1965	7.2	7.9	7.2	2.9	6.8	6.2	1.8
5/13/1965	7.2	8.5	7.2	3.5	6.7	6.2	1.7
5/14/1965	7.2	7.4	7.2	2.4	6.5	6.1	1.7
5/15/1965	7.2	6.9	6.9	1.9	6.1	6.1	1.6
5/16/1965	7.2	6.9	6.9	1.9	6.1	6.1	1.6
5/17/1965	7.2	6.9	6.9	1.9	6.2	6.2	1.7
5/18/1965	7.2	7.4	7.2	2.4	6.3	6.2	1.7
5/19/1965	7.2	7.4	7.2	2.4	6.5	6.3	1.8
5/20/1965	7.2	7.4	7.2	2.4	6.5	6.3	1.8
5/21/1965	7.2	7.4	7.2	2.4	6.5	6.3	1.8
5/22/1965	7.2	7.4	7.2	2.4	6.5	6.3	1.8
5/23/1965	7.2	7.4	7.2	2.4	6.5	6.3	1.8
5/24/1965	7.2	7.4	7.2	2.4	6.5	6.2	1.8
5/25/1965	7.2	7.4	7.2	2.4	6.3	6.2	1.7
5/26/1965	7.2	7.4	7.2	2.4	6.2	6.1	1.7
5/27/1965	7.2	6.9	6.9	1.9	6.1	5.9	1.6
5/28/1965	7.2	6.9	6.9	1.9	5.8	5.6	1.4
5/29/1965	7.2	6.9	6.9	1.9	5.5	5.3	1.1
5/30/1965	7.2	6	6	1	5.2	5.1	0.8
5/31/1965	7.2	5.6	5.6	0.6	4.9	4.9	0.6
6/1/1965	6	5.6	5.6	0.6	4.8	4.9	0.5

Figure 23. Layout of the FLOWS page in the CCHTSAM.

The pink column is also a synthetic record constructed similarly to the light green column, except that the proposed water right was not enforced. In this case, no monthly median constraint was applied for all time steps. The net result of this operation was that the daily flow for any time step was equal to the historical discharge minus the withdrawal or zero, whichever was larger (during periods of very low historical flows, the full withdrawal resulted in negative discharges).

The tan column on the FLOWS page represents the baseline flow regime at the Braided site. This is a synthetic time series that is based on the historical discharges at the gage but accounts for effects such as flow losses (due to seepage) and evapotranspiration between the gage and the Braided site. The gold and light aqua columns are similar to the light green and pink columns defined earlier. They represent the flow effects of the stipulated hypothetical withdrawal at the gage, with and without enforcement of the median monthly flow constraint, respectively, and accounting for time lags and conveyance losses in the same manner used to calculate the baseline at the Braided site.

For simplicity, the light green and gold columns depicting the effects of the withdrawal constrained by the median monthly flow are defined as “Scenario 1” in subsequent summary tables and graphs. The pink and light aqua columns, representing the unconstrained withdrawal are referred to as “Scenario 2.”

The LOOKUP (Lookup Tables) page

Lookup tables (fig. 24) contain the flow-habitat data derived from the GIS habitat mapping process. The discharges recorded in the lookup table correspond to the flows that were simulated with River2D. The habitat areas associated with each flow were normalized according to site length (units = m^2/km). Four separate lookup tables were created: for the Gage site with and without LWD and for the Braided site with and without LWD.

The format of the lookup tables may seem confusing but they were designed for computational efficiency in the habitat time series calculations. The values contained in a column for discharge or habitat for a target species are offset and repeated in the adjacent column. For example, the discharges contained in figure 24 ranged from 0 to 9,996 ft^3/s as listed in column C. The same discharges are offset (moved up one row) in column D. Normalized habitat areas for the Sonora sucker for the same flow range are contained in column E and repeated with offset in column F. This design was used to facilitate linear interpolation of habitat areas for discharges in the flow time series that were intermediate to flows recorded in the lookup tables (see discussion of HABTS pages for more details).

Each lookup table consists of two parts (fig. 24). The first part, in columns C–F, is used in the habitat time series calculations. The second part, in columns H–Y, contains the normalized habitat areas for all of the target species, corresponding to the discharges listed in columns C and D. Each time a target species is selected on the OPTIONS page, the two columns of habitat data for that species are automatically copied from the array (columns H–Y) and pasted into columns E and F. This convention was adopted for the sake of computational efficiency, allowing updates to be completed in several seconds rather than several minutes.

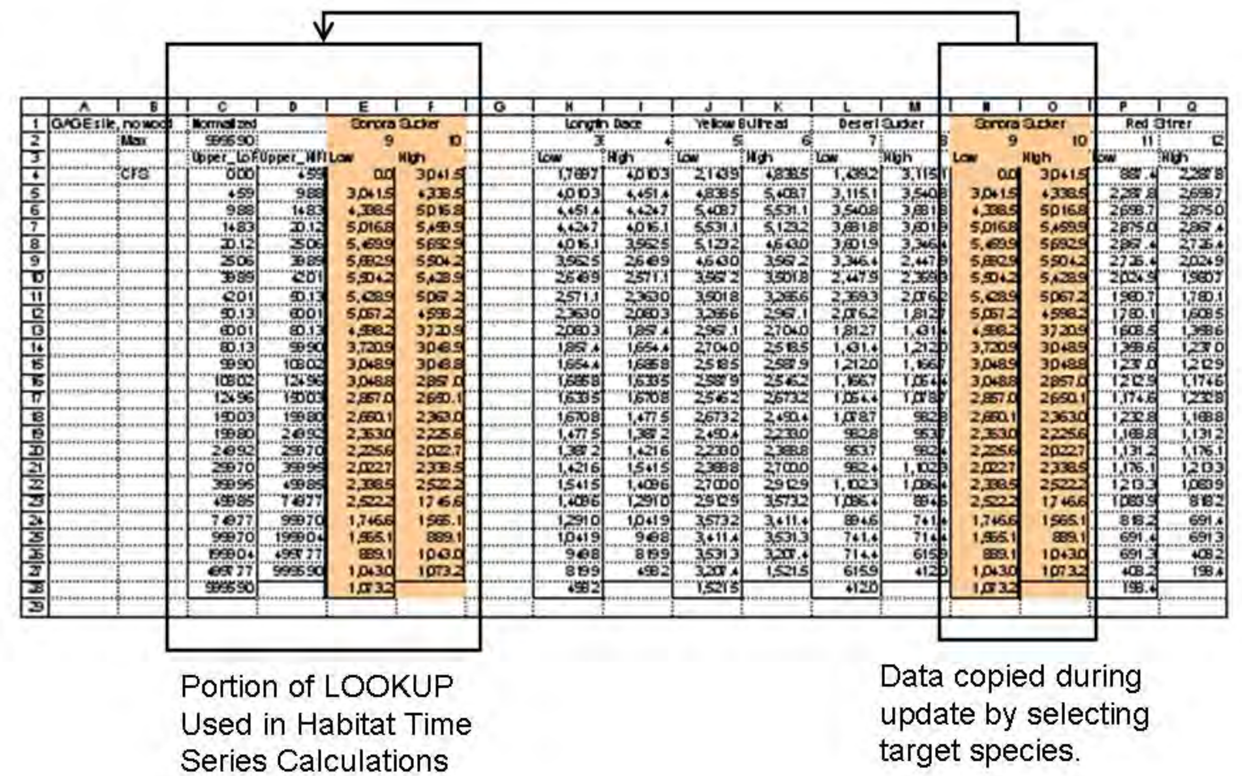


Figure 24. A portion of the lookup table for the Gage site, with no LWD included in the normalized habitat areas.

The HABTS (Habitat Time Series) page

Figure 25 illustrates a portion of the HABTS page, showing the layout of data and habitat time series calculation fields.

Columns A, B, and C contain various expressions of the date for each flow and habitat value in the spreadsheet. Columns B and C convert the date in column A to the appropriate year and month, respectively, for each entry. These conversions were necessary for subsequent use in pivot tables (used to perform various statistical analyses on the data) and to produce intelligible graphics. Discharges for the Baseline, Scenario 1, and Scenario 2 are listed in columns D–F and are linked by formula to the same discharges and dates as those found on the FLOWS page.

Columns G–I contain values for a rather ambiguous term called “Slope” for the baseline and the two scenarios. These “slopes” are actually ratios representing the linear distance of a discharge in columns D, E, or F between the lower and upper brackets of the flow range in the lookup table (LOOKUP) that would contain that discharge. For example, the baseline discharge on May 4, 1965, was 9.1 ft^3/s (cell D8, fig. 25). The flow range in the lookup table containing that discharge would be between 4.59 and 9.88 ft^3/s. The “slope” for that discharge is calculated as:

$$Slope = (Q_{INT} - Q_{LB}) / (Q_{UB} - Q_{LB}) \qquad (6)$$

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Cherry Creek														
2															
3	Hypothetical withdrawal in cfs =	5													
4				Gage Site											
5				No Wood											
6				Sonora Sucker											
7	Date	Year	Month	Baseline Q, Gage site	Gage Site Constrained to Median Monthly Flow	Gage Site Unconstrained to Median Monthly Flow	Base Slope	Scene 1 Slope	Scene 2 Slope	Base Normalized Area	Scenario 1 Normalized Area	Scenario 2 Normalized Area	Baseline 10-day Running Mean	Scenario 1 10-day Running Mean	Scenario 2 10-day Running Mean
8	5/4/1965	1965	5	9.1	7.20	4.1	0.8519	0.49	0.89	4146.43205	3681	2717.42			
9	5/5/1965	1965	5	8.5	7.20	3.5	0.7386	0.49	0.76	3999.46953	3681	2319.75			
10	5/6/1965	1965	5	8.5	7.20	3.5	0.7386	0.49	0.76	3999.46953	3681	2319.75			
11	5/7/1965	1965	5	8.5	7.20	3.5	0.7386	0.49	0.76	3999.46953	3681	2319.75			
12	5/8/1965	1965	5	7.9	7.20	2.9	0.6253	0.49	0.63	3852.50702	3681	1922.08	3928.438	3681	2127.54
13	5/9/1965	1965	5	7.9	7.20	2.9	0.6253	0.49	0.63	3852.50702	3681	1922.08	3886.798	3681	2014.87
14	5/10/1965	1965	5	7.9	7.20	2.9	0.6253	0.49	0.63	3852.50702	3681	1922.08	3847.608	3674	1908.82
15	5/11/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3808.418	3666	1802.77
16	5/12/1965	1965	5	7.9	7.20	2.9	0.6253	0.49	0.63	3852.50702	3681	1922.08	3769.228	3659	1696.73
17	5/13/1965	1965	5	8.5	7.20	3.5	0.7386	0.49	0.76	3999.46953	3681	2319.75	3756.981	3659	1663.59
18	5/14/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3744.735	3659	1630.45
19	5/15/1965	1965	5	6.9	6.90	1.9	0.4364	0.44	0.41	3607.5695	3608	1259.29	3732.488	3659	1597.31
20	5/16/1965	1965	5	6.9	6.90	1.9	0.4364	0.44	0.41	3607.5695	3608	1259.29	3732.488	3659	1597.31
21	5/17/1965	1965	5	6.9	6.90	1.9	0.4364	0.44	0.41	3607.5695	3608	1259.29	3720.241	3659	1564.17
22	5/18/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3693.298	3659	1491.27
23	5/19/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3693.298	3659	1491.27
24	5/20/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3705.545	3666	1524.40
25	5/21/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3717.791	3674	1557.54
26	5/22/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3717.791	3674	1557.54
27	5/23/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3705.545	3666	1524.40
28	5/24/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3693.298	3659	1491.27
29	5/25/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3659.006	3630	1398.48
30	5/26/1965	1965	5	7.4	7.20	2.4	0.5309	0.49	0.52	3730.03826	3681	1590.68	3614.918	3590	1279.17
31	5/27/1965	1965	5	6.9	6.90	1.9	0.4364	0.44	0.41	3607.5695	3608	1259.29	3570.829	3551	1159.87
32	5/28/1965	1965	5	6.9	6.90	1.9	0.4364	0.44	0.41	3607.5695	3608	1259.29	3526.74	3512	1040.57

HDUR_B_LWD / Chart_data / DAY_COUNTS / SUMMARY / LOOKUP / HABTS / QDUR / HabDUR /

Figure 25. A portion of the HABTS page, showing the layout of input data and calculation fields.

where

Q_{INT} is the interpolation discharge from column D
Q_{LB} is the lower bracket of the flow range in the lookup table
and
Q_{UB} is the upper bracket of the flow range.

For our example, the “slope” for a discharge of 9.1 ft^3/s would be:

Slope $Q_{9.1}$= (9.1 – 4.59)/(9.88 – 4.59) = 0.8519 (the value in cell G8, fig. 25). Simply put, this means that a discharge of 9.1 ft^3/s is 85.19 percent of the distance between 4.59 ft^3/s and 9.88 ft^3/s.

The habitat values corresponding to the daily discharges listed in columns D–F are located in columns J, K, and L, labeled respectively. These habitat values are determined by the following process:

1. The flow range corresponding to the daily discharge for the date (for example, May 4, 1965 in column D) is found in the lookup table.
2. The habitat area corresponding to that discharge is calculated as:

$$HA_Q = Slope_Q \times (HA_{UB} - HA_{LB}) + HA_{LB} \quad (7)$$

where
HA_Q is the habitat area corresponding to the daily discharge
$Slope_Q$ is the slope for the discharge calculated in equation 6
and
HA_{UB} is the habitat area for the upper bracket of habitat areas from the lookup table (for example, column F in fig. 24)
and
HA_{LB} is the habitat area for the lower bracket (for example, column E in figure 24).

Following the example for a discharge of 9.1 ft^3/s, the habitat area for Sonora suckers (without LWD) corresponding to the upper bracket (9.88 ft^3/s) is 4,338.5 m^2/km and is 3,041.5 m^2/km for the lower bracket (4.59 ft^3/s). The habitat area associated with a discharge of 9.1 ft^3/s is calculated as:

$$HA_{Q9.1} = 0.8519 \times (4{,}338.5 - 3{,}041.5) + 3{,}041.5 = 4146.43 \quad (8)$$

where 4146.43 is the value in cell J8, fig. 25.

Columns M–O contain the calculations for the habitat metric used in this analysis to represent biologically significant habitat conditions for a particular time period. Biological significance in this context refers to a habitat limitation of sufficient magnitude and duration to be a potential limiting factor or bottleneck constraining population size, growth, or survival of the target species. For this analysis, we selected the lowest consecutive 10-day average habitat value for each month as the habitat metric by which the scenarios were compared to the baseline. The values in columns M–O represent the first step in the computation of the habitat metric, containing 10-day centered running means for each date (the value recorded for a particular day is the average of the previous four days, the current day, and the five following days).

A pivot table for each habitat time series group (for example, Gage site with no LWD) is located at the bottom of the time series computation rows (fig. 26). These pivot tables array the minimum 10-day running mean from columns M–O (fig. 25) for each month and year in the time series. The pivot tables are automatically updated whenever a target species button is activated on the OPTIONS page.

		Month								
Year	Data	1	2	3	4	5	6	7	8	9
1965	Min of Baseline 10-day Running Mean					3,414	2,519	2,657	2,642	2,698
	Min of Scenario1 10-day Running Mean					3,414	2,519	2,679	2,642	2,698
	Min of Scenario2 10-day Running Mean					736	0	412	0	0
1966	Min of Base	2,382	5,445	5,007	4,129	3,387	3,289	3,142	3,514	3,336
	Min of Scen	2,432	5,026	4,635	3,919	3,387	3,289	3,142	3,514	3,336
	Min of Scen	2,432	5,026	4,299	2,671	663	398	0	1,007	524
1967	Min of Base	3,495	3,314	3,350	3,213	3,240	3,142	3,133	3,387	3,314
	Min of Scen	3,495	3,314	3,350	3,213	3,240	3,142	3,142	3,387	3,314
	Min of Scen	954	464	563	192	265	0	0	663	464
1968	Min of Base	2,334	2,428	3,024	4,792	3,725	3,370	3,492	3,725	3,502
	Min of Scen	2,353	2,444	3,129	3,982	3,534	3,299	3,436	3,696	3,460
	Min of Scen	2,353	2,444	3,129	3,923	1,577	643	948	1,577	974
1969	Min of Base	3,004	4,141	3,242	4,574	4,012	3,446	3,412	3,421	3,292
	Min of Scen	3,094	4,338	3,373	3,975	3,534	3,387	3,392	3,421	3,292
	Min of Scen	2,274	4,338	3,373	3,534	2,353	822	729	756	404
1970	Min of Base	3,654	3,571	4,052	3,615	3,370	3,077	2,830	3,027	2,853
	Min of Scen	3,654	3,571	4,047	3,615	3,365	3,077	2,830	2,975	2,705
	Min of Scen	1,385	1,160	2,448	1,279	616	7	0	333	570
1971	Min of Base	3,593	3,676	3,606	3,127	3,070	2,605	2,625	2,981	2,922
	Min of Scen	3,593	3,676	3,606	3,127	3,070	2,605	2,625	2,981	2,929
	Min of Scen	1,220	1,445	1,259	7	0	0	0	159	0

Figure 26. A portion of a pivot table located below the habitat time series computation group for the Gage site, with no LWD, on the HABTS page.

The SUMMARY Page

The SUMMARY page (fig. 27) contains calculated differences in the lowest 10-day monthly averages between the baseline and the two scenarios, respectively. These differences are expressed as percentages, calculated as:

$$\Delta \% = ((HAB_{SCEN} - HAB_{BASE})/HAB_{BASE}) \times 100\% \qquad (9)$$

where

HAB_{SCEN} is the habitat metric for one of the scenarios

and

HAB_{BASE} is the habitat metric for the baseline.

These two variables are linked to the pivot tables on the HABTS page and the summary table updates automatically whenever a target species button is activated on the OPTIONS page.

Calculated differences in the habitat metrics are arrayed by month (in columns) and years (in rows). Below each month at the top of the table, the columns are segregated by scenario. Scenario 1 is highlighted with a light green background and Scenario 2 with a pink background. Individual cells in the body of the summary table are conditionally formatted such that the background of the cell turns red if the habitat metric for the scenario is 10 percent or more lower than it was for the baseline for the same time period. Cell backgrounds turn green if the habitat metric for a scenario is 10 percent or more higher than it was for the baseline. This convention allows a quick visual comparison of the effects of the two scenarios, given a stipulated hypothetical withdrawal.

The MONTH-COUNTS page

The MONTH-COUNTS page contains a count of the number of months in which either scenario produced a habitat reduction of 10 percent or more, as calculated on the SUMMARY page. Two groups of tables are presented on this sheet. The first group contains the month-count for each scenario and site,

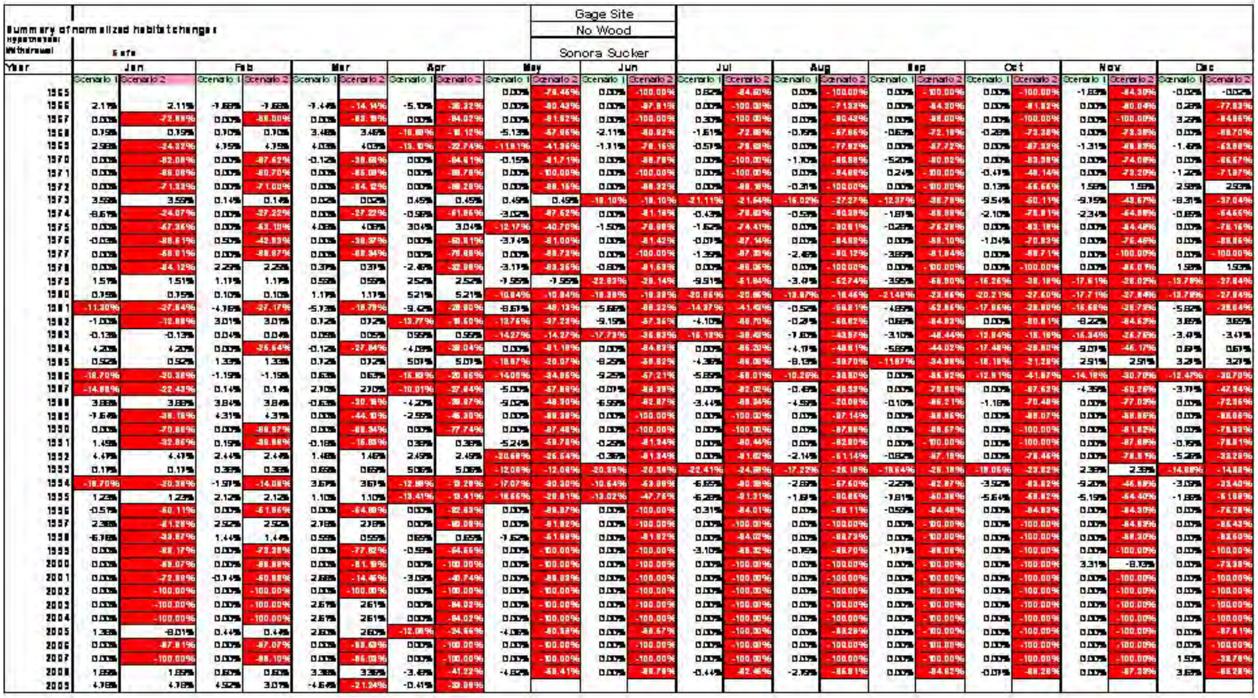


Figure 27. A habitat summary table for Sonora sucker at the Gage site, without LWD, found on the SUMMARY page of the CCHTSAM workbook. Red cells indicate months when reduction in Sonora sucker habitat decreased by more than 10% compared to the baseline condition.

summarized for the entire period of record (fig. 28). The second group contains month-counts arrayed by month and summarized for all years (fig. 29). These tables can be accessed individually by selecting one of the light green activator buttons on the OPTIONS page.

The AGGREGATE SUMMARIES page

The summary tables generated in the CCHTSAM (fig. 27, for example) are useful for examining the effects of various scenarios month-by-month, year-by-year, and species-by-species, but not as useful for comparing effects across all years and all species simultaneously. We developed a series of individual Excel© spreadsheets to perform the latter type of analysis: one for each site, condition (with or without LWD), and scenario (hypothetical diversion with and without enforcement of the water right). These spreadsheets are only partially interactive and require a certain amount of user intervention to generate aggregate summary charts. To update the aggregate summary spreadsheets, both the CCHTSAM workbook and one of the aggregate summary workbooks must be open at the same time. Raw data from the SUMMARY page (fig. 27) are updated in the aggregate summary workbook and reformatted as input to a pivot table each time a target species activator button is selected on the OPTIONS page of the CCHTSAM spreadsheet. The reformatted data must be copied and pasted as values in the appropriate columns on the “Monthly Data” page of the aggregate summary workbook (fig. 30). These data serve as input to a pivot table, which must be manually updated to calculate the average monthly percentage difference in the habitat metric for all years and target species (fig. 31). Data from the pivot table are plotted as a bar chart (fig. 32), which updates automatically whenever the pivot table is updated.

Gage Site, No Wood	Sonora Sucker		Gage Site, With LWD	Sonora Sucker	
Hypothetical Withdrawal	5 cfs		Hypothetical Withdrawal	5 cfs	
	Scenario 1	Scenario 2		Scenario 1	Scenario 2
TOTAL MONTHS WITH HABITAT REDUCTION OF 10% OR MORE	60	446	TOTAL MONTHS WITH HABITAT REDUCTION OF 10% OR MORE	72	467

Braided Site, No Wood	Sonora Sucker		Braided Site, With LWD	Sonora Sucker	
Hypothetical Withdrawal	5 cfs		Hypothetical Withdrawal	5 cfs	
	Scenario 1	Scenario 2		Scenario 1	Scenario 2
TOTAL MONTHS WITH HABITAT REDUCTION OF 10% OR MORE	34	475	TOTAL MONTHS WITH HABITAT REDUCTION OF 10% OR MORE	0	171

Figure 28. An example of the "full period" table found on the MONTHS-COUNT page.

TOTAL MONTHS WITH HABITAT REDUCTION OF 10% OR MORE

Gage Site
No Wood
Sonora Sucker

Hypothetical Withdrawal 5 cfs

	Jan		Feb		Mar		Apr		May		Jun	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
All Years	4	29	0	22	0	22	8	34	11	42	7	44
	Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
	5	44	4	44	4	44	8	44	5	40	4	37

TOTAL MONTHS WITH HABITAT REDUCTION OF 10% OR MORE

Gage Site
With LWD
Sonora Sucker

Hypothetical Withdrawal 5 cfs cfs

	Jan		Feb		Mar		Apr		May		Jun	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
All Years	7	32	2	27	0	25	10	37	11	42	6	44
	Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
	5	44	3	44	4	44	8	44	9	44	7	40

Figure 29. An example of a "month-by-month" table found on the MONTHS-COUNT page.

Braided Site
With LWD
withdrawal 10.00

Month	Sonora suc	Sonora sucker 2	Speckled d	Speckled dace 2	Desert Suc	Desert Sucker 2	Longfin Da	Longfin Dace 2	Roundtail c	Roundtail chub 2	Fathead m	Fathead minnow 2	Yellow Bull	Yellow Bullhead 2	Green sun	Green sunfish 2	Red Shine	Red Shiner 2
Jan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Jan	0.52%	-0.81%	4.42%	8.48%	-0.25%	-0.21%	2.17%	5.66%	-5.50%	-0.42%	-0.19%	-0.81%	3.18%	6.70%	-1.94%	-3.22%	2.08%	3.44%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.43%	0.00%	-44.17%	0.00%	-77.43%	0.00%	-43.55%	0.00%	-50.23%	0.00%	-47.57%	0.00%	-18.49%
Jan	-0.08%	1.15%	4.17%	6.87%	-0.69%	2.71%	-0.61%	1.79%	-0.90%	1.07%	-1.25%	1.38%	-0.92%	2.37%	-0.61%	1.17%	0.54%	7.09%
Jan	1.34%	-100.00%	1.74%	-100.00%	1.16%	-6.22%	2.05%	-14.44%	0.83%	-75.97%	1.82%	6.61%	2.69%	-28.94%	2.44%	7.07%	2.15%	1.94%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.70%	0.00%	-44.66%	0.00%	-77.49%	0.00%	-44.00%	0.00%	-51.12%	0.00%	-48.13%	0.00%	-19.56%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.60%	0.00%	-44.47%	0.00%	-77.47%	0.00%	-43.83%	0.00%	-50.78%	0.00%	-47.91%	0.00%	-19.15%
Jan	0.00%	-100.00%	0.00%	-100.00%	3.75%	-17.90%	3.25%	-39.37%	0.03%	-76.76%	6.44%	-34.02%	0.00%	-50.34%	4.57%	-40.82%	0.00%	-18.62%
Jan	0.83%	2.99%	2.75%	6.30%	0.55%	1.29%	2.96%	5.35%	0.48%	-3.57%	3.96%	10.00%	4.21%	8.22%	4.47%	11.92%	1.66%	3.72%
Jan	1.19%	-78.80%	0.72%	-76.80%	0.42%	-12.33%	2.18%	-29.60%	-0.79%	-56.88%	5.92%	-25.24%	0.83%	-43.17%	5.19%	-30.89%	0.68%	-19.30%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.79%	0.00%	-44.83%	0.00%	-77.51%	0.00%	-44.16%	0.00%	-51.43%	0.00%	-48.32%	0.00%	-19.94%
Jan	-0.15%	-100.00%	-2.28%	-100.00%	-2.66%	-18.04%	-4.32%	-35.51%	-0.90%	-76.06%	-7.12%	-35.39%	-3.85%	-42.99%	-6.97%	-39.02%	-3.04%	-12.08%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-24.90%	0.00%	-43.16%	0.00%	-77.30%	0.00%	-42.63%	0.00%	-48.37%	0.00%	-46.43%	0.00%	-16.26%
Jan	-0.72%	-100.00%	-4.63%	-100.00%	-1.52%	-10.36%	-3.02%	-25.91%	0.96%	-75.50%	-3.29%	-12.64%	-2.83%	-37.60%	-3.36%	-15.83%	-3.18%	-7.81%
Jan	-0.36%	1.31%	2.16%	7.95%	0.00%	2.21%	-0.20%	4.47%	-1.66%	-0.36%	-2.05%	-1.56%	-0.44%	5.06%	-1.80%	-2.62%	1.98%	6.56%
Jan	2.51%	-75.62%	1.54%	-70.67%	4.42%	0.29%	3.69%	-3.73%	1.76%	-54.61%	11.20%	-4.71%	2.20%	-16.66%	10.24%	-5.77%	5.25%	-1.60%
Jan	0.00%	-100.00%	0.00%	-100.00%	2.08%	-22.58%	0.00%	-42.82%	1.70%	-76.46%	0.00%	-42.32%	0.00%	-47.72%	0.00%	-46.04%	0.00%	-15.49%
Jan	-1.39%	-25.65%	-2.10%	-21.90%	-1.83%	-1.27%	-5.24%	-2.69%	-2.29%	-24.57%	-9.51%	-0.25%	-4.79%	-6.89%	-9.23%	-0.95%	-2.31%	-1.25%
Jan	-2.26%	-1.32%	-4.59%	-3.08%	-2.30%	-0.11%	-5.08%	-3.35%	0.46%	1.60%	-12.93%	-10.60%	-6.38%	-3.99%	-12.92%	-10.21%	-5.39%	-0.37%
Jan	2.06%	-3.81%	3.29%	8.22%	-1.18%	1.69%	2.91%	6.73%	-2.27%	4.33%	10.22%	26.45%	6.33%	6.68%	12.49%	29.01%	0.89%	3.54%
Jan	1.27%	1.96%	2.21%	5.61%	1.42%	4.14%	1.39%	3.30%	1.28%	0.88%	1.96%	2.78%	1.79%	4.45%	1.84%	2.38%	2.25%	8.15%
Jan	-1.12%	-59.58%	2.52%	-53.96%	1.33%	-6.67%	1.34%	-22.75%	0.00%	-34.24%	-0.42%	-27.48%	-0.77%	-34.30%	-0.38%	-30.55%	-0.96%	-18.29%
Jan	-6.89%	-73.19%	2.07%	-68.96%	0.26%	-9.03%	2.27%	-23.72%	0.21%	-49.86%	4.41%	-8.72%	-3.90%	-40.00%	6.46%	-15.18%	-3.06%	-18.57%
Jan	1.01%	-56.13%	1.15%	-54.52%	1.48%	-1.74%	3.93%	1.12%	1.07%	-43.14%	4.80%	9.82%	6.15%	-7.63%	5.25%	11.04%	2.74%	1.14%
Jan	-0.01%	-82.47%	-2.98%	-80.70%	0.81%	-11.15%	1.83%	-29.95%	-3.09%	-59.68%	14.36%	-27.24%	-1.31%	-45.32%	9.35%	-35.02%	1.30%	-17.60%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.43%	0.00%	-44.16%	0.00%	-77.42%	0.00%	-43.54%	0.00%	-50.21%	0.00%	-47.55%	0.00%	-18.46%
Jan	-2.14%	-100.00%	-5.88%	-100.00%	-1.97%	-6.24%	-6.29%	-21.42%	-1.27%	-75.89%	-5.70%	0.58%	-8.29%	-37.92%	-5.65%	-1.35%	-5.11%	-2.24%
Jan	1.39%	2.70%	3.12%	5.37%	1.15%	0.53%	6.34%	10.62%	-2.19%	-1.50%	4.03%	13.07%	8.82%	16.70%	4.04%	15.28%	2.73%	3.34%
Jan	1.11%	1.36%	1.03%	3.49%	2.25%	3.80%	1.89%	3.10%	1.56%	1.13%	2.46%	2.24%	2.02%	3.71%	0.10%	-2.76%	2.84%	6.78%
Jan	-2.57%	-59.79%	-1.76%	-55.15%	0.00%	-7.71%	-1.12%	-23.71%	0.00%	-34.09%	-5.27%	-27.77%	-2.53%	-34.29%	-5.19%	-30.74%	-1.97%	-18.39%
Jan	1.27%	1.53%	1.67%	2.02%	3.12%	4.37%	2.20%	2.85%	-1.92%	2.25%	-3.15%	1.63%	3.08%	4.04%	-5.21%	0.93%	5.66%	7.86%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.97%	0.00%	-45.17%	0.00%	-77.56%	0.00%	-44.46%	0.00%	-52.01%	0.00%	-48.69%	0.00%	-20.65%
Jan	1.43%	-100.00%	1.14%	-100.00%	1.49%	-5.91%	1.67%	-14.56%	-2.01%	-75.96%	4.88%	8.93%	3.47%	-29.74%	4.92%	6.18%	2.68%	0.40%
Jan	-0.65%	-98.14%	-1.82%	-98.08%	0.03%	-19.95%	0.61%	-43.01%	-1.91%	-74.59%	-0.29%	-43.55%	-0.65%	-51.07%	-0.39%	-47.74%	-0.48%	-20.32%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.54%	0.00%	-44.38%	0.00%	-77.45%	0.00%	-43.74%	0.00%	-50.60%	0.00%	-47.80%	0.00%	-18.94%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.02%	0.00%	-42.47%	0.00%	-76.95%	0.00%	-42.25%	0.00%	-46.13%	0.00%	-45.25%	0.00%	-14.10%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.34%	0.00%	-44.16%	0.00%	-77.35%	0.00%	-43.54%	0.00%	-50.22%	0.00%	-47.56%	0.00%	-18.47%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.08%	0.00%	-42.43%	0.00%	-76.90%	0.00%	-42.25%	0.00%	-45.89%	0.00%	-45.13%	0.00%	-13.90%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-21.63%	0.00%	-37.76%	0.00%	-73.26%	0.00%	-37.60%	0.00%	-41.05%	0.00%	-40.35%	0.00%	-11.69%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-21.63%	0.00%	-37.76%	0.00%	-73.26%	0.00%	-37.60%	0.00%	-41.05%	0.00%	-40.35%	0.00%	-11.69%
Jan	1.03%	3.83%	1.70%	7.74%	1.33%	1.46%	2.96%	8.16%	-2.12%	-0.42%	5.76%	-4.69%	2.06%	-2.14%	6.36%	-4.60%	1.26%	3.26%
Jan	0.00%	-100.00%	0.00%	-100.00%	0.00%	-25.05%	0.00%	-42.45%	0.00%	-76.92%	0.00%	-42.25%	0.00%	-45.99%	0.00%	-45.18%	0.00%	-13.98%
Jan	0.00%	-100.00%	0.00%	-100.00%	-0.09%	-25.09%	0.00%	-42.42%	0.00%	-76.88%	0.00%	-42.25%	0.00%	-45.82%	0.00%	-45.10%	0.00%	-13.85%
Jan	-2.34%	-28.86%	-4.94%	-24.50%	-2.46%	0.64%	-4.49%	3.00%	-2.28%	-17.92%	1.56%	5.13%	2.48%	1.43%	1.31%	5.61%	-6.93%	-6.03%

Figure 30. A portion of the "Monthly Data" page of an aggregate summary spreadsheet. Data for each species must be copied from the "HTS_transform" page and pasted as values into the appropriate columns for the species.

	Month												
Data	Jan	Feb	Mar	Apr	May	June	July	August	September	October	November	December	Grand Total
Average of Sonora sucker 1	-0.08%	0.42%	0.69%	-0.28%	-0.54%	-0.81%	-0.84%	0.72%	-0.89%	-0.77%	-0.04%	-1.78%	-0.35%
Average of Speckled dace 1	0.15%	0.95%	1.32%	0.51%	0.88%	-0.26%	-0.40%	0.67%	-0.48%	-0.61%	0.04%	-1.49%	0.11%
Average of Desert Sucker 1	0.28%	0.73%	0.71%	0.70%	1.34%	0.74%	0.97%	0.77%	0.21%	0.22%	0.37%	-0.02%	0.59%
Average of Longfin Dace 1	0.35%	0.95%	1.39%	1.69%	0.93%	0.07%	0.43%	0.41%	-0.06%	0.18%	0.15%	-0.70%	0.48%
Average of Roundtail chub 1	-0.47%	0.14%	0.37%	-0.94%	1.02%	0.69%	0.47%	0.39%	-0.29%	-0.19%	0.40%	-0.13%	0.12%
Average of Fathead minnow 1	0.74%	1.88%	1.94%	5.01%	2.03%	-0.05%	1.45%	0.80%	0.03%	0.66%	-0.23%	-0.11%	1.18%
Average of Yellow Bullhead 1	0.29%	0.96%	1.44%	1.06%	-0.07%	-0.56%	-0.60%	0.33%	-0.59%	-0.18%	-0.17%	-1.56%	0.03%
Average of Green sunfish 1	0.58%	1.78%	1.98%	4.45%	1.63%	-0.20%	1.06%	0.57%	-0.14%	0.46%	-0.14%	-0.32%	0.98%
Average of Red Shiner 1	0.10%	0.94%	1.24%	0.55%	0.20%	-0.46%	-0.50%	-0.02%	-0.26%	-0.02%	-0.15%	-1.36%	0.02%
Average of Sonora sucker 2	-64.26%	-49.74%	-45.92%	-76.58%	-90.16%	-94.17%	-93.76%	-93.88%	-94.59%	-94.23%	-93.77%	-83.30%	-81.23%
Average of Speckled dace 2	-62.41%	-47.36%	-41.91%	-74.02%	-89.08%	-94.00%	-93.54%	-93.81%	-94.50%	-94.07%	-93.39%	-81.77%	-80.02%
Average of Desert Sucker 2	-11.53%	-9.46%	-7.69%	-14.51%	-19.62%	-21.46%	-19.74%	-18.74%	-19.65%	-19.99%	-19.28%	-16.36%	-16.51%
Average of Longfin Dace 2	-21.93%	-17.26%	-14.66%	-27.94%	-36.97%	-38.30%	-37.15%	-36.40%	-36.59%	-36.43%	-35.29%	-30.49%	-30.80%
Average of Roundtail chub 2	-48.37%	-37.55%	-34.00%	-57.13%	-67.23%	-70.16%	-69.57%	-70.63%	-71.06%	-70.86%	-71.09%	-62.78%	-60.89%
Average of Fathead minnow 2	-19.45%	-14.35%	-11.99%	-23.38%	-35.41%	-37.98%	-35.14%	-32.68%	-32.80%	-33.07%	-32.41%	-26.48%	-27.94%
Average of Yellow Bullhead 2	-27.78%	-21.01%	-18.49%	-34.51%	-42.99%	-43.10%	-42.68%	-42.90%	-42.73%	-42.43%	-41.69%	-37.25%	-36.48%
Average of Green sunfish 2	-21.91%	-16.35%	-14.03%	-27.16%	-39.38%	-41.27%	-39.17%	-37.10%	-37.02%	-37.03%	-36.16%	-29.63%	-31.37%
Average of Red Shiner 2	-8.41%	-6.28%	-5.59%	-12.52%	-15.13%	-14.59%	-14.38%	-14.24%	-13.72%	-13.45%	-13.17%	-12.37%	-11.99%

Braided Site
With LWD

Hypothetical
Withdrawal 10 cfs

Month	Sonora sucker 1	Sonora sucker 2	Speckled dace 1	Speckled dace 2	Desert Sucker 1	Desert Sucker 2	Longfin Dace 1	Longfin Dace 2	Roundtail chub 1	Roundtail chub 2	Fathead minnow 1	Fathead minnow 2	Yellow Bullhead 1	Yellow Bullhead 2	Green sunfish 1	Green sunfish 2	Red Shiner 1	Red Shiner 2
Jan	-0.08%	-64.26%	0.15%	-62.41%	0.28%	-11.53%	0.35%	-21.93%	-0.47%	-48.37%	0.74%	-19.45%	0.29%	-27.78%	0.58%	-21.91%	0.10%	-8.41%
Feb	0.42%	-49.74%	0.95%	-47.36%	0.73%	-9.46%	0.95%	-17.26%	0.14%	-37.55%	1.88%	-14.35%	0.96%	-21.01%	1.78%	-16.35%	0.94%	-6.28%
Mar	0.69%	-45.92%	1.32%	-41.91%	0.71%	-7.69%	1.39%	-14.66%	0.37%	-34.00%	1.94%	-11.99%	1.44%	-18.49%	1.98%	-14.03%	1.24%	-5.59%
Apr	-0.28%	-76.58%	0.51%	-74.02%	0.70%	-14.51%	1.69%	-27.94%	-0.94%	-57.13%	5.01%	-23.38%	1.06%	-34.51%	4.45%	-27.16%	0.55%	-12.52%
May	-0.54%	-90.16%	0.88%	-89.08%	1.34%	-19.62%	0.93%	-36.97%	1.02%	-67.23%	2.03%	-35.41%	-0.07%	-42.99%	1.63%	-39.38%	0.20%	-15.13%
June	-0.81%	-94.17%	-0.26%	-94.00%	0.74%	-21.46%	0.07%	-38.30%	0.69%	-70.16%	-0.05%	-37.98%	-0.56%	-43.10%	-0.20%	-41.27%	-0.46%	-14.59%
July	-0.84%	-93.76%	-0.40%	-93.54%	0.97%	-19.74%	0.43%	-37.15%	0.47%	-69.57%	1.45%	-35.14%	-0.60%	-42.68%	1.06%	-39.17%	-0.50%	-14.38%
Aug	0.72%	-93.88%	0.67%	-93.81%	0.77%	-18.74%	0.41%	-36.40%	0.39%	-70.63%	0.80%	-32.68%	0.33%	-42.90%	0.57%	-37.10%	-0.02%	-14.24%
Sept	-0.89%	-94.59%	-0.48%	-94.50%	0.21%	-19.65%	-0.06%	-36.59%	-0.29%	-71.06%	0.03%	-32.80%	-0.59%	-42.73%	-0.14%	-37.02%	-0.26%	-13.72%
Oct	-0.77%	-94.23%	-0.61%	-94.07%	0.22%	-19.99%	0.18%	-36.43%	-0.19%	-70.86%	0.66%	-33.07%	-0.18%	-42.43%	0.46%	-37.03%	-0.02%	-13.45%
Nov	-0.04%	-93.77%	0.04%	-93.39%	0.37%	-19.28%	0.15%	-35.29%	0.40%	-71.09%	-0.23%	-32.41%	-0.17%	-41.69%	-0.14%	-36.16%	-0.15%	-13.17%
Dec	-1.78%	-83.30%	-1.49%	-81.77%	-0.02%	-16.36%	-0.70%	-30.49%	-0.13%	-62.78%	-0.11%	-26.48%	-1.56%	-37.25%	-0.32%	-29.63%	-1.36%	-12.37%

Figure 31. Pivot table page of an aggregate summary spreadsheet. The pivot table at the top must be manually updated. The table at the bottom of the page is formatted for plotting and automatically updates from the pivot table.

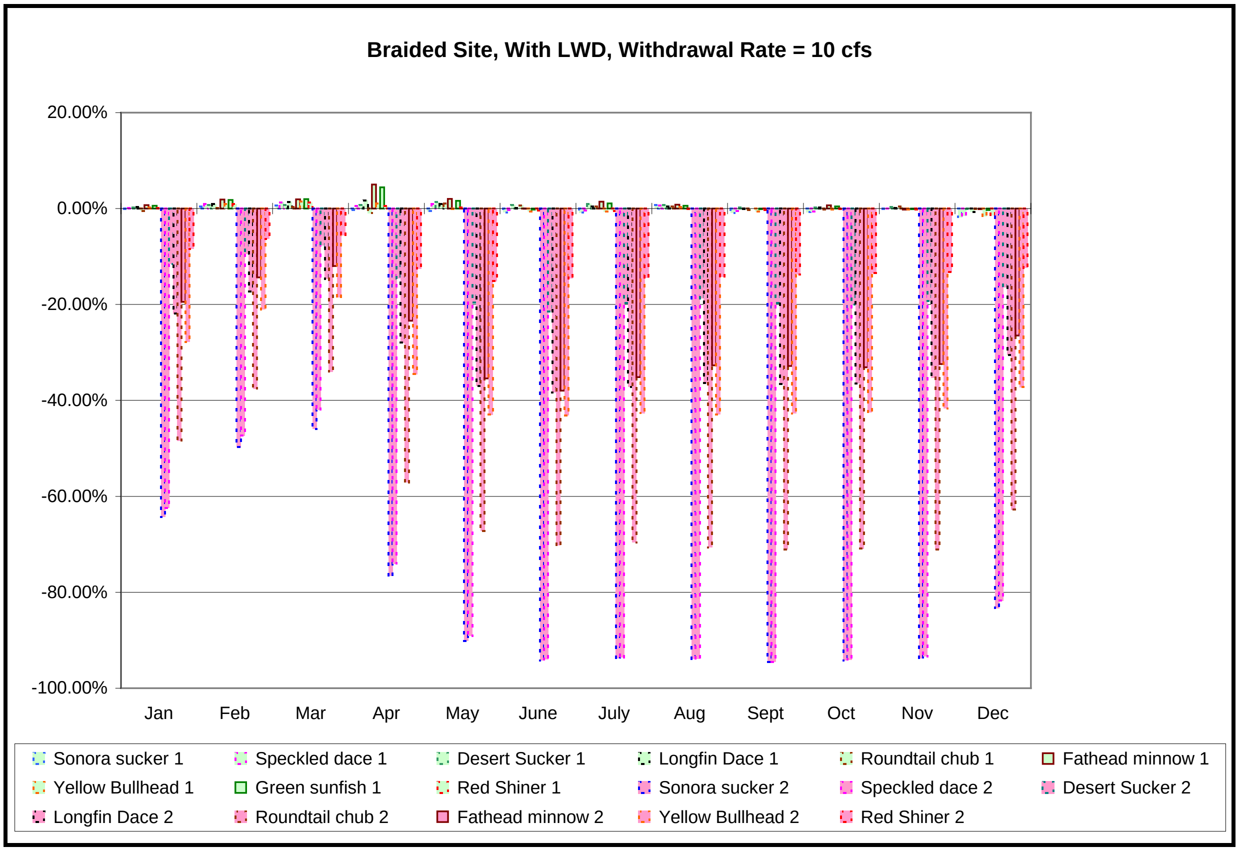


Figure 32. Example of an aggregate summary bar chart. Chart series are ordered such that results for Scenario 1 (water right enforced) are grouped to the left for each month and displayed with light green bars. Results for scenario 2 (water right not enforced) are grouped to the right for each month and displayed with pink bars. Series for individual species are delineated by various colors and patterns of bar outlines.

Graphics

A variety of charts are included in the CCHTSAM to facilitate visualization of the time series data embodied in the workbook and to assist in the interpretation of causal relations. These graphs are presented in two basic formats. The first type is a sequential habitat time series showing the lowest 10-day habitat value for the baseline and both scenarios for each month and year in the period of record (fig. 33). Individual charts for a particular site and habitat value with and without LWD are accessed by selecting one of the light aqua activator buttons on the OPTIONS page (or by selecting an appropriate tab in the body of the workbook).

The second type of chart is in the format of a duration curve, which plots the value of a variable against the probability that the value will be equaled or exceeded (fig. 34). Both habitat duration and flow duration curves are available and can be accessed by selecting one of the blue activator buttons on the OPTIONS page. In contrast to the time series charts illustrated in figure 33, data for a duration curve must be updated (using the activator button) each time a change is made in the workbook (for example, selecting a different target species or stipulating a different withdrawal rate). The time series charts are automatically updated whenever a change is made, so an up-to-date chart can be viewed by selecting a chart tab in the body of the workbook. The duration curve charts are only updated when the activator button is clicked.

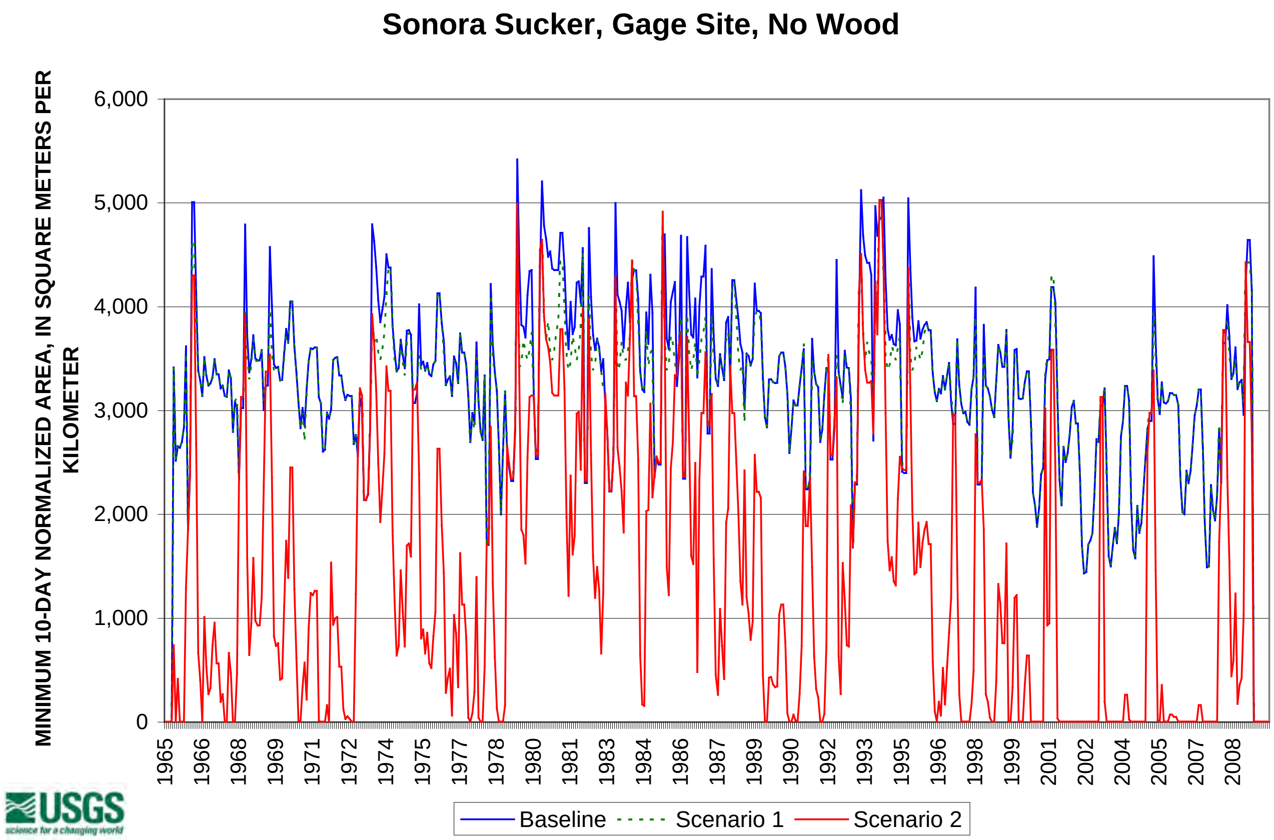


Figure 33. An example of a habitat time series chart.

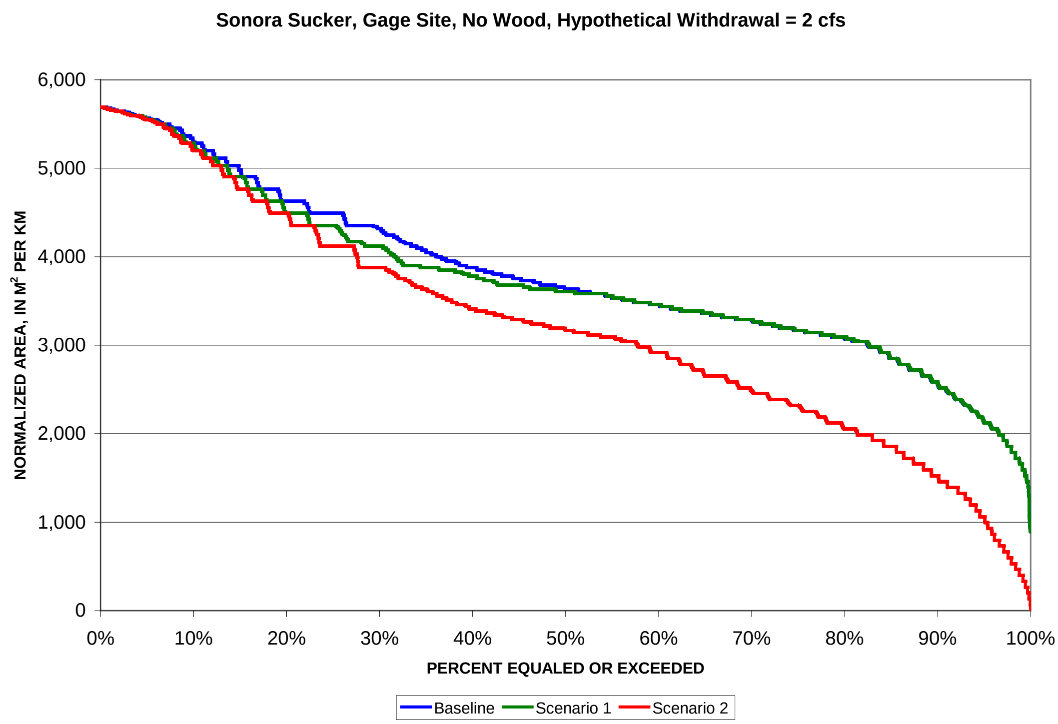
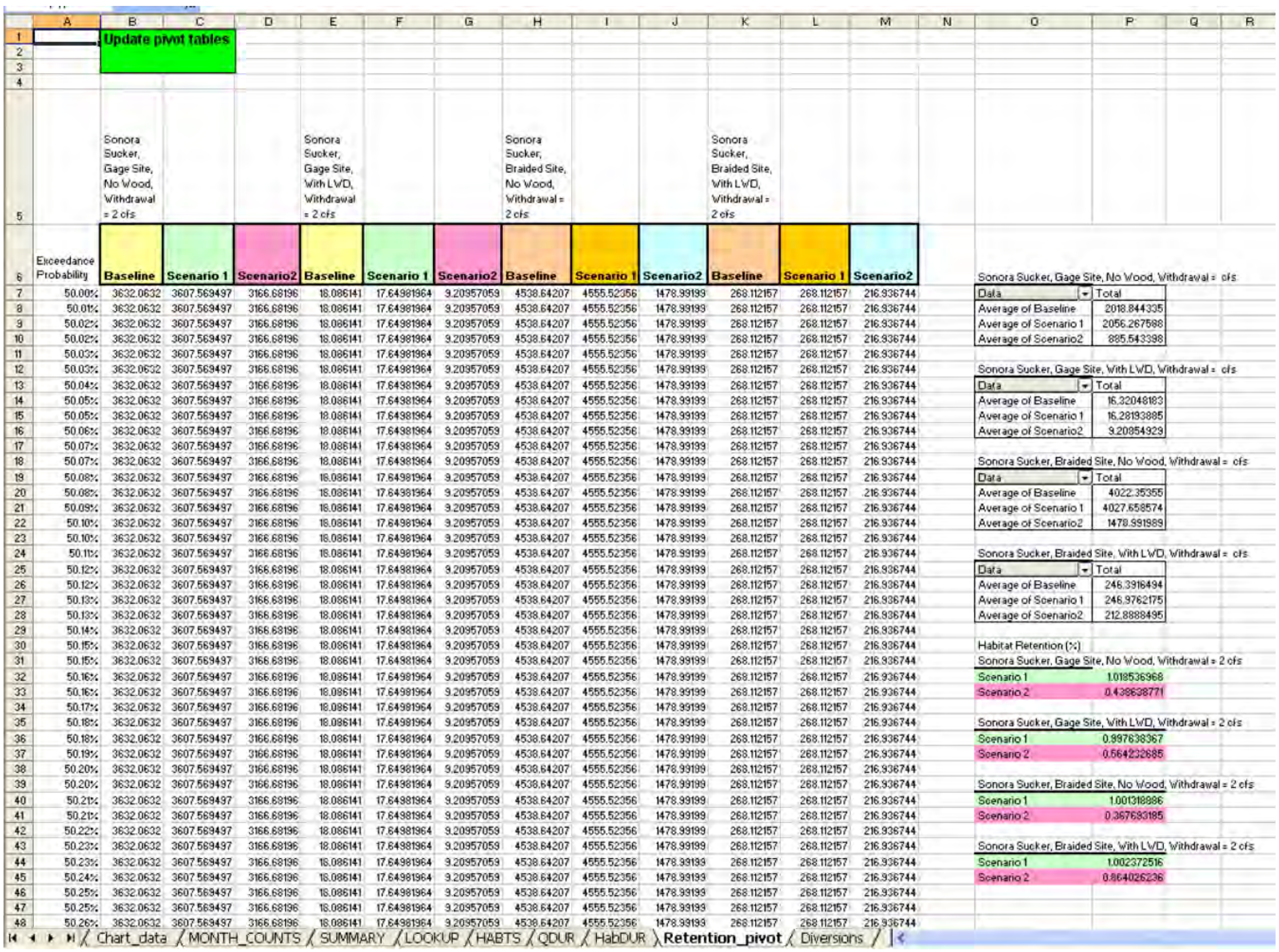


Figure 34. An example of a habitat duration chart.

Habitat Retention

Habitat retention is conceptually simple, but can become complicated depending on how it is calculated. Fundamentally, habitat retention is the ratio between the amount of habitat available under an alternative divided by the amount of habitat available under the baseline, and is expressed as a percentage. The most elementary version of this metric uses the total amount of habitat for the entire period of record to calculate the ratio. Habitat retention could also be calculated using habitat values for a critical period of the year (for example, only using habitat values for June, July, and August). Another commonly used approach has been to select only the habitat values occurring below the median of the habitat duration curve to calculate the ratio. This method considers only the lower 50 percent of the habitat values in the time series as being biologically significant (Bovee and others, 2007). We have chosen to use this metric to describe habitat retention because its biological relevance has been demonstrated in other studies relating habitat dynamics to population responses (Nehring and Anderson, 1993; Bovee and others, 1994).

Whenever a habitat duration curve is generated, data for the lower 50 percent of the ordered and ranked values from the HabDUR (habitat duration) page are written to a “Retention Pivot” page, where the imported data is input to a pivot table. Four such pivot tables are included on this page, one for each site, with and without LWD. There are three columns of habitat values for each site and LWD condition: the Baseline, Scenario 1 (with water right), and Scenario 2 (without water right) (fig. 35). The general procedure for populating this page with data is to run the CCHTSAM spreadsheet for a particular withdrawal rate, select a species, and then update all four of the habitat duration charts. Following these steps, the “Update Pivot Tables” macro is activated, and all four pivot tables are automatically updated. For each table, a corresponding habitat retention table was populated for each site, LWD condition, and scenario by dividing the average area for the scenario by the average area for the baseline. These data were then exported one species at a time to two external spreadsheets, where the results were accumulated for all species and plotted as habitat retention charts (fig. 36).



Update pivot tables

Exceedance Probability	Baseline (Sonora Sucker, Gage Site, No Wood, Withdrawal = 2 cfs)	Scenario 1	Scenario2	Baseline (Sonora Sucker, Gage Site, With LWD, Withdrawal = 2 cfs)	Scenario 1	Scenario2	Baseline (Sonora Sucker, Braided Site, No Wood, Withdrawal = 2 cfs)	Scenario 1	Scenario2	Baseline (Sonora Sucker, Braided Site, With LWD, Withdrawal = 2 cfs)	Scenario 1	Scenario2
50.00%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.01%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.02%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.02%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.03%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.03%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.04%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.05%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.05%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.06%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.07%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.07%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.08%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.08%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.09%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.10%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.10%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.11%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.12%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.12%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.13%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.13%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.14%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.15%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.15%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.16%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.16%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.17%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.18%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.18%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.19%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.20%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.20%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.21%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.21%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.22%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.23%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.23%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.24%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.25%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.25%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744
50.26%	3632.0632	3607.569497	3166.68196	18.086141	17.64981964	9.20957059	4538.64207	4555.52356	1478.99199	268.112157	268.112157	216.936744

Sonora Sucker, Gage Site, No Wood, Withdrawal = cfs

Data	Total
Average of Baseline	2018.844335
Average of Scenario 1	2056.267588
Average of Scenario2	885.543398

Sonora Sucker, Gage Site, With LWD, Withdrawal = cfs

Data	Total
Average of Baseline	16.32048183
Average of Scenario 1	16.28193885
Average of Scenario2	9.20854929

Sonora Sucker, Braided Site, No Wood, Withdrawal = cfs

Data	Total
Average of Baseline	4022.35355
Average of Scenario 1	4027.658574
Average of Scenario2	1478.991989

Sonora Sucker, Braided Site, With LWD, Withdrawal = cfs

Data	Total
Average of Baseline	246.3916494
Average of Scenario 1	246.9762175
Average of Scenario2	212.8888495

Habitat Retention (%)

Sonora Sucker, Gage Site, No Wood, Withdrawal = 2 cfs

Scenario 1	1.018536968
Scenario 2	0.438638771

Sonora Sucker, Gage Site, With LWD, Withdrawal = 2 cfs

Scenario 1	0.997638367
Scenario 2	0.564232685

Sonora Sucker, Braided Site, No Wood, Withdrawal = 2 cfs

Scenario 1	1.001318886
Scenario 2	0.367683185

Sonora Sucker, Braided Site, With LWD, Withdrawal = 2 cfs

Scenario 1	1.002372516
Scenario 2	0.864026236

Chart_data / MONTH_COUNTS / SUMMARY / LOOKUP / HABTS / QDUR / HabDUR / Retention_pivot / Diversions

Figure 35. Layout of the “Habitat Retention” page.

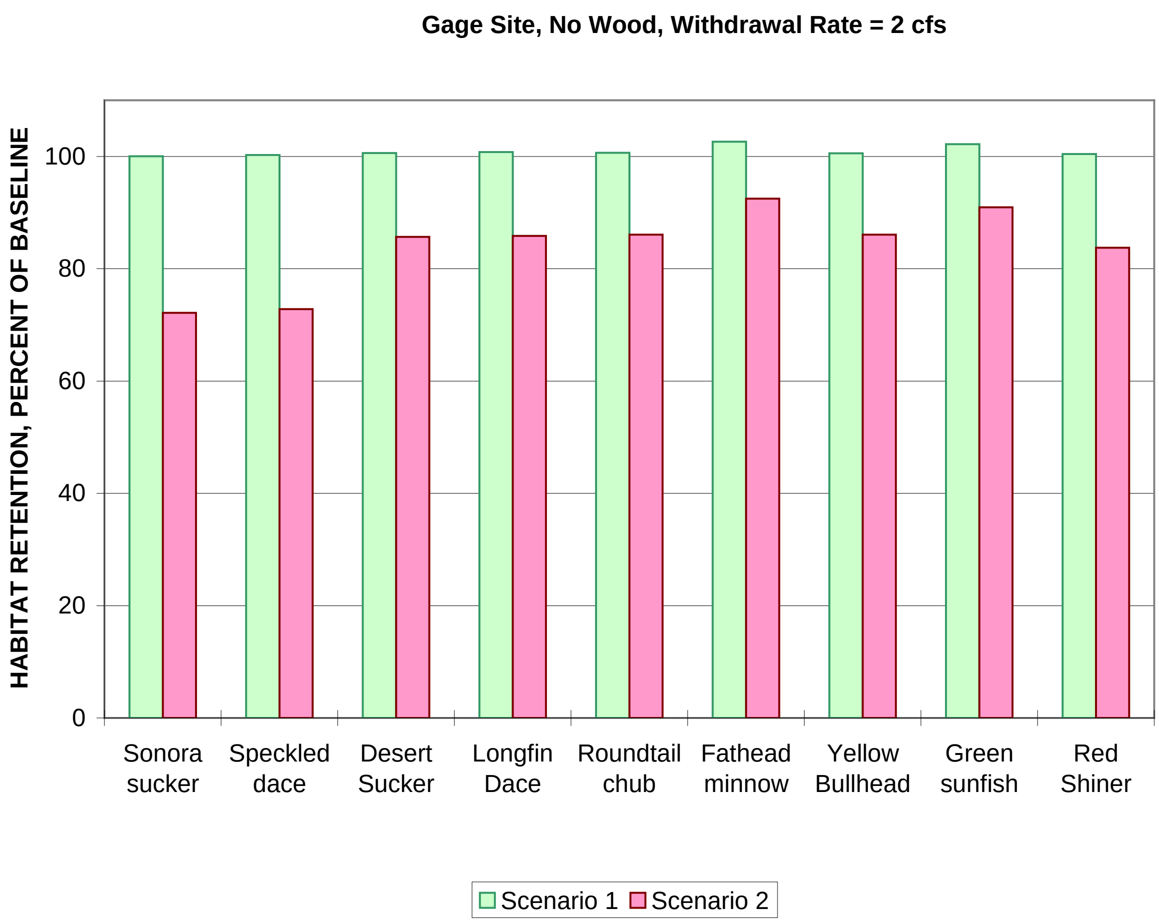


Figure 36. An example of a habitat retention chart.

Results

Each step in the model building and simulation process produces intermediate results that are evaluated for accuracy and completeness prior to proceeding to the next step. The rationale for the results of each step in the process are described below with qualifying rationale for the adjustments made.

Hydrodynamic Model Calibration

Gage Site Calibration

At the Gage site there were numerous large boulders that necessitated a longitudinal adjustment of roughness to obtain calibration to the water surface profile. In addition, there was a significant jump in the water surface profile caused by a constriction between boulders that necessitated dividing the site into two zones. One zone occupied the bulk of the Gage site from the staff gage at Northing 3743363.67, Easting 513074.03 to the jump in the profile at Northing 3743512.83, Easting 513071.01. The upstream zone proceeded from the profile jump to the top of the site at Northing 3743536.99, Easting 513062.08.

A water surface profile and discharge measurement were obtained on September 20, 2008, at a flow of 0.132 m^3/s (4.65 ft^3/s). We also calibrated to a second water surface profile at the Gage site that had been obtained by marking the water's edge at approximately 1.133 m^3/s (40 ft^3/s) on July 16 during the initial site visit. Adjustments are made to the roughness assigned to each point in the bed file resulting in longitudinal variation in roughness until the simulated WSP conditions matched the observed conditions as shown in figure 37. Note: at some locations the water surface elevation was measured on both sides of the stream, producing the apparent discontinuities in the water surface profile. The relatively poor fit between simulated and observed conditions at the 1.133 m^3/s discharge was accepted because of the inherent inaccuracies in placing markers at the water's edge and recovering the elevation of those markers two months later. This site was dominated by numerous large boulders so we did not vary roughness with discharge, rather we relied on simulation of momentum change among the boulders in the model to establish the water surface profile at higher flows.

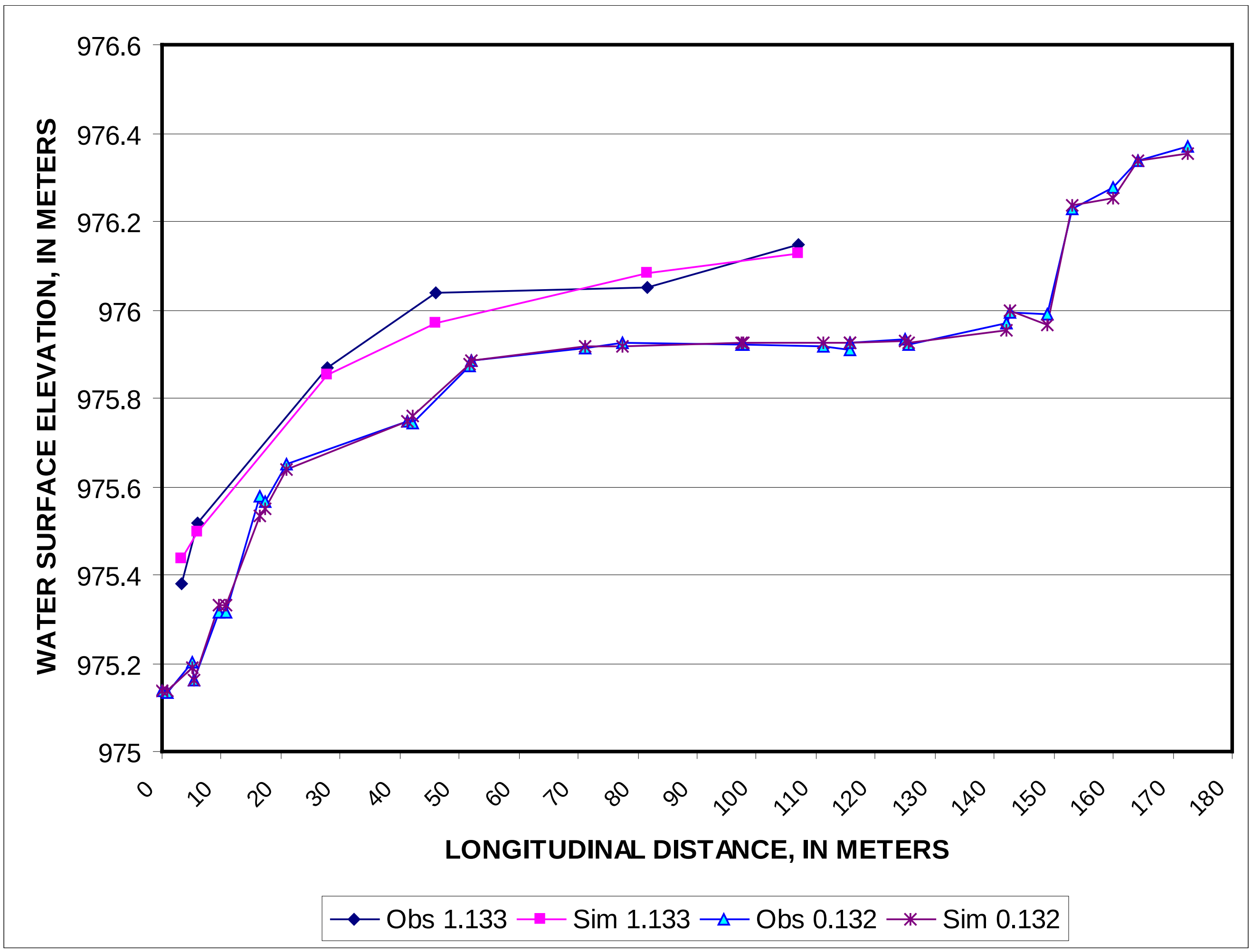


Figure 37. Observed (Obs) and simulated (Sim) water surface profiles for the Gage site at discharges of 0.132 and 1.133 m^3/s (4.65 and 40 ft^3/s).

Braided Site Calibration

One WSP and discharge set were obtained at the Braided site on September 24, 2008, at a discharge of 0.137 m^3/s (4.837 ft^3/s). River2D was calibrated to the observed water surface profile using a uniform roughness height for the entire wetted channel. Adjusting that roughness value yielded the match of observed and simulated conditions shown in figure 38.

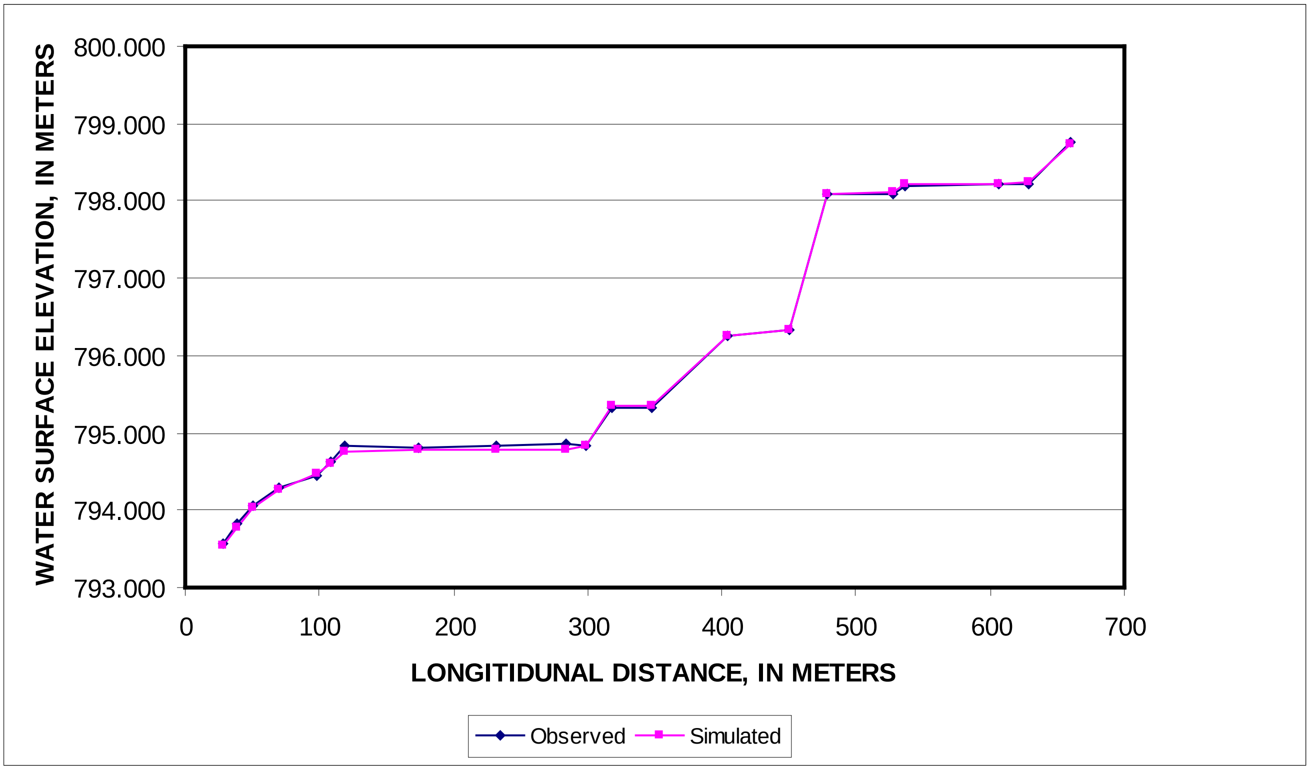


Figure 38. Observed and simulated water surface profiles for the Braided site at 0.137 m^3/s (4.84 ft^3/s).

Variation of Roughness With Discharge

Flow at the Gage site is dominated by colluvial boulders. Thus, the most significant factor determining water surface elevation as the discharge changes is energy loss due to momentum changes. As shown in equations 2 and 3, momentum change is explicitly calculated within the River 2D model. Thus, the dominant phenomenon affecting water surface profile is implicit in the simulations.

The effective surface roughness height may decline with increasing discharge because the amount of the water column occluded by the bed material decreases with increasing depth. Water surface profile data for a higher discharge such as 500 ft^3/s (14.16 m^3/s) would have provided more information with which to estimate the change in roughness height occurring with discharge and would have improved the rating curve for each site. However, such data were not available, nor was it feasible to collect such data due to safety considerations. For these reasons, we used the same longitudinal surface roughness distribution for all discharges at the Gage site.

The Braided site lies in a broad alluvial valley and, as such, is not dominated by boulders. The stage-discharge relationship was extended to 10,000 ft^3/s (283.16 m^3/s) using the River2D model and an assumed roughness based on the dominant particle size at the site. We believe that changes in effective roughness height, with discharge, may influence the behavior of the stream at this site. However, as with the Gage site, adequate data to quantify the actual flow conditions were lacking.

As a means of approximating the likely change in roughness with increasing discharge, we generated a linear relationship between roughness height and discharge using the roughness needed to calibrate the model at 0.137 m^3/s (4.837 ft^3/s) and the assumed roughness based on dominant particle size used in the 10,000 ft^3/s (283.16 m^3/s) simulation noted above. We assumed a linear decrease in roughness from 1.0 m roughness height (Ks) at 0.137 m^3/s to 0.4 m roughness height (approximately the D85) at 5.66 m^3/s and a constant roughness for higher discharges. The flow-roughness relation we used is given in figure 39. At the lower discharges, the model roughness is significantly higher than the dominant particle size. The roughness required to calibrate the model incorporates numerous flow resistance phenomena not captured by the density of data collected at the site. It was impractical to measure every particle on the stream bed; thus, adjusting roughness to achieve calibration is standard practice when applying the model.

Rating Curves

The rating curves used for this study were presented in table 8. Both study sites were augmented with artificial extensions of the topography and computational mesh to ensure that arbitrary boundary conditions did not influence the flow field at the limits of the habitat study areas. Thus, the rating curves

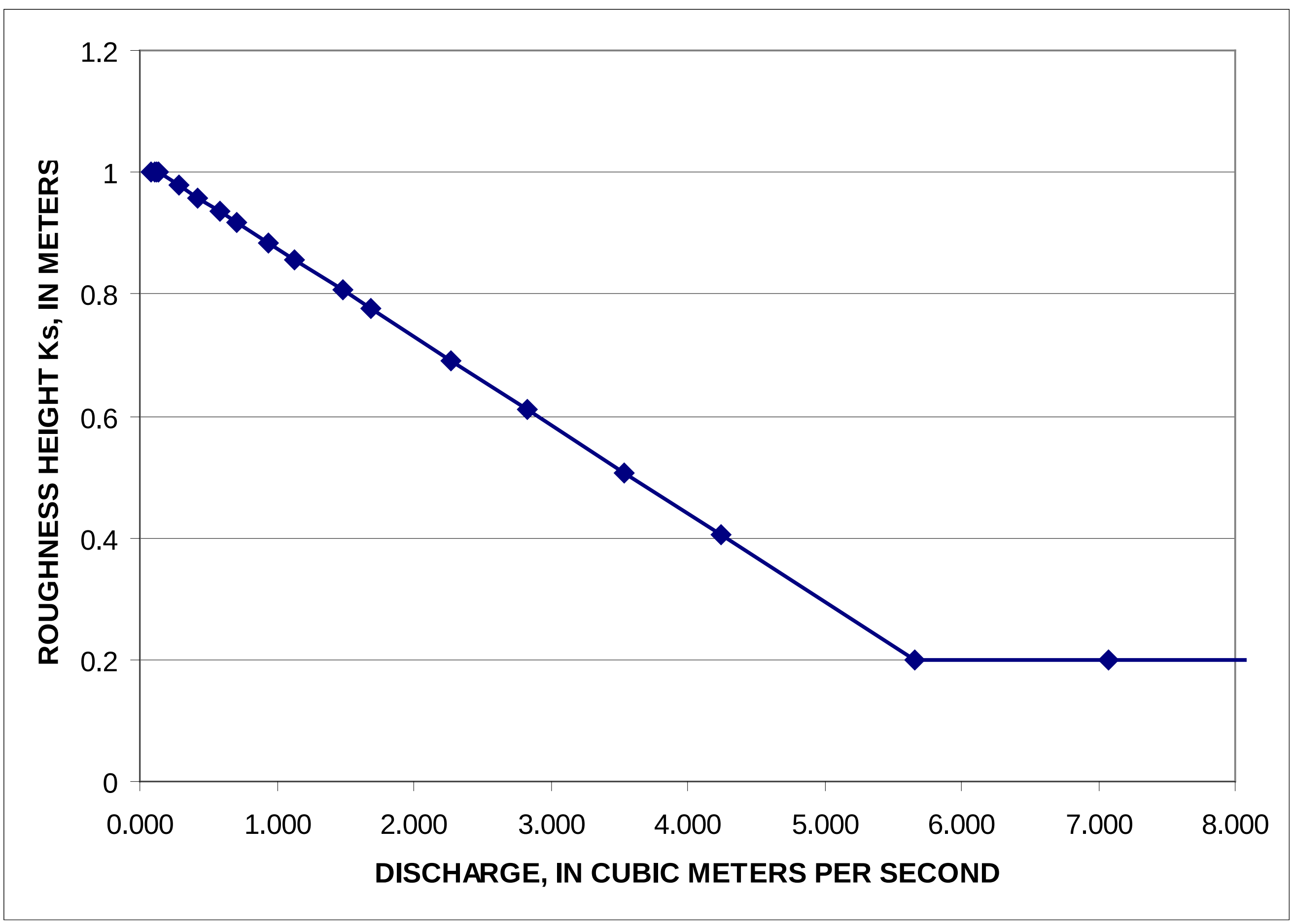


Figure 39. Braided site roughness height-discharge relation.

were not applied at the simulation boundary, but were placed at the downstream extent of the habitat study areas at the location of the staff gages. Specific discharge equations were applied at the simulation exit boundaries for the two study sites. All two-dimensional model runs were forced to conform to the rating curve at the respective staff gage locations by trial-and-error adjustment of the specific discharge equation coefficients.

Flow Model Results

Cherry Creek experiences a large range of discharges, but most of the time the flow is quite low. The following figures (40–41) show simulated wetted area at the discharges that occurred during field data collection in September 2008.

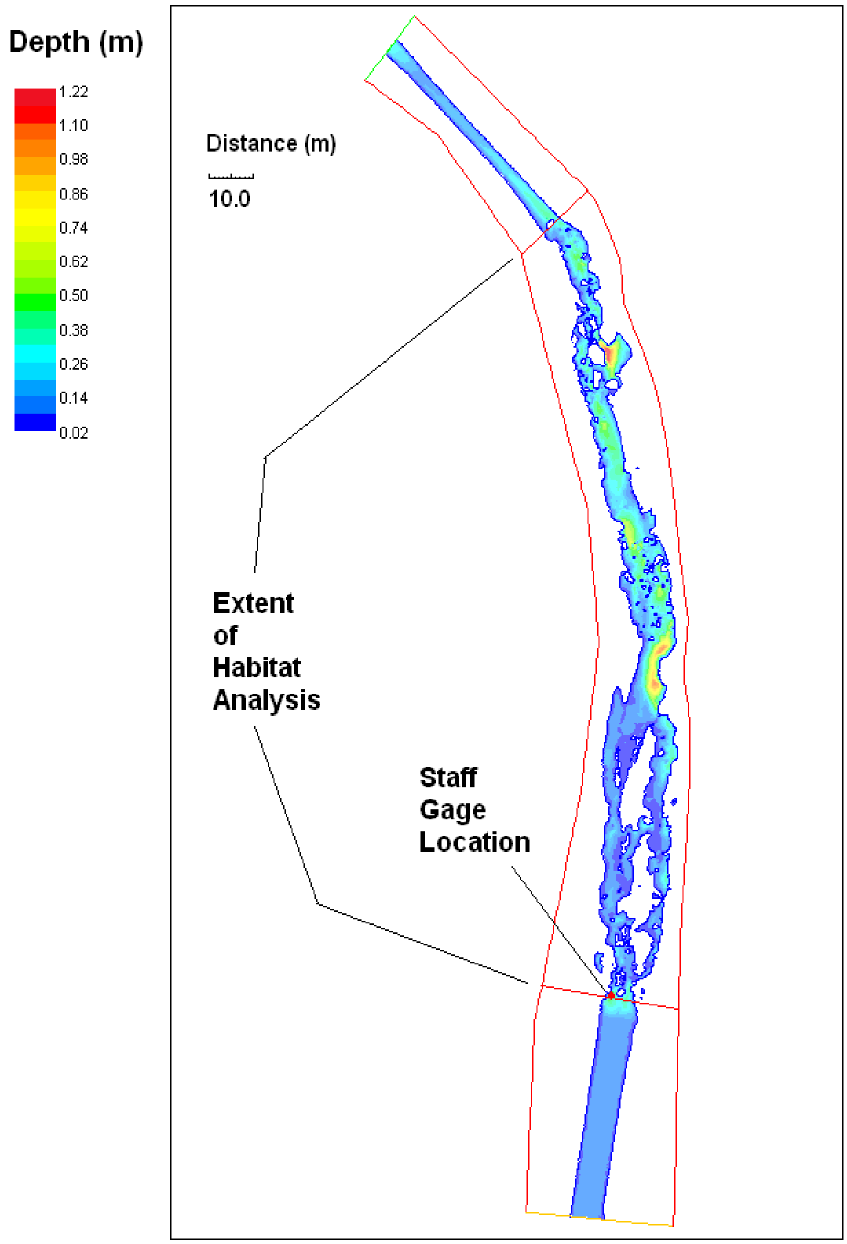


Figure 40. Depth distribution at Gage site for the 0.132 m^3/s (4.67 ft^3/s) discharge.

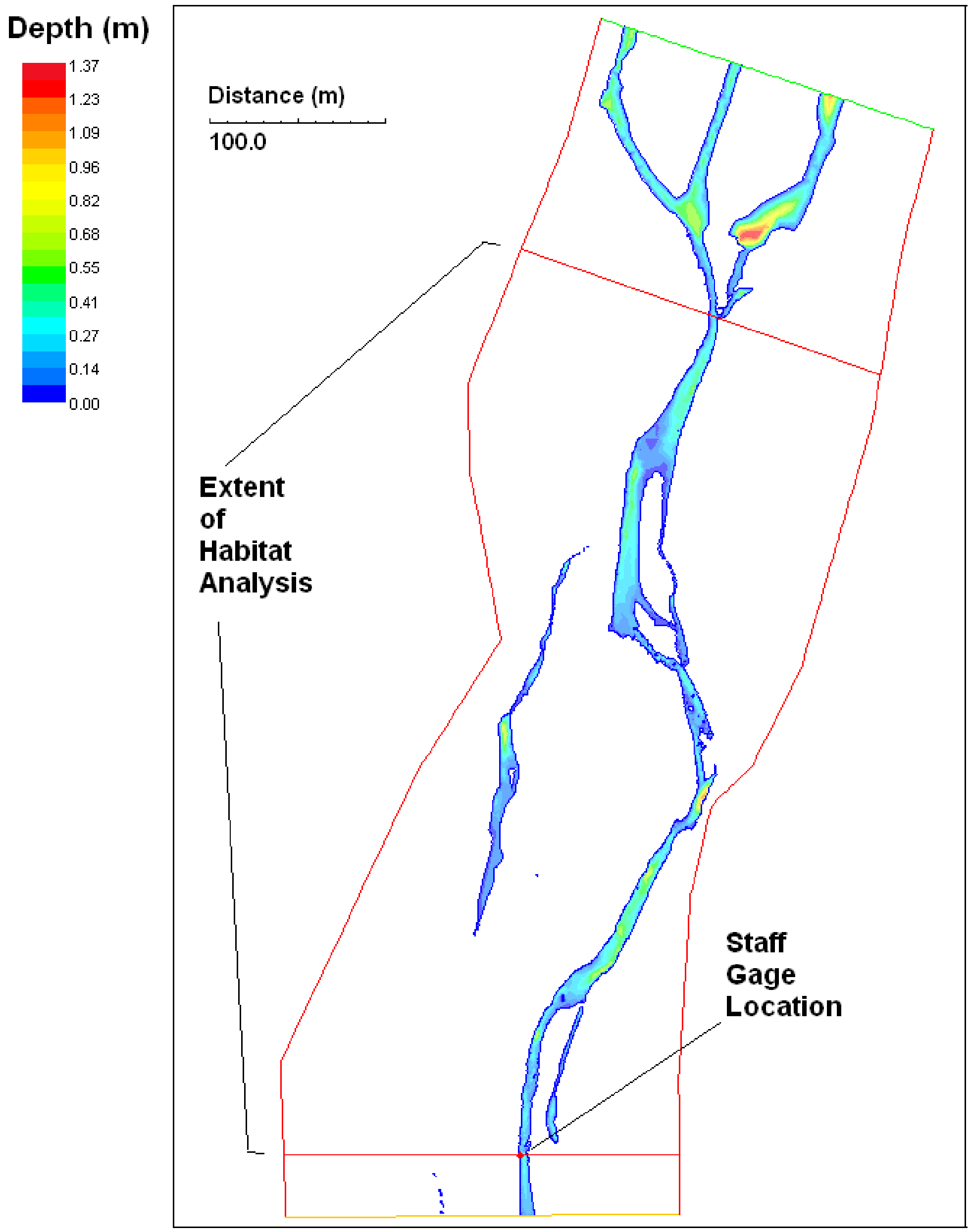


Figure 41. Depth distribution at Braided site for the 0.137 m^3/s (4.84 ft^3/s) discharge.

Figure 42 shows the modeled extent of inundation at the Braided site for the 3,800 ft^3/s (107.8 m^3/s) flow that occurred on December 26, 2008. Note the portions of the simulation domain that extend beyond the region of habitat analysis. These extensions ensure that boundary conditions do not unduly influence the flow field at the upstream and downstream extent of the habitat analysis area.

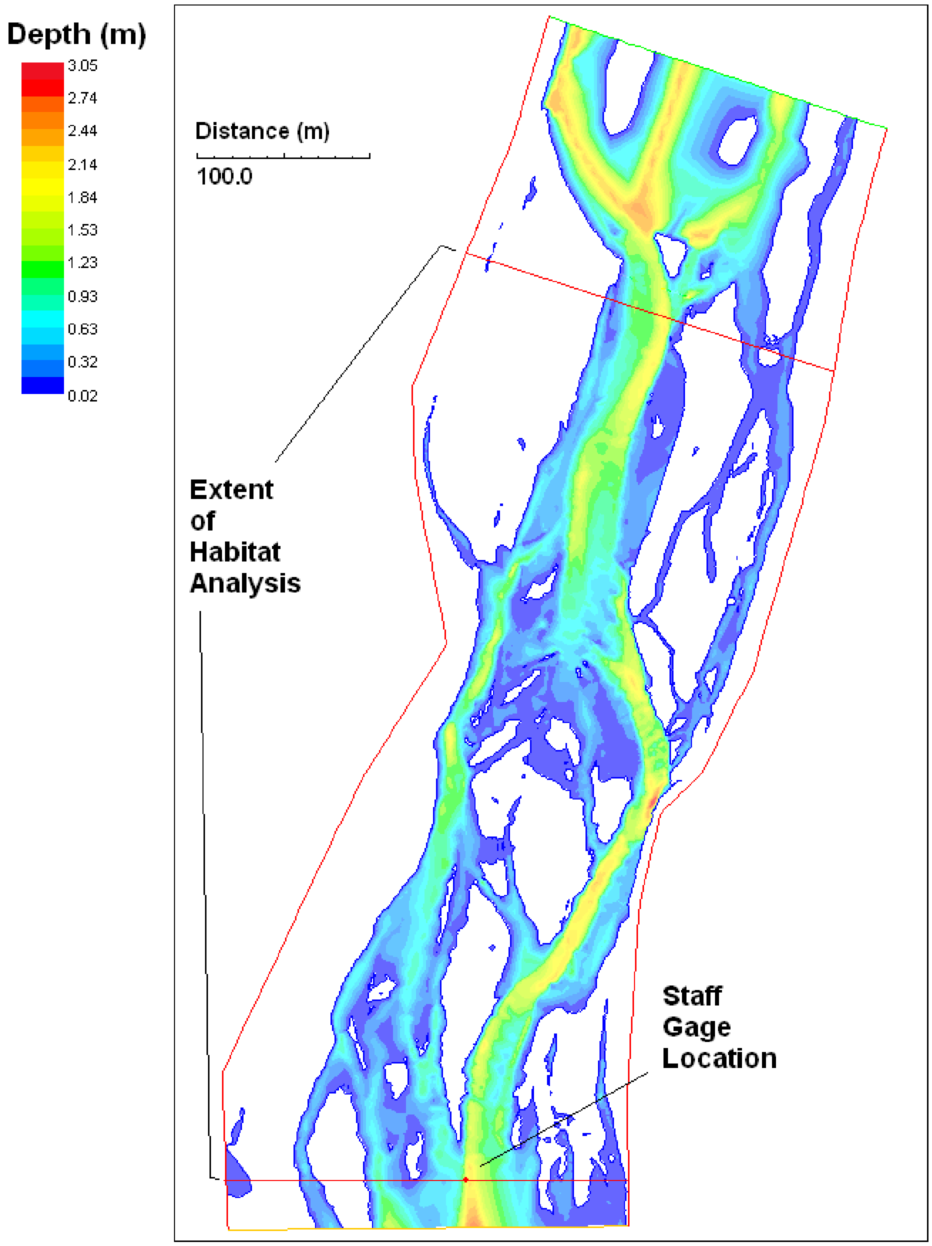


Figure 42. Depth distribution for Braided site for a simulated discharge of 3,800 ft^3/s (107.8 m^3/s)

For each of the simulated flows given in table 8, a comma-delimited file of flow attributes was generated and passed to the habitat analysis. The full set of River2D model solution files and resulting flow attribute files is contained in a DVD available from the USGS Fort Collins Science Center.

Synthesized Hydrographs

Flow Routing

A routing method was developed to translate flows at USGS 09497980 Cherry Creek Near Globe, Ariz., to the Braided site (see appendix 3). The resulting hydrograph is compared with the gage record and the available streamflow measurements in figure 43. This routing scheme was applied to the

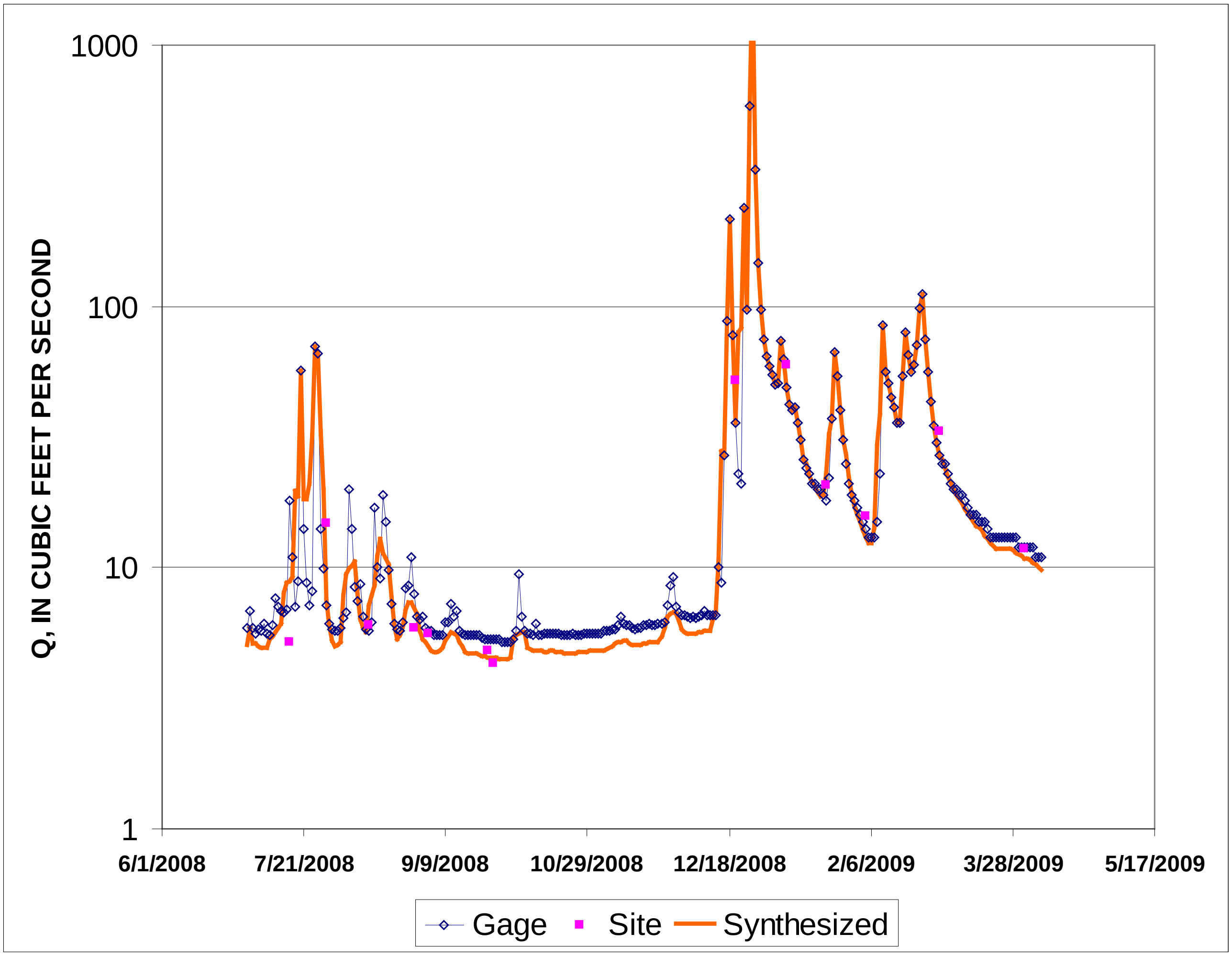


Figure 43. Synthesized daily discharge at the Braided site compared to onsite flow observations and Cherry Creek gage flows. The onsite observations indicate that flow at the Braided site is approximately the same as the gage above about 10 ft^3/s and clearly lower than the gage at base flow.

44 years of daily flow values to produce the baseline hydrograph for the Braided site corresponding to flows occurring at the Gage site.

Gage Site

The habitat analyses conducted in this study described the differences in aquatic habitat for various species produced under different hypothetical withdrawal scenarios. The habitat time series for each scenario are compared with the habitat produced by the historical flow record. As noted above, we use the term "baseline" to describe the historic daily flow record and all habitat time series that are derived from the historic flow record.

To describe the effects of implementing a water right in Cherry Creek, we initially hypothesized five levels of constant diversion of water from the creek at a point upstream of the Gage site as shown in figure 20. The flow at the gage was depleted by the amount withdrawn to produce two synthetic hydrographs (diversion with and without water right enforcement) for each level of diversion described above. Thus, five 44-year daily flow hydrographs were produced for the gage site (1 baseline, 2 diversion without water right enforcement, and 2 diversion with water right enforcement). We report two representative examples of these scenarios (2 and 10 ft^3/s withdrawal) in detail in this document. Thus a total of 9 hydrographs are included in the examples evaluated below.

Braided Site

We applied the flow routing scheme to the 9 44-year hydrographs developed for the Gage site to produce 9 hydrographs for the Braided site based on the corresponding baseline and hypothetical diversion conditions. The method for calculating these hydrographs was then incorporated into the analysis package in CCHTSAM, allowing interactive evaluation of the habitat effects of user-determined levels of diversion withdrawal.

Habitat-Discharge Relationships

Relations between discharge and normalized habitat area for the nine target species investigated in this study are shown in figures 44–51, arrayed according to site, with and without LWD. Two charts are presented for each case. The first chart shows the habitat-discharge function across the entire range of simulated discharges and the second is truncated to display habitat areas for discharges less than 200 ft^3/s. These truncated charts are presented to allow better visualization of habitat conditions at low flows.

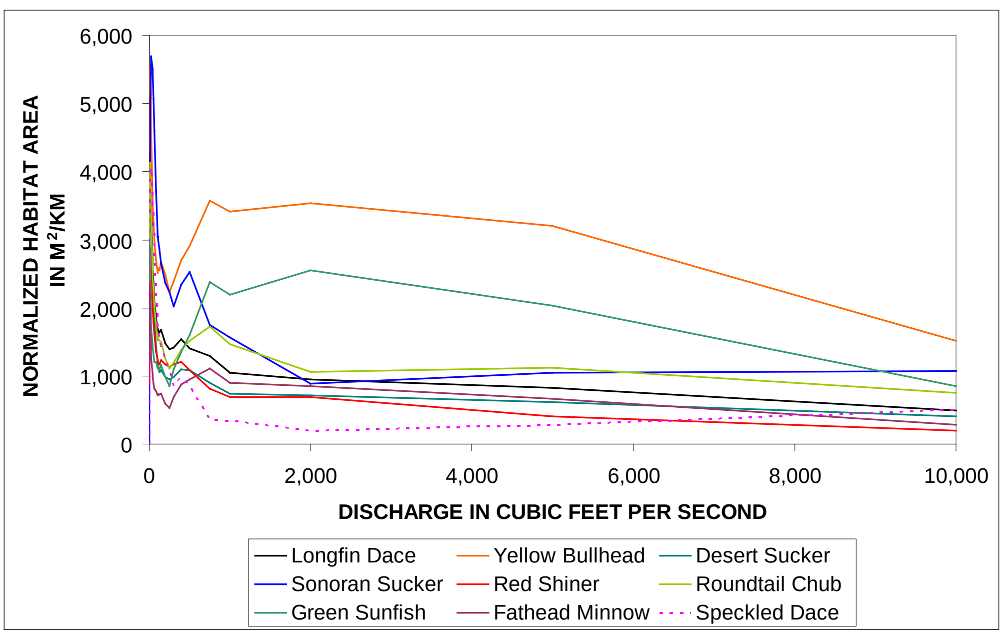


Figure 44. Habitat-discharge chart for the Gage site, without LWD in the habitat calculation, for the full range of simulated flows.

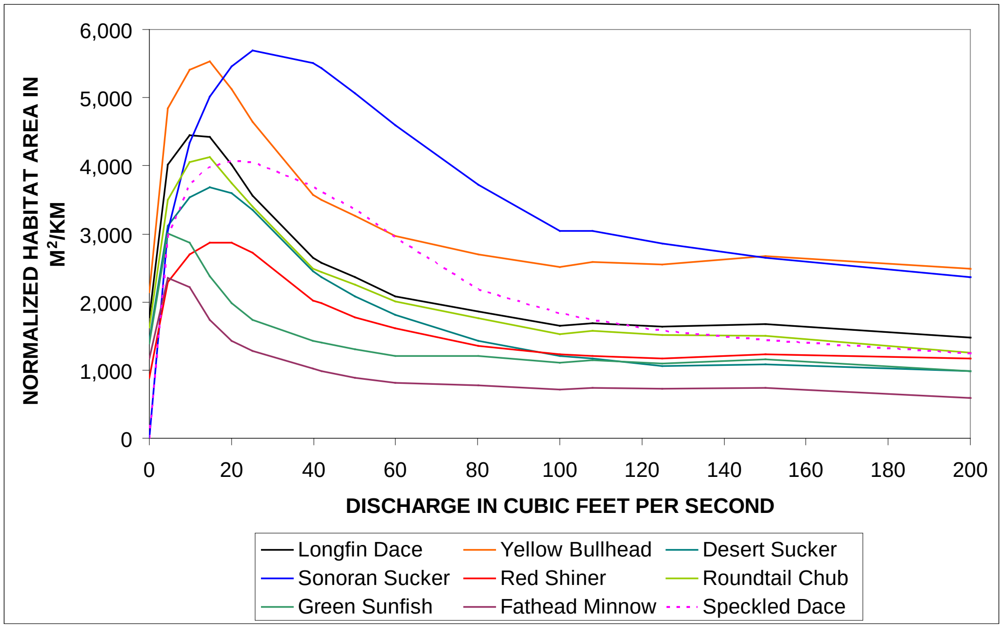


Figure 45. Habitat-discharge chart for the Gage site, without LWD in the habitat calculation, for flows between 0 and 200 ft³/s.

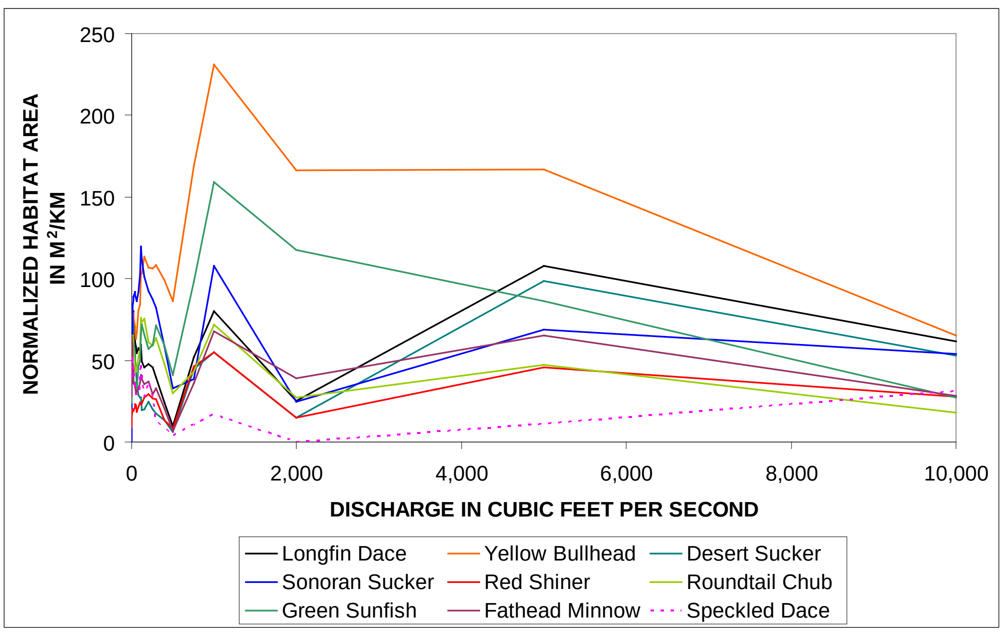


Figure 46. Habitat-discharge chart for the Gage site, with LWD in the habitat calculation, for the full range of simulated flows.

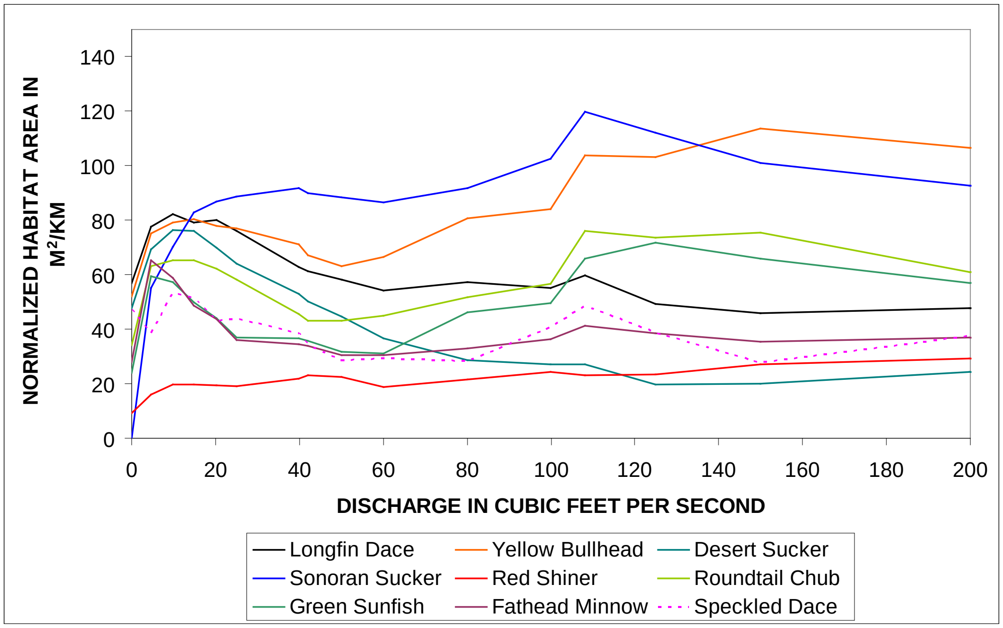


Figure 47. Habitat-discharge chart for the Gage site, with LWD in the habitat calculation, for flows between 0 and 200 ft^3/s.

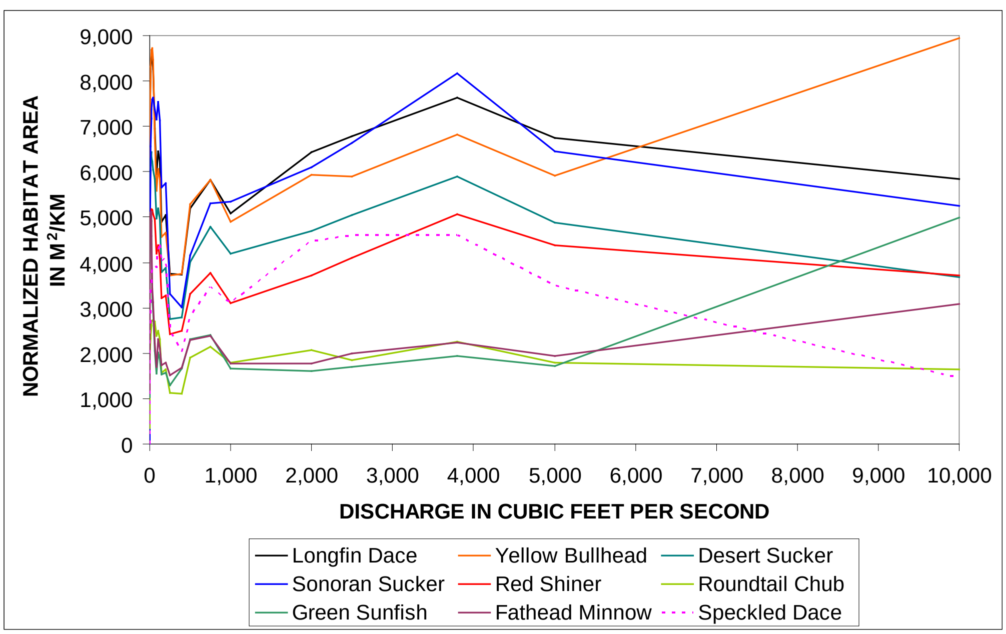


Figure 48. Habitat-discharge chart for the Braided site, without LWD in the habitat calculation, for the full range of simulated flows.

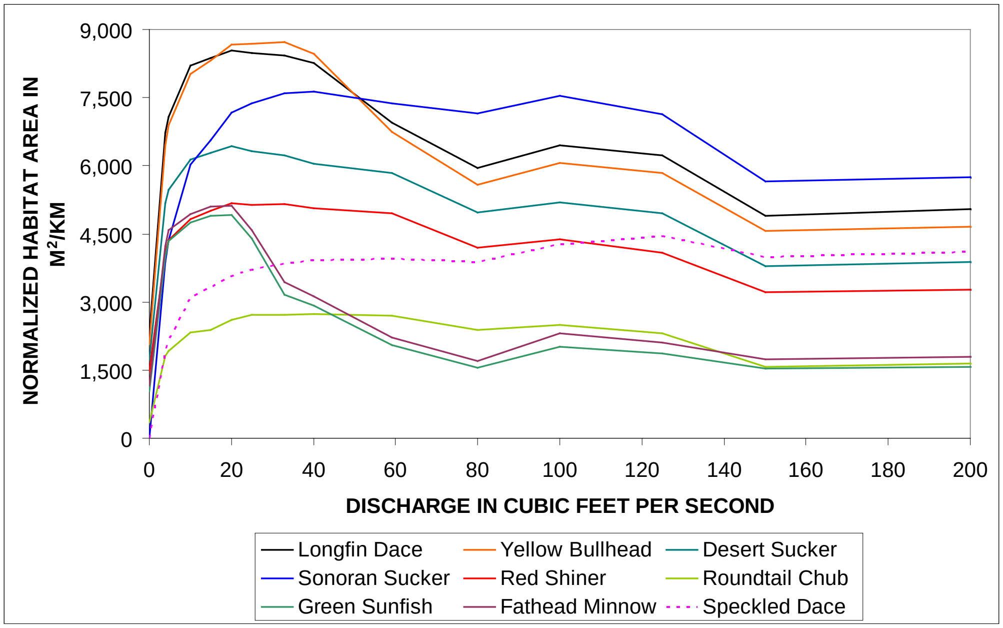


Figure 49. Habitat-discharge chart for the Braided site, without LWD in the habitat calculation, for flows between 0 and 200 ft^3/s.

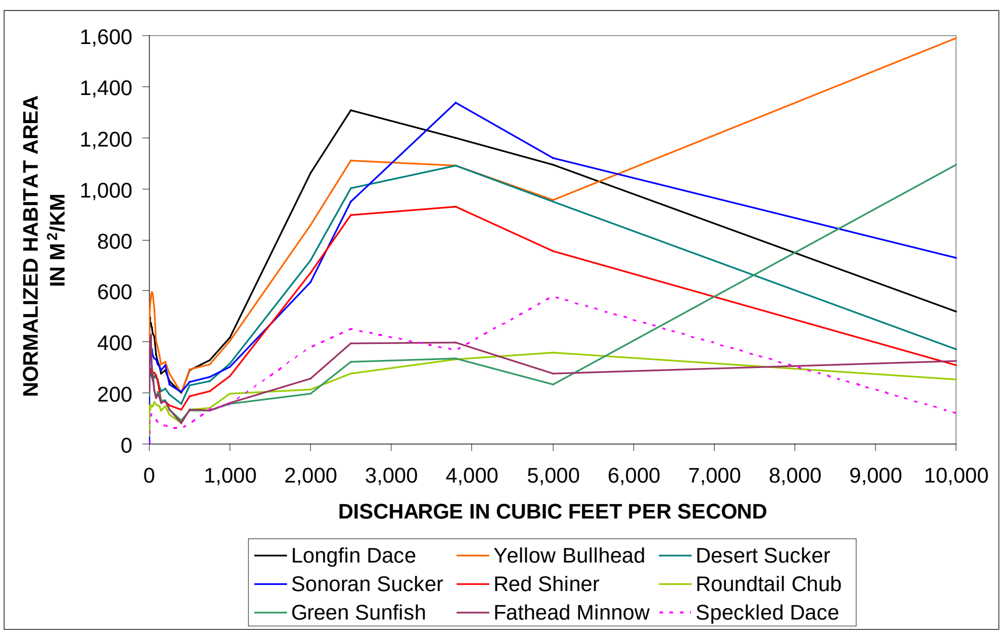


Figure 50. Habitat-discharge chart for the Braided site, with LWD in the habitat calculation, for the full range of simulated flows.

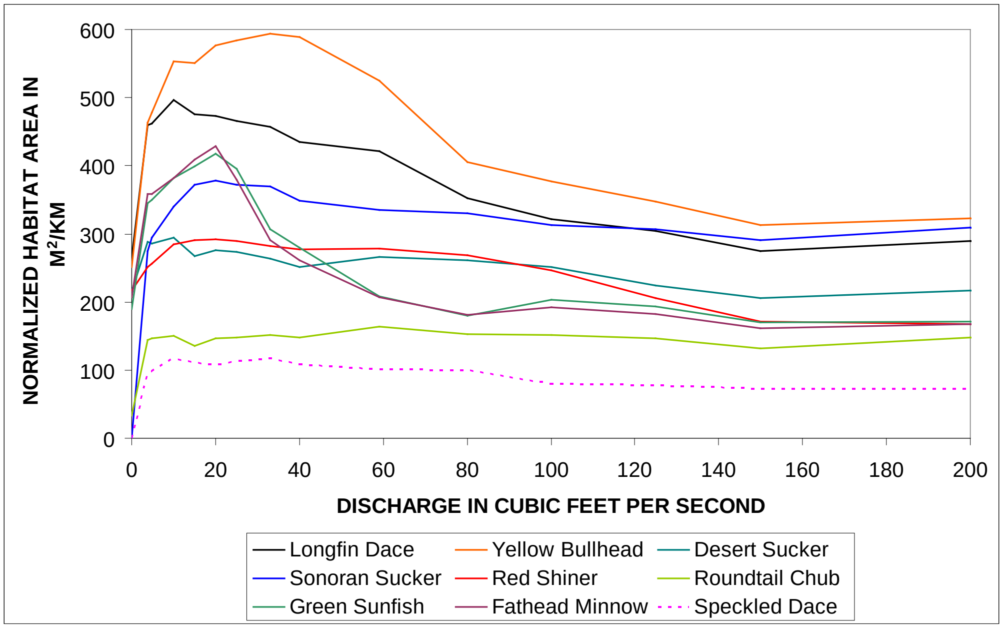


Figure 51. Habitat-discharge chart for the Braided site, with LWD in the habitat calculation, for flows between 0 and 200 ft^3/s.

Discussion

Simulation Uncertainties

Numerical models of complex phenomena such as open channel flow generally behave more predictably when applied to smooth, gradually changing channels with few abrupt changes in slope or channel geometry. The conditions observed in Cherry Creek included both abrupt slope and geometric changes. Substantial effort was devoted to adjusting model parameters to match the observed conditions resulting in the calibration characteristics shown in figures 37 and 38. At the Gage site, we found flow separation at the lowest discharges and sub-divided the model where flow between two very large boulders could not be simulated by a single set-up of the model for the entire site. At the Braided site we encountered excessive flow through the stream bed and reduced the default groundwater transmissivity to achieve calibration to the observed conditions.

In addition to these bathymetric considerations, lack of data at higher flows introduces an undetermined amount of uncertainty to the high flow simulations. The high ends of both rating curves are based on unverifiable assumptions about the behavior of the stream. However, because the River2D model incorporates the basic physics of fluid motion in an open channel, we believe the simulated conditions at higher flows to be realistic. It is our judgment that while additional data would allow us to better quantify such things as the wetted area at higher flows, the resulting pattern of habitat phenomena over the range of discharges would not be substantially altered and the trends of the analysis would be similar to those described herein. The focus of this analysis is on low discharge conditions near the observed flow, so the uncertainty issues related to high flow simulations were deemed to have insignificant influence on the overall results of the analysis.

Determination of Beneficial Use

When evaluating the beneficial use of water for out-of-stream use, the benefit can often be described in terms of acres of crop that can be irrigated, number of households that can be served by a municipal water supply, or the production of an industry that would use the water. To evaluate the benefits of water used within the stream, we use habitat for native and introduced fish species as the measure of performance. The principle product of this study is an analysis tool: the CCHTSAM model, which displays the effects of establishing or not establishing an instream water right in Cherry Creek if the creek is subject to withdrawal of water for consumptive use. To illustrate the model's use, we prepared two CCHTSAM case examples withdrawing 2 ft^3/s and 10 ft^3/s which are discussed below.

Time Series Trial Runs

An unlimited number of trial runs can be made using the CCHTSAM model, owing to the fact that virtually any hypothetical withdrawal can be entered on the OPTIONS page. In addition, it would be possible to generate 153 different tables and graphs for a single withdrawal scenario (17 charts and tables multiplied by 9 target species). Although we have attempted to provide decisionmakers a variety of analytical tools to evaluate the potential costs or benefits of enforcing the proposed U.S. Forest Service water right, we have done so at the risk of information overload. For this report, we examine the effects of two scenarios and two hypothetical withdrawal rates applied to each. Scenario 1 represents flow and habitat conditions, constrained by the proposed U.S. Forest Service water right, whereas scenario 2 represents an unconstrained situation, with no water right in effect. The two hypothetical withdrawal rates tested in this example were 2 ft^3/s and 10 ft^3/s.

Effects on Discharge

The effects of the different scenarios and hypothetical diversion rates on the daily discharges at the Gage and Braided sites are displayed as flow duration curves in figures 52–55. The Y-axes of these charts have been truncated at 100 ft^3/s to allow better visualization of the effects on low flows. At discharges higher than 100 ft^3/s the differences between the historical baseline flows and the two scenarios are small compared to the magnitude of the discharge and appear to converge to nearly the same flow.

Under scenario 1 (water right in effect), daily discharges converged with the baseline at 6.8 ft^3/s at the Gage site and at 5.8 ft^3/s at the Braided site (figs. 52–55). This means that the discharges under scenario 1 equaled those of the baseline approximately 40 percent of the time at the Gage site and 38 percent of the time at the Braided site, regardless of the hypothetical withdrawal.

Under scenario 1, full allotment of a 2 ft^3/s diversion could be delivered 30.7 percent of the time and a 10 ft^3/s diversion could be achieved 18.4 percent of the time. In either case, some diversion would be possible 40.4 percent of the time under scenario 1. In contrast, some level of diversion could be made 100 percent of the time under scenario 2. In this case, the average annual delivery with a 2 ft^3/s diversion would be approximately 1,448 acre-feet per year, and an unconstrained 10 ft^3/s diversion could deliver and average of 5,488 acre-feet per year. These delivery volumes were based on a rule of diverting the total hypothetical withdrawal or the total streamflow, whichever was less. With the water right enforced, average annual deliveries with a 2 ft^3/s diversion would be reduced to 508 acre-feet per year, or approximately 35 percent of the unconstrained volume. For the 10 ft^3/s diversion, average annual deliveries with scenario 1 in effect would be reduced to 1,820 acre-feet per year, or about 33 percent of the unconstrained volume.

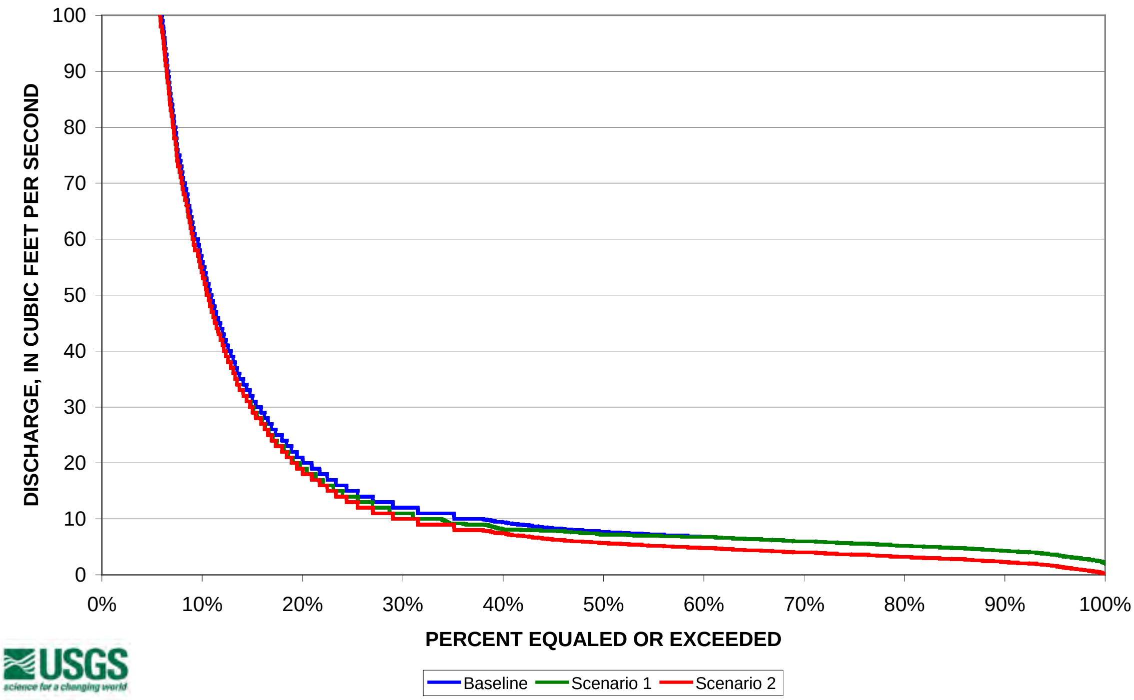


Figure 52. Flow duration curve for the Gage site under baseline conditions and scenarios 1 and 2, assuming a hypothetical diversion of 2 ft³/s.

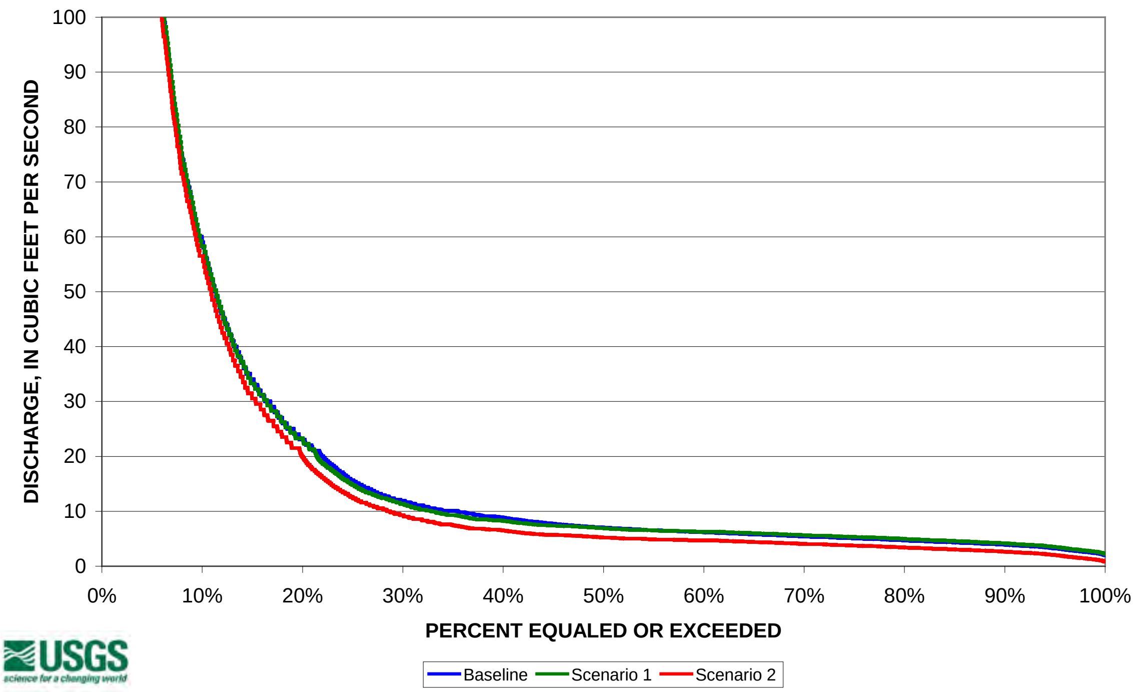


Figure 53. Flow duration curve for the Braided site under baseline conditions and scenarios 1 and 2, assuming a hypothetical diversion of 2 ft³/s.

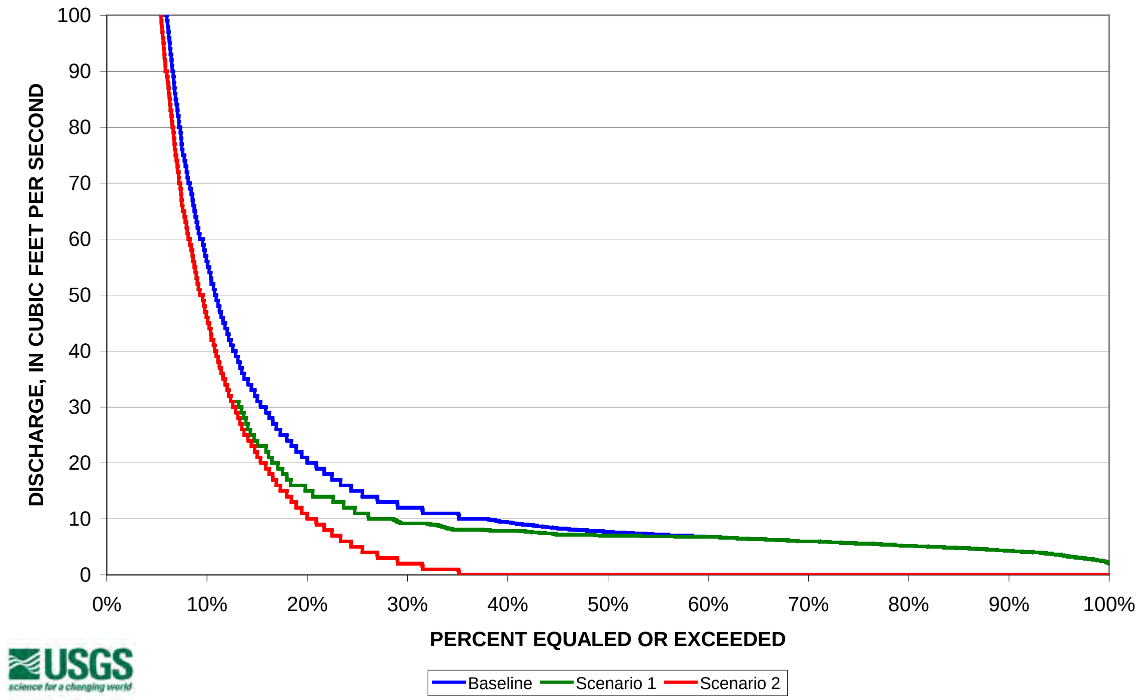


Figure 54. Flow duration curve for the Gage site under baseline conditions and scenarios 1 and 2, assuming a hypothetical diversion of 10 ft^3/s.

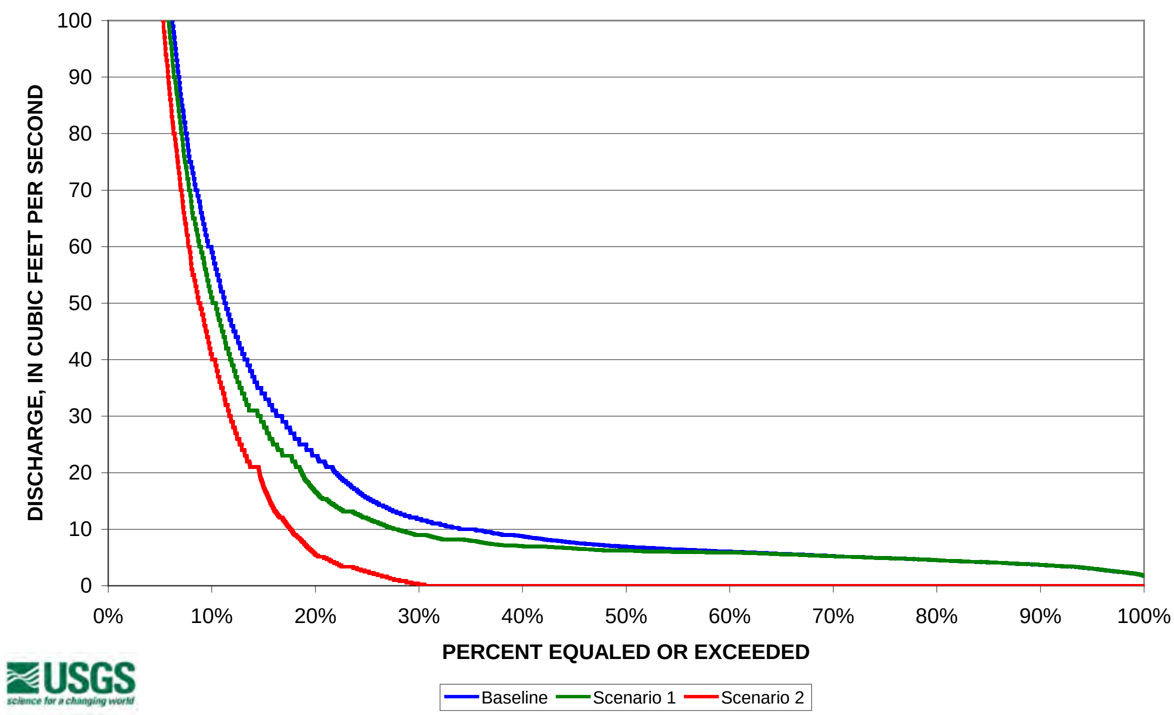


Figure 55. Flow duration curve for the Braided site under baseline conditions and scenarios 1 and 2, assuming a hypothetical diversion of 10 ft^3/s.

With no water right constraint (scenario 2), the flow in Cherry Creek would consist of the inflow minus either the 2 ft^3/s or 10 ft^3/s diversion. In the case of a 2 ft^3/s diversion, the discharge at both sites could be reduced by that amount at all times, but would have been reduced to zero only once during the period of record (figs. 52 and 53). With a 10 ft^3/s unconstrained diversion, however, the discharge at the Gage site would have been reduced to zero approximately 65 percent of the time (fig. 54) and nearly 70 percent of the time at the Braided site (fig. 55).

Effects on Lowest 10-Day Monthly Habitat

The detailed, year-by-year and month-by-month summary tables showing the effects of the two hypothetical withdrawals under scenarios 1 and 2 are shown in appendix 4. In the interest of brevity, we present here only the aggregate summary charts for the two scenarios with the two hypothetical diversion rates mentioned previously. Figures 56–63 show the average monthly changes in habitat for all species under both scenarios for the hypothetical withdrawal test cases. These charts represent changes in the lowest consecutive 10-day habitat metric, averaged across all years for each month. The charts consistently showed that under scenario 1 (water right in effect), changes in this metric were typically less than 10 percent in either direction. These results also indicate that with the water right in effect, diversions of up to 10 ft^3/s produced few negative changes and commonly resulted in slight increases in the habitat metric.

In contrast, results under scenario 2 (no water right in effect) were consistently negative, and habitat losses were greater (often 100 percent) as the withdrawal increased. The largest reductions in this habitat metric tended to occur from late spring through early autumn (roughly between May and November), with smaller reductions during winter and early spring (December through April). Habitat reductions during all periods under scenario 2 tended to be larger for native species (particularly Sonora sucker, speckled dace, and roundtail chub) than for the introduced species.

Figures 64–67 summarize the month-counts for reductions of 10 percent or more in the 10-day lowest consecutive habitat metric for the entire period of record. These results are consistent with figures 56–63, but illustrate a slightly different phenomenon. Figures 56–63 show the effects of the hypothetical withdrawals and scenarios on the magnitude of habitat changes. Figures 64–67 illustrate the change in frequency in habitat reductions in excess of 10 percent that result from the various test cases. There were 528 months in the period of record we used in this analysis. Examination of the month-count charts reveals that under scenario 2 and a withdrawal rate of 2 ft^3/s, significant habitat reductions occurred during 26–75 percent of the months, in both reaches. Under scenario 2 and a withdrawal rate of 10 ft^3/s, significant habitat reductions occurred in between 70 and 93 percent of the months . In contrast, a maximum of 4 percent of the months saw such reductions under scenario 1 with a 2 ft^3/s withdrawal and a maximum of 7 percent with a 10 ft^3/s withdrawal.

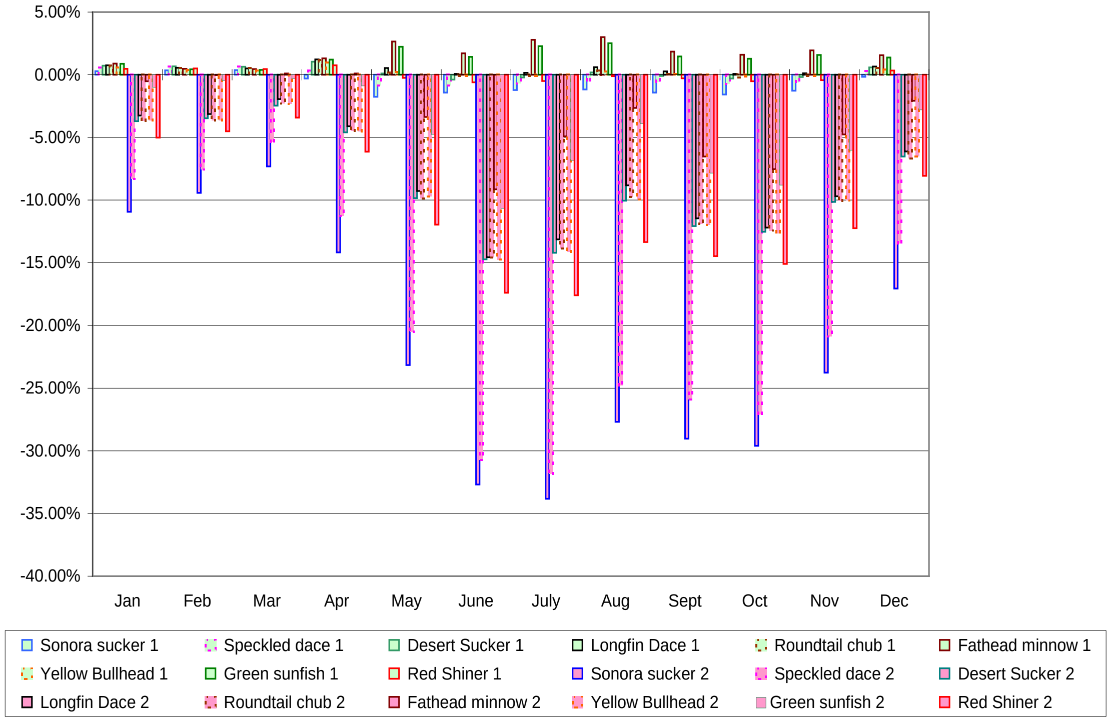


Figure 56. Average monthly change in habitat area (lowest 10 consecutive days) for the Gage site, with no LWD and with a hypothetical withdrawal of 2 ft³/s.

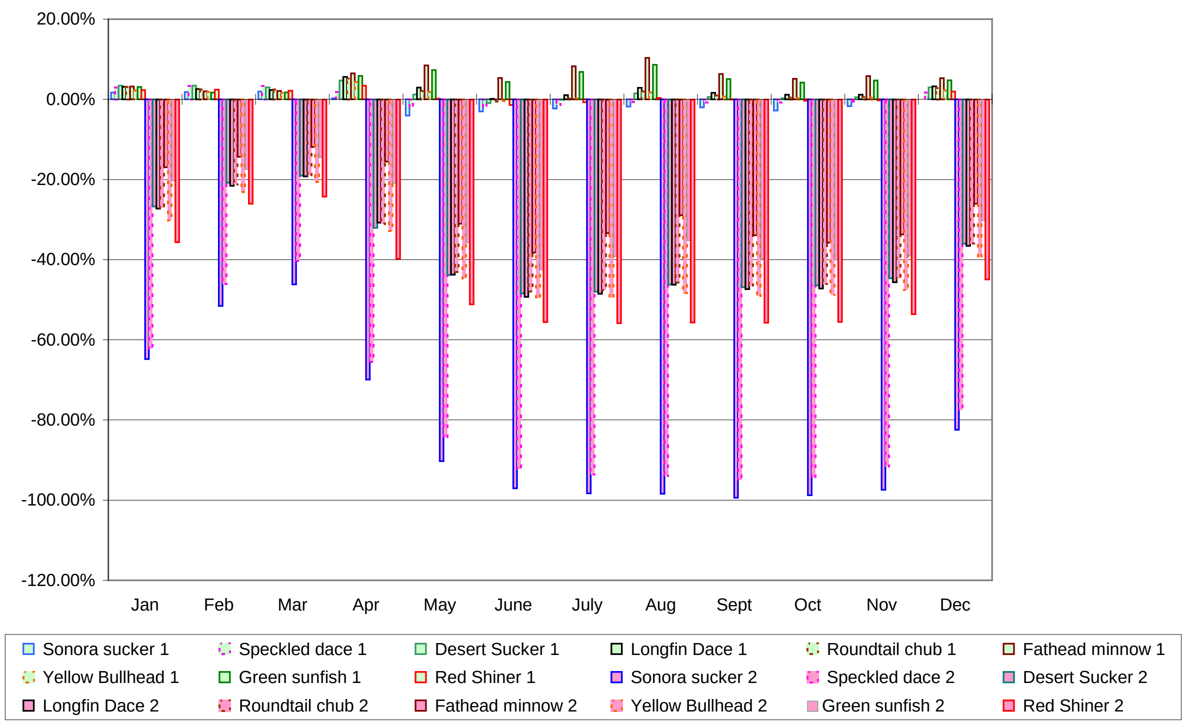


Figure 57. Average monthly change in habitat area (lowest 10 consecutive days) for the Gage site, with no LWD and with a hypothetical withdrawal of 10 ft³/s.

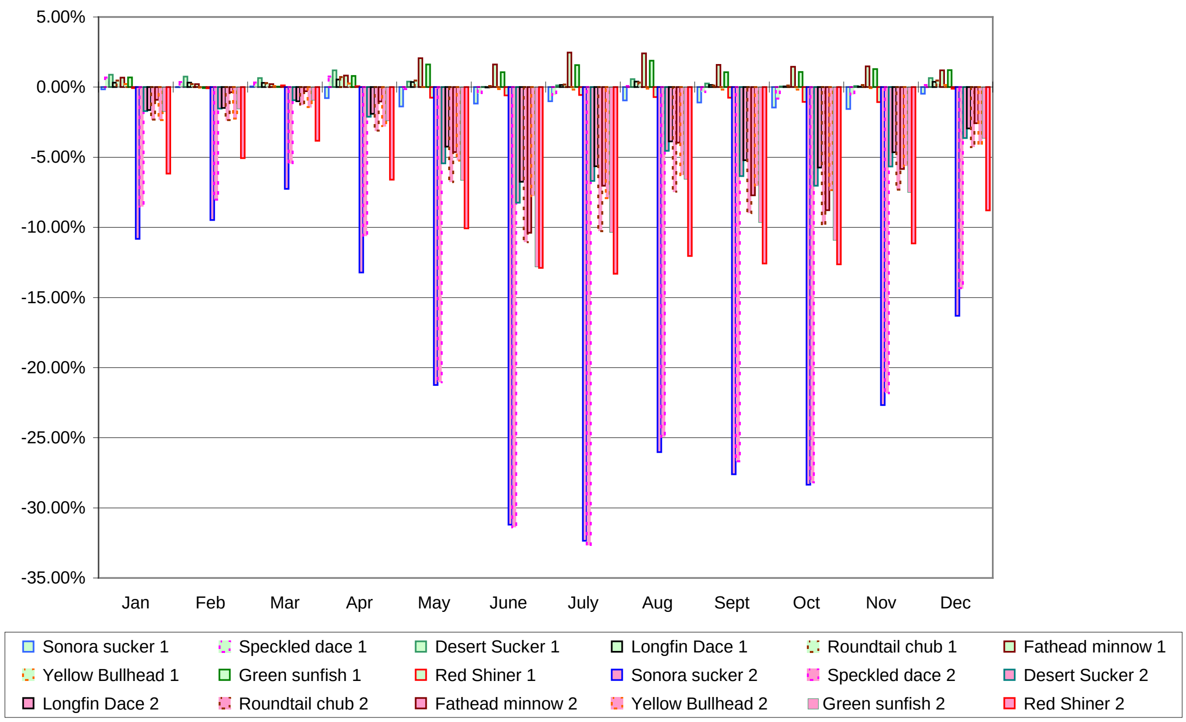


Figure 58. Average monthly change in habitat area (lowest 10 consecutive days) for the Gage site, with LWD and a hypothetical withdrawal of 2 ft³/s.

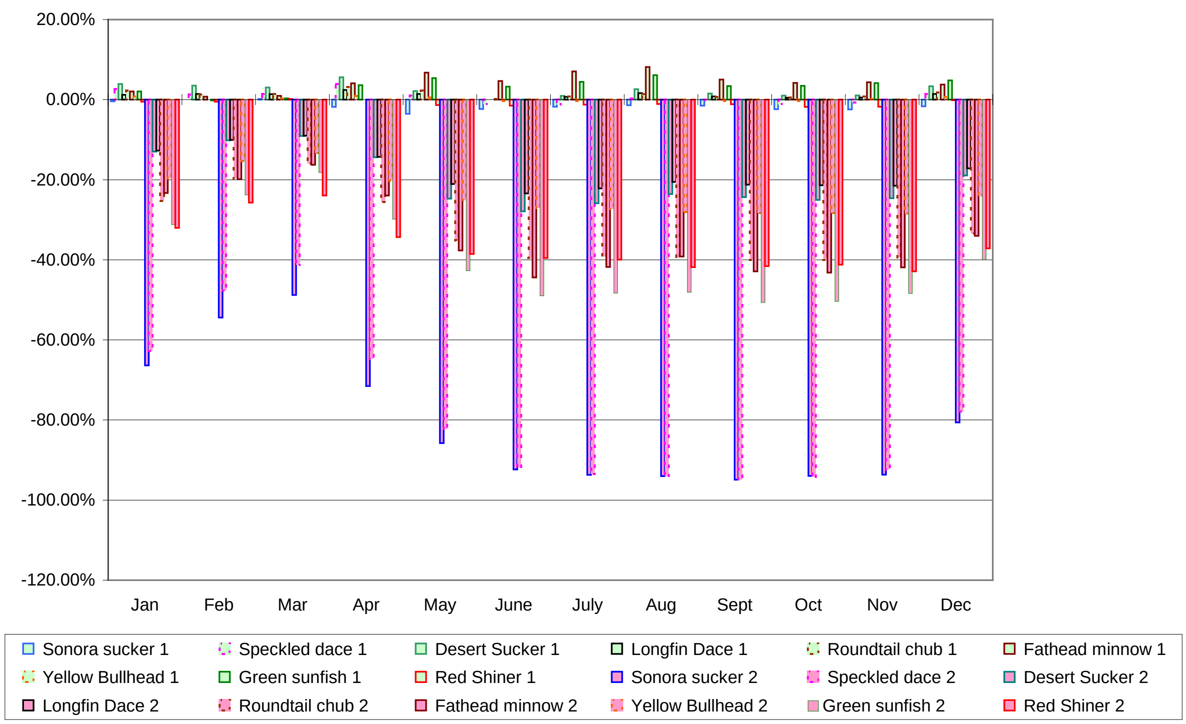


Figure 59. Average monthly change in habitat area (lowest 10 consecutive days) for the Gage site, with LWD and a hypothetical withdrawal of 10 ft³/s.

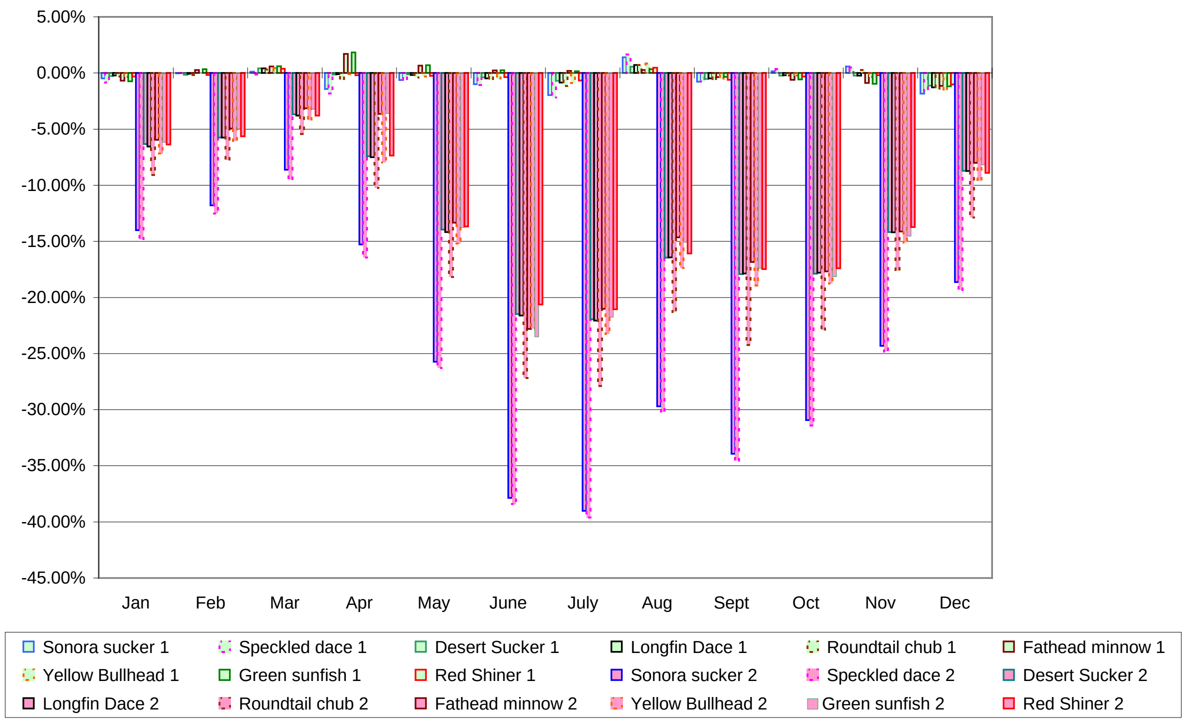


Figure 60. Average monthly change in habitat area (lowest 10 consecutive days) for the Braided site, with no LWD and with a hypothetical withdrawal of 2 ft^3/s.

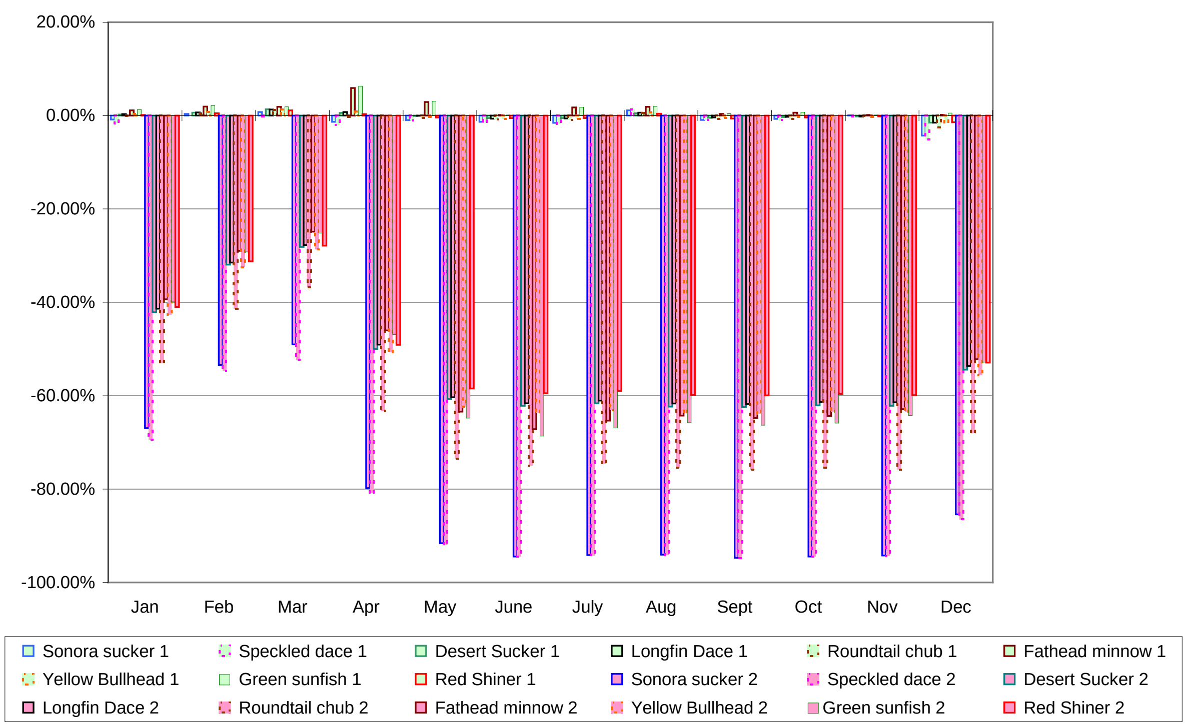


Figure 61. Average monthly change in habitat area (lowest 10 consecutive days) for the Braided site, with no LWD and with a hypothetical withdrawal of 10 ft^3/s.

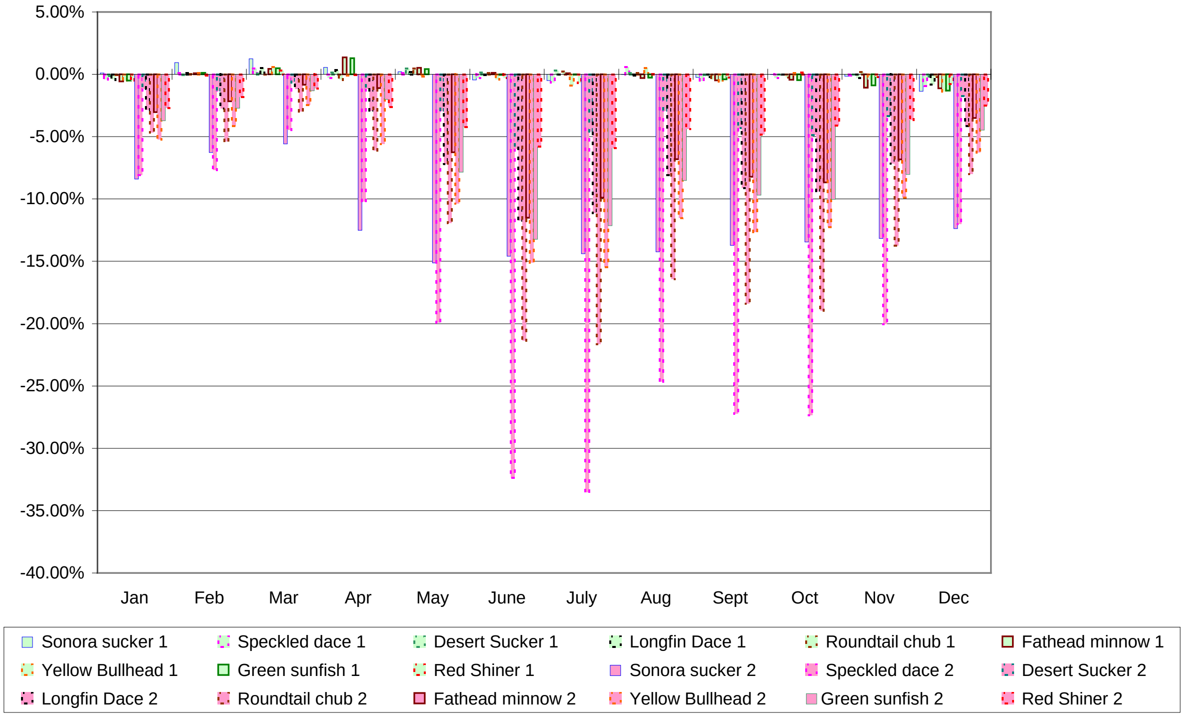


Figure 62. Average monthly change in habitat area (lowest 10 consecutive days) for the Braided site, with LWD and a hypothetical withdrawal of 2 ft^3/s.

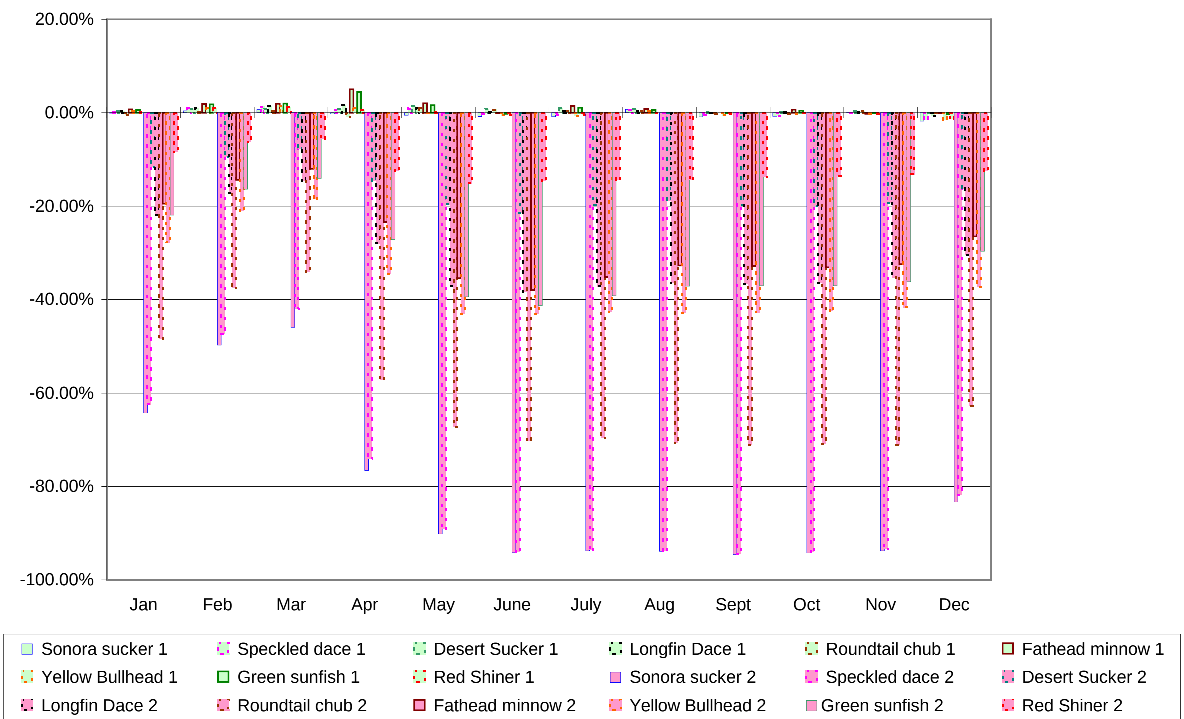


Figure 63. Average monthly change in habitat area (lowest 10 consecutive days) for the Braided site, with LWD and a hypothetical withdrawal of 10 ft^3/s.

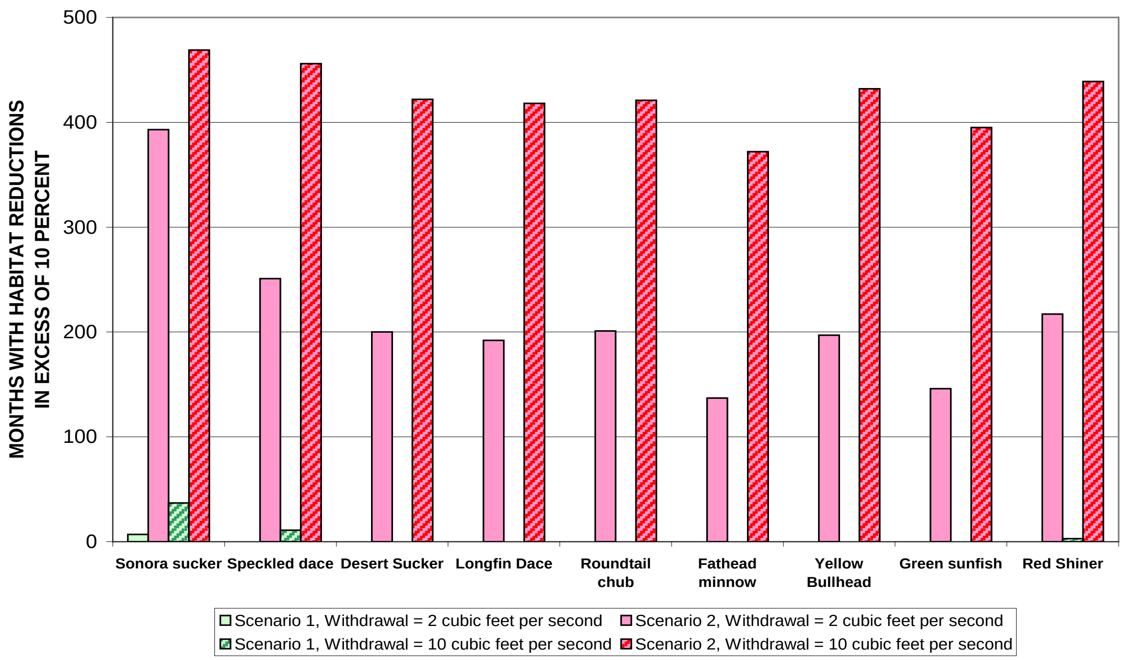


Figure 64. Count of months having a habitat reduction of 10 percent or more at the Gage site for the period of record, without LWD.

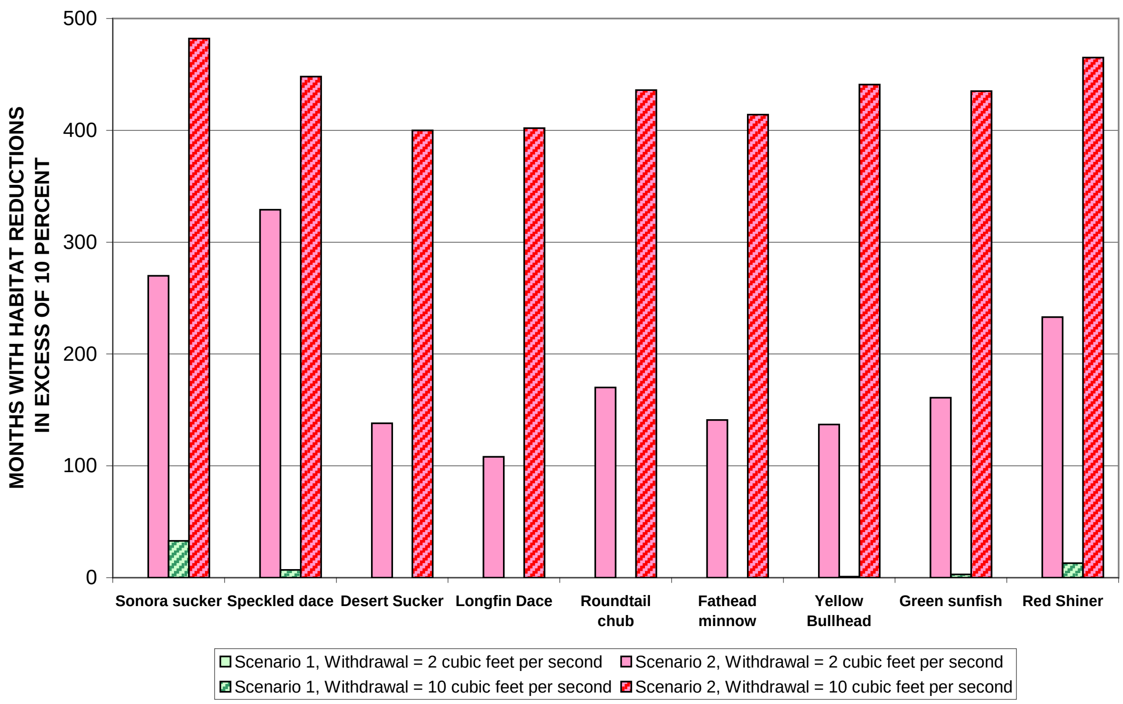


Figure 65. Count of months having a habitat reduction of 10 percent or more at the Gage site for the period of record, with LWD.

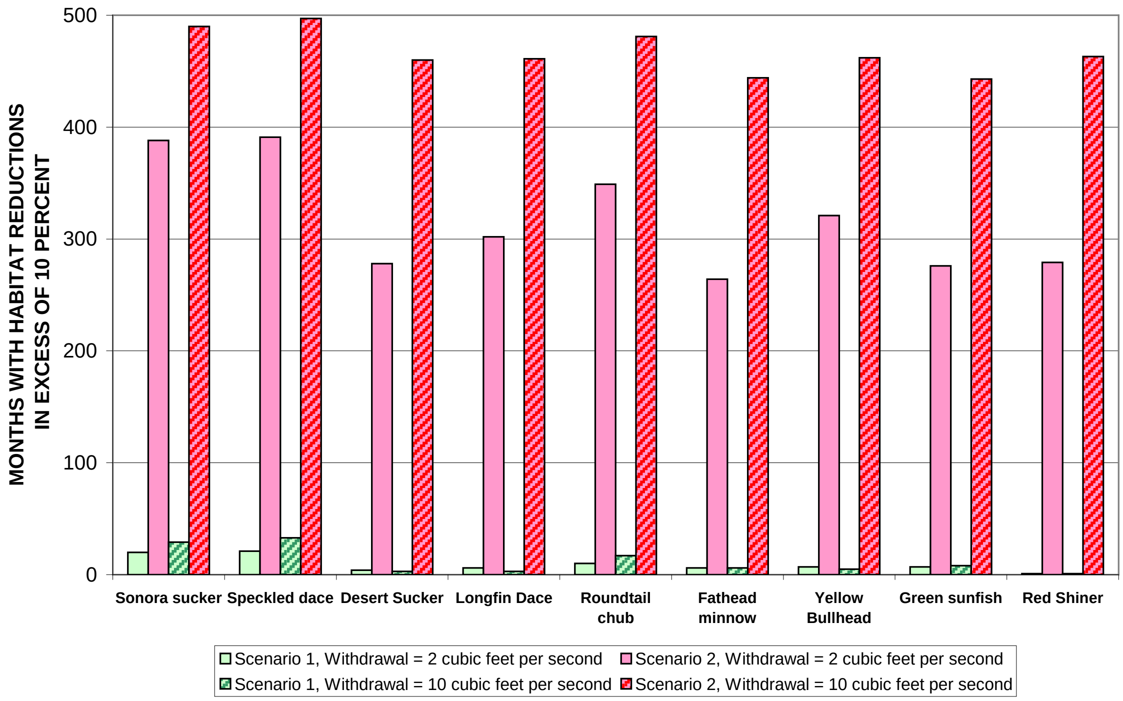


Figure 66. Count of months having a habitat reduction of 10 percent or more at the Braided site for the period of record, without LWD.

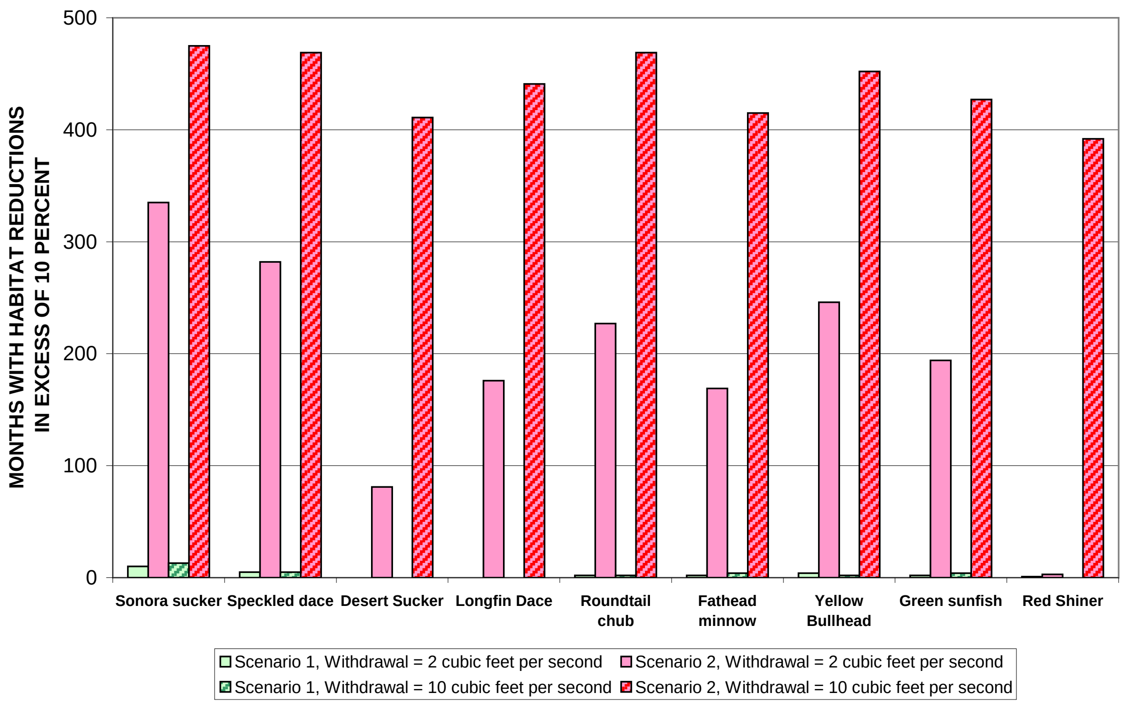


Figure 67. Count of months having a habitat reduction of 10 percent or more at the Braided site for the period of record, with LWD.

Habitat Retention

Retention of available habitat below the median of the habitat duration curves for all months and species is graphed in figures 68–75. Note that Sonora sucker and Speckled dace habitat retention reaches zero when the 10 ft^3/s diversion is applied without enforcement of the water right for habitat evaluation with or without large woody debris. This is due to the periods when the hypothetical diversion removes all water from the stream.

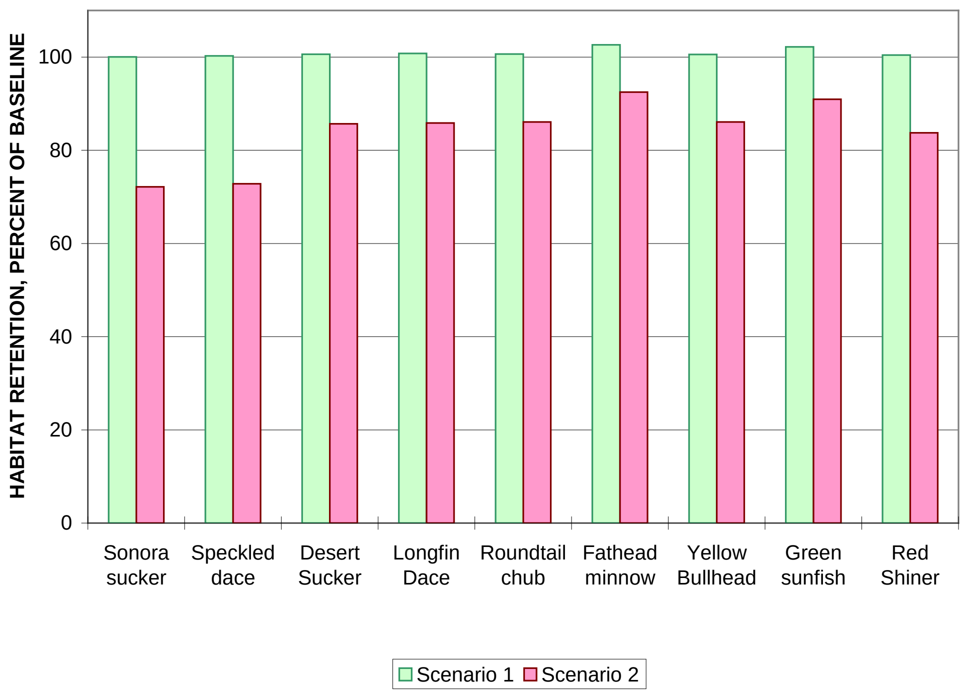


Figure 68. Habitat retention for the Gage site, without LWD and with a hypothetical withdrawal of 2 ft^3/s.

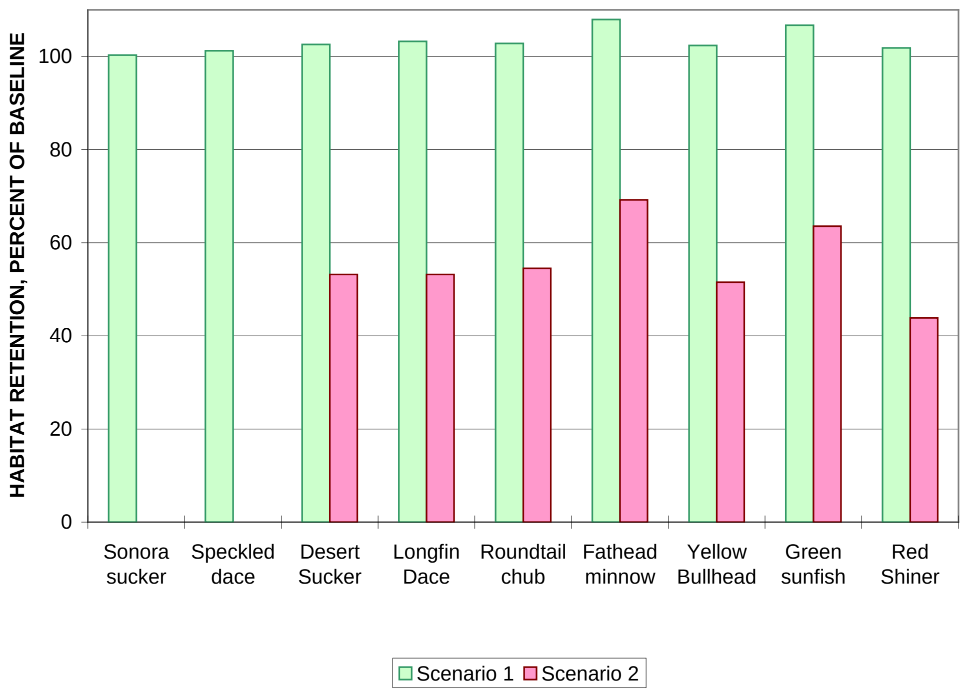


Figure 69. Habitat retention for the Gage site, without LWD and with a hypothetical withdrawal of 10 ft^3/s.

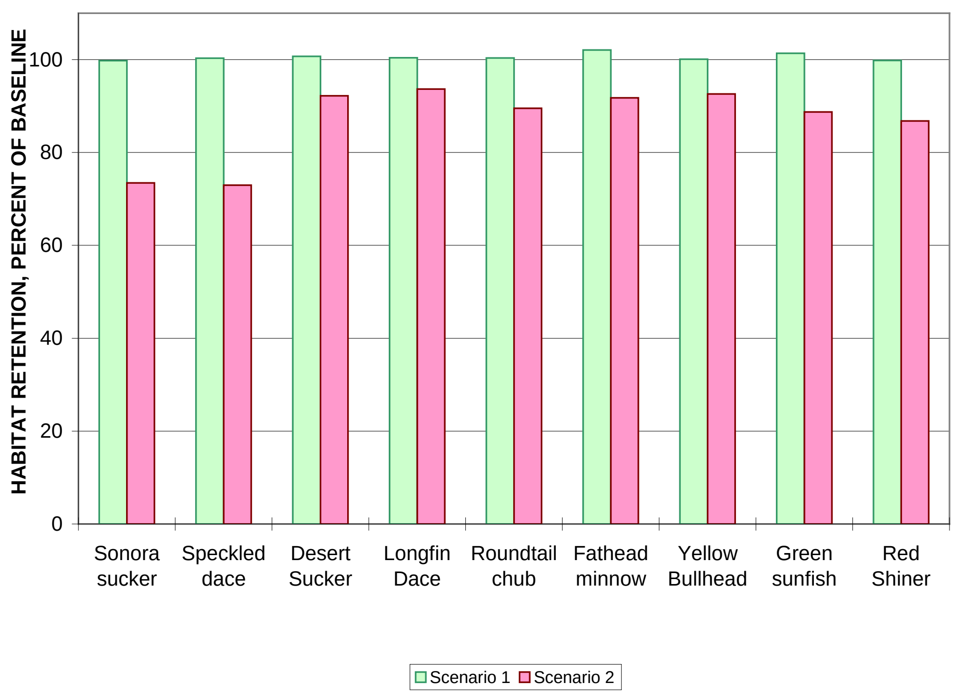


Figure 70. Habitat retention for the Gage site, with LWD and with a hypothetical withdrawal of 2 ft^3/s.

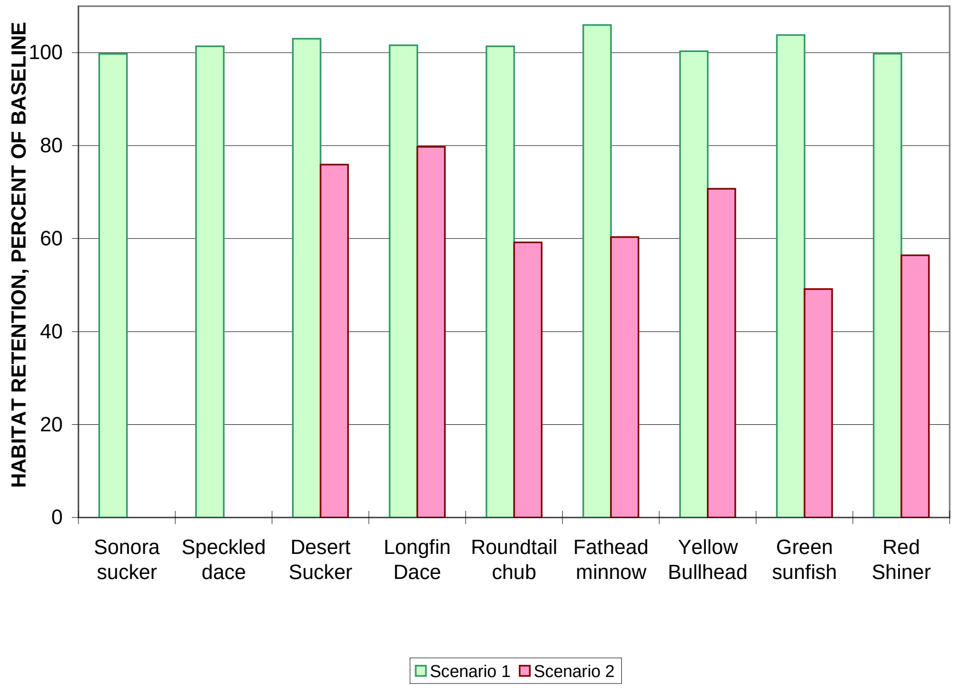


Figure 71. Habitat retention for the Gage site, with LWD and with a hypothetical withdrawal of 10 ft^3/s.

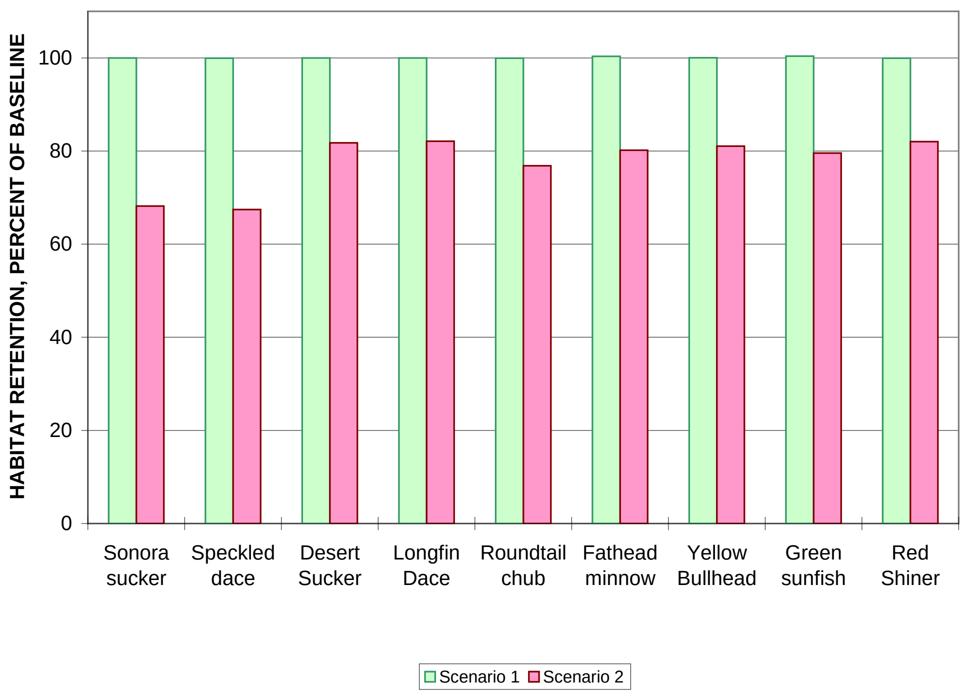


Figure 72. Habitat retention for the Braided site, without LWD and with a hypothetical withdrawal of 2 ft^3/s.

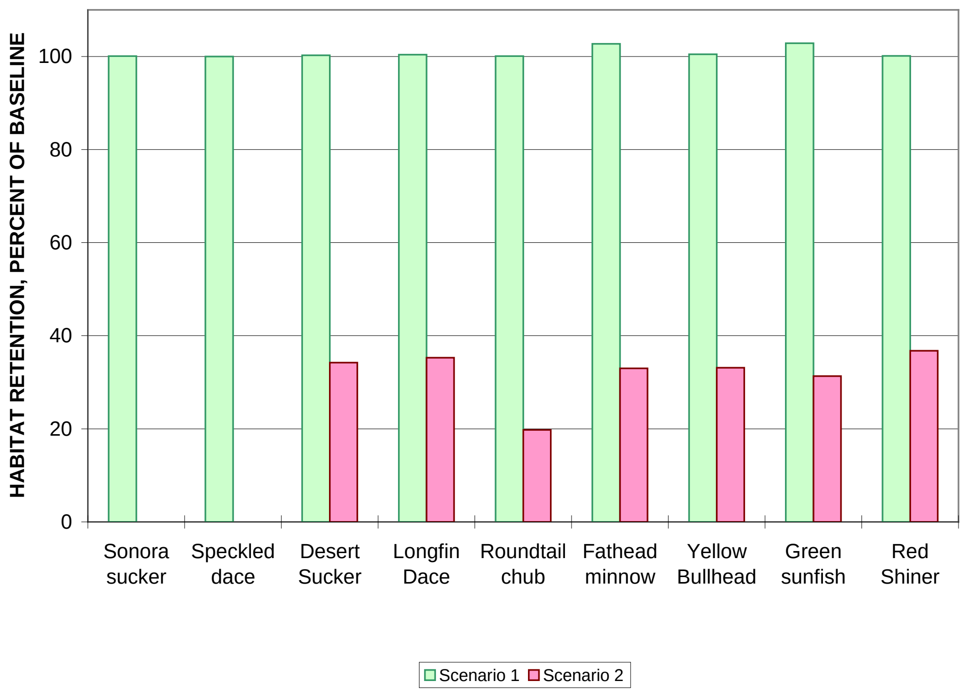


Figure 73. Habitat retention for the Braided site, without LWD and with a hypothetical withdrawal of 10 ft³/s.

Figure 74. Habitat retention for the Braided site, with LWD and a hypothetical withdrawal of 2 ft³/s.

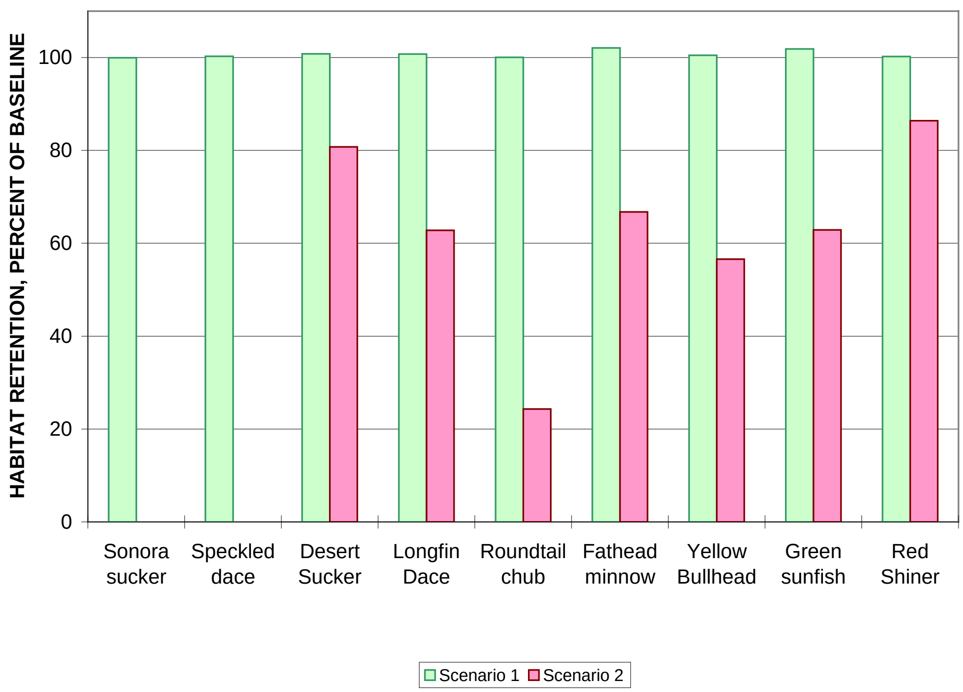


Figure 75. Habitat retention for the Braided site, with LWD and a hypothetical withdrawal of 10 ft^3/s.

Summary of Trial Runs

Scenario Comparisons

Scenarios 1 and 2 provided a distinct dichotomy of habitat effects for all species at both sites. Under Scenario 1, habitat reductions tended to be minor, regardless of the hypothetical diversion, and on occasion actually resulted in habitat increases. The minor habitat reductions were expected because low flows would be protected under this scenario. The modest habitat increases probably resulted from allowing water to be diverted at times when streamflow was relatively high, corresponding to times when the baseline streamflow exceeded the peak for the flow-habitat curves. If the baseline discharge was higher than the flow at which the habitat maxima occured, removing water would have the effect of moving backward along the habitat curve, toward the habitat maxima.

Scenario 2 resulted in a consistent pattern of habitat reductions for all species at both sites. The amount of habitat loss was related to the magnitude of the hypothetical diversion. Because this scenario provided no protection of low flows, reductions in discharge could occur at any time. Large diversions often resulted in extensive periods of very low or zero streamflow. Consequently, habitat reductions occurred for all species, the magnitude of the reduction being a function of how much habitat persisted at very low discharges.

Species Comparisons

The effects of the various hypothetical diversions on individual target species, especially under Scenario 2 and illustrated by figures 52–63 and 68–75, show some interesting potential groupings. The native specialist species (Sonora sucker, speckled dace, and roundtail chub) formed Group 1, which tended to experience the largest habitat reductions regardless of the site or whether LWD was included in the habitat calculation. Group 2 included both native and introduced species: longfin dace, desert sucker, yellow bullhead, and red shiner, all of which experienced moderate habitat reductions under Scenario 2. Group 3 consisted of green sunfish and fathead minnows, both introduced species, which tended to be the least affected by the reduced-flow scenarios.

These groupings appear to be related to the discharge-habitat functions for the individual species. Figure 76 shows the flow ranges that retain 50 percent, 75 percent, and 90 percent of the habitat maxima for each of the target species at both sites (without LWD). Species associated with Group 1 tended to retain relatively large percentages of their habitat maxima over a fairly wide range of flows, but not at low flows. In contrast, the species of Group 3 retained large percentages of their habitat maxima at very low flows, some of which approached zero discharge as their habitat optima. Species associated with Group 2 tended to exhibit retention of maximum habitat over a relatively wide range of flows, but the habitat optima generally occurred at lower discharges than for Group 1 and higher than Group 3.

These results support the general hypothesis that species in Group 1 are more sensitive to reduced low flows because their habitat optima occur in the higher flow ranges and are essentially eliminated at very low discharges. It is noteworthy that the green sunfish is one of the species whose habitat is least affected by low flow reductions. This species is a known predator on native fish larvae

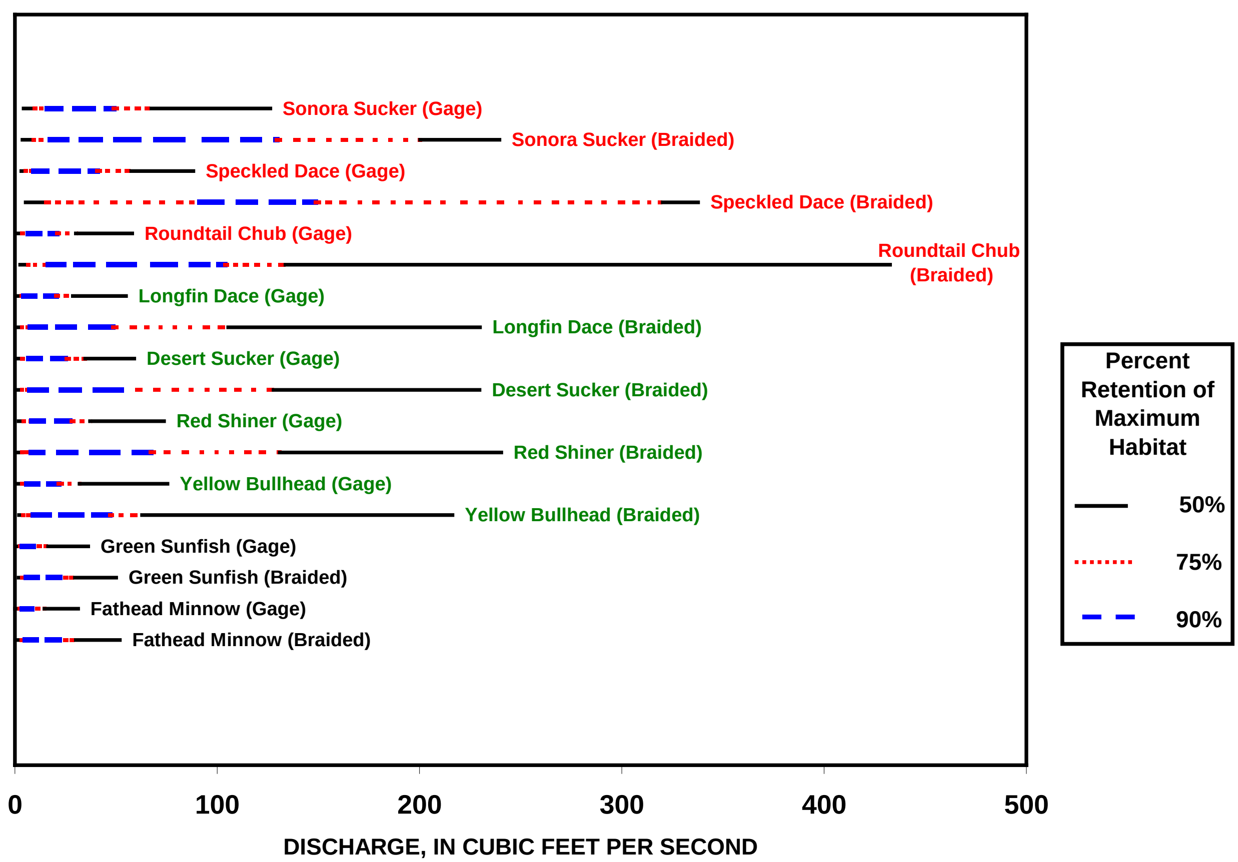


Figure 76. Ranges of discharges providing 50 percent, 75 percent, and 90 percent of the habitat maxima for all target species at both Cherry Creek study sites. Data labels for Group 1 are in red typeface, Group 2 in green typeface, and Group 3 in black typeface.

(Dudley and Matter, 2000; Carpenter and Mueller, 2008), is an aggressive competitor for food and space (Karp and Tyus, 1990), and has been implicated in local extinctions of native species in some rivers (Moyle and Nichols, 1974; Moyle, 1976; Fuller, 2009). Increased densities of native species resulting from habitat reductions, coupled with their forced co-location with green sunfish, could result in lower growth rates of the natives and increased predation by green sunfish. The severity of this "double jeopardy" situation probably depends on the magnitude of the habitat reduction, the concomitant response in population densities of the native fish and green sunfish, and on the frequency and duration of such episodes during the life cycles of the species.

Site Comparisons

Figure 76 also illustrates a major difference in the habitat characteristics of the Gage and Braided sites. Generally, the range of discharges that retain large percentages of the habitat maxima is much broader for all species at the Braided site, and the 90-percent retention range is typically higher. This phenomenon is almost certainly related to differences in channel morphology between the two sites. The Gage site is narrowly confined, which means that at very low discharges the water tends to be concentrated in the riffles and pools. For the same reason, high discharges also tend to be concentrated, resulting in velocities that exceed the tolerances of most of the species. In contrast, the channel at the Braided site allows water to spread out more at both high and low discharges. At zero discharge, pools at the Gage site retain relatively large areas with depths in excess of 0.5 m, whereas most of the pool area at the Braided site is less than 0.25 m deep (fig. 77). At high flows, the discharge in the Braided channel is distributed through a network of distributary channels, allowing dissipation of extreme velocities. Consequently, low flow habitat tends to be retained more at the Gage site and high flow habitat at the Braided site.

LWD or No LWD?

The inclusion of LWD as a habitat variable was problematic during our analysis. Many biologists agree that LWD is an important component of stream habitat with rationales including retention of organic carbon (Bilby and Likens, 1980; Ward and Aumen, 1986), local modification of channel morphology and stream hydraulics (Abbe and Montgomery, 1996; Dudley and others, 1998), provision of colonization sites for stream macroinvertebrates (France, 1997), creation of habitat heterogeneity (Hicks and others, 1991), and provision of hiding cover and refugia, particularly for small fish (Lister and Genoe, 1970; Zika and Peter, 2002, Pease and others, 2006). Most of the research regarding the ecological role of LWD, however, has not been conducted in desert streams like Cherry Creek. During our topographic surveys, we observed high densities of small but unidentified fish in and around patches of LWD. We are unsure, however, whether the fish had a natural affinity for LWD as a preferred habitat or if they were simply hiding from the surveyors.

Including LWD as a habitat variable in our models had several somewhat inconsistent effects on the habitat-flow functions used in the CCHTSAM model. One consistency, however, was that inclusion of LWD in the habitat calculations resulted in much lower total habitat areas than using only the substrate and hydraulic habitat variables in the model. This phenomenon was the result of the relative scarcity of LWD patches in either site.

At the Gage site, the habitat-flow functions for discharges above 750 ft^3/s, with LWD, behaved similarly to those where LWD was not included in the habitat model (see for example, figs. 44 and 46).

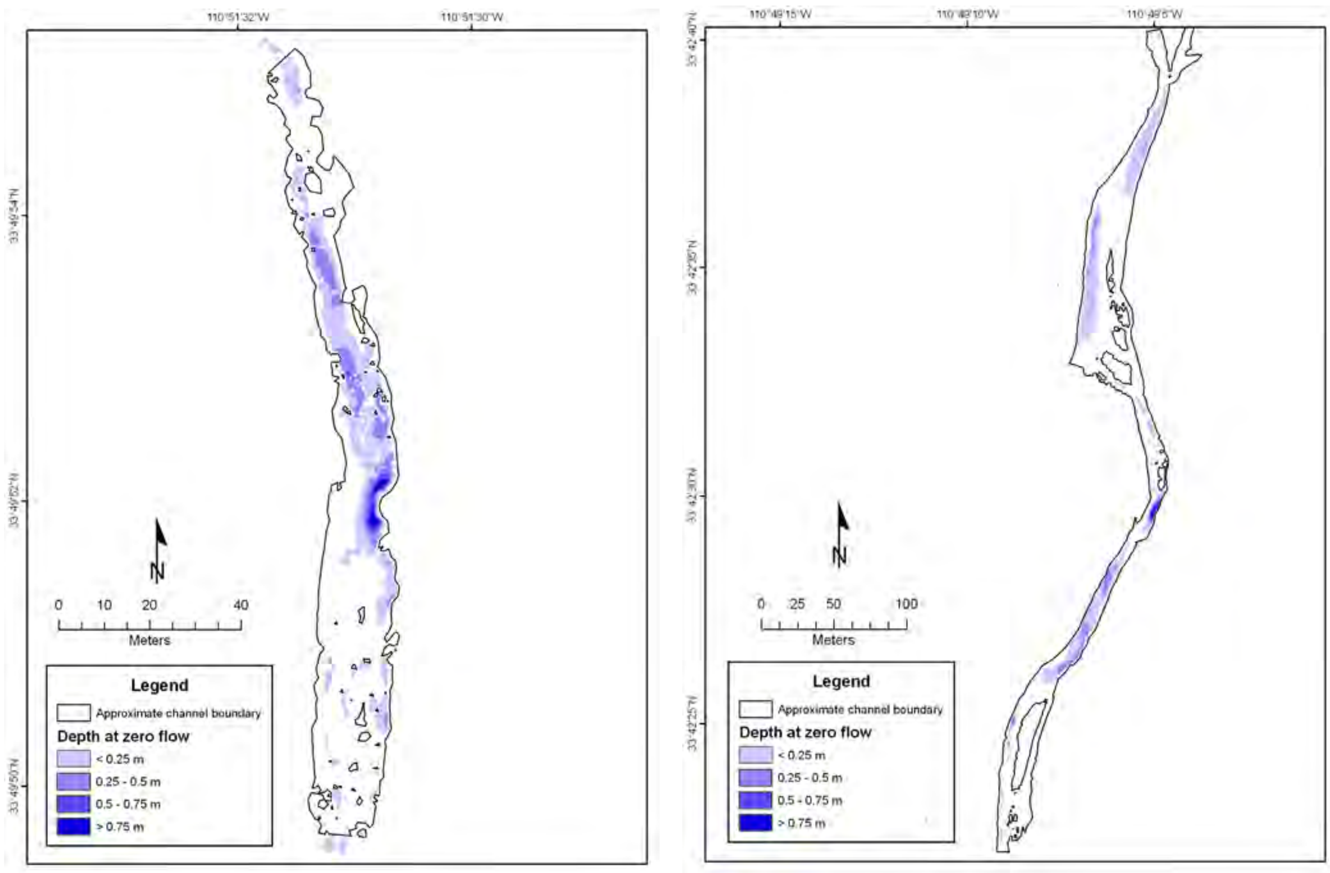


Figure 77. Depths of pools at zero discharge in the Gage site (left) and Braided site (right).

In the low flow range (0–200 ft^3/s), however, the effects of inclusion of LWD were fairly obvious. When LWD was included in the habitat model, the habitat area tended to stabilize and was nearly constant between 20 ft^3/s and 200 ft^3/s. When LWD was not included in the model, habitat areas steadily declined for most species at discharges higher than 20 ft^3/s. This phenomenon reflects a relative stability in habitat suitability in the areas immediately adjacent to the channel margin, where LWD patches tended to occur the most often.

At the Braided site, the habitat-flow relationship without LWD showed several distinct peaks in habitat area, approximately in the ranges of 20–60 ft^3/s, 500–1,000 ft^3/s, and around 3,800 ft^3/s (fig. 48). These peaks corresponded to optimal hydraulic habitat conditions in the main channel (the 20–60 ft^3/s case) and in secondary channels at the higher flows. In contrast, when LWD was included in the habitat model, the first peak in the habitat-flow curve was in the same flow range as that without LWD, but steadily increased from 400 ft^3/s up to approximately 3,800 ft^3/s (fig. 50).

The differences in the models incorporating LWD at the two sites are attributable in part to differences in channel configuration and in part to the type of LWD present. LWD was nearly absent at the Gage site. The limited patches of LWD at this site existed most commonly in the form of root wads and attached terrestrial vegetation that had toppled into the water. Both types tended to occur in small patches along the channel margins and on top of the narrow strip of bank area adjacent to the stream. As discharge increased from 0 to approximately 1,000 ft^3/s, the normalized amount of inundated LWD increased at a rate of 0.23 m^2 for every incremental increase in discharge of 1 ft^3/s. Beyond 1,000 ft^3/s, the area of inundated LWD leveled off to an almost imperceptible rate of change (fig. 78).

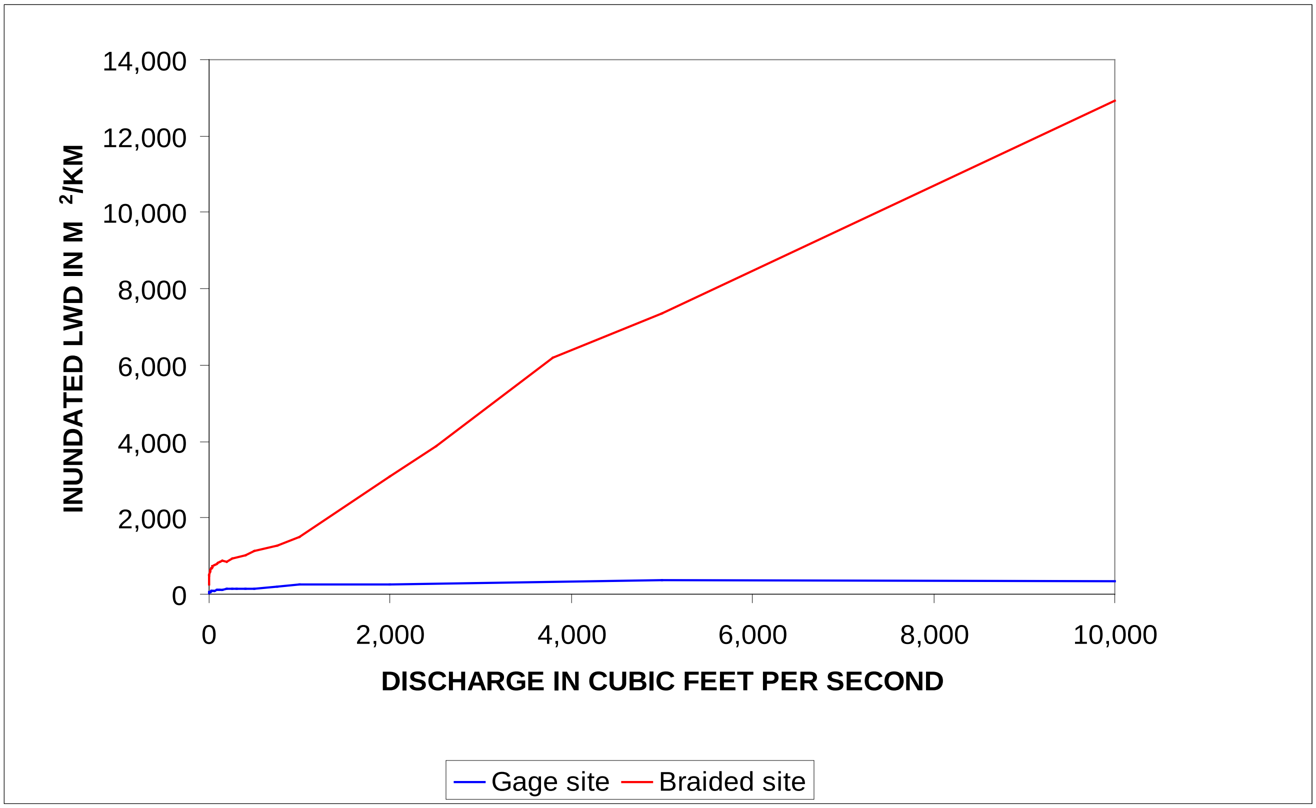


Figure 78. Inundation of LWD as a function of discharge at the two study sites.

The Braided site also contained patches of root wads and attached terrestrial vegetation, but unlike the Gage site, contained very large debris piles consisting of uprooted trees and dislodged shrubbery scattered erratically over the entire floodplain/secondary channel area between the terrace walls of the site. As discharge increased from 0 to 1,000 ft^3/s, new debris deposits were inundated at a relatively steady normalized rate of 1.24 m^2 for every 1 ft^3/s increase in discharge, slightly over five times faster than the rate of inundation at the Gage site (fig. 78). Above 1,000 ft^3/s, newly inundated LWD was accreted at a slightly lower, but still appreciable, rate of 0.77 m^2 per cubic feet per second increase in discharge.

Conclusion

This report conveys CCHTSAM for use in evaluating conditions with and without an instream water right for any proposed level of water withdrawal from Cherry Creek. The model and supporting data were prepared as part of Federal employees' official duties and are publically available as "Work of the United States Government" as defined in 17 USC § 101.

References Cited

Abbe, T.B., and Montgomery, D.R., 1996, Large woody debris jams, channel hydraulics and habitat formation in large rivers, *in* Proceedings of International Symposium on Habitat Hydraulics, Trondheim, Norway 18–20 Aug. 1994: Regulated Rivers—Research and Management, v. 12, p. 201–221.

Bilby, R.E., and Likens, G.E., 1980, Importance of organic debris dams in the structure and function of stream ecosystems: Ecology, v. 61, p. 1,107–1,113.

Bovee, K.D., Newcomb, T.J., and Coon, T.G., 1994, Relations between habitat variability and population dynamics of bass in the Huron River, Michigan: U.S. Department of the Interior, National Biological Survey, Biological Report 21, 63 p.

Bovee, K.D., Waddle, T.J., Bartholow, J., and Burris, L. 2007, A decision support framework for water management in the upper Delaware River: U.S. Geological Survey Open-File Report 2007-1172, 122 p.

Bovee, K.D., Waddle, T.J., Talbert, C., Hatten, J.R., and Batt, T.R. 2008a, Development and application of a decision support system for water management investigations in the Upper Yakima River, Washington: U.S. Geological Survey Open-File Report 2008-1251, 289 p.

Bovee, K.D., Waddle, T.J., and Spears, J.M., 2008b, Streamflow and endangered species habitat in the lower Isleta reach of the middle Rio Grande: U.S. Geological Survey Open-File Report 2008-1323, 177 p.

Carpenter, J., and Mueller, G.A., 2008, Small nonnative fishes as predators of larval razorback suckers: Southwestern Naturalist, v. 53, p. 236–242.

Dudley, R.K., and Matter, W.J., 2000, Effects of small green sunfish (*Lepomis cyanellus*) on recruitment of Gila chub (*Gila intermedia*) in Sabino Creek, Arizona: Southwestern Naturalist, v. 45, p. 24–29.

Dudley, S.J., Fischenich, J.C., and Abt, S.R., 1998, Effect of woody debris entrapment on flow resistance: Journal of the American Water Resources Association, v. 34, p. 1,189–1,198.

France, R.L., 1997, Macroinvertebrate colonization of woody debris in Canadian Shield lakes following riparian clearcutting: Conservation Biology, v. 11, p. 513–521.

Fuller, P., 2009, Lepomis cyanellus: USGS Nonindigenous Aquatic Species Database, Gainesville, Fla., accessed March 4, 2009 at *http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=380*.

Ghanem, A.H., Steffler, P.M., Hicks, F.E., and Katopodis, C., 1996, Two dimensional finite element flow modeling of physical fish habitat, *in* Proceedings of International Symposium on Habitat Hydraulics, Trondheim, Norway, 18–20 Aug. 1994: Regulated Rivers—Research and Management, v. 12, p.185–200.

Hicks, B.J., Hall, J.D., Bisson, P.A., and Sedell ,J.R,. 1991, Responses of salmonids to habitat change: American Fisheries Society Special Publication, v. 19, p. 483–518.

Karp, C.A., and Tyus, H.M., 1990, Behavioral interactions between young Colorado squawfish and six fish species: Copeia, v. 1, p. 25–34.

Lister, D.B., and Genoe, H.S., 1970, Stream habitat utilization by cohabiting underyearlings of chinook (*Oncorhynchus tshawytscha)* and coho (*O. kisutch*) salmon in the Big Qualicum River, British Columbia: Journal of the Fisheries Research Board of Canada, v. 27, p. 1,215–1,224.

Moyle, P.B., 1976, Fish introductions in California—History and impact on native fishes: Biological Conservation, v. 9, p. 101–118.

Moyle, P. B., and Nichols, R., 1974, Decline of the native fish fauna of the Sierra Nevada foothills, central California: The American Midland Naturalist, v. 92, no. 1, p. 72–83.

Nehring, R.B., and Anderson, R.M., 1993, Determination of population-limiting critical salmonid habitats in Colorado streams using the Physical Habitat Simulation System: Rivers, v. 4, no. 1, p. 1–19.

Pease, A.A., Davis, J.J., Edwards, M.S., and Turner, T.F., 2006, Habitat and resource use by larval and juvenile fishes in an arid-land river (Rio Grande, New Mexico): Freshwater Biology, v. 51, p. 475–486.

Steffler, P., 2002, Bed topography file editor and users manual: Edmonton, Alberta, Canada, University of Alberta, 119 p., accessed Jan. 21, 2009, at *http://www.river2d.ualberta.ca/download.htm.*

Steffler, P., and Blackburn, J., 2002, River2D—Two-dimensional depth averaged model of river hydrodynamics and fish habitat—Introduction to depth averaged modeling and users manual: Edmonton, Alberta, Canada, University of Alberta, 119 p., accessed Jan. 21, 2009, at *http://www.river2d.ualberta.ca/download.htm.*

Thomas, J.A., and Bovee, K.D., 1993, Application and testing of a procedure to evaluate transferability of habitat suitability criteria—Regulated Rivers: Research & Management, v. 8, p. 285–294.

Ward, G.M., and Aumen, N.G., 1986, Woody debris as a source of fine particulate organic matter in coniferous forest stream ecosystems: Canadian Journal of Fisheries and Aquatic Sciences, v. 43, p. 1,635–1,642.

Waddle, T. and Steffler, P., 2002, R2D_Mesh—Mesh generation program for River2D two dimensional depth averaged finite element—Introduction to mesh generation and user's manual: U.S. Geological Survey, 31 p., accessed accessed November 20, 2008 at *http://www.river2d.ualberta.ca/download.htm.*

Zika, U., and Peter, A., 2002, The introduction of woody debris into a channelized stream—Effect on trout populations and habitat: River Research and Applications, v. 18, no. 4, p. 355–366.

Appendix 1. Rating Curve Adjustment

The relative (height only) rating curve derived from the stage information for the Cherry Creek gage (USGS 09497980) was adjusted such that it coincided with the 4.64 ft^3/s (0.132 m^3/s) observed water surface elevation. This translated rating was then used to extrapolate to a 10,000 ft^3/s (283 m^3/s) water surface elevation at the Gage site. We extracted a water surface elevation from this translated curve for the 40 ft^3/s (1.133 m^3/s) estimated discharge observed during the July 16 reconnaissance trip when the estimated water's edge was marked with rebar for later measurement. We found that the translated rating curve overestimated the observed elevation by 0.057 m, so a linear offset adjustment of the form ($\Delta Q/\text{Max } Q \times Q40 \times C$) was used to adjust the translated curve such that it intersected the 4.64 ft^3/s (0.132 m^3/s) observed water surface elevation, the 40 ft^3/s (1.133 m^3/s) observed elevation and the extrapolated 10,000 ft^3/s (283 m^3/s) water surface elevation. In this relation, Max Q is 283 m^3/s , Q40 is 1.133 m^3/s, and C was determined to be 1.1 by fitting to the 0.132 m^3/s observation. Thus, the effect of the 0.057 m offset at 40 ft^3/s (1.133 m^3/s) diminished to zero at the maximum discharge. A similar adjustment was applied downward from 40 ft^3/s (1.133 m^3/s) to 4.64 ft^3/s (0.132 m^3/s) to ensure the final rating curve reported in table 8 did not contain abrupt changes in water surface elevation that were artifacts of the calculation.

Appendix 2. Pebble Counts

Two Wolman counts were performed at the Braided site and are reported in aggregate here.

Table 2-1. Size characteristics and exceedance probabilities of pebbles from two Wolman counts.[1]

Number	Exceedance %	Sample	Long	Median	Short
1	0.005747	61	0.005	0.005	0.004
2	0.011494	46	0.008	0.005	0.004
3	0.017241	94	0.011	0.008	0.006
4	0.022989	62	0.012	0.008	0.006
5	0.028736	19	0.013	0.009	0.006
6	0.034483	95	0.014	0.010	0.006
7	0.040230	45	0.016	0.010	0.006
8	0.045977	94	0.017	0.010	0.007
9	0.051724	97	0.021	0.014	0.008
10	0.057471	42	0.022	0.014	0.008
11	0.063218	2	0.025	0.016	0.010
12	0.068966	67	0.026	0.018	0.011
13	0.074713	93	0.027	0.020	0.011
14	0.080460	97	0.028	0.020	0.011
15	0.086207	14	0.029	0.020	0.011
16	0.091954	20	0.029	0.020	0.011
17	0.097701	73	0.033	0.020	0.012
18	0.103448	80	0.036	0.021	0.012
19	0.109195	26	0.037	0.022	0.015
20	0.114943	86	0.039	0.027	0.015
21	0.120690	40	0.040	0.027	0.016
22	0.126437	42	0.040	0.028	0.017
23	0.132184	95	0.043	0.029	0.017
24	0.137931	6	0.045	0.030	0.018
25	0.143678	56	0.045	0.030	0.018
26	0.149425	83	0.045	0.031	0.018
27	0.155172	63	0.046	0.032	0.018
28	0.160920	10	0.047	0.032	0.019
29	0.166667	1	0.048	0.033	0.019
30	0.172414	3	0.049	0.034	0.020
31	0.178161	38	0.050	0.035	0.020
32	0.183908	64	0.051	0.036	0.020
33	0.189655	93	0.052	0.037	0.021
34	0.195402	66	0.053	0.037	0.021
35	0.201149	64	0.054	0.038	0.022
36	0.206897	41	0.056	0.039	0.022
37	0.212644	25	0.057	0.039	0.022
38	0.218391	60	0.057	0.039	0.022
39	0.224138	52	0.058	0.040	0.023

Table 2-1. Size characteristics and exceedance probabilities of pebbles from two Wolman counts (cont.).[1]

Number	Exceedance %	Sample	Long	Median	Short
40	0.229885	96	0.058	0.040	0.023
41	0.235632	17	0.058	0.041	0.026
42	0.241379	57	0.059	0.042	0.026
43	0.247126	96	0.059	0.042	0.026
44	0.252874	30	0.060	0.042	0.026
45	0.258621	43	0.060	0.042	0.027
46	0.264368	88	0.060	0.043	0.027
47	0.270115	99	0.060	0.043	0.027
48	0.275862	54	0.062	0.045	0.027
49	0.281609	77	0.062	0.046	0.028
50	0.287356	81	0.068	0.046	0.030
51	0.293103	30	0.068	0.047	0.030
52	0.298851	68	0.069	0.050	0.030
53	0.304598	4	0.070	0.050	0.030
54	0.310345	12	0.070	0.050	0.030
55	0.316092	88	0.070	0.051	0.030
56	0.321839	90	0.074	0.052	0.030
57	0.327586	46	0.075	0.052	0.030
58	0.333333	35	0.075	0.053	0.030
59	0.339080	74	0.076	0.053	0.030
60	0.344828	61	0.077	0.054	0.031
61	0.350575	9	0.078	0.054	0.032
62	0.356322	33	0.078	0.055	0.032
63	0.362069	16	0.080	0.056	0.032
64	0.367816	17	0.080	0.056	0.035
65	0.373563	49	0.081	0.058	0.035
66	0.379310	62	0.082	0.058	0.035
67	0.385057	82	0.082	0.058	0.036
68	0.390805	75	0.083	0.060	0.036
69	0.396552	51	0.084	0.060	0.037
70	0.402299	89	0.085	0.060	0.037
71	0.408046	28	0.090	0.061	0.038
72	0.413793	70	0.090	0.061	0.038
73	0.419540	78	0.091	0.062	0.038
74	0.425287	35	0.093	0.062	0.039
75	0.431034	44	0.093	0.062	0.040
76	0.436782	22	0.095	0.062	0.040
77	0.442529	23	0.095	0.063	0.041
78	0.448276	72	0.095	0.064	0.041
79	0.454023	86	0.095	0.065	0.042
80	0.459770	55	0.098	0.066	0.042
81	0.465517	41	0.100	0.067	0.043
82	0.471264	91	0.100	0.068	0.044
83	0.477011	43	0.100	0.068	0.044
84	0.482759	87	0.107	0.070	0.044
85	0.488506	92	0.108	0.072	0.045
86	0.494253	26	0.108	0.072	0.045
87	0.500000	3	0.109	0.072	0.046

Table 2-1. Size characteristics and exceedance probabilities of pebbles from two Wolman counts (cont.).[1]

Number	Exceedance %	Sample	Long	Median	Short
88	0.505747	28	0.109	0.073	0.047
89	0.511494	83	0.110	0.074	0.047
90	0.517241	91	0.112	0.076	0.048
91	0.522989	99	0.115	0.078	0.048
92	0.528736	47	0.119	0.078	0.048
93	0.534483	89	0.119	0.078	0.048
94	0.540230	15	0.120	0.080	0.049
95	0.545977	27	0.120	0.080	0.050
96	0.551724	51	0.121	0.080	0.050
97	0.557471	50	0.122	0.080	0.051
98	0.563218	92	0.124	0.080	0.051
99	0.568966	68	0.125	0.081	0.051
100	0.574713	55	0.126	0.082	0.052
101	0.580460	16	0.126	0.082	0.055
102	0.586207	2	0.128	0.083	0.056
103	0.591954	5	0.130	0.085	0.058
104	0.597701	21	0.130	0.085	0.058
105	0.603448	69	0.132	0.086	0.058
106	0.609195	36	0.133	0.086	0.058
107	0.614943	58	0.135	0.091	0.059
108	0.620690	32	0.135	0.091	0.060
109	0.626437	52	0.136	0.092	0.060
110	0.632184	24	0.138	0.092	0.061
111	0.637931	48	0.138	0.095	0.061
112	0.643678	45	0.140	0.095	0.062
113	0.649425	18	0.141	0.100	0.062
114	0.655172	22	0.145	0.100	0.062
115	0.660920	39	0.145	0.103	0.063
116	0.666667	23	0.147	0.103	0.064
117	0.672414	7	0.150	0.103	0.065
118	0.678161	11	0.150	0.105	0.065
119	0.683908	57	0.150	0.106	0.065
120	0.689655	59	0.150	0.108	0.067
121	0.695402	84	0.150	0.109	0.068
122	0.701149	24	0.153	0.109	0.068
123	0.706897	48	0.157	0.110	0.068
124	0.712644	8	0.160	0.111	0.068
125	0.718391	37	0.160	0.118	0.069
126	0.724138	21	0.162	0.118	0.070
127	0.729885	34	0.164	0.119	0.070
128	0.735632	40	0.166	0.120	0.071
129	0.741379	13	0.170	0.120	0.071
130	0.747126	63	0.170	0.120	0.072
131	0.752874	60	0.171	0.121	0.073
132	0.758621	29	0.174	0.122	0.080

Table 2-1. Size characteristics and exceedance probabilities of pebbles from two Wolman counts (conc.).[1]

Number	Exceedance %	Sample	Long	Median	Short
133	0.764368	71	0.175	0.123	0.080
134	0.770115	65	0.176	0.123	0.080
135	0.775862	44	0.180	0.124	0.080
136	0.781609	85	0.180	0.129	0.081
137	0.787356	58	0.182	0.130	0.083
138	0.793103	76	0.188	0.131	0.085
139	0.798851	53	0.190	0.133	0.085
140	0.804598	20	0.191	0.133	0.085
141	0.810345	69	0.192	0.135	0.087
142	0.816092	84	0.193	0.135	0.087
143	0.821839	31	0.203	0.140	0.088
144	0.827586	72	0.213	0.141	0.089
145	0.833333	7	0.214	0.141	0.090
146	0.839080	39	0.220	0.142	0.090
147	0.844828	79	0.220	0.145	0.091
148	0.850575	38	0.222	0.145	0.091
149	0.856322	13	0.227	0.151	0.091
150	0.862069	50	0.230	0.160	0.093
151	0.867816	49	0.235	0.162	0.094
152	0.873563	76	0.236	0.162	0.095
153	0.879310	71	0.240	0.163	0.099
154	0.885057	56	0.250	0.163	0.100
155	0.890805	82	0.252	0.167	0.102
156	0.896552	59	0.260	0.168	0.110
157	0.902299	74	0.265	0.169	0.110
158	0.908046	65	0.270	0.175	0.111
159	0.913793	70	0.272	0.180	0.113
160	0.919540	1	0.278	0.180	0.117
161	0.925287	54	0.280	0.180	0.121
162	0.931034	47	0.300	0.183	0.122
163	0.936782	75	0.300	0.197	0.124
164	0.942529	53	0.328	0.200	0.130
165	0.948276	81	0.346	0.200	0.135
166	0.954023	98	0.350	0.200	0.140
167	0.959770	80	0.360	0.211	0.140
168	0.965517	78	0.380	0.239	0.144
169	0.971264	87	0.440	0.242	0.144
170	0.977011	25	0.580	0.255	0.151
171	0.982759	100	0.660	0.294	0.160
172	0.988506	67	0.710	0.315	0.176
173	0.994253	4	0.840	0.344	0.294

[1] Twenty six observations classified as sand were omitted from this table.

Appendix 3. Braid Site Routing Scheme

The Cherry Creek gage is located near the southern end of the incised valley portion of the watershed. Between the gage and our Braided site the valley transitions to a broad valley with alluvial deposits ranging from 150 m to 400 m wide. There is no continuous record near the Braided site, so to generate habitat time series at the Braided site it was necessary to develop a routing scheme to translate flow at the gage downstream to the Braided site.

Ideally, one would select a standard routing scheme to generate a flow record at the Braided site given the available record at the Gage site. However, most routing methods require at least a short continuous record at the target site and we were limited to a total of 14 spot measurements including two obtained during our topographic data collection field trip. Spot measurements at the Braided site were transmitted from Tonto National Forest personnel through a spreadsheet which was updated as the measurements were made.

As there were insufficient data for a standard routing scheme, we routed the flow based on the following assumptions:

(1) The broad valley between the Gage and Braided sites attenuates instantaneous peak flows, but the higher average daily flows reported in the Cherry Creek gage record reach the Braided site as the same average value recorded at the gage. Stated simply, we assumed the averaging from instantaneous to daily values sufficiently attenuates the peak flows to approximate flow at the Braided site.

(2) The intermittent reach acts as a buffer and modifies or absorbs small scale freshets but produces a continuous outflow from a shallow aquifer.

(3) Evapotranspiration extracts 15 percent of the 0.146 m^3/s (5 ft^3/s) flow from the stream, has negligible effect at 0.566 m^3/s (20 ft^3/s), and can be represented as a linear proration of the losses calculated from 0.146 m^3/s (5 ft^3/s) to 0.566 m^3/s (20 ft^3/s).

Thus, a hydrograph can be synthesized at the Braided site by assuming that daily mean flows higher than approximately 0.566 m^3/s (20 ft^3/s) at the gage reach the Braided site with negligible attenuation, that flows less than 0.566 m^3/s (20 ft^3/s) are reduced by a linear depletion that is 0 percent at 0.566 m^3/s (20 ft^3/s) and 15 percent at 0.146 m^3/s (5 ft^3/s) to account for evapotranspiration, and that the buffering effect of the intermittent reach can be approximated by calculating flow below 0.566 m^3/s (20 ft^3/s) as a 5-point centered running mean.

For daily average flow at the gage between 0.142 m^3/s (5 ft^3/s) and 0.566 m^3/s (20 ft^3/s) the evapotranspiration loss coefficient, including linear proration, and the resulting Braided site flow are calculated as:

$$LossCoef = \frac{\left(20 - \overline{Q_{Gage}}\right)}{(20 - 5)} \times 0.15 \qquad (3\text{–}1)$$

$$Q_{Braid} = \overline{Q_{Gage}} \times \left(1 - LossCoef\right) \qquad (3\text{–}2)$$

where

$\overline{Q_{Gage}}$ is the daily average discharge at the gage (the bar indicates 5 day running mean),

Q_{Braid} is the daily average discharge at the Braided site

and

$LossCoef$ is the evapotranspiration loss coefficient.

Running mean values at the gage above 20 ft^3/s were considered sufficiently high that evapotranspiration losses would be less than stream gaging error, so those values were passed downstream with no depletion. The following cases illustrate this effect.

Table 3-1. Routing scheme examples.

Running mean at gage (ft^3/s)	Loss coefficient	Resulting flow at Braided Site (ft^3/s)
3	0.17	2.49
4	0.16	3.36
5	0.15	4.25
10	0.10	9
15	0.05	14.25
20	0.00	20

This routing approach does not account for flow from intervening tributaries between the Gage and Braided Sites. All tributaries in this section are ephemeral and are most likely to contribute to Cherry Creek flow during monsoon rain and possibly during rare low elevation snow melt events. As such, the influence of such runoff would likely be during high flow events when habitat is least influenced by water withdrawals.

Appendix 4. Detailed Habitat Summary Tables for All Target Species at the Gage and Braided Sites, With and Without LWD, for Hypothetical Withdrawal Rates of 2 Cubic ft^3/s and 10 Cubic ft^3/s.

The following summary tables show the effects of scenarios 1 and 2 as side-by-side comparisons. Scenario 1 represents the effects of the hypothetical withdrawal rates, with the proposed U.S.Forest Service water right in effect, and is highlighted with a light green background in the column headings for each month. Scenario 2 depicts the effects of having no water right, and is highlighted with a pink background in the column headings for each month.

Summary of normalized habitat changes Hypothetical Withdrawal 2 cfs										Gage Site No Wood Sonora Sucker														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-21.35%	0.00%	-52.63%	0.33%	-44.58%	0.00%	-49.83%	0.00%	-49.14%	0.00%	-46.73%	0.00%	-13.53%	-0.01%	-0.01%
1966	0.88%	0.88%	-1.10%	-2.83%	0.00%	-4.70%	0.00%	-11.86%	0.00%	-21.73%	0.00%	-27.46%	0.00%	-36.72%	0.00%	-15.99%	0.00%	-24.69%	0.00%	-30.45%	0.00%	-29.09%	0.23%	-19.78%
1967	0.00%	-16.05%	0.00%	-25.99%	0.00%	-23.84%	0.00%	-32.14%	0.00%	-30.45%	0.00%	-36.72%	0.21%	-36.53%	0.00%	-21.73%	0.00%	-25.99%	0.00%	-47.38%	0.00%	-39.69%	1.32%	-18.84%
1968	0.32%	0.32%	0.28%	0.28%	1.37%	1.37%	-3.40%	-5.69%	-1.97%	-13.15%	-0.15%	-23.62%	0.00%	-16.57%	-0.26%	-13.15%	0.00%	-15.82%	0.00%	-16.32%	0.00%	-16.32%	0.00%	-13.67%
1969	1.10%	1.10%	2.02%	2.02%	1.61%	1.61%	-2.70%	-6.83%	-4.03%	-12.21%	0.00%	-18.46%	0.00%	-20.35%	0.00%	-19.94%	0.00%	-27.31%	0.00%	-27.02%	0.00%	-14.46%	0.00%	-12.94%
1970	0.00%	-13.41%	0.00%	-14.49%	0.00%	-12.06%	0.00%	-13.55%	0.00%	-22.71%	0.00%	-40.77%	0.00%	-46.84%	-1.29%	-39.47%	-5.42%	-10.33%	0.00%	-32.60%	0.00%	-16.85%	0.00%	-14.05%
1971	0.00%	-13.63%	0.00%	-13.33%	0.00%	-14.26%	0.00%	-37.69%	0.00%	-41.28%	0.00%	-50.89%	0.00%	-50.51%	0.00%	-39.08%	0.10%	-31.96%	0.10%	-11.16%	0.00%	-16.56%	0.02%	-15.74%
1972	0.00%	-15.51%	0.00%	-15.25%	0.00%	-24.55%	0.00%	-33.85%	0.00%	-38.70%	0.00%	-36.08%	0.00%	-36.72%	0.00%	-36.72%	0.00%	-49.50%	0.17%	-22.02%	0.57%	0.57%	1.14%	1.14%
1973	1.40%	1.40%	0.05%	0.05%	-0.01%	-0.01%	0.18%	0.18%	0.24%	0.24%	-5.73%	-5.73%	-6.55%	-6.55%	-10.32%	-10.49%	-10.13%	-12.06%	-6.36%	-12.72%	-5.43%	-12.34%	0.00%	-11.96%
1974	-0.31%	-8.54%	0.00%	-10.44%	0.00%	-10.44%	0.00%	-12.82%	-0.41%	-13.82%	0.00%	-22.29%	0.00%	-20.85%	0.00%	-13.31%	-1.39%	-17.07%	0.00%	-20.49%	0.00%	-13.00%	0.00%	-12.97%
1975	0.00%	-13.13%	0.00%	-12.89%	1.50%	1.50%	1.21%	1.21%	-4.20%	-12.17%	0.00%	-18.85%	-0.07%	-17.98%	0.00%	-21.87%	-0.14%	-18.94%	0.00%	-23.84%	0.00%	-24.84%	0.00%	-19.47%
1976	-0.01%	-13.11%	0.22%	-3.69%	0.00%	-11.57%	0.00%	-12.76%	-0.47%	-13.44%	0.00%	-30.15%	0.00%	-26.87%	0.00%	-24.98%	0.00%	-36.72%	0.00%	-14.49%	0.00%	-17.91%	0.00%	-28.94%
1977	0.00%	-13.09%	0.00%	-14.70%	0.00%	-13.77%	0.00%	-19.12%	0.00%	-36.88%	0.00%	-49.14%	-0.65%	-40.97%	-1.70%	-42.59%	-1.41%	-13.60%	0.00%	-39.45%	0.00%	-47.39%	0.00%	-48.78%
1978	0.00%	-24.55%	0.90%	0.90%	0.15%	0.15%	0.00%	-11.52%	-0.34%	-13.70%	0.00%	-22.57%	0.00%	-33.85%	0.00%	-50.13%	0.00%	-66.23%	0.00%	-49.32%	0.00%	-33.62%	0.82%	0.82%
1979	0.64%	0.64%	0.45%	0.45%	0.24%	0.24%	0.87%	0.87%	-2.77%	-2.77%	-9.50%	-9.50%	-5.07%	-13.01%	-1.66%	-12.87%	-1.15%	-13.22%	-7.62%	-11.73%	-11.02%	-11.02%	-4.39%	-10.96%
1980	0.30%	0.30%	0.04%	0.04%	0.47%	0.47%	2.03%	2.03%	-3.38%	-3.38%	-5.74%	-5.74%	-5.90%	-5.90%	-6.36%	-6.36%	-7.53%	-7.53%	-10.68%	-10.68%	-10.96%	-10.96%	-2.14%	-10.96%
1981	0.00%	-10.96%	0.00%	-10.40%	0.00%	-5.83%	-2.03%	-10.38%	-2.97%	-12.66%	-0.20%	-13.64%	-8.92%	-12.07%	-0.20%	-13.11%	-3.41%	-12.88%	-9.55%	-10.07%	-9.46%	-11.54%	0.00%	-12.13%
1982	0.16%	-2.95%	1.16%	1.16%	0.29%	0.29%	-2.70%	-5.58%	-6.03%	-11.95%	-3.94%	-13.13%	-0.96%	-15.03%	0.00%	-13.26%	-0.27%	-13.57%	0.00%	-21.87%	-2.67%	-11.00%	1.45%	1.45%
1983	0.05%	0.05%	0.01%	0.01%	0.02%	0.02%	0.40%	0.40%	-4.69%	-4.69%	-10.77%	-11.90%	-10.16%	-12.10%	-4.33%	-12.36%	-2.77%	-7.74%	-0.62%	-1.60%	-8.39%	-8.39%	-0.51%	-0.51%
1984	1.67%	1.67%	0.00%	-9.03%	0.00%	-11.05%	0.00%	-12.02%	0.00%	-22.29%	0.00%	-32.76%	0.00%	-34.32%	-1.00%	-12.31%	-4.39%	-10.64%	-9.18%	-10.72%	-2.24%	-12.43%	0.27%	0.27%
1985	0.37%	0.37%	0.52%	0.52%	0.29%	0.29%	2.02%	2.02%	-5.84%	-5.84%	-2.98%	-13.26%	-0.41%	-13.74%	-6.26%	-12.07%	-9.67%	-11.79%	-6.21%	-6.21%	1.17%	1.17%	1.31%	1.31%
1986	0.00%	-5.86%	0.99%	0.14%	0.24%	0.24%	-3.14%	-6.29%	-3.78%	-11.84%	-4.00%	-13.12%	-2.84%	-13.43%	-6.08%	-11.48%	0.00%	-25.70%	-9.43%	-12.24%	-6.76%	-10.02%	-3.77%	-10.02%
1987	-0.97%	-7.05%	0.78%	0.39%	1.07%	1.07%	-1.03%	-10.07%	-0.59%	-13.17%	0.00%	-26.28%	0.00%	-30.60%	0.00%	-16.80%	0.00%	-20.50%	0.00%	-27.16%	0.00%	-12.72%	0.00%	-12.56%
1988	1.52%	1.52%	1.50%	1.50%	0.00%	-11.48%	0.00%	-12.06%	-3.47%	-12.61%	-1.82%	-13.55%	-0.62%	-15.23%	-1.37%	-1.37%	0.27%	-12.90%	0.00%	-14.73%	0.00%	-19.12%	0.00%	-15.54%
1989	-0.10%	-8.22%	1.78%	1.78%	0.00%	-12.37%	0.00%	-12.44%	0.00%	-26.28%	0.00%	-44.49%	0.00%	-46.53%	0.00%	-27.39%	0.00%	-26.72%	0.00%	-28.35%	0.00%	-28.94%	0.00%	-28.79%
1990	0.00%	-14.70%	0.00%	-13.79%	0.00%	-14.18%	0.00%	-20.29%	0.00%	-35.60%	0.00%	-51.15%	0.00%	-46.29%	0.00%	-39.03%	0.00%	-40.89%	0.00%	-41.33%	0.00%	-30.45%	0.00%	-20.35%
1991	0.81%	-1.19%	0.08%	-7.35%	-0.07%	-0.07%	0.15%	0.15%	-2.12%	-13.27%	0.00%	-22.43%	0.00%	-29.39%	0.00%	-31.52%	0.00%	-49.14%	0.00%	-47.06%	0.00%	-36.24%	-0.14%	-22.94%
1992	1.78%	1.78%	0.82%	0.82%	0.54%	0.54%	1.01%	1.01%	-8.48%	-9.03%	0.00%	-22.43%	0.00%	-30.45%	-0.72%	-9.87%	0.00%	-13.70%	0.00%	-20.21%	0.00%	-20.49%	-0.88%	-0.88%
1993	0.09%	0.09%	0.15%	0.15%	0.27%	0.27%	1.93%	1.93%	-4.19%	-4.19%	-5.86%	-5.86%	-8.23%	-8.23%	-9.30%	-9.58%	-9.58%	-9.58%	-8.73%	-8.73%	0.73%	0.73%	-3.77%	-5.43%
1994	0.00%	-5.86%	0.46%	-3.79%	1.44%	1.47%	-2.43%	-4.60%	-7.88%	-11.15%	-5.37%	-12.94%	-1.86%	-13.31%	0.00%	-13.14%	-0.40%	-13.45%	-0.68%	-13.51%	-3.30%	-12.35%	-0.61%	-8.67%
1995	0.49%	0.49%	0.78%	0.78%	0.45%	0.45%	-4.70%	-4.70%	-8.51%	-10.18%	-7.99%	-12.58%	-1.47%	-13.36%	-0.07%	-13.33%	-4.64%	-12.38%	-2.32%	-13.26%	-1.23%	-12.96%	0.00%	-12.81%
1996	0.00%	-12.72%	0.00%	-12.82%	0.00%	-12.98%	0.00%	-23.41%	0.00%	-34.48%	0.00%	-40.17%	0.00%	-32.72%	0.00%	-35.28%	-0.44%	-26.36%	0.00%	-32.76%	0.00%	-24.69%	0.00%	-17.78%
1997	0.98%	-1.72%	1.21%	1.21%	1.10%	1.10%	0.00%	-13.29%	0.00%	-30.45%	0.00%	-42.02%	0.00%	-44.52%	0.00%	-43.88%	0.00%	-45.85%	0.00%	-46.29%	0.00%	-32.76%	0.00%	-25.56%
1998	0.00%	-11.39%	0.57%	0.57%	0.21%	0.21%	0.25%	0.25%	-2.11%	-12.81%	0.00%	-30.45%	0.00%	-32.14%	0.00%	-37.04%	0.00%	-43.90%	0.00%	-45.15%	0.00%	-27.75%	0.00%	-13.49%
1999	0.00%	-13.76%	0.00%	-16.32%	0.00%	-19.80%	0.00%	-12.97%	0.00%	-45.13%	0.00%	-52.08%	-1.70%	-43.36%	-0.27%	-17.12%	-1.43%	-15.20%	0.00%	-38.35%	0.00%	-38.84%	0.00%	-38.35%
2000	0.00%	-28.35%	0.00%	-28.20%	0.00%	-22.29%	0.00%	-45.87%	0.00%	-60.06%	0.00%	-63.49%	0.00%	-70.42%	0.00%	-64.31%	0.00%	-55.56%	0.00%	-54.20%	1.36%	1.36%	0.00%	-16.32%
2001	0.00%	-16.06%	0.00%	-12.14%	1.07%	1.07%	0.00%	-12.07%	0.00%	-38.84%	0.00%	-56.82%	0.00%	-63.49%	0.00%	-50.00%	0.00%	-52.91%	0.00%	-51.15%	0.00%	-47.85%	0.00%	-41.87%
2002	0.00%	-40.00%	0.00%	-42.08%	0.00%	-45.62%	0.00%	-55.40%	0.00%	-78.13%	0.00%	-92.59%	0.00%	-91.74%	0.00%	-77.52%	0.00%	-75.76%	0.00%	-72.99%	0.00%	-60.42%	0.00%	-48.66%
2003	0.00%	-49.14%	0.00%	-49.14%	1.05%	1.05%	0.00%	-32.14%	0.00%	-54.26%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	0.00%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	0.00%	-48.18%
2004	0.00%	-49.14%	0.00%	-49.14%	1.05%	1.05%	0.00%	-32.14%	0.00%	-54.26%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	0.00%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	0.00%	-48.18%
2005	0.51%	-4.18%	0.17%	0.17%	1.04%	1.04%	-1.29%	-8.90%	-0.80%	-13.31%	0.00%	-38.84%	0.00%	-44.59%	0.00%	-28.50%	0.00%	-41.01%	0.00%	-41.85%	0.00%	-40.34%	0.00%	-35.12%
2006	0.00%	-35.12%	0.00%	-34.80%	0.00%	-36.24%	0.00%	-41.31%	0.00%	-56.50%	0.00%	-65.57%	0.00%	-66.23%	0.00%	-54.79%	0.00%	-57.64%	0.00%	-51.73%	0.00%	-49.75%	0.00%	-44.76%
2007	0.00%	-43.22%	0.00%	-36.72%	0.00%	-32.91%	0.00%	-50.13%	0.00%	-70.18%	0.00%	-88.89%	0.00%	-88.50%	0.00%	-58.14%	0.00%	-64.94%	0.00%	-68.26%	0.00%	-60.79%	0.76%	-6.18%
2008	0.75%	0.75%	0.24%	0.24%	1.33%	1.33%	0.00%	-12.20%	-0.46%	-13.19%	0.00%	-26.58%	0.00%	-23.53%	-1.30%	-17.90%	0.00%	-32.60%	0.00%	-28.50%	0.00%	-27.02%	1.45%	1.45%
2009	1.90%	1.90%	1.98%	1.98%	0.00%	-6.12%	0.00%	-11.78%																

Figure 4-1. Habitat summary table for Sonora sucker (*Catostomus insignis*), Gage site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes
Hypothetical Withdrawal 10 cfs

Gage Site
No Wood
Sonora Sucker

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-100.00%	0.00%	-100.00%	1.64%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.03%	-71.70%
1966	4.22%	4.22%	-2.64%	-20.30%	0.00%	-40.88%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.37%	-100.00%
1967	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.30%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	6.76%	-100.00%
1968	1.48%	1.48%	1.57%	1.57%	6.94%	6.94%	-5.60%	-56.46%	-1.97%	-100.00%	-0.15%	-100.00%	0.00%	-100.00%	-0.26%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1969	6.42%	-100.00%	7.87%	7.87%	8.08%	8.08%	-4.11%	-76.82%	-4.03%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1970	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.19%	-100.00%	-4.38%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1971	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.45%	-100.00%	1.12%	-100.00%	0.00%	-100.00%	0.02%	-100.00%
1972	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.25%	-82.18%	3.78%	-76.01%	5.26%	5.26%
1973	7.33%	7.33%	0.32%	0.32%	0.29%	0.29%	0.90%	0.90%	2.10%	2.10%	-25.25%	-55.76%	-21.54%	-71.36%	-13.40%	-96.97%	-10.25%	-100.00%	-6.36%	-100.00%	-5.43%	-100.00%	0.00%	-100.00%
1974	-0.77%	-76.36%	0.00%	-96.97%	0.00%	-96.97%	0.00%	-100.00%	-0.41%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.39%	-100.00%	-1.30%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1975	0.00%	-100.00%	0.00%	-100.00%	8.29%	8.29%	6.08%	6.08%	-4.20%	-100.00%	0.00%	-100.00%	-0.07%	-100.00%	0.00%	-100.00%	-0.14%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1976	-0.05%	-100.00%	0.82%	-81.83%	0.00%	-98.40%	0.00%	-100.00%	-0.47%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1977	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.90%	-100.00%	-1.95%	-100.00%	-2.48%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1978	0.00%	-100.00%	4.80%	4.80%	0.75%	0.75%	-0.94%	-100.00%	-0.34%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	3.78%	-10.29%
1979	2.95%	2.95%	3.04%	3.04%	1.18%	1.18%	5.57%	5.57%	-20.22%	-21.22%	-18.88%	-91.25%	-5.58%	-100.00%	-3.22%	-100.00%	-1.64%	-100.00%	-12.27%	-100.00%	-13.56%	-100.00%	-4.61%	-100.00%
1980	2.31%	-76.59%	0.20%	0.20%	2.19%	2.19%	10.54%	10.54%	-25.26%	-29.78%	-25.04%	-57.02%	-22.52%	-68.69%	-13.63%	-69.05%	-19.60%	-80.99%	-17.41%	-98.48%	-13.78%	-100.00%	-4.61%	-100.00%
1981	0.00%	-100.00%	0.00%	-96.97%	0.00%	-63.42%	-3.07%	-92.44%	-2.97%	-100.00%	-0.20%	-100.00%	-10.74%	-100.00%	-0.20%	-100.00%	-3.41%	-100.00%	-14.76%	-100.00%	-11.54%	-100.00%	0.00%	-100.00%
1982	-0.58%	-35.64%	6.41%	6.26%	1.43%	1.43%	-6.93%	-58.20%	-6.03%	-100.00%	-3.94%	-100.00%	-0.96%	-100.00%	0.00%	-100.00%	-1.90%	-100.00%	0.00%	-100.00%	-8.74%	-100.00%	5.75%	-10.41%
1983	0.47%	-0.79%	0.07%	0.07%	0.09%	0.09%	2.64%	2.64%	-22.44%	-41.27%	-12.97%	-100.00%	-10.77%	-100.00%	-4.33%	-100.00%	-1.51%	-100.00%	-9.57%	-91.69%	-15.82%	-100.00%	-9.85%	-13.51%
1984	8.09%	-15.95%	0.00%	-89.58%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-4.07%	-82.69%	-4.62%	-100.00%	-16.23%	-96.92%	-6.14%	-100.00%	1.36%	1.36%
1985	1.93%	1.93%	2.75%	2.75%	1.43%	1.43%	10.03%	10.03%	-17.47%	-64.73%	-2.98%	-100.00%	-0.41%	-100.00%	-6.44%	-100.00%	-11.14%	-100.00%	-17.09%	-87.49%	2.78%	-50.85%	6.80%	6.80%
1986	0.00%	-66.04%	4.14%	-43.38%	1.28%	1.28%	-4.32%	-67.36%	-7.11%	-100.00%	-4.00%	-100.00%	-2.84%	-100.00%	-7.19%	-96.75%	0.00%	-100.00%	-9.85%	-100.00%	-11.30%	-92.27%	-6.28%	-92.27%
1987	-1.33%	-75.44%	2.42%	-24.30%	5.60%	5.60%	-1.03%	-93.92%	-0.59%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.25%	-100.00%	0.00%	-100.00%
1988	8.21%	-71.95%	8.17%	8.17%	0.00%	-100.00%	0.00%	-100.00%	-3.47%	-100.00%	-1.82%	-100.00%	-0.62%	-100.00%	-3.04%	-100.00%	-0.77%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1989	-2.12%	-84.31%	8.12%	-8.45%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1990	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1991	2.37%	-100.00%	0.38%	-100.00%	-0.37%	-38.09%	0.76%	0.76%	-2.12%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.14%	-100.00%
1992	9.00%	9.00%	5.20%	5.20%	3.06%	3.06%	4.83%	-23.44%	-12.89%	-89.58%	0.00%	-100.00%	0.00%	-100.00%	-1.05%	-93.64%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.09%	-55.69%
1993	0.31%	0.31%	0.83%	0.83%	1.38%	1.38%	10.34%	10.34%	-24.33%	-33.41%	-23.50%	-66.04%	-19.57%	-85.24%	-14.23%	-92.51%	-17.61%	-92.51%	-16.92%	-89.22%	5.20%	-75.55%	-12.34%	-41.69%
1994	0.00%	-66.04%	1.62%	-60.72%	6.59%	3.81%	-2.93%	-37.32%	-9.03%	-98.44%	-5.37%	-100.00%	-1.86%	-100.00%	-1.31%	-100.00%	-0.40%	-100.00%	-0.68%	-100.00%	-6.17%	-100.00%	-0.14%	-79.41%
1995	2.52%	2.52%	5.15%	5.15%	2.53%	2.53%	-10.03%	-37.70%	-11.74%	-95.47%	-7.99%	-100.00%	-1.47%	-100.00%	-0.07%	-100.00%	-5.59%	-100.00%	-2.32%	-100.00%	-1.23%	-100.00%	0.00%	-100.00%
1996	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.44%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1997	5.45%	-100.00%	6.48%	4.75%	5.52%	-21.89%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1998	0.00%	-98.42%	2.61%	-73.39%	1.11%	1.11%	1.32%	1.32%	-2.11%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1999	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.58%	-100.00%	-0.27%	-100.00%	-1.43%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2000	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	6.35%	-91.97%	0.00%	-100.00%
2001	0.00%	-100.00%	0.00%	-96.56%	5.57%	-71.52%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2002	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2003	0.00%	-100.00%	0.00%	-100.00%	5.42%	-20.23%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2004	0.00%	-100.00%	0.00%	-100.00%	5.42%	-20.23%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2005	2.62%	-6.77%	0.95%	0.95%	5.53%	5.53%	-1.29%	-81.17%	-0.80%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2006	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2007	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.63%	-66.10%
2008	3.85%	3.85%	1.18%	1.18%	6.63%	-44.63%	0.00%	-100.00%	-0.46%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.91%	-98.16%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	4.80%	-100.00%
2009	9.51%	-10.43%	9.68%	-27.64%	0.00%	-70.02%	0.00%	-100.00%																

Figure 4-2. Habitat summary table for Sonora sucker (*Catostomus insignis*), Gage site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Gage Site

With LWD

Hypothetical Withdrawal 2 cfs

Sonora Sucker

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-18.37%	0.00%	-52.63%	-0.11%	-43.23%	0.00%	-49.80%	0.00%	-49.14%	0.00%	-46.73%	0.00%	-9.16%	0.07%	-5.83%
1966	-0.78%	-1.61%	-0.64%	-1.66%	0.00%	-4.63%	0.00%	-8.37%	0.00%	-18.73%	0.00%	-25.42%	0.00%	-35.98%	0.00%	-11.96%	0.00%	-22.21%	0.00%	-28.87%	0.00%	-27.31%	0.00%	-19.14%
1967	0.00%	-11.97%	0.00%	-23.73%	0.00%	-21.21%	0.00%	-30.80%	0.00%	-28.87%	0.00%	-35.98%	0.00%	-35.98%	0.00%	-18.73%	0.00%	-23.73%	0.00%	-47.38%	0.00%	-39.28%	0.00%	-23.73%
1968	-0.42%	-0.42%	0.49%	0.49%	0.39%	0.39%	-3.80%	-6.39%	-1.35%	-8.99%	-0.10%	-21.02%	0.00%	-12.62%	-0.18%	-8.99%	0.00%	-11.70%	0.00%	-12.28%	0.00%	-12.28%	0.00%	-9.37%
1969	0.00%	-8.57%	-0.40%	-1.30%	0.10%	-0.17%	-2.60%	-6.95%	-2.82%	-8.54%	0.00%	-14.85%	0.00%	-17.09%	0.00%	-16.61%	0.00%	-25.25%	0.00%	-24.91%	0.00%	-10.13%	0.00%	-8.89%
1970	0.00%	-9.10%	0.00%	-10.23%	0.00%	-8.47%	0.00%	-9.17%	0.00%	-19.88%	0.00%	-40.48%	0.00%	-46.84%	-0.84%	-39.27%	-4.19%	-19.75%	0.00%	-31.33%	0.00%	-12.91%	0.00%	-9.76%
1971	0.00%	-9.21%	0.00%	-9.07%	0.00%	-10.06%	0.00%	-37.07%	0.00%	-41.04%	0.00%	-50.89%	0.00%	-50.51%	0.00%	-38.37%	0.00%	-35.98%	-1.57%	-11.68%	0.00%	-12.59%	0.00%	-11.70%
1972	0.00%	-11.35%	0.00%	-11.04%	0.00%	-22.04%	0.00%	-32.75%	0.00%	-38.17%	0.00%	-35.25%	0.00%	-35.98%	0.00%	-35.15%	0.00%	-49.50%	-0.11%	-24.92%	-7.49%	-7.49%	-0.05%	-0.05%
1973	-0.20%	-0.20%	0.44%	0.44%	0.16%	0.16%	0.44%	0.44%	-0.85%	-0.85%	-6.46%	-6.46%	-6.82%	-6.82%	-7.75%	-7.87%	-7.11%	-8.46%	-4.39%	-8.78%	-3.78%	-8.60%	0.00%	-8.41%
1974	-0.27%	-6.38%	0.00%	-7.86%	0.00%	-7.86%	0.00%	-8.83%	-0.28%	-9.38%	0.00%	-19.38%	0.00%	-17.73%	0.00%	-9.06%	-0.93%	-13.41%	0.00%	-17.25%	0.00%	-8.91%	0.00%	-8.90%
1975	0.00%	-8.98%	0.00%	-8.86%	0.10%	-0.57%	-3.07%	-3.07%	-2.94%	-8.52%	0.00%	-15.31%	-0.05%	-14.33%	0.00%	-18.89%	-0.09%	-15.55%	0.00%	-21.21%	0.00%	-22.38%	0.00%	-16.26%
1976	0.00%	-9.80%	0.17%	-7.96%	0.00%	-8.30%	0.00%	-8.80%	-0.32%	-9.21%	0.00%	-28.52%	0.00%	-24.74%	0.00%	-22.55%	0.00%	-35.98%	0.00%	-10.20%	0.00%	-14.19%	0.00%	-27.14%
1977	0.00%	-8.96%	0.00%	-10.45%	0.00%	-9.27%	0.00%	-15.65%	0.00%	-36.16%	0.00%	-49.14%	-0.99%	-40.52%	-1.10%	-42.54%	-0.96%	-9.74%	0.00%	-39.00%	0.00%	-47.39%	0.00%	-48.78%
1978	0.00%	-22.04%	-0.12%	-0.12%	0.18%	0.18%	0.00%	-8.22%	-0.23%	-9.42%	0.00%	-19.71%	0.00%	-32.75%	0.00%	-50.13%	0.00%	-66.23%	0.00%	-49.17%	0.00%	-32.47%	-4.00%	-4.00%
1979	0.37%	0.37%	-0.71%	-0.71%	0.37%	0.37%	-0.49%	-0.49%	-1.61%	-1.61%	-7.64%	-7.64%	-3.49%	-9.10%	-1.14%	-8.85%	-0.79%	-9.02%	-5.46%	-8.35%	-8.01%	-8.01%	-3.20%	-7.99%
1980	-1.73%	-7.25%	0.10%	0.10%	-0.53%	-0.53%	-0.18%	-0.18%	-2.21%	-2.21%	-6.48%	-6.48%	-6.68%	-6.68%	-5.95%	-5.99%	-7.13%	-7.13%	-7.92%	-7.92%	-7.99%	-7.99%	-1.59%	-7.99%
1981	0.00%	-7.99%	0.00%	-7.85%	0.00%	-6.59%	-1.86%	-7.83%	-2.06%	-8.75%	-0.14%	-9.21%	-6.27%	-8.48%	-0.13%	-8.97%	-2.35%	-8.86%	-7.77%	-8.13%	-6.73%	-8.20%	0.00%	-8.50%
1982	-0.34%	-3.15%	0.03%	-1.19%	0.22%	0.02%	-3.25%	-6.50%	-4.25%	-8.41%	-2.69%	-8.98%	-0.65%	-10.97%	0.00%	-9.04%	-0.18%	-9.18%	0.00%	-18.89%	0.00%	-9.20%	-0.71%	-0.71%
1983	0.08%	0.08%	0.47%	0.47%	0.30%	0.30%	-0.13%	-0.13%	-4.60%	-4.60%	-7.59%	-8.38%	-7.13%	-8.48%	-3.01%	-8.61%	-2.43%	-8.84%	-7.65%	-7.65%	-7.99%	-7.99%	-1.36%	-1.36%
1984	-0.75%	-2.77%	0.00%	-7.51%	0.00%	-8.02%	0.00%	-8.44%	0.00%	-19.38%	0.00%	-31.50%	0.00%	-33.28%	-1.57%	-10.88%	-3.83%	-8.71%	-6.89%	-7.99%	-1.56%	-8.64%	-0.33%	-0.33%
1985	0.37%	0.37%	-0.62%	-0.62%	0.50%	0.50%	0.43%	0.43%	-6.61%	-6.61%	-2.03%	-9.04%	-0.28%	-9.34%	-4.40%	-8.47%	-6.84%	-8.34%	-7.49%	-7.49%	-6.63%	-6.63%	-1.30%	-2.20%
1986	0.00%	-6.63%	0.00%	-5.72%	0.14%	-1.34%	-3.25%	-6.72%	-2.51%	-8.35%	-2.74%	-8.97%	-1.94%	-9.28%	-4.54%	-8.32%	0.00%	-23.39%	-6.58%	-8.55%	-5.54%	-7.85%	-3.41%	-7.85%
1987	-1.42%	-6.93%	0.00%	-3.99%	-0.84%	-1.02%	-0.75%	-7.80%	-0.40%	-8.99%	0.00%	-24.06%	0.00%	-29.05%	0.00%	-13.10%	0.00%	-17.28%	0.00%	-25.08%	0.00%	-8.78%	0.00%	-8.70%
1988	-1.10%	-6.64%	0.00%	-1.84%	0.00%	-8.18%	0.00%	-8.46%	-2.40%	-8.73%	-1.23%	-9.26%	-0.42%	-11.14%	-2.34%	-8.50%	0.00%	-9.35%	0.00%	-10.57%	0.00%	-15.63%	0.00%	-11.33%
1989	-0.22%	-5.88%	0.00%	-3.30%	0.00%	-8.61%	0.00%	-8.65%	0.00%	-24.06%	0.00%	-44.42%	0.00%	-46.51%	0.00%	-25.39%	0.00%	-24.57%	0.00%	-26.45%	0.00%	-27.14%	0.00%	-26.97%
1990	0.00%	-10.39%	0.00%	-9.36%	0.00%	-9.80%	0.00%	-17.07%	0.00%	-34.71%	0.00%	-51.15%	0.00%	-46.22%	0.00%	-38.54%	0.00%	-40.57%	0.00%	-41.00%	0.00%	-28.87%	0.00%	-17.09%
1991	0.00%	-8.49%	0.05%	-8.06%	0.78%	0.78%	-4.32%	-5.60%	-1.45%	-9.04%	0.00%	-19.55%	0.00%	-27.66%	0.00%	-30.10%	0.00%	-49.14%	0.00%	-47.06%	0.00%	-35.44%	-0.10%	-20.95%
1992	-0.05%	-0.05%	-0.14%	-0.14%	0.19%	0.19%	-3.89%	-6.14%	-7.12%	-7.51%	0.00%	-19.55%	0.00%	-28.87%	-1.29%	-9.64%	0.00%	-9.24%	0.00%	-16.93%	0.00%	-17.25%	0.23%	-5.65%
1993	0.06%	0.06%	0.36%	0.36%	0.36%	0.36%	0.23%	0.23%	-3.72%	-3.72%	-6.63%	-6.63%	-7.31%	-7.31%	-7.45%	-7.65%	-7.65%	-7.65%	-7.56%	-7.56%	-7.31%	-7.31%	-4.16%	-6.03%
1994	0.00%	-6.63%	0.00%	-6.65%	-0.08%	-0.08%	-2.02%	-4.47%	-5.78%	-8.11%	-3.69%	-8.89%	-1.27%	-9.06%	0.00%	-8.98%	-0.27%	-9.12%	-0.46%	-9.15%	-2.12%	-8.60%	-0.67%	-6.26%
1995	-0.66%	-0.66%	0.36%	0.36%	-0.01%	-0.01%	-4.65%	-4.65%	-6.60%	-7.80%	-5.53%	-8.72%	-1.00%	-9.08%	-0.05%	-9.07%	-3.36%	-8.70%	-1.58%	-9.04%	-0.85%	-8.90%	0.00%	-8.82%
1996	0.00%	-8.78%	0.00%	-8.83%	0.00%	-8.91%	0.00%	-20.71%	0.00%	-33.46%	0.00%	-39.82%	0.00%	-31.49%	0.00%	-34.35%	-0.29%	-24.28%	0.00%	-31.50%	0.00%	-22.21%	0.00%	-14.03%
1997	0.00%	-11.52%	-0.22%	-1.39%	0.00%	-6.12%	0.00%	-9.05%	0.00%	-28.87%	0.00%	-41.87%	0.00%	-44.51%	0.00%	-43.82%	0.00%	-45.85%	0.00%	-46.29%	0.00%	-31.50%	0.00%	-23.22%
1998	0.00%	-8.22%	0.00%	-7.69%	0.44%	0.44%	-1.31%	-1.31%	-1.46%	-8.82%	0.00%	-28.87%	0.00%	-30.80%	0.00%	-36.34%	0.00%	-43.89%	0.00%	-45.15%	0.00%	-25.77%	0.00%	-9.14%
1999	0.00%	-9.26%	0.00%	-12.28%	0.00%	-16.44%	0.00%	-8.90%	0.00%	-45.13%	0.00%	-52.08%	-1.13%	-43.38%	-0.18%	-13.65%	-0.97%	-11.22%	0.00%	-37.80%	0.00%	-38.35%	0.00%	-37.80%
2000	0.00%	-26.45%	0.00%	-26.28%	0.00%	-19.38%	0.00%	-45.87%	0.00%	-60.06%	0.00%	-63.49%	0.00%	-70.42%	0.00%	-64.31%	0.00%	-55.56%	0.00%	-54.20%	-3.85%	-7.89%	0.00%	-12.28%
2001	0.00%	-11.97%	0.00%	-8.66%	0.00%	-7.02%	0.00%	-8.48%	0.00%	-38.35%	0.00%	-56.82%	0.00%	-63.49%	0.00%	-50.00%	0.00%	-52.91%	0.00%	-51.15%	0.00%	-47.85%	0.00%	-41.64%
2002	0.00%	-39.64%	0.00%	-41.90%	0.00%	-45.56%	0.00%	-55.40%	0.00%	-78.13%	0.00%	-92.59%	0.00%	-91.74%	0.00%	-77.52%	0.00%	-75.76%	0.00%	-72.99%	0.00%	-60.42%	0.00%	-48.66%
2003	0.00%	-49.14%	0.00%	-49.14%	0.00%	-4.72%	0.00%	-30.80%	0.00%	-54.24%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	0.00%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	0.00%	-48.18%
2004	0.00%	-49.14%	0.00%	-49.14%	0.00%	-4.72%	0.00%	-30.80%	0.00%	-54.24%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	0.00%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	0.00%	-48.18%
2005	0.31%	-3.39%	0.24%	0.24%	-0.48%	-0.48%	-1.04%	-7.37%	-0.54%	-9.06%	0.00%	-38.35%	0.00%	-44.56%	0.00%	-26.62%	0.00%	-40.75%	0.00%	-41.68%	0.00%	-40.01%	0.00%	-34.17%
2006	0.00%	-34.17%	0.00%	-33.82%	0.00%	-35.44%	0.00%	-41.04%	0.00%	-56.50%	0.00%	-65.57%	0.00%	-66.23%	0.00%	-54.79%	0.00%	-57.64%	0.00%	-51.40%	0.00%	-49.75%	0.00%	-44.74%
2007	0.00%	-43.19%	0.00%	-35.98%	0.00%	-31.68%	0.00%	-50.13%	0.00%	-70.18%	0.00%	-88.89%	0.00%	-88.50%	0.00%	-58.14%	0.00%	-64.94%	0.00%	-68.26%	0.00%	-60.79%	-0.89%	-16.38%
2008	-0.10%	-0.10%	0.00%	0.00%	0.00%	-6.41%	0.00%	-8.53%	-0.32%	-9.01%	0.00%	-24.40%	0.00%	-20.87%	-1.05%	-15.09%	0.00%	-31.33%	0.00%	-26.62%	0.00%	-24.91%	0.00%	-10.31%
2009	-0.66%	-2.96%	-0.39%	-4.59%	0.00%	-6.73%	0.00%	-8.32%																

Figure 4-3. Habitat summary table for Sonora sucker (*Catostomus insignis*), Gage site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Gage Site
With LWD
Sonora Sucker

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-100.00%	0.00%	-100.00%	-0.53%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.16%	-80.70%
1966	-3.34%	-18.06%	-1.55%	-18.56%	0.00%	-36.39%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1967	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1968	-3.38%	-3.38%	0.04%	0.04%	1.70%	-0.27%	-5.55%	-51.97%	-1.35%	-100.00%	-0.10%	-100.00%	0.00%	-100.00%	-0.18%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1969	0.00%	-100.00%	-0.56%	-12.35%	-2.58%	-3.75%	-3.88%	-74.19%	-2.82%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1970	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.42%	-100.00%	-4.49%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1971	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.85%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1972	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-3.90%	-67.05%	-12.67%	-84.55%	-0.47%	-0.47%
1973	-0.34%	-0.34%	2.40%	2.40%	0.82%	0.82%	2.21%	2.21%	-7.26%	-7.26%	-21.83%	-51.05%	-17.93%	-68.17%	-9.95%	-96.61%	-7.19%	-100.00%	-4.39%	-100.00%	-3.78%	-100.00%	0.00%	-100.00%
1974	-0.62%	-76.00%	0.00%	-96.61%	0.00%	-96.61%	0.00%	-100.00%	-0.28%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.93%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1975	0.00%	-100.00%	0.00%	-100.00%	0.49%	-7.45%	-12.16%	-25.25%	-2.94%	-100.00%	0.00%	-100.00%	-0.05%	-100.00%	0.00%	-100.00%	-0.09%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1976	0.00%	-100.00%	0.85%	-81.77%	0.00%	-98.23%	0.00%	-100.00%	-0.32%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1977	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.15%	-100.00%	-1.26%	-100.00%	-1.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1978	0.00%	-100.00%	-0.40%	-18.02%	0.64%	-10.91%	-0.41%	-100.00%	-0.23%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-7.97%	-33.89%
1979	1.67%	1.67%	-3.10%	-3.10%	1.84%	1.84%	-1.21%	-1.21%	-18.37%	-19.10%	-14.32%	-90.23%	-3.84%	-100.00%	-2.22%	-100.00%	-1.12%	-100.00%	-8.73%	-100.00%	-9.83%	-100.00%	-3.36%	-100.00%
1980	-1.73%	-81.95%	0.57%	0.57%	-0.92%	-0.92%	-1.78%	-1.78%	-23.09%	-26.30%	-21.58%	-52.43%	-18.85%	-65.22%	-11.88%	-69.03%	-15.76%	-78.81%	-12.73%	-98.30%	-10.01%	-100.00%	-3.36%	-100.00%
1981	0.00%	-100.00%	0.00%	-96.61%	0.00%	-59.44%	-2.89%	-91.56%	-2.06%	-100.00%	-0.14%	-100.00%	-7.54%	-100.00%	-0.13%	-100.00%	-2.35%	-100.00%	-11.43%	-100.00%	-8.20%	-100.00%	0.00%	-100.00%
1982	-1.69%	-36.73%	0.35%	-15.21%	1.08%	-0.70%	-7.28%	-53.81%	-4.25%	-100.00%	-2.69%	-100.00%	-0.65%	-100.00%	0.00%	-100.00%	-1.29%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-5.11%	-14.15%
1983	0.57%	-0.19%	2.35%	2.35%	1.50%	1.50%	0.25%	0.25%	-20.73%	-36.68%	-9.14%	-100.00%	-7.55%	-100.00%	-3.01%	-100.00%	-2.43%	-100.00%	-13.97%	-91.62%	-10.01%	-100.00%	-13.76%	-17.65%
1984	-0.75%	-27.11%	0.00%	-88.35%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-4.24%	-83.38%	-3.83%	-100.00%	-11.91%	-96.57%	-3.28%	-100.00%	-5.46%	-5.46%
1985	0.25%	0.25%	-1.65%	-1.65%	2.30%	2.30%	0.09%	0.09%	-15.60%	-60.87%	-2.03%	-100.00%	-0.28%	-100.00%	-4.53%	-100.00%	-7.88%	-100.00%	-14.87%	-86.73%	-17.17%	-62.31%	-12.94%	-24.72%
1986	0.00%	-62.31%	0.00%	-49.68%	1.09%	-26.59%	-4.12%	-63.76%	-5.01%	-100.00%	-2.74%	-100.00%	-1.94%	-100.00%	-5.33%	-96.43%	0.00%	-100.00%	-6.88%	-100.00%	-8.74%	-91.43%	-5.18%	-91.43%
1987	-1.63%	-72.89%	0.00%	-31.14%	-3.80%	-10.96%	-0.75%	-93.22%	-0.40%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.18%	-100.00%	0.00%	-100.00%
1988	-1.39%	-76.98%	0.00%	-22.37%	0.00%	-100.00%	0.00%	-100.00%	-2.40%	-100.00%	-1.23%	-100.00%	-0.42%	-100.00%	-2.34%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1989	-1.61%	-82.86%	0.00%	-25.78%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1990	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1991	0.00%	-100.00%	0.25%	-100.00%	3.88%	-5.77%	-6.64%	-46.54%	-1.45%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.10%	-100.00%
1992	-1.88%	-2.22%	-1.02%	-2.18%	1.56%	-1.61%	-5.95%	-50.29%	-10.26%	-88.35%	0.00%	-100.00%	0.00%	-100.00%	-2.52%	-94.37%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.07%	-59.87%
1993	0.55%	0.55%	1.77%	1.77%	0.37%	0.37%	-4.74%	-4.74%	-22.56%	-28.99%	-19.76%	-62.31%	-15.39%	-83.53%	-10.97%	-91.62%	-13.38%	-91.62%	-14.57%	-88.35%	-13.13%	-83.53%	-13.79%	-36.13%
1994	0.00%	-62.31%	0.00%	-63.76%	-1.68%	-3.59%	-3.04%	-32.51%	-6.60%	-98.27%	-3.69%	-100.00%	-1.27%	-100.00%	-0.90%	-100.00%	-0.27%	-100.00%	-0.46%	-100.00%	-4.30%	-100.00%	-0.61%	-74.43%
1995	-3.54%	-7.52%	0.63%	0.63%	-1.67%	-2.63%	-9.96%	-32.79%	-8.91%	-94.93%	-5.53%	-100.00%	-1.00%	-100.00%	-0.05%	-100.00%	-4.02%	-100.00%	-1.58%	-100.00%	-0.85%	-100.00%	0.00%	-100.00%
1996	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.29%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1997	0.00%	-100.00%	-0.59%	-15.16%	0.00%	-48.93%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1998	0.00%	-98.25%	0.00%	-81.92%	1.62%	1.62%	-13.32%	-19.24%	-1.46%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1999	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.70%	-100.00%	-0.18%	-100.00%	-0.97%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2000	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-8.01%	-93.15%	0.00%	-100.00%
2001	0.00%	-100.00%	0.00%	-96.29%	0.00%	-71.16%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2002	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2003	0.00%	-100.00%	0.00%	-100.00%	0.00%	-47.83%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2004	0.00%	-100.00%	0.00%	-100.00%	0.00%	-47.83%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2005	1.39%	-6.01%	1.44%	1.44%	-0.79%	-0.79%	-1.04%	-79.15%	-0.54%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2006	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2007	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.91%	-67.92%
2008	-0.48%	-6.74%	0.04%	0.04%	0.00%	-53.35%	0.00%	-100.00%	-0.32%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.46%	-98.06%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2009	-1.83%	-24.76%	-0.48%	-36.26%	0.00%	-66.69%	0.00%	-100.00%																

Figure 4-4. Habitat summary table for Sonora sucker (*Catostomus insignis*), Gage site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Braided Site

No Wood

Sonora Sucker

Hypothetical Withdrawal 2 cfs

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965									1.50%	-36.47%	-3.96%	-52.22%	2.33%	-28.38%	12.20%	-44.93%	0.00%	-50.69%	0.70%	-46.73%	0.00%	-23.47%	-1.43%	-1.43%
1966	-1.56%	-1.56%	-1.05%	-3.90%	0.00%	-6.45%	-2.39%	0.54%	0.00%	-29.79%	-1.84%	-30.46%	0.00%	-35.27%	2.12%	-24.10%	0.00%	-39.04%	0.00%	-27.33%	0.00%	-25.27%	-0.64%	-22.07%
1967	0.00%	-23.27%	0.00%	-33.77%	-0.78%	-31.76%	-1.68%	-30.68%	0.00%	-27.33%	0.00%	-35.27%	0.00%	-35.27%	0.00%	-29.79%	-5.98%	-28.59%	-10.08%	-47.71%	0.00%	-40.53%	0.00%	-33.77%
1968	0.18%	0.18%	-0.27%	-0.27%	-0.47%	-0.47%	-12.80%	-16.45%	7.71%	-17.29%	1.12%	-53.31%	0.00%	-24.38%	0.11%	-24.39%	0.01%	-30.35%	0.00%	-32.23%	-0.12%	-24.72%	0.00%	-23.04%
1969	2.07%	-4.29%	0.59%	0.24%	0.70%	0.70%	-4.91%	-23.54%	6.25%	-10.05%	0.00%	-26.74%	0.00%	-28.50%	1.10%	-27.17%	1.68%	-28.43%	1.65%	-29.33%	-1.91%	-21.46%	0.00%	-16.68%
1970	0.00%	-23.86%	0.00%	-22.69%	0.00%	-8.35%	0.00%	-23.41%	0.00%	-37.79%	0.00%	-40.51%	-0.77%	-48.64%	2.12%	-25.97%	-1.55%	-36.77%	0.00%	-30.09%	0.00%	-22.64%	0.00%	-23.00%
1971	0.00%	-23.15%	0.00%	-24.11%	0.00%	-24.19%	0.00%	-36.47%	0.00%	-41.00%	-2.01%	-50.89%	0.00%	-50.51%	12.18%	-35.71%	0.00%	-36.22%	-2.48%	-22.47%	0.00%	-23.45%	0.00%	-21.60%
1972	0.00%	-23.32%	0.00%	-28.35%	-1.56%	-30.32%	0.00%	-31.68%	0.00%	-38.22%	0.00%	-41.11%	0.00%	-35.27%	0.00%	-35.27%	0.00%	-44.73%	2.81%	-9.04%	8.37%	7.51%	0.11%	0.11%
1973	0.25%	0.25%	0.21%	0.21%	0.17%	0.17%	0.05%	0.05%	0.52%	0.26%	-1.61%	-21.13%	-23.36%	-25.25%	23.08%	22.87%	15.97%	-8.09%	-5.77%	-26.02%	-0.83%	-8.28%	4.11%	4.33%
1974	1.70%	-8.15%	0.00%	-1.26%	0.00%	17.59%	0.00%	-16.65%	-0.37%	-22.37%	0.00%	-50.15%	0.00%	-27.22%	2.20%	-20.91%	-1.25%	-21.74%	0.13%	-27.93%	-0.63%	-20.72%	-0.52%	-19.77%
1975	0.00%	-24.36%	0.00%	-11.69%	0.44%	-0.11%	1.07%	1.07%	8.87%	-6.14%	0.00%	-26.75%	-0.06%	-25.13%	0.00%	-36.98%	-0.13%	-32.53%	0.00%	-31.76%	0.00%	-32.69%	0.00%	-25.66%
1976	1.20%	-20.84%	1.44%	-7.29%	0.00%	-4.07%	0.23%	-11.58%	2.07%	-20.82%	0.00%	-26.99%	-1.09%	-36.42%	1.03%	-33.82%	0.02%	-35.27%	0.00%	-23.25%	0.00%	-26.22%	0.00%	-25.37%
1977	0.00%	-12.93%	0.00%	-22.54%	0.00%	-22.74%	0.00%	-27.44%	0.00%	-35.47%	0.00%	-49.14%	0.00%	-47.54%	-6.68%	-56.52%	3.53%	-25.58%	0.00%	-40.67%	-1.55%	-48.21%	0.00%	-48.78%
1978	0.00%	-31.89%	1.15%	-0.03%	1.03%	1.03%	0.00%	-3.83%	-0.30%	-23.29%	0.00%	-30.57%	0.00%	-31.68%	0.00%	-50.13%	0.00%	-66.23%	-0.37%	-49.99%	0.00%	-30.47%	-0.11%	-8.44%
1979	-0.74%	-0.74%	0.95%	1.03%	0.76%	0.76%	0.36%	0.36%	-2.89%	-7.87%	-4.16%	-7.19%	1.20%	-20.92%	-1.50%	-21.38%	6.46%	-18.70%	20.99%	9.86%	11.63%	22.90%	0.00%	6.82%
1980	-10.85%	-10.27%	0.17%	0.17%	1.09%	0.55%	-0.56%	0.66%	-8.98%	-10.47%	-2.47%	-24.33%	-27.26%	-28.33%	-5.28%	-9.04%	-18.44%	-18.44%	22.63%	22.63%	15.16%	23.25%	0.00%	22.75%
1981	0.00%	18.95%	0.00%	19.42%	-0.18%	-18.08%	-3.43%	-7.14%	-2.70%	-19.91%	-0.81%	-23.09%	-3.42%	-17.39%	0.34%	-20.02%	-3.26%	-25.66%	6.51%	5.95%	-8.67%	-10.57%	-3.01%	-7.80%
1982	0.62%	-3.84%	-4.60%	-8.53%	0.16%	0.77%	-2.76%	-22.63%	0.85%	-8.05%	-3.57%	-24.71%	-0.07%	-30.31%	0.46%	-20.85%	-4.61%	-22.91%	0.00%	-29.92%	0.00%	-23.24%	-3.67%	-1.07%
1983	0.24%	0.76%	0.35%	0.35%	-0.06%	-0.06%	0.52%	0.52%	-5.58%	-13.20%	6.37%	-8.09%	0.25%	-19.91%	2.29%	-12.55%	-2.41%	-25.03%	7.64%	5.63%	23.25%	20.93%	-1.50%	-5.58%
1984	-2.20%	-7.42%	-5.70%	3.81%	0.00%	18.73%	-2.30%	0.48%	0.00%	-35.05%	0.00%	-43.37%	0.00%	-39.06%	-1.74%	-11.67%	-3.13%	-24.73%	-2.33%	-3.74%	1.99%	-7.66%	0.32%	0.32%
1985	0.74%	0.74%	0.98%	0.82%	0.79%	0.79%	1.94%	1.65%	-25.02%	-27.25%	-12.65%	-24.30%	-1.90%	-23.02%	-2.96%	-13.41%	-6.98%	-14.20%	0.44%	-9.80%	-13.50%	-23.22%	0.67%	-5.25%
1986	-0.53%	-20.47%	0.00%	-7.74%	0.72%	0.72%	-9.88%	-18.88%	12.80%	1.61%	-3.62%	-24.74%	-2.62%	-19.51%	-5.91%	-18.60%	1.56%	-29.76%	-8.47%	-27.54%	-1.74%	-4.71%	-22.66%	-12.34%
1987	-12.65%	-19.87%	0.77%	-1.79%	0.71%	0.64%	2.86%	1.16%	-0.01%	-18.33%	-1.64%	-26.66%	0.00%	-27.53%	-1.34%	-22.04%	0.00%	-25.47%	1.65%	-38.92%	0.58%	-10.30%	-16.04%	-10.52%
1988	-2.01%	6.90%	0.78%	0.18%	-2.28%	-1.35%	0.00%	-12.43%	-3.04%	-20.15%	-1.64%	-23.70%	-0.56%	-23.27%	-1.90%	-9.09%	0.00%	-22.53%	-0.80%	-29.21%	0.00%	-41.36%	0.00%	-21.53%
1989	-0.44%	-15.70%	-1.37%	-3.77%	0.00%	-7.21%	-1.72%	-8.68%	-1.59%	-30.92%	-1.48%	-45.17%	1.11%	-48.18%	-0.35%	-38.75%	1.57%	-42.10%	-1.77%	-34.80%	0.00%	-25.37%	0.00%	-25.18%
1990	0.00%	-21.12%	0.00%	-22.19%	0.00%	-21.83%	0.00%	-28.32%	0.14%	-32.55%	0.00%	-51.15%	0.00%	-48.96%	-0.38%	-45.72%	1.62%	-45.34%	0.00%	-41.32%	0.02%	-32.46%	0.00%	-28.50%
1991	-1.22%	-7.26%	0.38%	-16.26%	-0.19%	-0.19%	0.64%	0.64%	-1.92%	-24.22%	0.00%	-30.44%	-3.53%	-36.06%	1.74%	-31.33%	-3.66%	-49.14%	-9.62%	-47.06%	0.00%	-34.67%	0.27%	-29.01%
1992	0.36%	0.36%	0.89%	0.28%	0.60%	1.85%	-10.33%	-16.02%	-5.87%	-13.74%	0.00%	-30.44%	2.01%	-29.06%	-0.17%	-15.25%	0.00%	-22.95%	0.00%	-46.26%	0.00%	-34.54%	-16.79%	-15.33%
1993	0.09%	0.09%	0.61%	0.61%	0.32%	0.32%	0.37%	-1.11%	-3.47%	-5.39%	-22.60%	-24.92%	-28.25%	-28.25%	20.19%	19.92%	4.02%	2.65%	-1.28%	-13.55%	2.06%	-0.03%	3.42%	2.98%
1994	0.18%	-25.67%	1.50%	-21.37%	-0.21%	-1.13%	-2.43%	-3.46%	0.55%	-8.67%	-4.87%	-25.32%	-1.68%	-24.17%	0.00%	-21.27%	-0.36%	-23.72%	-2.19%	-23.61%	-4.34%	-16.88%	-12.24%	-18.77%
1995	0.22%	0.55%	-0.20%	0.15%	-0.09%	-0.09%	-2.25%	-8.70%	1.58%	-0.72%	9.48%	-13.16%	-1.33%	-24.00%	-0.06%	-24.08%	-1.53%	-23.85%	-2.10%	-24.30%	-1.12%	-25.24%	0.00%	-11.62%
1996	0.00%	-10.87%	0.00%	-10.10%	0.00%	-19.46%	0.00%	-31.36%	0.00%	-32.47%	0.00%	-39.50%	1.64%	-42.09%	0.00%	-33.47%	-1.76%	-35.97%	0.00%	-30.70%	0.00%	-32.56%	0.00%	-26.09%
1997	0.00%	-22.51%	0.25%	0.23%	0.00%	-13.57%	-0.48%	-22.76%	0.00%	-28.67%	0.00%	-41.73%	1.78%	-45.39%	2.99%	-39.43%	-10.61%	-34.58%	6.55%	-37.47%	0.05%	-37.22%	1.54%	-26.85%
1998	-1.41%	-4.95%	2.54%	-10.75%	0.21%	0.21%	0.41%	0.41%	-6.93%	-17.76%	1.59%	-27.37%	0.00%	-41.46%	1.44%	-35.70%	0.00%	-44.45%	0.00%	-45.15%	-0.10%	-30.02%	0.00%	-23.61%
1999	0.00%	-22.77%	0.00%	-24.72%	0.00%	-31.10%	0.00%	-19.20%	0.00%	-45.12%	0.00%	-52.08%	-0.79%	-47.04%	-0.25%	-27.35%	2.72%	-24.43%	0.00%	-37.28%	0.00%	-37.88%	0.00%	-37.28%
2000	0.00%	-24.59%	0.00%	-28.62%	-0.19%	-29.96%	-1.50%	-46.68%	0.00%	-60.06%	0.00%	-63.49%	0.00%	-70.42%	13.54%	-64.31%	0.00%	-55.56%	-16.77%	-54.20%	-4.29%	-6.87%	0.00%	-24.72%
2001	0.00%	-23.24%	0.00%	-17.61%	1.30%	-5.85%	-1.08%	-7.24%	0.00%	-37.88%	0.00%	-56.82%	0.00%	-61.65%	2.85%	-56.92%	-7.15%	-53.85%	0.00%	-47.09%	0.00%	-42.95%	0.00%	-42.33%
2002	0.00%	-39.29%	0.00%	-42.32%	1.90%	-46.55%	-9.79%	-55.40%	0.00%	-78.13%	0.00%	-92.59%	0.00%	-91.74%	0.00%	-76.68%	0.00%	-75.76%	0.00%	-72.99%	0.00%	-57.63%	-16.63%	-48.66%
2003	0.00%	-45.23%	0.00%	-49.14%	0.55%	-0.31%	0.00%	-29.50%	0.00%	-47.82%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	-0.68%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	2.51%	-41.75%
2004	0.00%	-45.23%	0.00%	-49.14%	0.55%	-0.31%	0.00%	-29.50%	0.00%	-47.82%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	-0.68%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	2.51%	-41.75%
2005	4.03%	2.84%	0.34%	0.34%	-0.36%	-0.36%	0.16%	-6.57%	-0.72%	-24.17%	0.00%	-37.88%	0.44%	-45.66%	0.00%	-26.24%	0.00%	-40.51%	0.00%	-41.52%	0.00%	-39.70%	0.00%	-33.27%
2006	0.00%	-33.27%	0.00%	-32.87%	0.02%	-34.48%	0.00%	-40.79%	0.00%	-56.50%	0.00%	-65.57%	0.00%	-66.23%	0.00%	-50.01%	0.00%	-57.64%	0.00%	-50.70%	0.00%	-46.84%	0.00%	-44.18%
2007	0.00%	-46.68%	-1.82%	-48.37%	0.07%	-29.75%	0.00%	-50.13%	0.00%	-70.18%	0.00%	-88.89%	0.00%	-88.50%	0.00%	-58.14%	0.00%	-64.94%	0.00%	-68.26%	0.00%	-60.79%	-4.75%	-4.77%
2008	0.37%	0.37%	0.57%	-2.35%	-0.18%	-16.70%	-2.41%	0.96%	-0.42%	-20.03%	1.55%	-38.25%	0.00%	-39.39%	1.83%	-18.77%	0.05%	-31.63%	0.00%	-28.97%	1.65%	-29.33%	0.00%	-19.80%
2009	-2.23%	-3.87%	-1.27%	-5.02%	0.00%	-26.45%	0.00%	-7.71%																

Figure 4-5. Habitat summary table for Sonora sucker (*Catostomus insignis*), Braided site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Braided Site
No Wood
Sonora Sucker

Hypothetical Withdrawal 10 cfs

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									1.50%	-100.00%	-3.96%	-100.00%	2.33%	-100.00%	12.20%	-100.00%	0.00%	-100.00%	0.70%	-100.00%	0.00%	-100.00%	-1.43%	-51.69%
1966	-0.32%	-16.95%	-2.93%	-31.55%	0.00%	-40.23%	-2.39%	-100.00%	0.00%	-100.00%	-1.84%	-100.00%	0.00%	-100.00%	1.06%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.17%	-100.00%
1967	0.00%	-100.00%	0.00%	-100.00%	-0.78%	-100.00%	-1.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-7.12%	-100.00%	-10.08%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1968	2.56%	6.87%	2.64%	6.46%	1.13%	1.50%	-3.69%	-70.94%	7.81%	-100.00%	1.12%	-100.00%	0.00%	-100.00%	0.11%	-100.00%	0.01%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1969	2.07%	-100.00%	0.79%	-21.26%	3.07%	-15.93%	-6.38%	-96.84%	6.25%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.10%	-100.00%	1.68%	-100.00%	1.65%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1970	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.77%	-100.00%	-1.62%	-100.00%	-1.55%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1971	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.01%	-100.00%	0.00%	-100.00%	12.18%	-100.00%	0.00%	-100.00%	0.56%	-94.83%	0.00%	-100.00%	0.00%	-100.00%
1972	0.00%	-100.00%	0.00%	-100.00%	-1.56%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.06%	-96.63%	-0.27%	-97.70%	0.76%	-19.84%
1973	1.21%	-2.23%	0.15%	0.15%	-0.69%	-0.69%	0.27%	3.08%	-4.35%	-45.40%	-19.48%	-77.69%	-19.12%	-75.50%	19.24%	-96.22%	15.83%	-100.00%	-5.77%	-100.00%	-2.25%	-100.00%	1.30%	-100.00%
1974	0.32%	-81.73%	0.00%	-96.36%	0.00%	-96.36%	0.00%	-100.00%	-0.37%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.20%	-100.00%	-1.25%	-100.00%	0.13%	-100.00%	-0.63%	-100.00%	-0.52%	-100.00%
1975	0.00%	-100.00%	0.00%	-100.00%	0.56%	-5.05%	3.56%	-75.99%	10.73%	-100.00%	0.00%	-100.00%	-0.06%	-100.00%	0.00%	-100.00%	-0.13%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1976	1.01%	-100.00%	1.89%	-57.43%	0.00%	-98.43%	0.23%	-100.00%	2.07%	-100.00%	0.00%	-100.00%	-1.09%	-100.00%	1.49%	-100.00%	0.02%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1977	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-6.74%	-100.00%	2.50%	-100.00%	0.00%	-100.00%	-1.55%	-100.00%	0.00%	-100.00%
1978	0.00%	-100.00%	1.28%	-8.41%	4.22%	-44.01%	-3.04%	-100.00%	-0.30%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.37%	-100.00%	0.00%	-100.00%	-12.47%	-56.35%
1979	0.70%	0.81%	3.52%	8.50%	4.20%	4.20%	1.71%	4.95%	-26.06%	-76.16%	-7.80%	-91.03%	0.70%	-100.00%	-2.92%	-100.00%	5.99%	-100.00%	15.47%	-100.00%	11.27%	-100.00%	0.00%	-100.00%
1980	-10.85%	-82.99%	0.86%	0.86%	3.91%	5.53%	-2.98%	-26.13%	-20.58%	-73.40%	-19.84%	-87.12%	-18.48%	-73.83%	-1.09%	-62.81%	-13.57%	-81.39%	14.60%	-98.10%	11.27%	-100.00%	0.00%	-100.00%
1981	0.00%	-100.00%	0.00%	-98.67%	-0.18%	-65.22%	-2.10%	-92.33%	-2.70%	-100.00%	-0.18%	-100.00%	-4.40%	-100.00%	1.83%	-100.00%	-3.26%	-100.00%	0.94%	-100.00%	-10.57%	-100.00%	-8.16%	-100.00%
1982	-1.18%	-27.97%	-4.63%	-20.50%	1.58%	-4.66%	-7.82%	-79.67%	7.43%	-100.00%	-3.57%	-100.00%	-0.07%	-100.00%	1.94%	-100.00%	-1.71%	-100.00%	0.00%	-100.00%	-2.28%	-100.00%	-3.15%	-4.09%
1983	-2.73%	2.65%	1.76%	2.30%	-0.31%	-0.31%	1.92%	3.54%	-16.12%	-74.25%	13.47%	-100.00%	0.06%	-100.00%	2.29%	-100.00%	-2.41%	-100.00%	1.89%	-91.55%	19.72%	-100.00%	-19.59%	-67.53%
1984	-2.20%	-26.36%	-5.70%	-88.00%	0.00%	-100.00%	-2.30%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-6.04%	-95.87%	-3.13%	-100.00%	-4.62%	-96.84%	-0.36%	-100.00%	2.72%	-43.03%
1985	2.55%	3.91%	4.36%	5.13%	2.96%	5.04%	-1.68%	-20.75%	-16.02%	-76.60%	-2.70%	-100.00%	-0.37%	-100.00%	-1.71%	-100.00%	-6.69%	-100.00%	-4.53%	-87.33%	-12.08%	-72.60%	-13.98%	-72.04%
1986	-1.72%	-67.67%	0.00%	-54.98%	3.27%	3.85%	-5.08%	-72.20%	12.84%	-100.00%	-3.62%	-100.00%	-2.15%	-100.00%	-5.66%	-97.00%	1.56%	-100.00%	-9.03%	-100.00%	-3.09%	-92.10%	-24.38%	-86.09%
1987	-12.99%	-78.50%	0.97%	-25.75%	3.37%	-25.48%	2.86%	-93.09%	1.85%	-100.00%	-1.64%	-100.00%	0.00%	-100.00%	0.65%	-100.00%	0.00%	-100.00%	1.65%	-100.00%	1.18%	-100.00%	-18.51%	-100.00%
1988	-2.61%	-57.57%	1.49%	-20.24%	-2.28%	-100.00%	0.00%	-100.00%	-3.04%	-100.00%	-1.64%	-100.00%	-2.81%	-100.00%	-5.49%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1989	-3.32%	-86.18%	-3.50%	-28.64%	0.00%	-100.00%	-1.72%	-100.00%	-1.59%	-100.00%	-1.48%	-100.00%	1.11%	-100.00%	-0.35%	-100.00%	1.57%	-100.00%	-1.77%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1990	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.14%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.38%	-100.00%	1.62%	-100.00%	0.00%	-100.00%	0.02%	-100.00%	-1.24%	-100.00%
1991	-1.22%	-100.00%	1.22%	-100.00%	-0.97%	0.79%	3.20%	-60.60%	-1.92%	-100.00%	0.00%	-100.00%	-3.53%	-100.00%	1.74%	-100.00%	-3.66%	-100.00%	-9.62%	-100.00%	0.00%	-100.00%	-1.66%	-100.00%
1992	0.88%	-15.56%	1.62%	1.83%	2.96%	6.48%	-4.01%	-67.17%	1.69%	-88.94%	0.00%	-100.00%	0.62%	-100.00%	-0.66%	-90.70%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-23.85%	-61.02%
1993	-0.19%	-2.64%	3.04%	6.03%	1.50%	12.59%	-11.04%	-41.62%	-18.20%	-93.71%	-16.37%	-93.82%	-17.05%	-86.26%	16.43%	-90.77%	-1.22%	-90.20%	-6.55%	-84.50%	-5.53%	-84.89%	-27.13%	-93.82%
1994	-5.16%	-67.84%	1.55%	-59.08%	-4.55%	-16.11%	-1.76%	-80.86%	1.40%	-98.42%	-4.87%	-100.00%	-1.68%	-100.00%	-0.47%	-100.00%	-0.36%	-100.00%	-0.73%	-100.00%	-1.23%	-100.00%	-25.48%	-69.31%
1995	-8.13%	-13.97%	0.60%	-0.12%	2.29%	5.82%	-4.87%	-79.16%	17.05%	-94.54%	9.48%	-100.00%	-1.33%	-100.00%	-0.06%	-100.00%	-2.42%	-100.00%	-2.10%	-100.00%	-1.12%	-100.00%	0.00%	-100.00%
1996	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.64%	-100.00%	0.00%	-100.00%	-1.76%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1997	0.00%	-100.00%	2.99%	-13.63%	0.00%	-55.35%	-0.48%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.78%	-100.00%	2.99%	-100.00%	-10.61%	-100.00%	2.03%	-100.00%	0.05%	-100.00%	-1.47%	-100.00%
1998	-1.41%	-98.42%	2.54%	-86.92%	3.88%	8.19%	4.43%	-57.43%	0.10%	-100.00%	1.59%	-100.00%	0.00%	-100.00%	1.44%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.87%	-100.00%	0.00%	-100.00%
1999	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-3.99%	-100.00%	-0.25%	-100.00%	-2.55%	-91.91%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2000	0.00%	-100.00%	0.00%	-100.00%	-0.19%	-100.00%	-1.50%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	13.54%	-100.00%	0.00%	-100.00%	-16.77%	-100.00%	-1.38%	-93.84%	0.00%	-100.00%
2001	0.00%	-100.00%	0.00%	-96.91%	1.30%	-62.45%	-1.08%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.85%	-100.00%	-7.15%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2002	0.00%	-100.00%	0.00%	-100.00%	1.90%	-100.00%	-9.79%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-16.63%	-100.00%
2003	0.00%	-100.00%	0.00%	-100.00%	1.81%	-49.78%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.51%	-100.00%
2004	0.00%	-100.00%	0.00%	-100.00%	1.81%	-49.78%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.51%	-100.00%
2005	3.57%	-0.11%	2.35%	0.24%	0.79%	1.44%	0.16%	-87.76%	-0.72%	-100.00%	0.00%	-100.00%	0.44%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2006	0.00%	-100.00%	0.00%	-100.00%	0.02%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2007	0.00%	-100.00%	-1.82%	-100.00%	0.07%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-4.22%	-69.90%
2008	1.23%	-34.00%	3.02%	8.73%	-0.18%	-59.08%	-2.41%	-100.00%	-0.42%	-100.00%	1.55%	-100.00%	0.00%	-100.00%	0.86%	-99.81%	0.05%	-100.00%	0.00%	-100.00%	1.65%	-100.00%	0.00%	-100.00%
2009	-4.11%	-35.43%	-2.85%	-36.94%	0.00%	-71.71%	0.00%	-100.00%																

Figure 4-6. Habitat summary table for Sonora sucker (*Catostomus insignis*), Braided site, with no LWD and with a hypothetical withdrawal rate of 10 ft³/sec.

Braided Site

With LWD

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Sonora Sucker

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965									0.82%	-29.71%	-3.96%	-52.22%	5.75%	-31.12%	12.18%	-44.90%	0.00%	-50.44%	0.70%	-46.73%	-1.11%	-12.49%	-1.50%	-1.50%
1966	-0.39%	-0.39%	0.69%	0.94%	0.68%	1.15%	-1.05%	0.24%	0.00%	-22.05%	-0.93%	-26.23%	0.00%	-35.00%	0.95%	-17.90%	0.00%	-32.84%	0.00%	-26.73%	0.00%	-23.04%	0.64%	-19.64%
1967	0.00%	-13.94%	0.00%	-27.28%	-0.79%	-24.62%	-0.86%	-29.61%	0.00%	-26.73%	0.00%	-35.00%	0.00%	-35.00%	0.00%	-22.05%	-7.93%	-24.17%	-10.04%	-47.67%	0.00%	-40.37%	0.18%	-25.66%
1968	0.04%	0.04%	-0.73%	-0.73%	-1.14%	-1.14%	-6.57%	-9.22%	3.36%	-9.29%	0.68%	-48.89%	0.00%	-15.02%	0.05%	-12.87%	0.00%	-21.89%	0.00%	-23.68%	-0.05%	-15.22%	0.00%	-12.31%
1969	0.50%	1.04%	0.81%	1.55%	0.00%	0.00%	-2.76%	-13.18%	2.83%	-5.26%	0.00%	-17.95%	0.00%	-20.33%	0.48%	-19.26%	0.87%	-25.15%	0.86%	-25.43%	-0.86%	-11.37%	0.00%	-8.53%
1970	0.00%	-12.66%	0.00%	-12.27%	0.00%	-3.94%	0.00%	-12.47%	0.00%	-31.11%	0.00%	-40.32%	-0.25%	-48.28%	0.77%	-25.99%	-1.28%	-30.16%	0.00%	-29.62%	0.00%	-13.92%	0.00%	-12.24%
1971	0.00%	-12.36%	0.00%	-12.77%	0.00%	-13.48%	0.00%	-36.24%	0.00%	-40.88%	-2.01%	-50.89%	0.00%	-50.51%	11.78%	-34.71%	0.00%	-35.51%	0.16%	-13.06%	0.00%	-13.94%	0.07%	-12.23%
1972	0.00%	-13.45%	0.00%	-20.38%	-0.84%	-24.28%	0.00%	-31.27%	0.00%	-37.90%	0.00%	-40.84%	0.00%	-35.00%	0.00%	-35.00%	0.00%	-44.73%	3.90%	-20.16%	0.10%	0.10%	0.16%	0.16%
1973	-0.09%	-0.09%	0.21%	0.21%	0.30%	0.30%	0.20%	0.20%	0.19%	0.19%	-1.65%	-12.52%	-13.13%	-14.26%	9.70%	9.61%	6.69%	-4.64%	-2.70%	-13.62%	-0.93%	-4.84%	1.82%	1.91%
1974	1.18%	-3.73%	0.00%	-0.54%	0.00%	7.55%	0.00%	-8.41%	-0.17%	-11.91%	0.00%	-44.73%	0.00%	-19.36%	0.99%	-11.06%	-0.56%	-12.83%	0.06%	-19.72%	-0.29%	-10.70%	-0.24%	-10.11%
1975	0.00%	-12.84%	0.00%	-5.43%	0.69%	1.24%	0.66%	0.66%	3.92%	-3.44%	0.00%	-18.06%	-0.03%	-16.37%	0.00%	-30.05%	-0.06%	-25.31%	0.00%	-24.65%	0.00%	-25.88%	0.00%	-17.28%
1976	-0.04%	-6.64%	0.05%	-3.60%	0.00%	-1.89%	0.11%	-5.40%	0.93%	-11.10%	0.00%	-26.35%	-0.61%	-32.09%	0.62%	-27.63%	0.01%	-35.00%	0.00%	-13.16%	0.00%	-17.25%	0.00%	-24.68%
1977	0.00%	-7.24%	0.00%	-12.06%	0.00%	-12.18%	0.00%	-18.85%	0.00%	-35.20%	0.00%	-49.14%	0.00%	-46.84%	-2.14%	-52.43%	1.55%	-18.78%	0.00%	-40.39%	-0.98%	-47.91%	0.00%	-48.78%
1978	-0.70%	-22.12%	-0.43%	-0.10%	0.40%	0.40%	0.00%	-1.76%	-0.14%	-12.33%	0.00%	-23.09%	0.00%	-31.27%	0.00%	-50.13%	0.00%	-66.23%	-0.41%	-49.64%	0.00%	-29.93%	-1.07%	-0.93%
1979	-0.91%	-0.91%	0.23%	0.46%	0.39%	0.39%	0.44%	0.44%	1.35%	1.78%	-2.31%	-3.73%	0.54%	-10.92%	-0.70%	-11.01%	2.85%	-10.00%	8.76%	3.41%	4.85%	9.55%	0.00%	2.85%
1980	0.72%	1.17%	0.28%	0.28%	0.39%	0.96%	-0.11%	0.45%	-5.43%	-6.86%	-2.53%	-14.45%	-15.36%	-15.89%	-3.63%	-5.02%	-9.91%	-9.91%	9.48%	9.48%	6.33%	9.70%	0.00%	9.49%
1981	0.00%	7.91%	0.00%	8.21%	0.92%	-8.76%	-2.25%	-3.56%	-1.27%	-10.22%	-0.37%	-12.32%	-1.59%	-8.97%	0.16%	-10.36%	-1.52%	-13.45%	2.93%	2.68%	-4.24%	-5.17%	-1.41%	-3.66%
1982	-1.07%	-1.80%	-1.85%	-5.15%	0.07%	1.10%	0.36%	-9.12%	0.38%	-4.24%	-1.64%	-13.03%	-0.03%	-21.51%	0.21%	-10.88%	-2.09%	-14.80%	0.00%	-22.22%	-4.90%	-8.71%	-1.91%	0.43%
1983	0.39%	-1.97%	0.25%	0.25%	0.08%	0.08%	0.31%	0.31%	0.00%	-3.89%	2.68%	-4.56%	0.11%	-10.18%	1.05%	-6.53%	-0.71%	-10.88%	1.28%	2.16%	7.70%	7.54%	-1.75%	0.23%
1984	0.08%	0.24%	-2.76%	1.45%	0.00%	7.80%	-1.03%	0.21%	0.00%	-27.99%	0.00%	-42.97%	0.00%	-38.71%	-0.18%	-6.11%	-2.25%	-11.07%	-2.21%	-1.37%	0.92%	-3.54%	-0.61%	-0.61%
1985	0.30%	0.30%	0.42%	0.42%	0.24%	0.24%	1.37%	1.52%	-14.51%	-15.71%	-5.79%	-12.85%	-0.86%	-12.27%	-1.39%	-6.69%	-3.30%	-7.12%	-0.57%	-5.29%	-0.27%	-0.84%	0.44%	0.44%
1986	-0.55%	-11.98%	-1.13%	1.00%	0.37%	0.37%	-4.04%	-9.74%	5.59%	0.43%	-1.67%	-13.04%	-1.20%	-10.24%	-2.88%	-9.77%	0.84%	-23.90%	-4.03%	-14.32%	-1.38%	-2.28%	-11.62%	-6.64%
1987	-6.54%	-11.00%	1.08%	2.08%	0.54%	-0.03%	1.14%	0.39%	-0.12%	-9.66%	-0.86%	-22.77%	0.00%	-26.94%	-0.60%	-15.53%	0.00%	-19.64%	0.86%	-35.55%	0.27%	-4.78%	-7.94%	-5.37%
1988	-0.15%	0.41%	-0.19%	0.38%	-1.03%	-0.61%	0.00%	-5.96%	-1.43%	-10.30%	-0.75%	-12.59%	-0.25%	-13.16%	-1.68%	-0.83%	-0.57%	-9.13%	-0.36%	-20.85%	0.00%	-34.45%	0.00%	-12.40%
1989	0.44%	-7.89%	0.06%	0.06%	0.00%	-3.38%	-0.80%	-4.16%	-0.85%	-25.80%	-0.94%	-44.85%	1.05%	-47.97%	-0.12%	-35.04%	0.84%	-38.33%	-0.90%	-32.41%	0.00%	-24.68%	0.00%	-24.48%
1990	0.00%	-11.32%	0.00%	-11.87%	0.00%	-11.59%	0.00%	-20.24%	0.08%	-32.14%	0.00%	-51.15%	0.00%	-48.11%	-0.32%	-44.53%	1.11%	-45.05%	0.00%	-41.25%	0.01%	-31.90%	0.00%	-20.33%
1991	-3.51%	-1.63%	-1.09%	-8.66%	0.01%	0.01%	0.28%	0.28%	-0.88%	-12.80%	0.00%	-22.92%	-1.78%	-34.27%	0.94%	-30.23%	-3.66%	-49.14%	-9.62%	-47.06%	0.00%	-34.37%	0.30%	-21.67%
1992	0.29%	0.29%	0.16%	0.74%	0.27%	0.70%	0.23%	0.23%	-2.95%	-6.92%	0.00%	-22.92%	1.03%	-25.67%	-0.40%	-8.04%	0.00%	-12.27%	0.00%	-40.33%	0.00%	-27.09%	-6.60%	-3.55%
1993	0.89%	0.19%	0.40%	0.40%	0.18%	0.18%	0.19%	0.71%	-1.94%	-3.94%	-11.31%	-12.56%	-15.03%	-15.03%	8.61%	8.49%	1.36%	0.76%	2.04%	-3.88%	-0.81%	1.01%	3.50%	3.06%
1994	-0.80%	-14.91%	-0.86%	-7.23%	0.23%	1.13%	0.68%	-0.41%	-0.20%	-4.87%	-2.26%	-13.30%	-0.77%	-12.79%	0.00%	-11.08%	-0.17%	-12.60%	-1.00%	-12.55%	-2.01%	-8.48%	-1.89%	-5.86%
1995	0.20%	0.20%	0.05%	0.19%	0.17%	0.17%	-1.47%	-5.27%	0.55%	-0.43%	4.07%	-7.14%	-0.61%	-12.72%	-0.03%	-12.76%	-0.71%	-12.42%	-0.96%	-12.85%	-0.52%	-13.27%	0.00%	-5.41%
1996	0.00%	-5.06%	0.00%	-4.65%	0.00%	-9.99%	0.00%	-24.13%	0.00%	-32.09%	0.00%	-39.37%	0.85%	-40.52%	0.00%	-33.13%	-0.91%	-31.67%	0.00%	-30.23%	0.00%	-25.70%	0.00%	-17.08%
1997	0.19%	-7.63%	0.26%	0.26%	0.07%	0.07%	-0.22%	-11.99%	0.00%	-27.40%	0.00%	-41.67%	1.23%	-44.72%	1.92%	-38.91%	-11.36%	-34.13%	3.37%	-35.69%	0.03%	-36.79%	0.83%	-22.46%
1998	-0.65%	-2.30%	-0.03%	-0.03%	-0.61%	-0.61%	-0.53%	-0.53%	-3.19%	-9.15%	0.83%	-26.75%	0.00%	-41.04%	0.79%	-35.43%	0.00%	-44.39%	0.00%	-45.15%	-0.03%	-25.61%	0.00%	-12.55%
1999	0.00%	-12.20%	0.00%	-15.22%	0.00%	-23.12%	0.00%	-9.89%	0.00%	-45.12%	0.00%	-52.08%	0.93%	-45.58%	-0.11%	-20.91%	1.20%	-18.32%	0.00%	-37.08%	0.00%	-37.70%	0.00%	-37.08%
2000	0.00%	-23.86%	0.00%	-27.92%	-0.25%	-22.35%	-0.95%	-46.39%	0.00%	-60.06%	0.00%	-63.49%	0.00%	-70.42%	8.65%	-64.31%	0.00%	-55.56%	-16.77%	-54.20%	-0.67%	-0.54%	0.00%	-15.22%
2001	0.00%	-13.93%	0.00%	-9.72%	0.28%	0.28%	-0.50%	-3.65%	0.00%	-37.70%	0.00%	-56.82%	0.00%	-61.65%	2.34%	-56.89%	-7.15%	-53.85%	0.00%	-47.09%	0.00%	-42.95%	0.00%	-42.20%
2002	0.00%	-39.16%	0.00%	-42.20%	1.38%	-46.25%	-9.79%	-55.40%	0.00%	-78.13%	0.00%	-92.59%	0.00%	-91.74%	0.00%	-76.68%	0.00%	-75.76%	0.00%	-72.99%	0.00%	-57.63%	-16.63%	-48.66%
2003	0.00%	-45.23%	0.00%	-49.14%	0.33%	0.33%	0.00%	-29.00%	0.00%	-47.82%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	-0.68%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	1.89%	-41.75%
2004	0.00%	-45.23%	0.00%	-49.14%	0.33%	0.33%	0.00%	-29.00%	0.00%	-47.82%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	-0.68%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	1.89%	-41.75%
2005	-0.01%	-0.01%	-0.37%	-0.37%	0.35%	0.35%	0.36%	-3.59%	-0.33%	-12.79%	0.00%	-37.70%	0.43%	-45.36%	0.00%	-24.79%	0.00%	-40.42%	0.00%	-41.46%	0.00%	-39.58%	0.00%	-32.92%
2006	0.00%	-32.92%	0.00%	-32.51%	0.01%	-34.18%	0.00%	-40.69%	0.00%	-56.50%	0.00%	-65.57%	0.00%	-66.23%	0.00%	-50.01%	0.00%	-57.64%	0.00%	-50.70%	0.00%	-46.84%	0.00%	-42.26%
2007	0.00%	-46.66%	-0.91%	-47.31%	0.04%	-29.23%	0.00%	-50.13%	0.00%	-70.18%	0.00%	-88.89%	0.00%	-88.50%	0.00%	-58.14%	0.00%	-64.94%	0.00%	-68.26%	0.00%	-60.79%	-3.02%	-8.82%
2008	-3.63%	-0.37%	0.37%	-1.22%	0.22%	0.53%	-1.07%	0.43%	-0.19%	-10.44%	0.83%	-32.77%	0.00%	-32.98%	0.80%	-13.96%	0.03%	-31.16%	0.00%	-28.29%	0.86%	-25.43%	0.00%	-10.60%
2009	0.25%	0.25%	0.98%	1.13%	0.00%	-15.13%	0.00%	-3.49%																

Figure 4-7. Habitat summary table for Sonora sucker (*Catostomus insignis*), Braided site, with LWD and a hypothetical withdrawal rate of 2 ft³/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 10 cfs										Braided Site With LWD Sonora Sucker														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.82%	-100.00%	-3.96%	-100.00%	6.14%	-100.00%	12.18%	-100.00%	0.00%	-100.00%	0.70%	-100.00%	-0.77%	-100.00%	0.07%	-56.44%
1966	0.52%	-0.81%	1.13%	-15.79%	2.80%	-24.62%	-1.05%	-100.00%	0.00%	-100.00%	-0.93%	-100.00%	0.00%	-100.00%	0.47%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.87%	-100.00%
1967	0.00%	-100.00%	0.00%	-100.00%	-0.79%	-100.00%	-0.86%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-8.41%	-100.00%	-10.04%	-100.00%	0.00%	-100.00%	1.44%	-100.00%
1968	-0.08%	1.15%	0.40%	4.03%	-0.37%	-0.23%	-2.36%	-63.67%	3.41%	-100.00%	0.68%	-100.00%	0.00%	-100.00%	0.05%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1969	1.34%	-100.00%	2.87%	1.16%	0.08%	1.55%	-3.91%	-96.05%	2.83%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.48%	-100.00%	0.87%	-100.00%	0.86%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1970	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.24%	-100.00%	-1.15%	-100.00%	-0.92%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1971	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.01%	-100.00%	0.00%	-100.00%	11.78%	-100.00%	0.00%	-100.00%	0.88%	-93.48%	0.00%	-100.00%	0.31%	-100.00%
1972	0.00%	-100.00%	0.00%	-100.00%	-0.84%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.93%	-95.93%	0.23%	-97.01%	1.04%	-6.80%
1973	0.83%	2.99%	-0.20%	-0.20%	-0.78%	-0.78%	1.01%	2.42%	1.64%	-17.58%	-11.71%	-72.11%	-11.23%	-69.30%	8.09%	-95.98%	6.63%	-100.00%	-2.70%	-100.00%	-1.57%	-100.00%	0.57%	-100.00%
1974	1.19%	-78.80%	0.00%	-96.04%	0.00%	-96.04%	0.00%	-100.00%	-0.17%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.99%	-100.00%	-0.56%	-100.00%	0.06%	-100.00%	-0.29%	-100.00%	-0.24%	-100.00%
1975	0.00%	-100.00%	0.00%	-100.00%	2.61%	4.04%	3.01%	-66.61%	4.74%	-100.00%	0.00%	-100.00%	-0.03%	-100.00%	0.00%	-100.00%	-0.06%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1976	-0.15%	-100.00%	0.25%	-60.84%	0.00%	-98.15%	0.11%	-100.00%	0.93%	-100.00%	0.00%	-100.00%	-0.61%	-100.00%	0.81%	-100.00%	0.01%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1977	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.18%	-100.00%	1.10%	-100.00%	0.00%	-100.00%	-0.98%	-100.00%	0.00%	-100.00%
1978	-0.72%	-100.00%	0.58%	-8.02%	1.89%	-33.98%	-1.39%	-100.00%	-0.14%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.41%	-100.00%	0.00%	-100.00%	-0.63%	-43.49%
1979	-0.36%	1.31%	0.80%	2.63%	2.09%	2.09%	2.04%	2.57%	-9.49%	-66.00%	-4.01%	-89.34%	0.32%	-100.00%	-1.36%	-100.00%	2.64%	-100.00%	6.45%	-100.00%	4.70%	-100.00%	0.00%	-100.00%
1980	2.51%	-75.62%	1.31%	1.80%	1.75%	2.41%	2.38%	-3.08%	-12.78%	-65.38%	-12.24%	-83.90%	-11.03%	-67.28%	-0.42%	-58.12%	-7.55%	-77.18%	6.12%	-97.98%	4.70%	-100.00%	0.00%	-100.00%
1981	0.00%	-100.00%	0.00%	-98.57%	1.98%	-55.45%	-1.63%	-90.90%	-1.27%	-100.00%	-0.08%	-100.00%	-2.04%	-100.00%	0.84%	-100.00%	-1.52%	-100.00%	0.42%	-100.00%	-5.17%	-100.00%	-3.83%	-100.00%
1982	-1.39%	-25.65%	-1.20%	-5.11%	0.51%	-2.46%	-0.72%	-73.29%	3.34%	-100.00%	-1.64%	-100.00%	-0.03%	-100.00%	0.88%	-100.00%	-0.78%	-100.00%	0.00%	-100.00%	-6.76%	-100.00%	-2.45%	-0.46%
1983	-2.26%	-1.32%	1.23%	0.93%	0.42%	0.42%	1.58%	2.17%	-6.62%	-65.99%	5.66%	-100.00%	0.03%	-100.00%	1.05%	-100.00%	0.21%	-100.00%	0.49%	-90.45%	3.13%	-100.00%	-7.22%	-54.24%
1984	2.06%	-3.81%	-2.76%	-86.53%	0.00%	-100.00%	-1.03%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.01%	-94.90%	-2.20%	-100.00%	-1.78%	-96.27%	-0.17%	-100.00%	-0.07%	-35.47%
1985	1.27%	1.96%	1.88%	2.88%	0.96%	1.63%	1.23%	0.34%	-10.17%	-70.75%	-1.24%	-100.00%	-0.17%	-100.00%	-0.80%	-100.00%	-3.16%	-100.00%	-2.86%	-85.23%	-1.58%	-61.06%	1.79%	-58.15%
1986	-1.12%	-59.58%	-0.04%	-37.02%	1.81%	1.40%	-1.83%	-64.64%	5.61%	-100.00%	-1.67%	-100.00%	-0.99%	-100.00%	-3.09%	-96.39%	0.84%	-100.00%	-4.30%	-100.00%	-2.00%	-90.76%	-12.45%	-83.90%
1987	-6.89%	-73.19%	2.87%	-5.13%	2.23%	-15.99%	1.14%	-92.27%	0.72%	-100.00%	-0.86%	-100.00%	0.00%	-100.00%	0.29%	-100.00%	0.00%	-100.00%	0.86%	-100.00%	0.55%	-100.00%	-9.09%	-100.00%
1988	1.01%	-56.13%	1.17%	2.10%	-1.03%	-100.00%	0.00%	-100.00%	-1.43%	-100.00%	-0.75%	-100.00%	-1.26%	-100.00%	-2.44%	-100.00%	-0.89%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1989	-0.01%	-82.47%	1.43%	-5.07%	0.00%	-100.00%	-0.80%	-100.00%	-0.85%	-100.00%	-0.94%	-100.00%	1.05%	-100.00%	-0.12%	-100.00%	0.84%	-100.00%	-0.90%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1990	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.08%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.32%	-100.00%	1.11%	-100.00%	0.00%	-100.00%	0.01%	-100.00%	-0.54%	-100.00%
1991	-2.14%	-100.00%	-1.18%	-100.00%	-0.19%	2.37%	1.42%	-52.00%	-0.88%	-100.00%	0.00%	-100.00%	-1.78%	-100.00%	0.94%	-100.00%	-3.66%	-100.00%	-9.62%	-100.00%	0.00%	-100.00%	-0.55%	-100.00%
1992	1.39%	2.70%	0.50%	1.08%	1.12%	1.83%	1.07%	-50.81%	0.21%	-87.07%	0.00%	-100.00%	0.45%	-100.00%	-1.23%	-89.24%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-9.40%	-51.22%
1993	1.11%	1.36%	2.00%	1.70%	0.61%	4.03%	1.57%	-17.33%	-11.13%	-92.01%	-8.34%	-92.27%	-9.49%	-82.81%	7.00%	-90.04%	-1.02%	-88.73%	-0.50%	-81.10%	2.31%	-78.81%	-13.66%	-92.27%
1994	-2.57%	-59.79%	0.33%	-49.96%	2.19%	-1.07%	0.30%	-75.32%	0.19%	-98.15%	-2.26%	-100.00%	-0.77%	-100.00%	-0.22%	-100.00%	-0.17%	-100.00%	-0.33%	-100.00%	-0.57%	-100.00%	-9.28%	-60.88%
1995	1.27%	1.53%	0.53%	1.35%	1.27%	2.02%	-3.29%	-73.74%	7.19%	-94.07%	4.07%	-100.00%	-0.61%	-100.00%	-0.03%	-100.00%	-1.12%	-100.00%	-0.96%	-100.00%	-0.52%	-100.00%	0.00%	-100.00%
1996	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.85%	-100.00%	0.00%	-100.00%	-0.91%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1997	1.43%	-100.00%	2.13%	4.16%	0.49%	-34.90%	-0.22%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.23%	-100.00%	1.92%	-100.00%	-11.36%	-100.00%	1.51%	-100.00%	0.03%	-100.00%	-0.59%	-100.00%
1998	-0.65%	-98.14%	-0.35%	-84.23%	1.42%	1.45%	1.73%	-48.56%	0.05%	-100.00%	0.83%	-100.00%	0.00%	-100.00%	0.79%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.36%	-100.00%	0.00%	-100.00%
1999	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.83%	-100.00%	-0.11%	-100.00%	-1.59%	-90.65%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2000	0.00%	-100.00%	0.00%	-100.00%	-0.25%	-100.00%	-0.95%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	8.65%	-100.00%	0.00%	-100.00%	-16.77%	-100.00%	1.51%	-92.22%	0.00%	-100.00%
2001	0.00%	-100.00%	0.00%	-96.35%	1.99%	-52.25%	-0.50%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.34%	-100.00%	-7.15%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2002	0.00%	-100.00%	0.00%	-100.00%	1.38%	-100.00%	-9.79%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-16.63%	-100.00%
2003	0.00%	-100.00%	0.00%	-100.00%	1.40%	-34.57%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.89%	-100.00%
2004	0.00%	-100.00%	0.00%	-100.00%	1.40%	-34.57%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.89%	-100.00%
2005	1.03%	3.83%	0.84%	-0.72%	1.20%	1.53%	0.36%	-85.13%	-0.33%	-100.00%	0.00%	-100.00%	0.43%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2006	0.00%	-100.00%	0.00%	-100.00%	0.01%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2007	0.00%	-100.00%	-0.91%	-100.00%	0.04%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-3.40%	-61.67%
2008	-2.34%	-28.86%	1.83%	4.84%	1.62%	-43.45%	-1.07%	-100.00%	-0.19%	-100.00%	0.83%	-100.00%	0.00%	-100.00%	0.55%	-99.79%	0.03%	-100.00%	0.00%	-100.00%	0.86%	-100.00%	0.00%	-100.00%
2009	1.66%	-13.51%	1.51%	-17.19%	0.00%	-64.62%	0.00%	-100.00%																

Figure 4-8. Habitat summary table for Sonora sucker (*Catostomus insignis*), Braided site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Gage Site

No Wood

Desert Sucker

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-10.00%	0.00%	-25.84%	0.14%	-24.25%	-0.40%	-25.03%	0.00%	-24.97%	0.00%	-24.33%	-0.50%	-2.17%	-0.05%	-0.05%
1966	0.69%	0.69%	2.76%	3.91%	3.31%	3.31%	0.00%	-4.63%	0.00%	-10.18%	0.00%	-13.84%	0.00%	-19.48%	0.03%	-5.08%	0.00%	-12.09%	0.00%	-15.70%	0.00%	-14.86%	0.53%	-7.84%
1967	0.00%	-6.41%	0.00%	-12.92%	0.00%	-11.54%	0.00%	-16.73%	0.00%	-15.70%	0.00%	-19.48%	1.68%	-3.39%	2.03%	1.27%	0.00%	-12.92%	0.00%	-24.50%	0.00%	-21.18%	1.09%	1.09%
1968	0.13%	0.13%	0.22%	0.22%	1.32%	1.32%	2.37%	3.95%	-0.72%	-4.81%	-0.05%	-11.46%	0.00%	-6.78%	0.29%	-1.71%	0.00%	-6.26%	0.00%	-6.58%	0.00%	-6.58%	0.00%	-4.99%
1969	1.08%	1.08%	2.72%	2.72%	1.54%	1.54%	2.46%	3.17%	0.38%	-2.82%	0.00%	-8.02%	0.00%	-9.27%	0.00%	-9.01%	0.00%	-13.75%	0.00%	-13.56%	0.00%	-5.39%	0.00%	-4.79%
1970	0.00%	-4.85%	0.00%	-5.46%	0.00%	-3.60%	0.00%	-4.87%	0.00%	-10.81%	0.00%	-21.82%	0.00%	-24.36%	0.93%	-15.51%	0.18%	0.00%	0.00%	-17.02%	0.00%	-6.94%	0.00%	-5.20%
1971	0.00%	-4.88%	0.00%	-4.84%	0.00%	-5.38%	0.00%	-20.06%	0.00%	-22.11%	0.00%	-25.41%	0.66%	-24.82%	-0.11%	-1.78%	0.23%	-14.73%	1.51%	1.51%	1.43%	-2.82%	2.92%	1.20%
1972	2.12%	1.92%	0.00%	-5.89%	0.00%	-12.00%	0.00%	-17.77%	0.00%	-20.60%	0.00%	-19.10%	0.00%	-19.48%	0.18%	-17.44%	0.04%	-23.95%	0.99%	-5.41%	0.46%	0.46%	1.77%	1.77%
1973	1.39%	1.39%	-0.04%	-0.04%	-0.07%	-0.07%	0.09%	0.09%	0.74%	0.74%	3.10%	3.10%	0.15%	0.15%	-1.44%	-1.53%	-3.91%	-4.66%	-2.38%	-4.75%	-2.07%	-4.70%	0.00%	-4.65%
1974	2.41%	2.46%	0.00%	-4.09%	0.36%	0.34%	0.00%	-4.77%	-0.15%	-4.97%	0.00%	-10.54%	0.00%	-9.63%	-0.01%	-4.99%	-0.49%	-7.26%	-0.33%	-5.82%	0.00%	-4.79%	0.00%	-4.79%
1975	0.00%	-4.81%	1.66%	2.56%	1.28%	1.28%	1.54%	1.54%	-1.61%	-4.68%	0.00%	-8.28%	-0.34%	-5.64%	0.00%	-10.27%	-0.05%	-8.43%	0.00%	-11.54%	0.00%	-12.18%	0.00%	-8.83%
1976	0.00%	-5.03%	0.80%	0.80%	0.00%	-4.43%	2.47%	1.11%	-0.17%	-4.92%	0.00%	-15.52%	1.57%	-6.92%	-0.75%	-11.41%	0.51%	-15.02%	-1.46%	-5.17%	0.00%	-7.65%	0.00%	-14.77%
1977	0.00%	-4.81%	0.00%	-5.57%	0.00%	-4.89%	1.31%	-2.85%	0.00%	-19.58%	0.00%	-24.97%	-0.52%	-21.45%	1.06%	-18.99%	-1.47%	-4.60%	0.00%	-21.02%	0.00%	-24.51%	0.00%	-24.87%
1978	0.93%	-1.40%	0.54%	0.54%	0.05%	0.05%	0.00%	-4.54%	-0.12%	-5.02%	0.00%	-10.72%	0.00%	-17.77%	0.00%	-25.22%	0.00%	-28.73%	0.00%	-24.55%	3.31%	3.31%	0.70%	0.70%
1979	0.52%	0.52%	0.38%	0.38%	0.12%	0.12%	0.71%	0.71%	4.05%	4.05%	-3.57%	-3.57%	-1.89%	-4.93%	-0.61%	-4.78%	-0.42%	-4.82%	-3.97%	-3.97%	-4.39%	-4.39%	-1.75%	-4.37%
1980	1.57%	1.57%	0.03%	0.03%	0.28%	0.28%	2.38%	2.38%	3.89%	3.89%	-1.57%	-1.57%	-0.73%	-0.73%	-0.59%	-0.59%	-1.36%	-1.39%	-4.22%	-4.22%	-4.37%	-4.37%	-0.84%	-4.37%
1981	0.00%	-4.37%	0.36%	-0.82%	2.97%	4.04%	-0.68%	-4.06%	-1.12%	-4.75%	-0.07%	-4.88%	-1.75%	-2.22%	0.15%	-4.24%	-0.88%	-3.83%	-1.40%	-3.22%	-2.53%	-3.12%	1.14%	-1.79%
1982	3.27%	3.27%	1.18%	1.18%	0.20%	0.20%	3.16%	3.16%	-2.34%	-4.64%	-1.44%	-4.81%	-0.34%	-5.89%	0.51%	-2.63%	0.68%	-2.70%	0.00%	-10.27%	-0.86%	-0.86%	1.40%	1.40%
1983	0.98%	0.98%	0.11%	0.11%	0.10%	0.10%	0.34%	0.34%	3.75%	3.75%	-4.20%	-4.64%	-3.02%	-3.90%	-0.20%	-0.61%	-0.05%	-1.11%	1.68%	1.06%	0.69%	0.69%	2.17%	2.17%
1984	2.46%	2.46%	0.00%	-3.32%	0.00%	-4.41%	0.00%	-4.65%	0.00%	-10.54%	0.00%	-17.11%	0.00%	-18.06%	0.25%	-3.61%	2.01%	2.01%	2.22%	2.22%	0.91%	-0.99%	0.06%	0.06%
1985	0.37%	0.37%	0.28%	0.28%	0.12%	0.12%	2.83%	2.83%	3.80%	3.80%	-1.09%	-4.83%	-0.15%	-4.95%	-1.56%	-2.67%	-2.38%	-2.89%	-1.16%	-1.16%	1.46%	1.46%	1.84%	1.84%
1986	0.00%	-1.58%	2.72%	2.72%	0.14%	0.14%	3.82%	3.82%	-1.53%	-4.63%	-1.47%	-4.81%	-1.04%	-4.98%	0.73%	0.73%	0.09%	-1.73%	-3.31%	-4.39%	-3.10%	-3.10%	1.16%	-1.51%
1987	1.78%	1.68%	2.38%	2.52%	0.88%	0.88%	1.19%	0.12%	-0.22%	-4.82%	0.00%	-13.10%	0.10%	-15.09%	-0.32%	-3.61%	0.00%	-9.38%	-0.16%	-6.87%	-0.34%	-2.93%	0.00%	-4.73%
1988	1.56%	1.56%	1.39%	1.39%	0.00%	-4.56%	2.39%	2.31%	-1.30%	-4.74%	-0.66%	-4.93%	-0.37%	-5.97%	2.14%	2.14%	2.45%	2.45%	0.00%	-5.63%	0.00%	-8.46%	0.00%	-6.05%
1989	2.60%	2.15%	2.37%	2.37%	1.64%	-0.62%	1.67%	1.68%	0.00%	-13.10%	0.00%	-23.49%	0.00%	-24.22%	0.00%	-13.84%	0.00%	-13.38%	0.00%	-14.40%	0.00%	-14.77%	0.00%	-14.68%
1990	0.00%	-5.53%	0.00%	-4.96%	0.00%	-5.20%	0.00%	-9.27%	0.00%	-18.82%	0.00%	-25.47%	0.00%	-23.99%	0.70%	-14.35%	0.00%	-21.77%	0.00%	-22.00%	0.00%	-15.70%	2.37%	1.69%
1991	2.13%	2.13%	0.01%	-3.40%	0.44%	0.44%	0.05%	0.05%	-0.77%	-4.83%	0.00%	-10.63%	0.00%	-15.05%	0.00%	-16.36%	0.00%	-24.97%	0.00%	-24.42%	0.00%	-19.20%	2.77%	2.49%
1992	1.79%	1.79%	0.78%	0.78%	0.25%	0.25%	0.89%	0.89%	-3.10%	-3.32%	0.00%	-10.63%	0.86%	-12.43%	1.01%	-1.86%	0.00%	-4.89%	0.00%	-9.18%	0.22%	-4.74%	0.75%	0.75%
1993	0.05%	0.05%	0.03%	0.03%	0.08%	0.08%	2.20%	2.20%	3.38%	3.38%	-1.58%	-1.58%	-2.88%	-2.88%	-0.67%	-0.69%	0.19%	0.19%	-2.75%	-2.75%	0.52%	0.52%	3.67%	3.67%
1994	0.00%	-1.58%	2.26%	2.26%	2.95%	3.24%	3.54%	3.54%	2.21%	1.24%	-1.99%	-4.79%	-0.68%	-4.84%	0.36%	-4.27%	-0.15%	-4.85%	-0.24%	-4.86%	-0.43%	-4.15%	1.49%	-1.16%
1995	0.36%	0.36%	0.90%	0.90%	0.33%	0.33%	3.18%	3.77%	-3.27%	-3.95%	-3.01%	-4.74%	-0.53%	-4.84%	-0.02%	-4.84%	-1.68%	-4.58%	-0.85%	-4.83%	-0.45%	-4.79%	0.00%	-4.77%
1996	0.00%	-4.75%	0.00%	-4.77%	0.00%	-4.79%	0.00%	-11.27%	0.00%	-18.15%	0.00%	-21.50%	0.00%	-17.11%	0.00%	-18.63%	1.37%	-7.94%	0.00%	-17.11%	0.00%	-12.09%	0.00%	-7.56%
1997	1.16%	1.16%	1.51%	1.51%	0.98%	0.98%	0.00%	-4.83%	0.00%	-15.70%	0.00%	-22.56%	0.00%	-23.70%	0.00%	-23.37%	0.00%	-24.08%	0.00%	-24.20%	0.00%	-17.11%	0.00%	-12.64%
1998	0.00%	-4.42%	0.55%	0.55%	0.08%	0.08%	0.09%	0.09%	-0.79%	-4.77%	0.00%	-15.70%	0.00%	-16.73%	0.00%	-19.67%	0.00%	-23.51%	0.00%	-23.89%	0.00%	-14.03%	0.00%	-4.86%
1999	0.00%	-4.89%	0.00%	-6.58%	0.00%	-8.91%	4.05%	4.05%	0.00%	-23.88%	0.00%	-25.70%	0.38%	-12.83%	0.25%	-6.19%	0.38%	-1.26%	0.00%	-20.44%	0.00%	-20.73%	0.00%	-20.44%
2000	0.00%	-14.40%	0.00%	-14.31%	0.00%	-10.54%	0.00%	-24.09%	0.00%	-27.51%	0.00%	-28.20%	0.00%	-29.49%	0.21%	-28.03%	0.00%	-26.52%	2.22%	2.22%	1.59%	1.59%	0.00%	-6.58%
2001	0.00%	-6.41%	1.72%	0.96%	3.16%	3.16%	1.45%	-0.70%	0.00%	-20.73%	0.00%	-26.81%	0.00%	-28.20%	1.64%	-23.26%	0.00%	-25.90%	0.00%	-25.47%	0.00%	-24.63%	0.00%	-22.31%
2002	0.00%	-21.40%	0.00%	-22.50%	0.00%	-23.86%	0.00%	-26.49%	0.00%	-30.76%	0.00%	-32.78%	0.00%	-32.67%	0.00%	-30.67%	0.00%	-30.39%	0.00%	-29.94%	0.00%	-27.58%	0.00%	-24.84%
2003	0.00%	-24.97%	0.00%	-24.97%	1.08%	1.08%	0.00%	-16.73%	0.00%	-26.16%	0.00%	-31.49%	0.00%	-32.25%	0.00%	-30.76%	0.00%	-29.58%	0.00%	-30.58%	0.00%	-28.69%	0.00%	-24.71%
2004	0.00%	-24.97%	0.00%	-24.97%	1.08%	1.08%	0.00%	-16.73%	0.00%	-26.16%	0.00%	-31.49%	0.00%	-32.25%	0.00%	-30.76%	0.00%	-29.58%	0.00%	-30.58%	0.00%	-28.69%	0.00%	-24.71%
2005	1.54%	1.54%	0.10%	0.10%	1.03%	1.03%	3.08%	3.08%	-0.29%	-4.84%	0.00%	-20.73%	0.00%	-23.68%	0.12%	-11.28%	0.00%	-21.98%	0.00%	-22.46%	0.00%	-21.59%	0.00%	-18.53%
2006	0.00%	-18.53%	0.00%	-18.34%	0.00%	-19.20%	0.00%	-22.04%	0.00%	-26.73%	0.00%	-28.61%	0.00%	-28.73%	0.00%	-26.35%	0.00%	-26.99%	0.00%	-24.59%	0.00%	-25.12%	0.00%	-23.73%
2007	0.00%	-23.24%	0.00%	-19.48%	0.00%	-17.21%	0.00%	-25.22%	0.00%	-29.45%	0.00%	-32.31%	0.35%	-32.01%	2.67%	2.67%	0.00%	-28.49%	0.00%	-29.11%	0.00%	-27.66%	1.65%	1.65%
2008	0.58%	0.58%	0.12%	0.12%	1.93%	1.93%	0.00%	-4.68%	-0.17%	-4.82%	0.00%	-13.29%	-1.50%	-5.61%	-0.41%	-8.17%	0.00%	-17.02%	0.00%	-14.49%	0.00%	-13.56%	1.39%	1.39%
2009	2.47%	2.47%	2.45%	2.45%	1.00%	3.16%	0.00%	-4.62%																

Figure 4-9. Habitat summary table for desert sucker *(Catostomus clarki)*, Gage site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 10 cfs									Gage Site No Wood Desert Sucker															
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-55.54%	0.00%	-49.09%	0.70%	-47.88%	-0.34%	-51.78%	0.00%	-50.81%	0.00%	-52.06%	1.17%	-46.70%	-0.22%	-0.22%
1966	3.76%	3.76%	7.79%	14.66%	15.28%	18.86%	0.00%	-58.55%	0.00%	-55.42%	0.00%	-54.97%	0.00%	-54.28%	1.33%	-52.78%	0.00%	-55.19%	0.00%	-54.75%	0.00%	-54.85%	1.68%	-50.10%
1967	0.00%	-55.90%	0.00%	-55.09%	0.00%	-55.25%	0.00%	-54.62%	0.00%	-54.75%	0.00%	-54.28%	7.54%	-42.65%	9.81%	-31.86%	0.00%	-55.09%	0.00%	-51.70%	0.00%	-53.99%	5.77%	5.77%
1968	0.66%	0.66%	1.22%	1.22%	6.63%	6.63%	10.36%	-15.69%	-0.72%	-56.90%	-0.05%	-55.34%	-0.75%	-55.89%	0.60%	-55.49%	0.00%	-55.94%	0.00%	-55.86%	0.00%	-55.86%	0.00%	-56.29%
1969	6.43%	6.43%	13.63%	13.63%	7.72%	7.72%	7.79%	-36.64%	0.38%	-57.26%	0.00%	-55.69%	0.00%	-55.53%	0.00%	-55.58%	0.00%	-54.98%	0.00%	-55.01%	0.00%	-56.15%	0.00%	-57.16%
1970	0.00%	-56.60%	0.00%	-56.24%	0.00%	-57.78%	0.00%	-56.43%	0.00%	-55.34%	0.00%	-53.95%	0.00%	-52.00%	3.91%	-50.75%	-1.30%	-34.03%	0.00%	-54.58%	0.00%	-55.82%	0.00%	-56.37%
1971	0.00%	-56.33%	0.00%	-56.69%	0.00%	-56.40%	0.00%	-54.21%	0.00%	-53.92%	0.00%	-49.93%	0.66%	-49.79%	1.74%	-41.55%	1.38%	-45.21%	7.93%	-4.44%	4.23%	-54.00%	10.97%	-33.05%
1972	9.04%	-47.78%	0.00%	-56.01%	0.00%	-55.20%	0.00%	-54.49%	0.00%	-54.06%	0.00%	-54.33%	0.00%	-54.28%	0.90%	-51.48%	0.21%	-48.31%	2.93%	-37.90%	2.95%	2.95%	9.38%	9.38%
1973	8.01%	8.01%	-0.19%	-0.19%	-0.30%	-0.30%	0.21%	0.21%	4.27%	4.27%	-2.12%	-22.48%	-0.28%	-27.63%	-0.51%	-55.17%	-3.96%	-58.28%	-2.38%	-57.44%	-2.07%	-57.92%	0.00%	-58.41%
1974	8.62%	-36.60%	0.00%	-57.39%	0.89%	-55.42%	0.00%	-57.30%	-0.15%	-56.24%	0.00%	-55.38%	0.00%	-55.53%	0.33%	-56.57%	-0.49%	-56.08%	1.42%	-49.46%	0.00%	-57.09%	0.00%	-57.12%
1975	0.00%	-56.92%	7.36%	-48.00%	7.04%	7.04%	8.06%	8.06%	-1.61%	-58.13%	0.00%	-55.65%	0.19%	-54.05%	0.00%	-55.41%	-0.05%	-55.74%	0.00%	-55.25%	0.00%	-55.18%	0.00%	-55.69%
1976	0.01%	-54.36%	5.07%	-1.49%	0.00%	-57.46%	9.87%	-49.74%	-0.17%	-56.67%	0.00%	-54.77%	3.75%	-51.61%	-1.01%	-54.72%	3.57%	-51.75%	-2.88%	-55.91%	0.00%	-55.73%	0.00%	-54.86%
1977	0.00%	-56.98%	0.00%	-56.16%	0.00%	-56.19%	5.23%	-52.93%	0.00%	-54.27%	0.00%	-50.81%	-0.60%	-53.03%	3.41%	-50.11%	-0.74%	-55.03%	0.00%	-53.96%	0.00%	-51.71%	0.00%	-50.99%
1978	4.80%	-37.92%	3.44%	3.44%	0.27%	0.27%	-0.46%	-58.89%	-0.12%	-56.52%	0.00%	-55.36%	0.00%	-54.49%	0.00%	-50.31%	0.00%	-43.38%	0.00%	-49.95%	16.46%	-23.90%	3.49%	3.49%
1979	2.61%	2.61%	2.70%	2.70%	0.64%	0.64%	4.87%	4.87%	21.48%	21.48%	-7.39%	-53.54%	-2.08%	-57.33%	-1.20%	-57.25%	-0.60%	-56.82%	-5.70%	-57.31%	-5.41%	-59.35%	-1.84%	-59.39%
1980	8.65%	8.65%	0.15%	0.15%	1.55%	1.55%	13.63%	13.63%	9.00%	6.52%	-9.35%	-29.21%	-4.33%	-33.97%	-0.76%	-39.19%	-0.37%	-41.11%	-6.94%	-58.39%	-5.50%	-59.39%	-1.84%	-59.39%
1981	0.00%	-59.39%	1.43%	-55.26%	8.25%	-12.35%	-1.00%	-54.27%	-1.12%	-57.51%	-0.07%	-56.32%	-1.63%	-57.13%	1.32%	-55.61%	0.57%	-53.22%	-1.91%	-54.20%	-1.75%	-55.35%	4.11%	-51.90%
1982	13.23%	0.26%	6.54%	6.54%	0.80%	0.80%	17.96%	17.96%	-2.34%	-58.42%	-1.44%	-56.92%	-0.34%	-56.29%	2.59%	-53.23%	2.72%	-54.19%	0.00%	-55.41%	-3.53%	-31.66%	8.06%	8.06%
1983	2.90%	2.64%	0.40%	0.40%	0.50%	0.50%	1.96%	1.96%	21.69%	21.69%	-5.05%	-58.50%	-2.29%	-57.42%	2.33%	-53.73%	5.98%	-32.58%	9.95%	-22.13%	-3.48%	-45.46%	12.87%	12.87%
1984	14.21%	14.21%	0.00%	-52.45%	0.00%	-59.38%	0.00%	-58.34%	0.00%	-55.38%	0.00%	-54.57%	0.00%	-54.46%	1.80%	-41.60%	6.16%	-31.11%	8.21%	-28.32%	1.59%	-49.26%	0.25%	0.25%
1985	2.02%	2.02%	1.23%	1.23%	0.80%	0.80%	15.25%	15.25%	15.27%	-20.00%	-1.09%	-56.77%	-1.10%	-56.33%	-0.99%	-56.66%	-3.39%	-54.24%	-3.21%	-39.56%	8.52%	8.52%	11.04%	11.04%
1986	0.00%	-35.90%	14.56%	14.85%	0.68%	0.68%	20.97%	-7.79%	-2.78%	-58.58%	-1.47%	-56.93%	-1.04%	-56.81%	1.67%	-43.41%	2.30%	-44.64%	-3.47%	-57.91%	-3.29%	-52.89%	4.25%	-50.54%
1987	8.40%	-21.87%	9.70%	11.18%	4.75%	4.75%	1.79%	-53.38%	-0.22%	-56.88%	0.00%	-55.06%	0.84%	-54.36%	2.91%	-54.47%	0.00%	-55.53%	0.58%	-50.85%	-0.55%	-52.74%	0.00%	-57.64%
1988	8.90%	8.90%	7.92%	7.92%	0.00%	-59.03%	9.08%	-37.49%	-1.30%	-57.57%	-0.66%	-56.55%	-0.49%	-56.19%	8.84%	-4.18%	9.98%	-16.24%	0.00%	-56.05%	0.00%	-55.63%	0.00%	-55.93%
1989	6.56%	-42.02%	13.85%	13.85%	6.48%	-44.16%	5.44%	-52.37%	0.00%	-55.06%	0.00%	-52.89%	0.00%	-52.07%	0.00%	-55.02%	0.00%	-55.03%	0.00%	-54.91%	0.00%	-54.86%	0.00%	-54.87%
1990	0.00%	-56.03%	0.00%	-56.28%	0.00%	-56.19%	0.00%	-55.59%	0.00%	-54.36%	0.00%	-49.80%	0.00%	-51.93%	3.04%	-50.30%	0.00%	-53.72%	0.00%	-53.72%	0.00%	-54.75%	9.35%	-39.19%
1991	12.30%	-4.65%	0.04%	-40.46%	0.30%	0.30%	0.27%	0.27%	-0.77%	-56.76%	0.00%	-55.37%	0.00%	-54.83%	0.00%	-54.67%	0.00%	-50.81%	0.00%	-51.89%	0.00%	-54.32%	11.38%	-21.35%
1992	9.18%	9.18%	5.17%	5.17%	2.22%	2.22%	4.38%	4.38%	-4.90%	-52.45%	0.00%	-55.37%	3.08%	-48.62%	5.26%	-35.75%	0.00%	-56.26%	0.00%	-55.54%	1.21%	-50.72%	5.59%	-3.84%
1993	0.22%	0.22%	0.17%	0.17%	0.41%	0.41%	12.70%	12.70%	2.93%	-1.70%	-8.85%	-35.90%	-7.56%	-49.49%	0.68%	-47.28%	-2.69%	-48.66%	-4.20%	-49.27%	4.35%	4.35%	15.77%	5.76%
1994	0.00%	-35.90%	13.22%	13.02%	13.99%	17.93%	14.72%	14.84%	2.14%	-55.53%	-1.99%	-57.16%	-0.68%	-56.71%	0.08%	-56.67%	-0.15%	-56.55%	-0.24%	-56.48%	0.88%	-56.51%	6.66%	-41.22%
1995	1.59%	1.59%	5.24%	5.24%	2.26%	2.26%	9.33%	0.88%	-4.58%	-56.40%	-3.01%	-57.61%	-0.53%	-56.65%	-0.02%	-56.68%	-2.04%	-57.44%	-0.85%	-56.77%	-0.45%	-57.13%	0.00%	-57.32%
1996	0.00%	-57.44%	0.00%	-57.30%	0.00%	-57.11%	0.00%	-55.29%	0.00%	-54.45%	0.00%	-54.04%	0.00%	-54.60%	0.00%	-54.39%	6.98%	-46.94%	0.00%	-54.57%	0.00%	-55.19%	0.00%	-55.74%
1997	6.47%	6.47%	8.58%	8.58%	4.69%	4.69%	0.00%	-56.74%	0.00%	-54.75%	0.00%	-53.91%	0.00%	-53.24%	0.00%	-53.33%	0.00%	-52.51%	0.00%	-52.29%	0.00%	-54.57%	0.00%	-55.12%
1998	0.00%	-57.69%	2.61%	2.61%	0.39%	0.39%	0.73%	0.73%	-0.79%	-57.32%	0.00%	-54.75%	0.00%	-54.62%	0.00%	-54.26%	0.00%	-53.56%	0.00%	-52.92%	0.00%	-54.95%	0.00%	-56.50%
1999	0.00%	-56.20%	0.00%	-55.86%	0.00%	-55.58%	20.86%	-42.47%	0.00%	-52.91%	0.00%	-49.35%	2.96%	-45.34%	1.19%	-55.70%	2.30%	-47.17%	0.00%	-54.17%	0.00%	-54.13%	0.00%	-54.17%
2000	0.00%	-54.91%	0.00%	-54.92%	0.00%	-55.38%	0.00%	-52.52%	0.00%	-45.80%	0.00%	-44.42%	0.00%	-41.88%	0.47%	-43.84%	0.00%	-47.74%	12.42%	-8.27%	9.67%	9.67%	0.00%	-55.86%
2001	0.00%	-55.89%	7.50%	-50.64%	14.69%	16.43%	5.69%	-54.09%	0.00%	-54.13%	0.00%	-47.18%	0.00%	-44.42%	2.58%	-49.09%	0.00%	-48.96%	0.00%	-49.80%	0.00%	-51.47%	0.00%	-53.62%
2002	0.00%	-54.05%	0.00%	-53.73%	0.00%	-52.38%	0.00%	-47.81%	0.00%	-39.38%	0.00%	-35.40%	0.00%	-35.62%	0.00%	-39.56%	0.00%	-40.12%	0.00%	-41.01%	0.00%	-45.65%	0.00%	-51.05%
2003	0.00%	-50.81%	0.00%	-50.81%	5.57%	5.57%	0.00%	-54.62%	0.00%	-48.23%	0.00%	-37.95%	0.00%	-36.45%	0.00%	-39.38%	0.00%	-41.71%	0.00%	-39.75%	0.00%	-43.47%	0.00%	-51.29%
2004	0.00%	-50.81%	0.00%	-50.81%	5.57%	5.57%	0.00%	-54.62%	0.00%	-48.23%	0.00%	-37.95%	0.00%	-36.45%	0.00%	-39.38%	0.00%	-41.71%	0.00%	-39.75%	0.00%	-43.47%	0.00%	-51.29%
2005	8.51%	8.51%	0.38%	0.38%	5.32%	5.32%	11.96%	-29.42%	-0.29%	-56.71%	0.00%	-54.13%	0.00%	-53.16%	1.74%	-53.20%	0.00%	-53.98%	0.00%	-53.92%	0.00%	-54.03%	0.00%	-54.40%
2006	0.00%	-54.40%	0.00%	-54.42%	0.00%	-54.32%	0.00%	-53.73%	0.00%	-47.32%	0.00%	-43.63%	0.00%	-43.38%	0.00%	-48.08%	0.00%	-46.82%	0.00%	-47.87%	0.00%	-50.50%	0.00%	-53.04%
2007	0.00%	-53.82%	0.00%	-54.28%	0.00%	-54.56%	0.00%	-50.31%	0.00%	-41.97%	0.00%	-36.34%	0.35%	-36.22%	13.83%	-14.27%	0.00%	-43.87%	0.00%	-42.64%	0.00%	-46.89%	9.51%	-7.83%
2008	3.06%	3.06%	0.62%	0.62%	11.71%	11.71%	0.00%	-58.09%	-0.17%	-56.85%	0.00%	-55.04%	-1.08%	-51.05%	-0.63%	-55.27%	0.00%	-54.58%	0.00%	-54.89%	0.00%	-55.01%	7.43%	7.43%
2009	13.52%	13.52%	13.32%	13.32%	5.73%	-22.62%	0.00%	-58.66%																

Figure 4-10. Habitat summary table for desert sucker *(Catostomus clarki)*, Gage site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 2 cfs										Gage Site With LWD Desert Sucker														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-6.45%	0.00%	-14.44%	0.13%	-13.61%	-0.38%	-12.30%	0.00%	-14.17%	0.00%	-13.96%	0.74%	-0.24%	-0.10%	-0.10%
1966	2.04%	2.04%	1.70%	2.51%	3.16%	3.16%	0.00%	-3.47%	0.00%	-6.54%	0.00%	-8.52%	0.00%	-11.55%	0.22%	-3.40%	-0.39%	-7.52%	0.00%	-9.53%	0.05%	-9.03%	0.23%	-4.79%
1967	0.00%	-4.50%	0.00%	-8.03%	0.00%	-7.28%	0.00%	-10.08%	0.00%	-9.53%	0.00%	-11.55%	2.03%	2.03%	2.77%	2.77%	0.26%	-7.43%	0.00%	-14.01%	0.00%	-12.45%	1.17%	1.17%
1968	0.21%	0.21%	1.34%	1.34%	1.73%	1.73%	1.46%	2.43%	-0.54%	-3.63%	-0.04%	-7.24%	-0.42%	-3.76%	0.96%	0.94%	0.00%	-4.42%	0.00%	-4.59%	0.00%	-4.59%	0.56%	-2.90%
1969	0.93%	0.93%	2.81%	2.81%	1.37%	1.37%	2.79%	3.41%	2.60%	2.60%	0.00%	-5.38%	0.00%	-6.05%	0.00%	-5.91%	0.00%	-8.47%	0.00%	-8.37%	0.00%	-3.94%	0.00%	-3.61%
1970	0.00%	-3.65%	0.00%	-2.25%	0.00%	-0.07%	0.00%	-3.66%	0.00%	-6.89%	0.00%	-12.79%	0.00%	-13.97%	0.91%	-5.94%	1.83%	1.83%	0.00%	-10.23%	0.00%	-4.79%	0.00%	-3.84%
1971	0.00%	-3.66%	0.00%	-3.64%	0.00%	-3.94%	0.00%	-11.86%	0.00%	-12.95%	0.00%	-14.31%	1.14%	-10.04%	0.32%	-0.98%	0.80%	-7.54%	1.65%	1.65%	2.39%	2.39%	2.53%	2.53%
1972	2.09%	2.41%	0.00%	-4.22%	0.00%	-7.53%	0.00%	-10.64%	0.00%	-12.14%	0.21%	-10.43%	0.45%	-11.15%	0.59%	-9.89%	0.38%	-12.52%	1.12%	-5.75%	-0.51%	-0.51%	0.99%	0.99%
1973	1.12%	1.12%	0.02%	0.02%	-0.16%	-0.16%	-0.16%	-0.16%	0.96%	0.96%	3.70%	3.70%	1.76%	1.76%	-0.56%	-0.63%	-2.97%	-3.54%	-1.80%	-3.60%	-1.57%	-3.56%	0.20%	-2.63%
1974	2.79%	2.97%	0.60%	-0.75%	0.22%	2.31%	0.00%	-3.60%	-0.11%	-3.71%	0.00%	-6.74%	-0.07%	-5.90%	0.19%	-3.14%	-0.37%	-4.97%	1.99%	1.25%	0.67%	-0.57%	0.00%	-3.62%
1975	0.00%	-3.63%	1.64%	3.00%	0.67%	0.67%	1.54%	1.54%	0.53%	-1.84%	0.00%	-5.52%	0.12%	-2.99%	0.00%	-6.59%	-0.04%	-5.60%	0.00%	-7.28%	0.00%	-7.63%	0.56%	-4.09%
1976	0.02%	-3.76%	1.26%	1.26%	0.00%	3.20%	3.04%	2.62%	-0.13%	-3.69%	0.00%	-9.43%	2.30%	2.30%	0.56%	-2.16%	0.53%	-5.98%	-0.71%	-2.28%	0.00%	-5.18%	0.00%	-9.02%
1977	0.00%	-3.62%	0.00%	-4.04%	0.00%	-3.67%	1.15%	-1.23%	0.00%	-11.60%	0.00%	-14.17%	-0.27%	-12.52%	1.10%	-0.95%	-0.38%	-0.38%	0.00%	-12.36%	0.00%	-14.02%	0.00%	-14.14%
1978	0.77%	-0.87%	1.54%	1.54%	0.07%	0.07%	0.90%	-1.87%	-0.09%	-3.74%	0.00%	-6.84%	0.00%	-10.64%	0.00%	-14.25%	0.00%	-15.30%	0.00%	-13.86%	1.80%	1.80%	0.72%	0.72%
1979	0.87%	0.87%	0.13%	0.13%	0.23%	0.23%	0.37%	0.37%	2.72%	2.72%	3.22%	3.22%	-1.43%	-3.69%	-0.20%	-3.18%	-0.32%	-3.63%	-2.02%	-2.02%	-3.26%	-3.26%	-1.05%	-3.00%
1980	2.29%	2.29%	0.50%	0.50%	0.41%	0.41%	2.75%	2.75%	2.41%	2.41%	2.69%	2.69%	0.85%	0.85%	0.31%	0.31%	1.18%	1.18%	-2.94%	-2.94%	-3.12%	-3.12%	-0.40%	-3.06%
1981	0.59%	-1.91%	0.21%	-0.26%	2.07%	2.82%	1.34%	1.48%	-0.84%	-3.59%	-0.05%	-3.67%	-1.22%	-1.39%	0.23%	-3.08%	-0.44%	-2.68%	-0.57%	-1.97%	-0.81%	-1.20%	1.05%	-1.06%
1982	2.29%	2.29%	1.07%	1.07%	0.25%	0.25%	2.92%	2.92%	-1.78%	-3.53%	-1.09%	-3.63%	-0.26%	-4.22%	0.72%	-1.70%	0.67%	-1.94%	0.00%	-6.59%	0.18%	0.18%	1.35%	1.35%
1983	1.00%	1.00%	0.04%	0.04%	0.58%	0.58%	0.66%	0.66%	3.22%	3.22%	-3.19%	-3.53%	-1.42%	-2.10%	0.66%	0.33%	0.47%	-0.35%	2.95%	2.95%	2.54%	2.54%	2.61%	2.61%
1984	2.68%	2.68%	0.90%	1.10%	0.00%	-3.19%	0.00%	-3.54%	0.00%	-6.74%	0.00%	-10.28%	0.00%	-10.79%	0.94%	-1.73%	2.65%	2.65%	3.02%	3.02%	2.70%	2.65%	-0.27%	-0.27%
1985	0.61%	0.61%	0.04%	0.04%	0.33%	0.33%	4.27%	4.27%	2.88%	2.88%	-0.82%	-3.64%	-0.57%	-1.36%	-0.44%	-1.07%	-0.69%	-1.01%	1.00%	1.00%	1.15%	1.15%	1.52%	1.52%
1986	1.83%	2.71%	2.27%	2.27%	0.26%	0.26%	3.37%	3.37%	-1.25%	-3.52%	-1.11%	-3.63%	0.14%	-2.23%	2.21%	2.21%	1.10%	0.15%	-1.76%	-2.18%	-1.19%	-1.19%	1.87%	0.15%
1987	2.28%	2.74%	2.16%	2.68%	1.03%	1.03%	2.27%	3.08%	-0.16%	-3.63%	0.00%	-8.13%	0.02%	-6.92%	0.01%	-1.80%	0.00%	-6.11%	-0.01%	-4.13%	0.21%	-1.61%	0.11%	-3.47%
1988	1.21%	1.21%	0.74%	0.74%	0.00%	2.43%	2.73%	2.73%	2.06%	2.06%	-0.49%	-3.69%	0.44%	0.33%	1.93%	1.93%	2.29%	2.29%	0.00%	-4.06%	0.00%	-5.61%	0.55%	-2.46%
1989	2.66%	3.03%	2.47%	2.47%	2.73%	1.88%	2.58%	2.73%	0.00%	-8.13%	0.00%	-13.59%	0.00%	-13.90%	0.70%	-7.34%	0.00%	-8.28%	0.00%	-8.82%	0.00%	-9.02%	0.00%	-8.97%
1990	0.00%	-4.01%	0.00%	-3.71%	0.00%	-3.84%	0.00%	-6.05%	0.00%	-11.19%	0.00%	-14.33%	0.00%	-13.77%	0.88%	-6.26%	0.00%	-12.74%	0.00%	-12.88%	0.00%	-9.53%	2.32%	1.75%
1991	2.18%	2.18%	0.05%	-2.38%	0.55%	0.55%	0.80%	0.80%	-0.58%	-3.64%	0.00%	-6.79%	0.00%	-9.17%	0.43%	-8.37%	0.00%	-14.17%	0.00%	-13.99%	0.00%	-11.40%	2.03%	2.03%
1992	1.52%	1.52%	0.53%	0.53%	0.00%	0.00%	1.44%	1.44%	-1.44%	-1.62%	0.00%	-6.79%	1.76%	-2.02%	1.98%	1.86%	1.44%	1.26%	0.00%	-6.01%	0.40%	-3.23%	1.23%	1.23%
1993	0.95%	0.95%	0.28%	0.28%	-0.04%	-0.04%	2.24%	2.24%	3.16%	3.16%	1.55%	1.55%	-1.21%	-1.21%	1.39%	1.37%	1.63%	1.63%	-0.86%	-0.86%	0.62%	0.62%	3.00%	3.00%
1994	0.20%	0.37%	2.50%	2.50%	2.93%	3.10%	3.04%	3.04%	2.80%	2.80%	-1.50%	-3.61%	-0.51%	-3.64%	0.20%	-3.11%	-0.11%	-3.65%	0.12%	-2.98%	0.24%	-1.89%	2.80%	1.67%
1995	0.80%	0.80%	0.56%	0.56%	0.41%	0.41%	2.45%	2.81%	-0.91%	-1.44%	-2.28%	-3.58%	-0.40%	-3.64%	-0.02%	-3.64%	-1.19%	-3.38%	-0.64%	-3.64%	-0.34%	-3.61%	0.00%	-3.60%
1996	0.00%	-3.60%	0.00%	-3.60%	0.00%	-3.62%	0.00%	-7.14%	0.00%	-10.84%	0.00%	-12.63%	0.36%	-8.94%	0.35%	-10.78%	2.39%	0.53%	0.00%	-10.28%	0.00%	-7.58%	0.00%	-5.13%
1997	1.50%	1.50%	1.93%	1.93%	0.51%	0.51%	0.00%	-3.64%	0.00%	-9.53%	0.00%	-13.19%	0.00%	-13.74%	0.00%	-13.57%	0.00%	-13.87%	0.00%	-13.91%	0.00%	-10.28%	0.37%	-7.33%
1998	2.48%	2.89%	0.70%	0.70%	0.39%	0.39%	0.70%	0.70%	2.51%	-0.60%	0.00%	-9.53%	0.00%	-10.08%	0.00%	-11.65%	0.00%	-13.67%	0.00%	-13.81%	-0.04%	-8.20%	0.00%	-3.65%
1999	0.00%	-3.67%	0.00%	-4.59%	0.00%	-5.86%	3.00%	3.00%	0.00%	-13.80%	0.00%	-14.40%	0.66%	-0.15%	1.00%	-0.15%	1.19%	1.19%	0.00%	-12.06%	0.00%	-12.22%	0.00%	-12.06%
2000	0.00%	-8.82%	0.00%	-8.77%	0.00%	-6.74%	0.00%	-13.88%	0.00%	-14.95%	0.00%	-15.15%	0.00%	-15.52%	0.27%	-13.78%	0.00%	-14.65%	1.51%	1.51%	1.25%	1.25%	0.00%	-4.59%
2001	0.00%	-4.50%	1.25%	1.59%	2.27%	2.27%	3.24%	3.24%	0.00%	-12.22%	0.00%	-14.74%	0.89%	-13.29%	1.14%	-5.86%	0.00%	-14.46%	0.00%	-14.33%	0.00%	-14.06%	0.00%	-13.03%
2002	0.00%	-12.57%	0.00%	-13.14%	0.00%	-13.74%	0.00%	-14.64%	0.00%	-15.86%	0.00%	-16.38%	0.00%	-16.36%	0.00%	-15.84%	0.00%	-15.76%	0.00%	-15.64%	0.00%	-14.97%	0.00%	-14.13%
2003	0.00%	-14.17%	0.47%	-11.28%	1.33%	1.33%	0.00%	-10.08%	0.00%	-14.52%	0.00%	-16.05%	0.00%	-16.25%	0.00%	-15.86%	0.00%	-15.54%	0.00%	-15.81%	0.00%	-15.29%	0.00%	-14.08%
2004	0.00%	-14.17%	0.47%	-11.28%	1.33%	1.33%	0.00%	-10.08%	0.00%	-14.52%	0.00%	-16.05%	0.00%	-16.25%	0.00%	-15.86%	0.00%	-15.54%	0.00%	-15.81%	0.00%	-15.29%	0.00%	-14.08%
2005	1.12%	1.12%	0.48%	0.48%	1.02%	1.02%	2.90%	2.90%	-0.22%	-3.64%	0.00%	-12.22%	0.00%	-13.73%	1.08%	-1.34%	0.00%	-12.88%	0.00%	-13.14%	0.00%	-12.68%	0.00%	-11.04%
2006	0.00%	-11.04%	0.00%	-10.94%	0.00%	-11.40%	0.00%	-12.89%	0.00%	-14.72%	0.00%	-15.27%	0.00%	-15.30%	0.47%	-13.92%	0.00%	-14.79%	0.00%	-13.67%	0.00%	-14.22%	0.00%	-13.74%
2007	0.00%	-13.55%	0.00%	-11.55%	0.00%	-10.33%	0.00%	-14.25%	0.00%	-15.51%	0.00%	-16.26%	1.40%	1.40%	2.29%	2.29%	0.00%	-15.23%	0.00%	-15.41%	0.18%	-13.39%	1.93%	1.93%
2008	0.23%	0.23%	0.08%	0.08%	2.17%	2.17%	0.00%	-3.55%	-0.13%	-3.63%	0.00%	-8.23%	-0.65%	-1.68%	-0.03%	-4.82%	0.00%	-10.23%	0.00%	-8.87%	0.00%	-8.37%	1.40%	1.40%
2009	2.72%	2.72%	3.22%	3.22%	1.06%	3.30%	0.00%	-3.52%																

Figure 4-11. Habitat summary table for desert sucker *(Catostomus clarki)*, Gage site, with LWD and a hypothetical withdrawal rate of 2 ft³/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Gage Site
With LWD
Desert Sucker

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2
1965									0.00%	-33.29%	0.00%	-27.44%
1966	5.13%	5.13%	5.79%	16.22%	14.70%	16.92%	0.00%	-36.68%	0.00%	-33.15%	0.00%	-32.65%
1967	0.00%	-33.70%	0.00%	-32.78%	0.00%	-32.97%	0.00%	-32.26%	0.00%	-32.40%	0.00%	-31.89%
1968	0.10%	0.10%	6.21%	6.21%	8.59%	8.59%	9.52%	3.22%	-0.54%	-34.83%	-0.04%	-33.07%
1969	5.17%	5.17%	14.89%	14.89%	6.83%	6.83%	11.81%	-11.57%	8.04%	-29.59%	0.00%	-33.45%
1970	0.00%	-34.48%	0.00%	-32.81%	0.00%	-32.78%	0.00%	-34.29%	0.00%	-33.07%	0.00%	-31.53%
1971	0.00%	-34.18%	0.00%	-34.59%	0.00%	-34.26%	0.00%	-31.81%	0.00%	-31.49%	0.00%	-28.12%
1972	9.61%	-14.13%	0.00%	-33.82%	0.00%	-32.90%	0.00%	-32.12%	0.00%	-31.66%	1.03%	-31.24%
1973	7.04%	7.04%	0.76%	0.76%	-0.77%	-0.77%	-0.79%	-0.79%	2.45%	2.45%	12.18%	-2.58%
1974	10.29%	-11.42%	0.75%	-34.97%	0.54%	-28.70%	0.00%	-35.29%	-0.11%	-34.07%	0.00%	-33.10%
1975	0.00%	-34.85%	7.09%	-14.30%	3.53%	3.53%	9.17%	9.17%	0.53%	-35.11%	0.00%	-33.41%
1976	0.11%	-33.49%	7.62%	7.62%	0.00%	-28.76%	11.89%	-17.76%	-0.13%	-34.57%	0.00%	-32.42%
1977	0.00%	-34.91%	0.00%	-33.99%	0.00%	-34.01%	5.30%	-26.68%	0.00%	-31.87%	0.00%	-28.83%
1978	3.77%	-19.93%	7.62%	7.62%	0.31%	0.31%	1.12%	-36.08%	-0.09%	-34.39%	0.00%	-33.08%
1979	3.90%	3.90%	1.54%	1.54%	1.22%	1.22%	4.42%	4.42%	15.20%	15.20%	3.10%	-28.16%
1980	12.09%	12.09%	2.44%	2.44%	3.17%	3.17%	18.23%	18.23%	16.62%	16.62%	-1.72%	-15.29%
1981	0.59%	-36.79%	0.84%	-30.88%	5.93%	7.33%	3.67%	-31.24%	-0.84%	-35.52%	-0.05%	-34.17%
1982	14.15%	14.40%	5.87%	5.87%	1.31%	1.31%	15.27%	15.27%	-1.78%	-36.58%	-1.09%	-34.85%
1983	3.21%	3.82%	-0.77%	-0.77%	1.44%	1.44%	3.48%	3.48%	15.65%	15.65%	-3.84%	-36.67%
1984	15.80%	15.80%	0.90%	-31.17%	0.00%	-37.57%	0.00%	-36.48%	0.00%	-33.10%	0.00%	-32.21%
1985	2.01%	2.01%	0.16%	0.16%	2.17%	2.17%	21.01%	21.01%	15.40%	0.94%	-0.82%	-34.67%
1986	2.44%	-19.31%	9.89%	10.21%	0.84%	0.84%	15.84%	13.48%	-2.11%	-36.76%	-1.11%	-34.86%
1987	9.23%	3.79%	8.58%	13.04%	5.26%	5.26%	5.65%	-25.64%	-0.16%	-34.80%	0.00%	-32.75%
1988	7.61%	7.61%	5.43%	5.43%	0.00%	-33.45%	11.59%	4.19%	5.37%	-31.45%	-0.49%	-34.42%
1989	8.68%	-12.99%	12.88%	12.88%	10.51%	-12.94%	8.84%	-21.58%	0.00%	-32.75%	0.00%	-30.59%
1990	0.00%	-33.84%	0.00%	-34.12%	0.00%	-34.01%	0.00%	-33.34%	0.00%	-31.98%	0.00%	-28.01%
1991	12.06%	12.06%	0.23%	-23.16%	2.75%	2.75%	3.99%	3.99%	-0.58%	-34.66%	0.00%	-33.09%
1992	8.11%	8.11%	5.05%	5.05%	2.65%	2.65%	6.13%	6.13%	-2.84%	-33.02%	0.00%	-33.09%
1993	5.34%	5.34%	1.41%	1.41%	0.84%	0.84%	12.79%	12.79%	16.35%	12.39%	-3.33%	-21.12%
1994	0.20%	-22.22%	13.27%	13.27%	13.59%	16.29%	16.26%	16.41%	10.64%	-26.90%	-1.50%	-35.12%
1995	5.30%	5.30%	3.81%	3.81%	1.80%	1.80%	11.60%	14.32%	-1.93%	-34.91%	-2.28%	-35.63%
1996	0.00%	-35.44%	0.00%	-35.29%	0.00%	-35.06%	0.00%	-33.00%	0.00%	-32.07%	0.00%	-31.61%
1997	7.36%	7.36%	9.12%	9.12%	2.58%	2.58%	0.00%	-34.64%	0.00%	-32.40%	0.00%	-31.47%
1998	5.84%	-31.84%	2.26%	2.26%	1.96%	1.96%	4.50%	4.50%	2.51%	-33.29%	0.00%	-32.40%
1999	0.00%	-34.03%	0.00%	-33.65%	0.00%	-33.33%	15.44%	-8.64%	0.00%	-30.59%	0.00%	-27.65%
2000	0.00%	-32.58%	0.00%	-32.59%	0.00%	-33.10%	0.00%	-30.26%	0.00%	-24.89%	0.00%	-23.87%
2001	0.00%	-33.68%	4.89%	-24.49%	11.02%	12.02%	11.70%	-23.54%	0.00%	-31.72%	0.00%	-25.94%
2002	0.00%	-31.63%	0.00%	-31.32%	0.00%	-30.15%	0.00%	-26.43%	0.00%	-20.30%	0.00%	-17.69%
2003	0.00%	-28.83%	1.83%	-26.44%	6.54%	6.54%	0.00%	-32.26%	0.00%	-26.76%	0.00%	-19.34%
2004	0.00%	-28.83%	1.83%	-26.44%	6.54%	6.54%	0.00%	-32.26%	0.00%	-26.76%	0.00%	-19.34%
2005	6.48%	6.48%	-0.71%	-0.71%	5.28%	5.28%	13.29%	-0.53%	-0.22%	-34.61%	0.00%	-31.72%
2006	0.00%	-32.02%	0.00%	-32.04%	0.00%	-31.93%	0.00%	-31.34%	0.00%	-26.05%	0.00%	-23.29%
2007	0.00%	-31.38%	0.00%	-31.89%	0.00%	-32.20%	0.00%	-28.42%	0.00%	-22.10%	0.00%	-18.30%
2008	0.94%	0.94%	1.05%	1.05%	11.33%	11.33%	0.00%	-36.19%	-0.13%	-34.77%	0.00%	-32.73%
2009	15.39%	15.39%	15.24%	15.24%	4.90%	2.27%	0.00%	-36.86%				

Year	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965	0.63%	-27.46%	-0.50%	-30.56%	0.00%	-28.83%	0.00%	-29.87%	4.27%	-19.15%	-0.55%	-0.55%
1966	0.00%	-31.89%	1.64%	-28.07%	0.07%	-32.85%	0.00%	-32.40%	0.05%	-32.48%	1.33%	-29.27%
1967	8.71%	-10.55%	10.69%	-2.08%	0.65%	-32.34%	0.00%	-29.57%	0.00%	-31.58%	6.63%	6.63%
1968	-0.62%	-33.03%	4.87%	-28.27%	0.00%	-33.73%	0.00%	-33.65%	0.00%	-33.65%	0.80%	-33.61%
1969	0.00%	-33.28%	0.00%	-33.33%	0.00%	-32.67%	0.00%	-32.69%	0.00%	-33.98%	0.00%	-35.12%
1970	0.00%	-29.82%	4.02%	-22.45%	3.87%	-10.79%	0.00%	-32.22%	0.00%	-33.60%	0.00%	-34.22%
1971	4.33%	-24.72%	2.87%	-16.78%	2.80%	-23.43%	8.15%	8.15%	9.40%	-23.86%	13.39%	-7.08%
1972	0.45%	-31.58%	1.64%	-27.99%	1.23%	-26.56%	5.23%	-10.82%	-1.36%	-1.36%	7.06%	7.06%
1973	3.05%	-10.26%	1.44%	-31.60%	-3.01%	-36.41%	-1.80%	-35.44%	-1.57%	-35.99%	1.20%	-35.81%
1974	0.37%	-33.03%	1.97%	-32.42%	-0.37%	-33.89%	7.58%	-23.17%	3.16%	-32.99%	0.00%	-35.08%
1975	1.42%	-31.08%	0.00%	-33.14%	-0.04%	-33.51%	0.00%	-32.97%	0.00%	-32.88%	1.97%	-32.14%
1976	8.34%	-21.64%	1.61%	-28.85%	3.17%	-26.17%	-1.10%	-32.04%	0.00%	-33.50%	0.00%	-32.53%
1977	-0.33%	-30.77%	6.73%	-20.45%	2.02%	-28.97%	0.00%	-31.56%	0.00%	-29.58%	0.00%	-28.98%
1978	0.00%	-32.12%	0.00%	-28.42%	0.00%	-23.11%	0.00%	-28.16%	9.54%	1.21%	2.21%	2.21%
1979	-1.57%	-35.31%	-0.46%	-34.93%	-0.45%	-34.73%	-2.71%	-33.89%	-4.04%	-37.60%	-1.12%	-37.49%
1980	-0.98%	-18.08%	1.75%	-21.64%	4.12%	-20.10%	-5.02%	-36.94%	-3.99%	-37.57%	-1.17%	-37.52%
1981	0.48%	-32.70%	0.98%	-32.70%	1.26%	-28.79%	-0.20%	-29.46%	0.54%	-30.00%	4.82%	-24.21%
1982	-0.26%	-34.13%	3.71%	-27.63%	3.74%	-29.10%	0.00%	-33.14%	-0.94%	-8.80%	7.74%	7.74%
1983	-0.61%	-33.93%	4.99%	-26.75%	4.74%	-14.74%	12.72%	0.59%	3.47%	-9.24%	15.31%	15.31%
1984	0.00%	-32.08%	3.32%	-23.80%	10.08%	10.08%	11.75%	11.75%	7.72%	-16.70%	-1.27%	-1.27%
1985	0.02%	-32.58%	0.56%	-32.35%	-0.02%	-27.94%	2.35%	-19.86%	7.24%	7.24%	8.99%	8.99%
1986	0.42%	-33.71%	6.56%	-10.40%	5.17%	-13.71%	-1.35%	-34.72%	-1.07%	-31.50%	6.68%	-26.60%
1987	2.38%	-30.40%	3.01%	-29.69%	0.00%	-33.28%	2.11%	-28.39%	1.59%	-25.84%	0.11%	-35.60%
1988	2.42%	-30.31%	10.02%	5.44%	11.12%	11.12%	0.00%	-33.86%	0.00%	-33.39%	2.00%	-32.40%
1989	0.00%	-29.88%	1.30%	-31.83%	0.00%	-32.72%	0.00%	-32.58%	0.00%	-32.53%	0.00%	-32.54%
1990	0.00%	-29.77%	3.73%	-24.54%	0.00%	-31.33%	0.00%	-31.33%	0.00%	-32.40%	11.11%	1.13%
1991	0.00%	-32.49%	1.89%	-31.03%	0.00%	-28.83%	0.00%	-29.72%	0.00%	-31.93%	12.66%	0.64%
1992	6.13%	-18.07%	7.90%	-11.75%	3.70%	-30.73%	0.00%	-33.29%	1.57%	-28.87%	5.74%	0.32%
1993	-4.83%	-31.23%	3.81%	-20.70%	1.73%	-22.75%	-1.73%	-28.98%	5.11%	5.11%	15.99%	15.99%
1994	-0.51%	-34.61%	1.24%	-33.79%	-0.11%	-34.42%	0.61%	-33.83%	2.03%	-32.87%	9.75%	-17.50%
1995	-0.40%	-34.54%	-0.02%	-34.58%	-1.46%	-35.39%	-0.64%	-34.67%	-0.34%	-35.09%	0.00%	-35.31%
1996	1.49%	-31.22%	0.35%	-31.77%	10.31%	-13.91%	0.00%	-32.21%	0.00%	-32.89%	0.00%	-33.51%
1997	0.00%	-30.87%	0.00%	-30.96%	0.00%	-30.25%	0.00%	-30.06%	0.00%	-32.21%	0.60%	-32.42%
1998	0.00%	-32.26%	0.00%	-31.86%	0.00%	-31.15%	0.00%	-30.60%	0.47%	-32.31%	0.00%	-34.38%
1999	3.53%	-14.37%	3.71%	-29.85%	4.68%	-16.48%	0.00%	-31.76%	0.00%	-31.72%	0.00%	-31.76%
2000	0.00%	-22.04%	1.31%	-21.80%	0.00%	-26.38%	9.77%	9.77%	8.24%	8.24%	0.00%	-33.65%
2001	1.65%	-23.87%	6.54%	-21.49%	0.00%	-27.34%	0.00%	-28.01%	0.00%	-29.38%	0.00%	-31.23%
2002	0.00%	-17.83%	0.00%	-20.43%	0.00%	-20.81%	0.00%	-21.43%	0.00%	-24.78%	0.00%	-29.03%
2003	0.00%	-18.36%	0.00%	-20.30%	0.00%	-21.91%	0.00%	-20.56%	0.00%	-23.17%	0.00%	-29.22%
2004	0.00%	-18.36%	0.00%	-20.30%	0.00%	-21.91%	0.00%	-20.56%	0.00%	-23.17%	0.00%	-29.22%
2005	0.00%	-30.81%	3.36%	-26.99%	0.00%	-31.55%	0.00%	-31.48%	0.00%	-31.60%	0.00%	-32.02%
2006	0.00%	-23.11%	0.80%	-26.06%	0.00%	-25.67%	0.00%	-26.54%	0.00%	-28.57%	0.00%	-30.70%
2007	7.15%	1.42%	11.02%	11.02%	0.00%	-23.46%	0.00%	-22.58%	1.00%	-27.67%	9.61%	6.23%
2008	0.62%	-24.09%	0.36%	-33.01%	0.00%	-32.22%	0.00%	-32.56%	0.00%	-32.69%	7.98%	7.98%
2009												

Figure 4-12. Habitat summary table for desert sucker *(Catostomus clarki)*, Gage site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Braided Site

No Wood

Hypothetical Withdrawal 2 cfs

Desert Sucker

Year	Jan		Feb		Mar		Apr		May		Jun	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.65%	-21.43%	-2.48%	-32.75%
1966	-0.53%	-0.53%	0.48%	0.84%	-0.62%	1.08%	-0.83%	0.19%	0.00%	-16.27%	-0.73%	-18.42%
1967	0.00%	-10.78%	0.00%	-19.73%	-0.63%	-17.95%	-0.67%	-20.07%	0.00%	-18.04%	0.00%	-23.48%
1968	0.20%	0.20%	-0.27%	-0.27%	2.12%	2.12%	-5.16%	-6.43%	2.64%	-7.39%	0.54%	-34.34%
1969	0.32%	-0.03%	2.27%	2.82%	3.33%	3.33%	-1.90%	-9.14%	2.23%	-4.19%	0.00%	-13.55%
1970	0.00%	-10.10%	0.00%	-9.74%	0.00%	-3.13%	0.00%	-9.94%	0.00%	-22.44%	0.00%	-27.02%
1971	0.00%	-9.85%	0.00%	-10.19%	0.00%	-10.63%	0.00%	-24.30%	0.00%	-27.37%	-1.27%	-32.22%
1972	0.00%	-10.52%	0.00%	-15.08%	-0.66%	-17.49%	0.00%	-21.03%	0.00%	-25.45%	0.00%	-27.40%
1973	0.58%	0.58%	-0.03%	-0.03%	-0.12%	-0.12%	0.12%	0.12%	0.45%	0.20%	-0.43%	-8.08%
1974	-0.21%	-1.89%	0.00%	-0.42%	0.00%	5.91%	0.00%	-6.71%	-0.13%	-9.49%	0.00%	-31.78%
1975	0.00%	-10.25%	0.00%	-4.30%	0.27%	-0.15%	2.68%	2.68%	3.09%	-2.74%	0.00%	-13.61%
1976	-3.87%	-5.27%	-2.78%	1.23%	0.00%	-1.50%	0.09%	-4.29%	0.74%	-8.83%	0.00%	-17.79%
1977	0.00%	-5.75%	0.00%	-9.62%	0.00%	-9.71%	0.00%	-14.14%	0.00%	-23.62%	0.00%	-31.51%
1978	-2.97%	-2.95%	0.27%	0.71%	0.61%	0.61%	0.00%	-1.39%	-0.11%	-9.84%	0.00%	-16.96%
1979	-0.24%	-0.24%	1.03%	1.22%	0.36%	0.36%	0.27%	0.27%	0.93%	1.27%	-1.47%	-2.61%
1980	0.88%	1.20%	0.66%	0.66%	0.92%	0.51%	-3.29%	2.79%	-1.79%	-2.21%	-0.67%	-9.34%
1981	0.00%	6.16%	0.00%	6.41%	0.33%	-5.07%	-1.12%	-2.63%	-1.01%	-8.16%	-0.29%	-9.82%
1982	-2.77%	-3.72%	-4.22%	-8.18%	0.05%	-0.04%	0.59%	-1.32%	0.30%	-3.37%	-1.30%	-10.41%
1983	0.35%	-2.74%	0.21%	0.21%	0.14%	0.14%	0.40%	0.40%	-0.15%	-0.89%	2.09%	-3.61%
1984	-1.03%	0.48%	-1.93%	1.39%	0.00%	6.08%	-0.82%	0.17%	0.00%	-20.32%	0.00%	-28.89%
1985	0.57%	0.57%	1.07%	0.84%	0.66%	0.66%	7.07%	8.54%	-9.67%	-10.56%	-4.58%	-10.26%
1986	-0.14%	-7.87%	-3.87%	0.78%	0.35%	0.35%	-1.18%	-4.65%	4.39%	0.32%	-1.32%	-10.42%
1987	-1.90%	-4.65%	0.85%	1.66%	0.71%	0.55%	1.03%	0.43%	0.03%	-7.58%	-0.68%	-16.01%
1988	1.09%	0.65%	0.97%	0.52%	-0.81%	-0.48%	0.67%	-0.80%	-1.13%	-8.23%	-0.59%	-10.04%
1989	0.39%	-4.83%	0.41%	0.41%	1.36%	-1.36%	-0.63%	-3.31%	-0.67%	-18.37%	-0.71%	-29.75%
1990	0.00%	-9.02%	0.00%	-9.46%	0.00%	-9.23%	0.00%	-15.05%	0.06%	-21.61%	0.00%	-32.33%
1991	-6.53%	-4.36%	-2.98%	-3.11%	-0.13%	-0.13%	0.40%	0.40%	-0.70%	-10.22%	0.00%	-16.84%
1992	1.08%	1.08%	0.79%	0.32%	0.53%	3.47%	0.74%	0.74%	-2.11%	-4.92%	0.00%	-16.84%
1993	0.50%	0.26%	0.24%	0.24%	0.09%	0.09%	2.34%	1.95%	-0.92%	-1.45%	-8.96%	-9.85%
1994	-1.51%	-9.93%	-3.58%	-2.63%	0.31%	0.90%	1.01%	1.00%	0.32%	-3.42%	-1.79%	-10.63%
1995	0.43%	0.43%	0.65%	0.65%	-0.09%	-0.09%	-0.60%	-3.13%	0.56%	-0.21%	3.18%	-5.67%
1996	0.00%	-4.01%	0.00%	-3.69%	0.00%	-7.97%	0.00%	-17.65%	0.00%	-21.57%	0.00%	-26.36%
1997	0.49%	0.49%	0.55%	0.55%	0.55%	0.55%	-0.17%	-9.57%	0.00%	-18.62%	0.00%	-27.87%
1998	-0.52%	-1.83%	0.36%	0.36%	0.54%	0.54%	0.72%	0.72%	-2.53%	-7.30%	0.65%	-18.06%
1999	0.00%	-9.72%	0.00%	-11.72%	0.00%	-17.05%	0.00%	-7.90%	0.00%	-29.80%	0.00%	-32.70%
2000	0.00%	-16.14%	0.00%	-18.87%	-0.21%	-16.46%	-0.71%	-30.63%	0.00%	-35.67%	0.00%	-36.85%
2001	0.00%	-10.77%	0.00%	-7.17%	1.95%	1.95%	-0.39%	-2.91%	0.00%	-25.26%	0.00%	-34.50%
2002	0.00%	-26.22%	0.00%	-28.25%	0.99%	-30.51%	-6.00%	-33.97%	0.00%	-41.35%	0.00%	-45.07%
2003	0.00%	-28.23%	0.00%	-31.51%	2.50%	2.50%	0.00%	-19.53%	0.00%	-28.01%	0.00%	-42.67%
2004	0.00%	-28.23%	0.00%	-31.51%	2.50%	2.50%	0.00%	-19.53%	0.00%	-28.01%	0.00%	-42.67%
2005	2.87%	2.32%	0.15%	0.15%	0.03%	0.03%	-0.01%	-2.43%	-0.26%	-10.21%	0.00%	-25.26%
2006	0.00%	-22.12%	0.00%	-21.85%	0.01%	-22.95%	0.00%	-27.14%	0.00%	-34.38%	0.00%	-37.54%
2007	0.00%	-31.19%	-0.71%	-32.03%	0.03%	-19.69%	0.00%	-31.91%	0.00%	-39.01%	0.00%	-44.18%
2008	0.48%	0.48%	0.23%	-3.60%	0.67%	0.75%	-0.84%	0.34%	-0.15%	-8.33%	0.66%	-23.35%
2009	2.21%	2.21%	2.03%	2.17%	0.11%	-8.92%	0.00%	-2.76%				

Year	Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965	4.05%	-20.73%	7.49%	-27.60%	0.00%	-32.69%	0.46%	-30.50%	-2.41%	-3.32%	0.04%	0.04%
1966	0.00%	-23.48%	3.52%	-9.11%	0.00%	-23.57%	0.00%	-18.04%	0.00%	-15.75%	-0.64%	-11.67%
1967	-0.60%	-23.48%	-1.52%	-5.26%	-5.31%	-17.03%	-6.54%	-31.03%	0.00%	-27.04%	-1.09%	-1.83%
1968	0.00%	-11.55%	0.04%	-10.27%	0.00%	-16.24%	0.00%	-17.53%	-0.04%	-11.72%	0.00%	-9.81%
1969	0.00%	-15.13%	0.38%	-14.34%	0.68%	-17.53%	0.68%	-17.85%	-0.68%	-9.06%	0.00%	-6.80%
1970	-0.25%	-31.86%	0.60%	-17.23%	-2.79%	-2.80%	0.00%	-19.94%	0.00%	-10.67%	0.00%	-9.76%
1971	0.00%	-32.07%	7.71%	-22.68%	-0.65%	-14.72%	-0.17%	-5.21%	0.00%	-10.82%	-0.74%	-2.86%
1972	0.00%	-23.48%	0.00%	-23.48%	0.00%	-27.76%	-1.47%	-4.36%	0.09%	0.09%	0.51%	0.51%
1973	-7.36%	-8.09%	7.56%	7.50%	5.21%	-3.68%	-2.14%	-10.89%	-0.15%	-3.28%	1.43%	1.50%
1974	0.00%	-14.39%	0.78%	-8.82%	-0.44%	-9.81%	2.36%	-11.24%	-0.23%	-8.54%	-0.19%	-8.06%
1975	-0.02%	-12.41%	0.00%	-21.74%	-0.04%	-18.44%	0.00%	-18.00%	0.00%	-18.81%	0.00%	-13.00%
1976	-0.48%	-22.53%	0.49%	-19.89%	0.01%	-23.48%	0.00%	-10.35%	0.00%	-13.08%	0.00%	-16.68%
1977	0.00%	-31.25%	-1.80%	-36.06%	1.22%	-13.75%	0.00%	-27.10%	-0.73%	-31.29%	0.00%	-31.36%
1978	0.00%	-21.03%	0.00%	-31.91%	0.00%	-37.76%	-0.26%	-31.62%	-1.15%	-19.70%	2.84%	2.18%
1979	0.43%	-8.69%	-0.55%	-8.79%	2.24%	-7.95%	6.82%	2.61%	3.78%	7.44%	0.00%	2.22%
1980	-10.61%	-11.04%	-3.15%	-3.92%	-4.85%	-4.85%	7.39%	7.39%	4.93%	7.56%	0.00%	7.39%
1981	-1.26%	-7.16%	0.12%	-8.26%	-1.20%	-10.76%	2.31%	1.81%	-3.03%	-3.77%	-1.34%	-2.91%
1982	-0.02%	-16.01%	0.17%	-8.67%	-1.65%	-11.20%	0.00%	-16.38%	-6.17%	-1.49%	-4.59%	1.09%
1983	0.09%	-8.10%	0.83%	-5.21%	-3.17%	-2.15%	-3.26%	1.46%	-3.07%	-1.70%	-2.55%	0.31%
1984	0.00%	-26.00%	0.54%	-3.26%	-1.23%	1.05%	-0.15%	2.77%	-1.24%	-3.86%	0.21%	0.21%
1985	-0.68%	-9.79%	-1.10%	-5.33%	-1.89%	-4.97%	-0.46%	-0.84%	0.28%	-1.01%	0.93%	0.93%
1986	-0.95%	-8.17%	0.79%	-4.57%	0.66%	-17.21%	-3.21%	-11.47%	-0.50%	-2.01%	-8.13%	-4.08%
1987	0.00%	-18.17%	-0.47%	-11.40%	0.00%	-14.17%	0.68%	-24.70%	-0.32%	-3.59%	-5.75%	-3.69%
1988	-0.20%	-10.32%	-0.12%	0.00%	0.41%	0.20%	-0.28%	-15.47%	0.00%	-24.83%	0.00%	-9.65%
1989	0.68%	-31.68%	-0.09%	-24.39%	0.66%	-26.74%	-0.70%	-22.29%	0.00%	-16.68%	0.00%	-16.55%
1990	0.00%	-31.91%	-0.26%	-30.23%	0.82%	-30.20%	0.00%	-27.60%	0.01%	-21.50%	-5.92%	-11.08%
1991	-1.39%	-23.40%	0.74%	-20.31%	-2.35%	-31.51%	-6.27%	-30.64%	0.00%	-23.07%	-1.63%	-7.55%
1992	0.81%	-17.82%	-5.58%	-4.98%	0.00%	-9.78%	0.00%	-28.79%	0.00%	-19.75%	-6.36%	-0.35%
1993	-11.10%	-11.10%	6.73%	6.64%	1.57%	0.94%	3.75%	-0.92%	1.63%	0.09%	0.89%	0.78%
1994	-0.61%	-10.21%	0.00%	-8.84%	-0.13%	-10.05%	-0.79%	-10.01%	-1.59%	-6.76%	-2.26%	-1.61%
1995	-0.48%	-10.15%	-0.02%	-10.18%	-0.56%	-9.91%	-0.76%	-10.26%	-0.41%	-10.60%	0.00%	-4.29%
1996	0.67%	-27.56%	0.00%	-22.25%	-0.72%	-22.18%	0.00%	-20.35%	0.00%	-18.69%	0.00%	-12.96%
1997	0.88%	-29.04%	1.40%	-25.20%	-6.84%	-20.94%	2.40%	-22.91%	0.02%	-24.74%	0.66%	-15.98%
1998	0.00%	-27.60%	0.61%	-23.77%	0.00%	-29.70%	0.00%	-29.82%	-0.03%	-18.09%	0.00%	-10.01%
1999	0.21%	-30.07%	-0.09%	-15.36%	1.10%	-11.11%	0.00%	-24.85%	0.00%	-25.26%	0.00%	-24.85%
2000	0.00%	-39.08%	4.85%	-37.13%	0.00%	-34.03%	-10.37%	-33.52%	-2.42%	-0.54%	0.00%	-11.72%
2001	0.00%	-35.04%	1.59%	-36.78%	-4.46%	-33.61%	0.00%	-28.87%	0.00%	-26.91%	0.00%	-28.26%
2002	0.00%	-44.87%	0.00%	-40.03%	0.00%	-40.67%	0.00%	-39.86%	0.00%	-33.19%	-10.70%	-31.31%
2003	0.00%	-44.08%	0.00%	-41.35%	-0.37%	-39.24%	0.00%	-41.01%	0.00%	-37.69%	1.26%	-25.82%
2004	0.00%	-44.08%	0.00%	-41.35%	-0.37%	-39.24%	0.00%	-41.01%	0.00%	-37.69%	1.26%	-25.82%
2005	0.29%	-30.26%	0.00%	-16.90%	0.00%	-27.05%	0.00%	-27.74%	0.00%	-26.50%	0.00%	-22.12%
2006	0.00%	-37.76%	0.00%	-29.60%	0.00%	-34.80%	0.00%	-30.95%	0.00%	-29.29%	0.00%	-27.91%
2007	0.00%	-44.08%	0.00%	-34.98%	0.00%	-37.33%	0.00%	-38.41%	0.00%	-35.93%	-6.99%	0.43%
2008	0.00%	-23.71%	0.63%	-10.24%	0.02%	-20.98%	0.00%	-19.11%	0.68%	-17.85%	-2.10%	0.61%
2009												

Figure 4-13. Habitat summary table for desert sucker *(Catostomus clarki)*, Braided site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Braided Site

No Wood

Hypothetical Withdrawal 10 cfs

Desert Sucker

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.65%	-69.50%	-2.48%	-62.71%	4.98%	-65.55%	7.49%	-61.45%	0.00%	-64.74%	0.46%	-65.27%	-2.43%	-68.06%	-0.58%	-12.71%
1966	1.10%	0.60%	1.04%	-9.02%	2.22%	-15.69%	-0.83%	-69.71%	0.00%	-69.63%	-0.73%	-68.39%	0.00%	-66.98%	2.16%	-68.56%	0.00%	-69.48%	0.00%	-67.12%	0.00%	-67.85%	0.16%	-68.32%
1967	0.00%	-69.92%	0.00%	-69.42%	-0.63%	-69.51%	-0.67%	-67.31%	0.00%	-67.12%	0.00%	-66.98%	0.00%	-66.98%	1.42%	-65.63%	-5.68%	-68.39%	-6.54%	-65.08%	0.00%	-66.93%	2.21%	-62.60%
1968	2.74%	7.39%	1.88%	3.99%	3.35%	5.36%	-1.37%	-46.14%	2.68%	-69.55%	0.54%	-69.21%	0.00%	-69.91%	0.04%	-70.50%	0.00%	-69.94%	0.00%	-69.89%	0.00%	-69.89%	0.00%	-70.16%
1969	1.65%	-61.48%	3.18%	9.69%	5.25%	7.58%	-2.39%	-69.44%	2.23%	-70.21%	0.00%	-69.79%	0.00%	-69.69%	0.38%	-69.61%	0.68%	-68.10%	0.68%	-68.33%	0.00%	-70.07%	0.00%	-70.69%
1970	0.00%	-70.35%	0.00%	-70.13%	0.00%	-71.04%	0.00%	-70.24%	0.00%	-69.58%	0.00%	-66.94%	-0.40%	-65.88%	-0.85%	-65.99%	-2.73%	-62.14%	0.00%	-67.08%	0.00%	-69.87%	0.00%	-70.20%
1971	0.00%	-70.18%	0.00%	-70.41%	0.00%	-70.22%	0.00%	-66.96%	0.00%	-66.90%	-1.27%	-63.31%	0.00%	-63.49%	7.71%	-64.91%	-0.26%	-63.20%	-0.52%	-53.30%	0.00%	-69.90%	-0.07%	-67.09%
1972	0.00%	-69.97%	0.00%	-69.99%	-0.66%	-69.08%	0.00%	-67.05%	0.00%	-67.02%	0.00%	-67.00%	0.00%	-66.98%	0.00%	-66.98%	0.00%	-62.07%	-1.65%	-59.16%	0.27%	-56.06%	2.97%	-7.46%
1973	2.77%	4.20%	-0.18%	-0.18%	-0.16%	-0.16%	0.53%	0.61%	2.20%	4.42%	-7.41%	-52.23%	-5.55%	-49.34%	6.31%	-66.12%	5.16%	-68.79%	-2.14%	-70.86%	-0.65%	-70.03%	0.45%	-69.77%
1974	0.68%	-56.28%	0.00%	-66.54%	0.00%	-66.54%	0.00%	-70.78%	-0.13%	-70.13%	0.00%	-69.60%	0.00%	-69.69%	0.78%	-70.19%	-0.44%	-70.03%	2.78%	-68.45%	-0.23%	-70.62%	-0.19%	-70.67%
1975	0.00%	-70.50%	0.00%	-70.73%	0.60%	5.38%	4.96%	-30.14%	3.73%	-69.78%	0.00%	-69.77%	-0.02%	-69.85%	0.00%	-69.62%	-0.04%	-69.82%	0.00%	-69.52%	0.00%	-69.48%	0.00%	-69.79%
1976	-4.06%	-66.33%	-2.49%	-35.91%	0.00%	-69.50%	0.09%	-70.83%	0.74%	-70.13%	0.00%	-67.14%	-0.48%	-68.60%	0.65%	-69.27%	0.01%	-66.98%	0.00%	-69.99%	0.00%	-69.81%	0.00%	-67.16%
1977	0.00%	-69.03%	0.00%	-70.08%	0.00%	-70.09%	0.00%	-69.77%	0.00%	-66.98%	0.00%	-64.12%	0.00%	-66.49%	-1.83%	-68.01%	0.86%	-69.65%	0.00%	-67.00%	-0.73%	-65.21%	0.00%	-64.29%
1978	-1.96%	-63.82%	2.65%	3.10%	2.99%	2.54%	-1.10%	-70.48%	-0.11%	-70.30%	0.00%	-69.58%	0.00%	-67.05%	0.00%	-63.67%	0.00%	-57.01%	-0.26%	-63.59%	0.20%	-66.92%	-1.57%	-5.14%
1979	0.82%	1.31%	3.88%	9.35%	2.06%	2.06%	2.11%	6.82%	-4.30%	-46.95%	-2.83%	-63.58%	0.25%	-70.16%	-1.08%	-70.75%	2.07%	-69.71%	5.03%	-68.73%	3.66%	-68.73%	0.00%	-68.73%
1980	2.37%	-41.46%	2.93%	2.81%	3.35%	4.29%	6.77%	7.14%	-6.44%	-47.06%	-7.50%	-60.72%	-7.03%	-48.79%	0.04%	-40.94%	-2.89%	-54.60%	4.77%	-67.43%	3.66%	-68.73%	0.00%	-68.73%
1981	0.00%	-68.73%	0.00%	-67.99%	1.02%	-39.72%	-0.62%	-64.65%	-1.01%	-70.91%	-0.07%	-70.18%	-1.62%	-70.72%	0.66%	-70.47%	-1.20%	-70.77%	0.33%	-70.12%	-3.85%	-71.72%	-4.61%	-70.94%
1982	-3.36%	-14.16%	-4.49%	-6.02%	1.02%	-2.82%	3.44%	-50.27%	2.63%	-70.09%	-1.30%	-70.55%	-0.02%	-70.07%	0.70%	-70.32%	-0.61%	-70.23%	0.00%	-69.62%	-6.15%	-63.14%	-3.10%	-0.02%
1983	-5.46%	-0.90%	1.04%	1.08%	0.11%	0.11%	1.48%	4.63%	-1.84%	-46.70%	4.41%	-68.84%	0.02%	-70.23%	0.83%	-70.46%	-1.23%	-67.40%	-0.40%	-60.56%	-4.84%	-66.77%	-4.84%	-27.89%
1984	3.13%	6.26%	-1.93%	-60.58%	0.00%	-68.70%	-0.82%	-70.11%	0.00%	-69.60%	0.00%	-67.08%	0.00%	-67.04%	1.50%	-66.79%	0.14%	-64.36%	1.24%	-62.92%	0.46%	-69.67%	2.37%	3.57%
1985	1.91%	3.28%	4.93%	5.53%	2.45%	4.28%	8.27%	8.25%	-5.96%	-51.22%	-0.98%	-70.45%	-0.13%	-70.18%	-0.64%	-70.88%	-1.78%	-70.87%	0.76%	-58.45%	-3.57%	-30.67%	3.75%	-31.81%
1986	-0.84%	-43.20%	-5.00%	-17.82%	1.70%	1.80%	0.89%	-45.78%	4.40%	-69.55%	-1.32%	-70.55%	-0.78%	-70.43%	-1.73%	-67.81%	0.66%	-69.03%	-3.42%	-71.24%	-0.99%	-64.27%	-8.80%	-59.99%
1987	-1.99%	-51.55%	3.11%	2.24%	3.92%	6.83%	1.03%	-64.48%	0.69%	-70.26%	-0.68%	-68.39%	0.00%	-67.12%	0.23%	-69.98%	0.00%	-69.09%	0.68%	-68.33%	0.33%	-70.65%	-6.67%	-70.81%
1988	3.94%	-28.71%	2.28%	5.04%	-0.81%	-70.20%	2.54%	-68.49%	-1.13%	-70.93%	-0.59%	-70.31%	-0.99%	-70.09%	-3.87%	-59.35%	-0.18%	-65.19%	0.00%	-70.01%	0.00%	-69.75%	0.00%	-69.93%
1989	0.71%	-58.55%	3.10%	0.50%	1.36%	-70.56%	-0.63%	-70.60%	-0.67%	-68.80%	-0.71%	-66.23%	0.68%	-65.94%	-0.09%	-68.40%	0.66%	-68.57%	-0.70%	-67.86%	0.00%	-67.16%	0.00%	-67.16%
1990	0.00%	-69.91%	0.00%	-70.05%	0.00%	-70.09%	0.00%	-69.68%	0.06%	-67.05%	0.00%	-63.20%	0.00%	-66.05%	-0.26%	-67.53%	0.82%	-66.93%	0.00%	-66.88%	0.01%	-67.12%	-5.10%	-68.25%
1991	-5.22%	-63.69%	-2.65%	-61.34%	-0.63%	-0.41%	2.02%	-2.94%	-0.70%	-70.44%	0.00%	-69.59%	-1.39%	-67.63%	0.74%	-67.58%	-2.35%	-64.12%	-6.27%	-65.11%	0.00%	-66.99%	-4.14%	-66.59%
1992	5.06%	8.89%	1.04%	2.85%	3.06%	6.64%	3.60%	-18.91%	0.77%	-61.69%	0.00%	-69.59%	0.36%	-68.05%	-5.83%	-55.94%	0.00%	-70.14%	0.00%	-69.70%	0.00%	-69.69%	-8.20%	-17.56%
1993	1.06%	-2.24%	1.22%	4.17%	0.39%	9.58%	1.75%	-3.00%	-6.62%	-66.78%	-6.45%	-66.65%	-6.59%	-59.99%	5.47%	-62.32%	-0.32%	-62.54%	1.81%	-56.37%	4.06%	-39.70%	-10.73%	-66.65%
1994	-2.11%	-43.27%	-0.45%	-27.78%	1.73%	1.22%	1.39%	-53.70%	0.63%	-69.45%	-1.79%	-70.69%	-0.61%	-70.42%	-0.17%	-70.46%	-0.13%	-70.31%	-0.26%	-70.29%	-0.45%	-70.66%	-7.94%	-43.64%
1995	-0.29%	3.90%	1.66%	4.74%	2.36%	5.97%	-1.56%	-53.36%	5.77%	-65.20%	3.18%	-69.21%	-0.48%	-70.38%	-0.02%	-70.40%	-0.88%	-70.58%	-0.76%	-70.45%	-0.41%	-70.67%	0.00%	-70.79%
1996	0.00%	-70.78%	0.00%	-70.59%	0.00%	-70.66%	0.00%	-69.54%	0.00%	-67.03%	0.00%	-66.91%	0.67%	-67.56%	0.00%	-67.01%	-0.72%	-68.54%	0.00%	-67.07%	0.00%	-69.48%	0.00%	-69.82%
1997	2.28%	-62.49%	3.70%	7.28%	2.45%	-3.41%	-0.17%	-70.43%	0.00%	-67.36%	0.00%	-66.87%	0.88%	-64.70%	1.40%	-64.57%	-6.84%	-61.18%	1.05%	-63.84%	0.02%	-67.08%	-0.32%	-69.14%
1998	-0.52%	-69.47%	1.42%	-45.25%	2.32%	5.98%	2.82%	1.12%	0.04%	-70.57%	0.65%	-67.13%	0.00%	-67.09%	0.61%	-66.98%	0.00%	-66.84%	0.00%	-66.05%	-0.28%	-68.53%	0.00%	-70.29%
1999	0.00%	-70.10%	0.00%	-69.89%	0.00%	-69.72%	0.00%	-70.67%	0.00%	-66.04%	0.00%	-62.77%	-0.71%	-65.70%	-0.09%	-70.16%	0.05%	-63.09%	0.00%	-66.95%	0.00%	-66.94%	0.00%	-66.95%
2000	0.00%	-67.17%	0.00%	-67.18%	-0.21%	-69.60%	-0.71%	-65.94%	0.00%	-59.39%	0.00%	-58.04%	0.00%	-55.50%	4.85%	-57.73%	0.00%	-61.25%	-10.37%	-61.84%	0.94%	-56.10%	0.00%	-69.89%
2001	0.00%	-69.91%	0.00%	-68.39%	4.51%	-30.28%	-0.39%	-70.57%	0.00%	-66.94%	0.00%	-60.72%	0.00%	-56.84%	1.59%	-64.64%	-4.46%	-62.41%	0.00%	-61.32%	0.00%	-62.66%	0.00%	-66.91%
2002	0.00%	-66.91%	0.00%	-66.91%	0.99%	-65.88%	-6.00%	-61.32%	0.00%	-52.92%	0.00%	-48.68%	0.00%	-48.91%	0.00%	-52.20%	0.00%	-53.69%	0.00%	-54.61%	0.00%	-57.59%	-10.70%	-64.35%
2003	0.00%	-62.40%	0.00%	-64.12%	5.23%	-1.57%	0.00%	-67.09%	0.00%	-58.57%	0.00%	-51.42%	0.00%	-49.81%	0.00%	-52.92%	-0.37%	-55.33%	0.00%	-53.31%	0.00%	-57.09%	1.26%	-61.85%
2004	0.00%	-62.40%	0.00%	-64.12%	5.23%	-1.57%	0.00%	-67.09%	0.00%	-58.57%	0.00%	-51.42%	0.00%	-49.81%	0.00%	-52.92%	-0.37%	-55.33%	0.00%	-53.31%	0.00%	-57.09%	1.26%	-61.85%
2005	3.10%	-1.24%	1.40%	-1.66%	0.70%	4.49%	-0.01%	-61.06%	-0.26%	-70.42%	0.00%	-66.94%	0.29%	-66.62%	0.00%	-67.41%	0.00%	-66.89%	0.00%	-66.87%	0.00%	-66.90%	0.00%	-67.02%
2006	0.00%	-67.02%	0.00%	-67.03%	0.01%	-67.00%	0.00%	-66.67%	0.00%	-60.86%	0.00%	-57.25%	0.00%	-57.01%	0.00%	-59.18%	0.00%	-60.38%	0.00%	-61.05%	0.00%	-62.53%	0.00%	-65.35%
2007	0.00%	-66.84%	-0.71%	-67.42%	0.03%	-67.09%	0.00%	-63.67%	0.00%	-55.59%	0.00%	-49.70%	0.00%	-49.81%	0.00%	-60.17%	0.00%	-57.49%	0.00%	-56.27%	0.00%	-59.10%	-4.22%	-25.16%
2008	2.00%	2.24%	1.21%	2.76%	2.61%	-21.78%	-0.84%	-69.88%	-0.15%	-70.50%	0.66%	-69.19%	0.00%	-69.55%	0.43%	-69.38%	0.02%	-67.08%	0.00%	-67.17%	0.68%	-68.33%	-1.71%	-61.77%
2009	5.10%	-0.41%	4.10%	-4.64%	1.11%	-46.05%	0.00%	-70.25%																

Figure 4-14. Habitat summary table for desert sucker *(Catostomus clarki)*, Braided site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Braided Site
With LWD
Desert Sucker

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.01%	-5.74%	-0.30%	-10.91%	0.54%	-7.59%	-0.57%	-8.91%	0.73%	-10.96%	0.17%	-11.13%	-0.18%	0.84%	-1.87%	-1.87%
1966	-1.84%	-1.84%	0.89%	1.23%	0.05%	0.71%	0.00%	2.19%	0.00%	-3.42%	-0.04%	-5.47%	0.00%	-8.63%	-1.56%	-2.42%	0.83%	-3.73%	0.00%	-6.42%	-0.32%	-3.87%	-0.41%	-1.19%
1967	0.00%	-1.32%	0.00%	-4.90%	0.00%	-4.16%	0.00%	-7.03%	0.00%	-6.42%	0.00%	-8.61%	-0.60%	-0.66%	-1.83%	-1.75%	-0.11%	-3.10%	-2.31%	-11.15%	0.00%	-9.95%	0.24%	0.49%
1968	-0.53%	-0.53%	-1.24%	-1.24%	-1.50%	-1.00%	0.32%	1.14%	0.44%	1.76%	-0.04%	-11.18%	1.56%	2.28%	1.03%	1.48%	0.00%	-3.70%	0.00%	-3.84%	-0.01%	-1.45%	0.63%	1.14%
1969	0.05%	0.57%	0.34%	1.26%	0.04%	0.04%	2.00%	2.88%	1.00%	1.98%	0.00%	-2.24%	0.00%	-2.92%	0.09%	-2.71%	0.04%	-5.27%	0.01%	-5.20%	-0.17%	-0.84%	0.00%	-1.09%
1970	0.00%	-0.89%	-0.15%	0.24%	0.00%	0.13%	0.00%	-0.76%	0.00%	-5.96%	0.00%	-9.98%	-0.10%	-10.51%	-1.85%	-6.02%	0.62%	-0.17%	-0.01%	-7.20%	0.00%	-1.55%	0.00%	-0.87%
1971	0.00%	-0.73%	0.00%	-0.96%	0.00%	-1.05%	-0.01%	-8.97%	0.00%	-10.15%	-0.45%	-11.35%	-0.82%	-10.49%	0.47%	0.58%	-0.27%	-1.83%	0.82%	1.14%	-0.83%	0.32%	0.53%	3.09%
1972	1.62%	2.12%	0.00%	-3.63%	-0.01%	-4.39%	0.00%	-7.63%	0.00%	-9.25%	0.15%	-9.45%	1.96%	-6.23%	-0.15%	-5.89%	-0.57%	-8.59%	0.44%	-2.13%	0.41%	0.41%	1.77%	1.35%
1973	0.42%	0.42%	-1.21%	-1.21%	0.41%	0.41%	0.33%	0.33%	0.55%	0.55%	1.42%	2.01%	0.27%	2.25%	2.03%	2.69%	1.25%	0.18%	-0.54%	-1.46%	1.15%	0.91%	-0.18%	-0.28%
1974	0.45%	0.58%	0.48%	2.12%	-0.12%	0.99%	-0.59%	0.80%	-0.03%	-0.71%	0.00%	-9.77%	-0.52%	-1.58%	-0.89%	-1.23%	-0.11%	-1.79%	0.23%	0.72%	1.90%	1.86%	-0.05%	-1.13%
1975	0.00%	-1.01%	-0.06%	0.49%	1.04%	1.44%	0.22%	0.22%	0.98%	2.63%	0.00%	-2.28%	0.24%	0.34%	0.00%	-5.66%	-0.01%	-4.81%	0.00%	-4.16%	0.00%	-4.50%	1.80%	0.51%
1976	-2.45%	-0.92%	-2.59%	-0.70%	-0.05%	0.17%	1.23%	2.02%	1.52%	0.87%	0.00%	-6.31%	0.06%	0.50%	1.33%	0.29%	-0.67%	-5.12%	0.44%	-0.04%	0.00%	-2.04%	0.00%	-5.86%
1977	0.00%	0.17%	0.00%	-0.71%	-0.73%	-0.31%	-0.57%	1.68%	0.00%	-8.65%	0.00%	-11.26%	0.00%	-11.07%	1.10%	-5.35%	0.39%	0.07%	0.00%	-9.86%	0.01%	-11.16%	0.00%	-11.24%
1978	-2.32%	0.42%	0.33%	0.10%	0.21%	0.21%	1.74%	2.90%	0.44%	1.26%	0.00%	-3.71%	1.10%	-6.62%	0.00%	-11.31%	0.00%	-11.97%	-0.20%	-10.91%	0.14%	2.83%	-2.68%	-2.44%
1979	-2.11%	-2.11%	0.96%	2.20%	0.17%	0.17%	0.50%	0.50%	1.71%	1.24%	-0.44%	1.85%	0.53%	-0.25%	-1.08%	1.65%	0.55%	-0.41%	1.30%	1.88%	1.33%	2.21%	0.95%	1.49%
1980	1.35%	1.87%	0.41%	0.41%	0.74%	1.32%	-0.28%	0.47%	-0.09%	0.42%	1.41%	2.43%	0.51%	1.83%	-0.67%	1.37%	1.16%	1.45%	1.77%	1.77%	1.18%	1.81%	0.19%	1.96%
1981	2.08%	3.14%	-0.62%	-0.07%	1.27%	1.37%	-0.05%	1.34%	0.73%	-0.24%	-0.07%	-0.76%	0.88%	1.08%	1.45%	2.14%	0.79%	0.99%	-0.22%	0.18%	0.35%	1.40%	-1.33%	0.64%
1982	-1.02%	-1.39%	-1.10%	-2.92%	0.07%	1.62%	0.09%	0.46%	2.55%	3.65%	-0.33%	-1.17%	0.33%	-3.29%	-0.31%	-0.30%	0.02%	0.10%	0.32%	-3.16%	-2.71%	3.11%	-0.08%	0.34%
1983	0.22%	-1.09%	0.22%	0.22%	0.34%	0.34%	0.81%	0.81%	1.61%	2.42%	1.78%	2.48%	0.71%	1.31%	0.74%	1.40%	-2.98%	0.80%	-2.54%	0.44%	-1.15%	2.11%	-0.42%	1.47%
1984	-0.14%	0.00%	0.38%	0.96%	0.00%	1.46%	-0.02%	0.81%	0.00%	-5.08%	0.00%	-10.56%	1.30%	-7.22%	-0.46%	1.34%	-1.12%	0.22%	-0.81%	0.77%	-1.03%	0.22%	-0.28%	-0.28%
1985	0.77%	0.77%	0.78%	0.30%	0.40%	0.40%	0.31%	0.73%	0.29%	0.95%	2.16%	2.16%	0.12%	1.27%	0.58%	1.41%	0.74%	1.23%	0.96%	1.82%	-0.16%	-1.94%	0.37%	0.37%
1986	0.07%	1.93%	-1.35%	0.64%	0.13%	0.13%	-0.62%	0.69%	0.86%	2.05%	-0.33%	-1.20%	2.03%	3.00%	-0.96%	0.90%	-1.06%	-0.92%	0.81%	1.08%	0.88%	1.73%	0.20%	2.24%
1987	-0.84%	1.38%	-0.30%	0.59%	0.31%	-0.12%	0.07%	1.23%	1.82%	1.06%	-0.09%	-4.71%	-0.06%	-3.38%	0.94%	1.66%	0.00%	-3.76%	0.02%	-3.89%	0.46%	1.44%	1.87%	2.09%
1988	0.01%	0.40%	-0.71%	0.22%	0.21%	-0.09%	0.41%	0.83%	1.23%	1.96%	-0.15%	-0.90%	1.38%	2.07%	-2.77%	-1.36%	-1.04%	-1.29%	-0.07%	-3.55%	0.00%	-6.89%	0.47%	0.69%
1989	0.65%	1.02%	0.21%	0.21%	-0.44%	0.31%	0.05%	0.93%	-0.01%	-4.98%	0.01%	-10.79%	0.28%	-11.33%	0.59%	-5.87%	0.00%	-8.51%	-0.02%	-7.38%	0.00%	-5.86%	0.00%	-5.80%
1990	0.00%	-0.83%	0.00%	-0.67%	0.00%	-0.82%	0.00%	-2.92%	1.63%	-6.03%	0.00%	-11.36%	0.00%	-11.09%	0.22%	-6.34%	0.05%	-11.03%	0.05%	-10.12%	0.00%	-7.73%	-2.49%	-1.09%
1991	-2.71%	-2.10%	-0.22%	-1.27%	0.04%	0.04%	0.41%	0.41%	-0.15%	0.82%	0.00%	-3.66%	-0.03%	-8.01%	2.07%	-4.94%	-0.84%	-11.26%	-2.28%	-11.15%	-0.04%	-8.43%	-0.16%	0.52%
1992	0.60%	0.60%	0.36%	0.55%	0.30%	1.90%	0.65%	0.65%	1.03%	2.35%	0.34%	-3.34%	0.32%	-0.05%	-1.34%	-0.77%	1.43%	2.02%	0.00%	-8.66%	-1.08%	-0.93%	-3.60%	0.41%
1993	0.97%	1.32%	0.38%	0.38%	0.27%	0.27%	0.43%	0.97%	0.55%	0.91%	0.79%	0.79%	1.72%	1.72%	1.24%	2.84%	1.62%	2.64%	-0.41%	0.97%	-0.24%	1.07%	0.91%	1.20%
1994	0.00%	2.35%	-0.09%	1.40%	0.33%	0.18%	0.83%	0.69%	1.34%	1.69%	-0.45%	-1.34%	-0.15%	-1.00%	-0.43%	0.14%	0.05%	-0.85%	0.55%	0.69%	1.03%	2.11%	-2.74%	0.96%
1995	0.52%	0.52%	0.84%	0.84%	-0.48%	-0.48%	1.17%	1.67%	0.12%	1.57%	0.77%	-0.15%	-0.12%	-0.99%	0.79%	1.21%	-0.14%	-1.16%	-0.19%	-0.99%	-0.10%	-1.18%	0.00%	-1.08%
1996	0.00%	-1.01%	0.00%	-0.93%	0.00%	-1.08%	0.00%	-4.01%	0.00%	-7.84%	0.00%	-9.76%	-1.13%	-7.96%	0.90%	-6.58%	1.29%	1.83%	0.00%	-7.35%	0.00%	-4.45%	0.00%	-1.99%
1997	-0.29%	-0.98%	-0.25%	-0.25%	0.18%	0.18%	0.00%	2.42%	0.00%	-6.44%	-0.01%	-10.37%	0.05%	-9.82%	0.05%	-8.67%	-2.61%	-6.84%	0.39%	-7.85%	0.00%	-8.98%	-0.79%	-1.64%
1998	0.25%	2.27%	0.39%	0.39%	-1.44%	-1.44%	-1.30%	-1.30%	1.12%	2.07%	-0.02%	-6.42%	0.01%	-10.05%	-0.04%	-8.72%	0.00%	-10.92%	0.00%	-11.02%	1.88%	-2.49%	1.90%	2.18%
1999	0.00%	-0.64%	0.00%	-1.45%	-0.42%	-2.36%	0.09%	1.04%	0.00%	-11.03%	0.00%	-11.41%	0.71%	-2.54%	0.91%	0.85%	-0.25%	1.39%	0.44%	-8.77%	0.00%	-9.36%	0.01%	-9.17%
2000	0.00%	-5.64%	0.00%	-6.52%	0.00%	-2.57%	0.01%	-11.07%	0.00%	-11.75%	0.00%	-11.87%	0.00%	-12.10%	0.22%	-11.90%	0.00%	-11.57%	0.89%	1.13%	0.90%	1.14%	0.00%	-1.45%
2001	0.00%	-1.19%	0.39%	1.89%	1.14%	1.14%	-0.51%	-0.76%	-0.01%	-9.35%	0.00%	-11.62%	0.00%	-11.08%	0.48%	-8.61%	-1.55%	-11.65%	0.00%	-9.82%	0.00%	-9.37%	0.00%	-10.19%
2002	0.00%	-9.76%	0.00%	-10.34%	0.11%	-11.01%	-2.04%	-11.56%	0.00%	-12.31%	0.00%	-12.62%	0.00%	-12.60%	0.00%	-11.79%	0.00%	-12.25%	0.00%	-12.17%	0.00%	-10.62%	-3.84%	-11.23%
2003	0.00%	-9.78%	-0.67%	-8.83%	-0.61%	-0.61%	-0.02%	-5.39%	0.00%	-9.10%	0.00%	-12.42%	0.00%	-12.54%	0.00%	-12.31%	-0.12%	-12.11%	0.00%	-12.28%	0.00%	-11.96%	0.17%	-8.86%
2004	0.00%	-9.78%	-0.67%	-8.83%	-0.61%	-0.61%	-0.02%	-5.39%	0.00%	-9.10%	0.00%	-12.42%	0.00%	-12.54%	0.00%	-12.31%	-0.12%	-12.11%	0.00%	-12.28%	0.00%	-11.96%	0.17%	-8.86%
2005	0.60%	0.60%	0.69%	0.69%	0.63%	0.63%	0.70%	0.92%	0.17%	-0.40%	-0.01%	-9.33%	1.28%	-7.61%	0.03%	-0.83%	-0.01%	-10.03%	0.00%	-10.34%	0.00%	-9.85%	0.00%	-8.08%
2006	0.00%	-8.08%	0.00%	-7.97%	-0.02%	-8.39%	0.00%	-10.09%	0.00%	-11.61%	0.00%	-11.95%	0.00%	-11.97%	0.00%	-9.72%	0.00%	-11.65%	-0.23%	-10.43%	0.00%	-10.17%	0.00%	-8.71%
2007	-0.09%	-11.70%	-0.02%	-11.52%	-0.02%	-7.05%	0.00%	-11.31%	0.00%	-12.09%	0.00%	-12.55%	-0.37%	-8.64%	-0.01%	0.48%	0.00%	-11.92%	0.00%	-12.03%	-4.34%	-11.78%	1.16%	1.65%
2008	-3.19%	-0.88%	0.33%	-3.16%	0.55%	0.96%	0.00%	1.49%	0.20%	-0.68%	0.01%	-6.57%	-0.87%	-0.57%	1.27%	-0.84%	-0.01%	-7.58%	0.00%	-6.77%	0.01%	-5.20%	-1.82%	0.22%
2009	0.39%	0.39%	0.51%	0.88%	0.20%	1.05%	0.00%	1.49%																

Figure 4-15. Habitat summary table for desert sucker *(Catostomus clarki)*, Braided site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Braided Site

With LWD

Desert Sucker

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.01%	-25.29%	-0.30%	-21.41%	0.54%	-20.82%	-0.96%	-20.52%	0.73%	-22.65%	0.17%	-23.81%	1.62%	-14.63%	-0.37%	0.17%
1966	-0.25%	-0.21%	1.52%	1.95%	0.03%	1.55%	0.00%	-22.35%	0.00%	-25.25%	-0.04%	-25.15%	0.00%	-25.05%	-1.51%	-21.12%	1.74%	-23.00%	0.00%	-25.04%	-0.50%	-23.94%	0.24%	-19.32%
1967	0.00%	-25.43%	0.00%	-25.13%	0.00%	-25.19%	0.00%	-25.04%	0.00%	-25.03%	0.00%	-25.04%	1.57%	-12.56%	0.37%	-10.06%	-0.20%	-23.71%	-2.31%	-23.54%	0.00%	-24.99%	0.56%	-6.17%
1968	-0.69%	2.71%	1.94%	3.84%	0.71%	0.96%	1.22%	-7.27%	2.13%	-23.27%	-0.04%	-25.25%	2.30%	-22.05%	1.59%	-20.03%	0.00%	-25.44%	0.00%	-25.42%	0.00%	-25.42%	1.35%	-23.56%
1969	1.16%	-6.22%	1.89%	6.14%	0.40%	1.70%	3.27%	-16.88%	3.05%	-20.39%	0.00%	-25.35%	0.00%	-25.29%	0.09%	-25.24%	0.04%	-25.03%	0.01%	-25.07%	0.00%	-25.53%	0.00%	-25.91%
1970	0.00%	-25.70%	-0.15%	-23.24%	0.00%	-20.63%	0.00%	-25.63%	0.00%	-25.22%	0.00%	-25.04%	-0.14%	-23.24%	-1.94%	-21.50%	1.01%	-14.61%	-0.01%	-25.04%	0.00%	-25.40%	0.00%	-25.61%
1971	0.00%	-25.60%	0.00%	-25.73%	0.00%	-25.62%	-0.01%	-25.06%	0.00%	-25.04%	-0.45%	-22.30%	0.31%	-21.70%	1.24%	-14.50%	0.27%	-11.82%	1.36%	-2.08%	2.68%	-20.87%	2.96%	-10.95%
1972	3.75%	-17.90%	0.00%	-25.47%	-0.01%	-25.16%	0.00%	-25.04%	0.00%	-24.98%	0.29%	-24.51%	1.51%	-23.09%	-0.53%	-22.80%	-2.49%	-20.54%	-1.19%	-13.55%	1.25%	-1.21%	3.03%	-2.16%
1973	0.55%	1.29%	-1.15%	-1.15%	-1.20%	-1.20%	1.26%	-0.22%	4.74%	6.87%	6.91%	-9.89%	2.27%	-9.05%	3.43%	-19.77%	1.24%	-24.76%	-0.54%	-26.02%	1.03%	-24.61%	-0.31%	-24.77%
1974	0.42%	-12.33%	0.43%	-20.83%	0.38%	-19.60%	-0.59%	-24.57%	-0.03%	-25.56%	0.00%	-25.24%	0.21%	-24.06%	1.05%	-23.58%	-0.11%	-25.50%	1.83%	-17.08%	3.56%	-22.68%	-0.05%	-25.90%
1975	0.00%	-25.79%	0.39%	-18.44%	3.15%	5.65%	0.63%	2.04%	3.02%	-22.08%	0.00%	-25.34%	-0.15%	-22.91%	0.00%	-25.25%	-0.01%	-25.37%	0.00%	-25.19%	0.00%	-25.16%	2.07%	-23.20%
1976	-2.66%	-18.04%	-3.05%	-11.04%	-0.05%	-20.06%	2.59%	-18.09%	1.71%	-24.38%	0.00%	-25.03%	0.38%	-18.64%	2.02%	-20.86%	0.71%	-22.17%	0.21%	-24.24%	0.00%	-25.37%	0.00%	-25.03%
1977	0.00%	-24.90%	0.00%	-25.53%	-0.73%	-25.16%	0.28%	-20.52%	0.00%	-25.03%	0.00%	-22.91%	0.00%	-24.31%	3.08%	-18.83%	0.91%	-21.70%	0.00%	-24.96%	0.01%	-23.55%	0.00%	-23.04%
1978	-1.52%	-10.36%	1.47%	-0.30%	1.02%	0.06%	0.34%	-22.42%	2.58%	-23.73%	0.00%	-25.23%	1.10%	-24.22%	0.00%	-22.56%	0.00%	-18.07%	-0.16%	-22.26%	1.99%	-12.39%	-1.83%	-0.39%
1979	0.00%	2.21%	3.12%	8.08%	0.82%	0.76%	1.61%	2.31%	3.72%	-4.34%	6.13%	-17.65%	0.70%	-25.10%	3.49%	-23.16%	0.51%	-25.30%	1.09%	-22.42%	1.30%	-24.41%	0.95%	-24.01%
1980	4.42%	0.29%	1.45%	2.26%	1.49%	3.81%	0.10%	-0.26%	0.69%	-7.95%	7.22%	-14.60%	2.44%	-9.60%	1.36%	-10.11%	4.47%	-12.32%	1.15%	-24.22%	0.88%	-24.72%	0.19%	-24.58%
1981	2.08%	-22.58%	-0.03%	-22.20%	2.30%	-1.57%	-0.91%	-18.59%	0.73%	-25.32%	-0.02%	-25.59%	3.94%	-21.47%	0.85%	-22.45%	1.34%	-21.24%	0.85%	-22.15%	1.32%	-21.23%	-0.54%	-21.09%
1982	-1.83%	-1.27%	-0.70%	-1.15%	0.91%	1.26%	1.12%	-7.42%	4.45%	-22.39%	-0.33%	-25.82%	0.33%	-25.28%	-0.23%	-22.60%	0.52%	-22.66%	0.32%	-25.01%	-3.17%	-9.92%	-0.82%	2.12%
1983	-2.30%	-0.11%	0.79%	0.12%	1.41%	2.38%	3.32%	4.90%	2.82%	-3.94%	4.64%	-22.13%	3.29%	-22.18%	0.70%	-19.68%	-1.57%	-13.48%	-1.00%	-9.56%	0.80%	-12.02%	-2.64%	0.41%
1984	-1.18%	1.69%	0.38%	-18.28%	0.00%	-24.71%	-0.02%	-24.98%	0.00%	-25.24%	0.00%	-25.03%	1.51%	-23.13%	0.53%	-18.71%	-0.81%	-8.21%	-0.44%	-8.50%	1.06%	-17.25%	0.76%	2.03%
1985	1.42%	4.14%	1.61%	2.96%	0.85%	3.31%	0.74%	0.69%	2.17%	-8.54%	3.09%	-23.28%	0.35%	-22.80%	1.21%	-22.19%	0.55%	-21.47%	1.27%	-12.83%	-1.12%	0.23%	1.89%	2.27%
1986	1.33%	-6.67%	-0.31%	1.35%	1.01%	0.31%	2.45%	-4.74%	1.85%	-23.86%	-0.33%	-25.83%	4.06%	-22.23%	1.50%	-16.30%	0.24%	-19.22%	3.04%	-22.96%	2.27%	-18.97%	2.53%	-16.16%
1987	0.26%	-9.03%	1.88%	4.01%	2.02%	3.41%	0.15%	-18.41%	1.98%	-24.30%	-0.01%	-25.11%	0.29%	-22.55%	0.97%	-20.52%	0.00%	-25.28%	1.10%	-21.06%	1.52%	-21.00%	2.30%	-22.03%
1988	1.48%	-1.74%	1.37%	2.43%	0.21%	-20.96%	1.99%	-14.19%	4.88%	-21.33%	-0.15%	-25.68%	3.01%	-20.74%	-3.81%	-4.57%	-0.96%	-10.65%	0.00%	-25.49%	0.00%	-25.33%	0.89%	-23.75%
1989	0.81%	-11.15%	0.18%	-0.06%	-0.32%	-18.72%	-0.80%	-20.35%	-0.01%	-25.11%	0.01%	-24.38%	0.28%	-24.04%	2.05%	-23.57%	0.00%	-25.09%	-0.02%	-25.05%	0.00%	-25.02%	0.00%	-25.02%
1990	0.00%	-25.43%	0.00%	-25.51%	0.00%	-25.54%	0.00%	-25.29%	1.88%	-23.56%	0.00%	-22.21%	0.00%	-23.83%	-0.36%	-21.36%	0.05%	-24.91%	0.05%	-24.93%	0.00%	-25.03%	-3.07%	-13.48%
1991	-1.97%	-6.24%	-0.28%	-21.52%	0.18%	3.57%	2.04%	3.57%	0.97%	-23.63%	0.00%	-25.23%	-0.03%	-25.04%	2.86%	-22.86%	-0.84%	-22.91%	-2.28%	-23.69%	-0.02%	-25.02%	-1.70%	-10.89%
1992	1.15%	0.53%	1.51%	2.21%	1.74%	3.73%	2.59%	4.20%	2.90%	-18.73%	0.34%	-24.98%	1.39%	-18.83%	-2.83%	-14.33%	3.84%	-21.43%	0.00%	-25.30%	-0.67%	-22.14%	-6.51%	-5.40%
1993	2.25%	3.80%	1.89%	2.08%	1.22%	3.49%	0.82%	2.07%	3.88%	-17.44%	5.93%	-18.62%	2.96%	-17.83%	2.58%	-17.28%	3.04%	-17.78%	3.61%	-13.82%	2.64%	3.30%	3.98%	-15.47%
1994	0.00%	-7.71%	1.06%	-0.86%	1.32%	3.46%	2.59%	-9.94%	3.91%	-19.70%	-0.45%	-25.91%	-0.15%	-25.74%	1.87%	-24.35%	0.05%	-25.61%	1.52%	-24.48%	1.22%	-22.25%	-5.38%	-9.45%
1995	3.12%	4.37%	0.81%	1.72%	1.74%	3.53%	1.70%	-10.14%	2.74%	-20.59%	0.77%	-25.01%	-0.12%	-25.72%	2.19%	-24.10%	-0.22%	-25.85%	-0.19%	-25.76%	-0.10%	-25.90%	0.00%	-25.98%
1996	0.00%	-25.97%	0.00%	-25.85%	0.00%	-25.89%	0.00%	-25.20%	0.00%	-25.03%	0.00%	-25.04%	1.61%	-23.63%	1.67%	-23.78%	0.64%	-18.05%	0.00%	-25.04%	0.00%	-25.17%	0.00%	-25.37%
1997	1.49%	-5.91%	3.18%	4.76%	0.93%	2.43%	0.00%	-22.69%	0.00%	-25.05%	-0.01%	-25.04%	0.05%	-22.79%	0.05%	-22.91%	-2.61%	-20.54%	0.11%	-22.34%	0.00%	-25.02%	0.81%	-23.20%
1998	0.03%	-19.95%	0.20%	3.90%	-0.42%	-0.24%	0.46%	-0.11%	3.15%	-21.98%	-0.02%	-25.03%	0.01%	-25.02%	-0.04%	-25.04%	0.00%	-24.91%	0.00%	-24.43%	2.21%	-23.01%	2.20%	-23.27%
1999	0.00%	-25.54%	0.00%	-25.42%	0.00%	-24.27%	2.79%	-16.44%	0.00%	-24.44%	0.00%	-21.90%	3.38%	-16.52%	3.54%	-21.00%	-0.17%	-14.36%	0.44%	-24.71%	0.00%	-25.06%	0.01%	-25.05%
2000	0.00%	-25.02%	0.00%	-24.90%	0.00%	-24.52%	0.01%	-24.15%	0.00%	-19.56%	0.00%	-18.70%	0.00%	-17.18%	0.22%	-18.51%	0.00%	-20.82%	0.52%	-8.72%	0.50%	-3.63%	0.00%	-25.42%
2001	0.00%	-25.34%	2.38%	-17.60%	3.79%	3.85%	0.07%	-19.88%	-0.01%	-25.06%	0.00%	-20.45%	0.00%	-17.97%	1.53%	-19.20%	-1.55%	-21.63%	0.00%	-20.86%	0.00%	-21.82%	0.00%	-24.80%
2002	0.00%	-25.08%	0.00%	-24.93%	0.11%	-24.09%	-2.04%	-20.86%	0.00%	-15.75%	0.00%	-13.63%	0.00%	-13.73%	0.00%	-15.37%	0.00%	-16.16%	0.00%	-16.67%	0.00%	-18.42%	-3.84%	-23.09%
2003	0.00%	-21.63%	1.63%	-20.81%	1.54%	4.05%	-0.02%	-23.72%	0.00%	-19.04%	0.00%	-14.97%	0.00%	-14.17%	0.00%	-15.75%	-0.12%	-17.08%	0.00%	-15.96%	0.00%	-18.12%	0.17%	-21.23%
2004	0.00%	-21.63%	1.63%	-20.81%	1.54%	4.05%	-0.02%	-23.72%	0.00%	-19.04%	0.00%	-14.97%	0.00%	-14.17%	0.00%	-15.75%	-0.12%	-17.08%	0.00%	-15.96%	0.00%	-18.12%	0.17%	-21.23%
2005	1.33%	1.46%	2.97%	0.26%	2.68%	3.20%	1.95%	-13.64%	0.17%	-25.33%	-0.01%	-25.04%	3.82%	-21.78%	0.47%	-21.16%	-0.01%	-25.03%	0.00%	-25.06%	0.00%	-25.06%	0.00%	-25.05%
2006	0.00%	-25.05%	0.00%	-25.05%	-0.02%	-25.03%	0.00%	-24.90%	0.00%	-20.54%	0.00%	-18.22%	0.00%	-18.07%	0.00%	-19.43%	0.00%	-20.22%	-0.23%	-20.63%	0.00%	-21.72%	0.00%	-22.62%
2007	-0.09%	-25.09%	-0.02%	-25.06%	-0.02%	-25.01%	0.00%	-22.56%	0.00%	-17.23%	0.00%	-14.11%	1.28%	-10.34%	1.93%	-6.80%	0.00%	-18.36%	0.00%	-17.63%	-3.81%	-19.37%	0.13%	3.22%
2008	-2.46%	0.64%	1.57%	1.79%	0.77%	2.74%	0.00%	-23.43%	0.20%	-25.62%	0.01%	-25.11%	0.00%	-20.48%	1.43%	-24.17%	-0.01%	-25.03%	0.00%	-25.02%	0.01%	-25.07%	-1.18%	-12.82%
2009	-0.29%	0.01%	1.14%	1.17%	0.53%	-6.28%	0.00%	-24.01%																

Figure 4-16. Habitat summary table for desert sucker *(Catostomus clarki)*, Braided site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 2 cfs									Gage Site No Wood Speckled dace															
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-18.05%	0.00%	-52.63%	0.31%	-47.28%	0.00%	-49.79%	0.00%	-49.14%	0.00%	-46.73%	-1.48%	-4.99%	0.27%	0.27%
1966	1.38%	1.38%	0.87%	1.03%	2.06%	2.06%	0.00%	-7.96%	0.00%	-18.40%	0.00%	-25.21%	0.00%	-35.90%	-0.46%	-9.25%	0.00%	-21.94%	0.00%	-28.71%	0.00%	-27.12%	0.15%	-15.57%
1967	0.00%	-11.52%	0.00%	-23.48%	0.00%	-20.92%	0.00%	-30.66%	0.00%	-28.71%	0.00%	-35.90%	0.12%	-33.52%	1.03%	-7.04%	0.00%	-23.48%	0.00%	-47.38%	0.00%	-39.23%	1.51%	1.51%
1968	0.53%	0.53%	0.65%	0.65%	1.97%	1.97%	-1.58%	-2.66%	-1.28%	-8.52%	-0.09%	-20.74%	0.00%	-12.18%	-0.17%	-8.52%	0.00%	-11.25%	0.00%	-11.84%	0.00%	-11.84%	0.00%	-8.93%
1969	1.50%	1.50%	2.43%	2.43%	1.99%	1.99%	-1.51%	-3.59%	-2.68%	-8.11%	0.00%	-14.45%	0.00%	-16.74%	0.00%	-16.25%	0.00%	-25.03%	0.00%	-24.69%	0.00%	-9.66%	0.00%	-8.43%
1970	0.00%	-8.63%	0.00%	-9.76%	0.00%	-8.03%	0.00%	-8.69%	0.00%	-19.57%	0.00%	-40.45%	0.00%	-46.84%	-0.58%	-38.63%	-1.21%	-1.71%	0.00%	-31.19%	0.00%	-12.48%	0.00%	-9.29%
1971	0.00%	-8.72%	0.00%	-8.59%	0.00%	-9.60%	0.00%	-37.00%	0.00%	-41.01%	0.00%	-50.89%	0.00%	-50.51%	-0.04%	-38.30%	0.11%	-28.47%	1.30%	1.30%	0.00%	-12.16%	0.53%	-6.19%
1972	0.00%	-10.89%	0.00%	-10.58%	0.00%	-21.77%	0.00%	-32.63%	0.00%	-38.11%	0.00%	-35.17%	0.00%	-35.90%	0.28%	-33.87%	0.07%	-47.77%	0.53%	-22.54%	0.93%	0.93%	1.64%	1.64%
1973	1.93%	1.93%	0.34%	0.34%	0.47%	0.47%	0.27%	0.27%	1.08%	1.08%	-2.69%	-2.69%	-1.11%	-1.11%	-6.86%	-6.97%	-6.76%	-8.05%	-4.17%	-8.33%	-3.60%	-8.17%	0.00%	-8.00%
1974	0.34%	-5.29%	0.00%	-6.93%	0.00%	-6.93%	0.00%	-8.38%	-0.26%	-8.89%	0.00%	-19.07%	0.00%	-17.39%	0.00%	-8.59%	-0.88%	-13.00%	-1.22%	-13.21%	0.00%	-8.45%	0.00%	-8.44%
1975	0.00%	-8.51%	0.00%	-8.41%	1.53%	1.53%	1.61%	1.61%	-2.79%	-8.10%	0.00%	-14.93%	-0.36%	-13.94%	0.00%	-18.57%	-0.09%	-15.18%	0.00%	-20.92%	0.00%	-22.11%	0.00%	-15.91%
1976	0.01%	-9.01%	1.32%	1.32%	0.00%	-7.68%	0.00%	-8.35%	-0.30%	-8.73%	0.00%	-28.35%	0.00%	-24.52%	0.00%	-22.28%	0.00%	-35.90%	0.00%	-9.73%	0.00%	-13.78%	0.00%	-26.95%
1977	0.00%	-8.49%	0.00%	-9.98%	0.00%	-8.77%	0.00%	-15.27%	0.00%	-36.08%	0.00%	-49.14%	-1.00%	-40.46%	-1.04%	-42.54%	-0.91%	-9.38%	0.00%	-38.95%	0.00%	-47.39%	0.00%	-48.78%
1978	0.84%	-9.03%	1.13%	1.13%	0.36%	0.36%	0.00%	-7.76%	-0.22%	-8.94%	0.00%	-19.41%	0.00%	-32.63%	0.00%	-50.13%	0.00%	-66.23%	0.00%	-49.15%	1.50%	-21.65%	1.22%	1.22%
1979	0.94%	0.94%	0.88%	0.88%	0.53%	0.53%	1.09%	1.09%	1.45%	1.45%	-6.06%	-6.06%	-3.31%	-8.65%	-1.08%	-8.40%	-0.74%	-8.55%	-5.06%	-7.81%	-7.44%	-7.44%	-2.96%	-7.40%
1980	1.02%	1.02%	0.19%	0.19%	0.65%	0.65%	2.81%	2.81%	0.36%	0.36%	-2.69%	-2.69%	-2.59%	-2.59%	-3.38%	-3.38%	-3.85%	-3.89%	-7.15%	-7.15%	-7.40%	-7.40%	-1.42%	-7.40%
1981	0.00%	-7.40%	0.00%	-6.90%	0.61%	-0.82%	-1.16%	-6.89%	-1.95%	-8.31%	-0.13%	-8.72%	-5.63%	-7.74%	-0.13%	-8.50%	-1.51%	-6.86%	-2.35%	-5.28%	-4.73%	-5.85%	0.24%	-5.70%
1982	1.08%	1.08%	1.57%	1.57%	0.55%	0.55%	2.14%	2.14%	-4.04%	-8.00%	-2.55%	-8.51%	-0.61%	-10.52%	0.00%	-8.57%	-0.17%	-9.14%	0.00%	-18.57%	-1.41%	-1.41%	2.04%	2.04%
1983	0.58%	0.58%	0.24%	0.24%	0.42%	0.42%	0.74%	0.74%	1.69%	1.69%	-7.22%	-7.98%	-6.78%	-8.07%	-2.86%	-8.18%	-1.28%	-3.51%	0.06%	-0.81%	-0.50%	-0.50%	2.02%	2.02%
1984	2.05%	2.05%	0.00%	-5.64%	0.00%	-7.48%	0.00%	-8.03%	0.00%	-19.07%	0.00%	-31.37%	0.00%	-33.17%	0.41%	-5.75%	1.13%	1.13%	1.25%	1.25%	-1.10%	-5.50%	0.45%	0.45%
1985	0.82%	0.82%	0.69%	0.69%	0.48%	0.48%	2.75%	2.75%	-2.72%	-2.72%	-1.93%	-8.57%	-0.26%	-8.86%	-4.16%	-8.04%	-4.04%	-4.87%	-3.27%	-3.27%	2.04%	2.04%	2.06%	2.06%
1986	0.00%	-2.72%	1.91%	1.91%	0.52%	0.52%	1.69%	1.69%	-2.63%	-7.95%	-2.60%	-8.51%	-1.84%	-8.82%	-0.59%	-0.59%	-0.47%	-21.53%	-6.26%	-8.13%	-4.19%	-6.41%	-2.16%	-6.41%
1987	1.10%	0.51%	1.30%	1.18%	1.39%	1.39%	-0.70%	-6.55%	-0.38%	-8.53%	0.00%	-23.83%	0.00%	-28.88%	0.00%	-12.69%	0.00%	-16.93%	-0.53%	-24.35%	-1.30%	-6.98%	0.00%	-8.27%
1988	2.07%	2.07%	1.92%	1.92%	0.00%	-7.77%	0.77%	-0.31%	-2.28%	-8.29%	-1.17%	-8.78%	-0.39%	-10.69%	-0.13%	-0.13%	1.09%	1.09%	0.00%	-10.11%	0.00%	-15.25%	0.00%	-10.87%
1989	0.30%	-5.43%	2.30%	2.30%	1.03%	-4.30%	0.00%	-8.21%	0.00%	-23.83%	0.00%	-44.41%	0.00%	-46.51%	0.00%	-25.18%	0.00%	-24.34%	0.00%	-26.25%	0.00%	-26.95%	0.00%	-26.77%
1990	0.00%	-9.92%	0.00%	-8.88%	0.00%	-9.32%	0.00%	-16.72%	0.00%	-34.62%	0.00%	-51.15%	0.00%	-46.21%	0.00%	-38.49%	0.00%	-40.53%	0.00%	-40.97%	0.00%	-28.71%	0.82%	-10.90%
1991	1.59%	1.59%	0.12%	-6.09%	0.15%	0.15%	0.40%	0.40%	-1.37%	-8.57%	0.00%	-19.24%	0.00%	-27.47%	0.00%	-29.94%	0.00%	-49.14%	0.00%	-47.06%	0.00%	-35.35%	0.81%	-2.77%
1992	2.40%	2.40%	1.29%	1.29%	0.70%	0.70%	1.36%	1.36%	-5.26%	-5.64%	0.00%	-19.24%	0.60%	-28.28%	0.06%	-6.89%	0.00%	-8.75%	0.00%	-16.57%	0.33%	-13.98%	1.05%	1.05%
1993	0.20%	0.20%	0.38%	0.38%	0.56%	0.56%	2.35%	2.35%	-1.64%	-1.64%	-2.72%	-2.72%	-4.90%	-4.90%	-2.58%	-2.62%	-4.19%	-4.19%	-5.63%	-5.63%	1.03%	1.03%	1.12%	1.06%
1994	0.00%	-2.72%	2.05%	2.05%	1.95%	2.03%	1.24%	1.24%	-5.24%	-7.47%	-3.50%	-8.43%	-1.20%	-8.59%	0.00%	-8.52%	-0.26%	-8.64%	-0.43%	-8.67%	-1.87%	-7.79%	0.20%	-5.07%
1995	0.77%	0.77%	1.33%	1.33%	0.70%	0.70%	-1.40%	-1.40%	-5.55%	-6.69%	-5.26%	-8.28%	-0.95%	-8.61%	-0.04%	-8.60%	-2.95%	-8.04%	-1.50%	-8.57%	-0.80%	-8.44%	0.00%	-8.37%
1996	0.00%	-8.33%	0.00%	-8.38%	0.00%	-8.45%	0.00%	-20.42%	0.00%	-33.35%	0.00%	-39.79%	0.00%	-31.36%	0.00%	-34.26%	-0.04%	-22.82%	0.00%	-31.37%	0.00%	-21.94%	0.00%	-13.62%
1997	1.65%	1.65%	1.90%	1.90%	1.34%	1.34%	0.00%	-8.58%	0.00%	-28.71%	0.00%	-41.86%	0.00%	-44.51%	0.00%	-43.82%	0.00%	-45.85%	0.00%	-46.29%	0.00%	-31.37%	0.00%	-22.97%
1998	0.00%	-7.58%	0.79%	0.79%	0.53%	0.53%	0.57%	0.57%	-1.38%	-8.37%	0.00%	-28.71%	0.00%	-30.66%	0.00%	-36.27%	0.00%	-43.89%	0.00%	-45.15%	0.00%	-25.55%	0.00%	-8.66%
1999	0.00%	-8.77%	0.00%	-11.84%	0.00%	-16.08%	0.00%	-8.44%	0.00%	-45.13%	0.00%	-52.08%	-1.03%	-43.36%	-0.17%	-13.26%	0.43%	-8.87%	0.00%	-37.74%	0.00%	-38.30%	0.00%	-37.74%
2000	0.00%	-26.25%	0.00%	-26.08%	0.00%	-19.07%	0.00%	-45.87%	0.00%	-60.06%	0.00%	-63.49%	0.00%	-70.42%	0.00%	-64.31%	0.00%	-55.56%	1.57%	-51.17%	1.66%	1.66%	0.00%	-11.84%
2001	0.00%	-11.53%	0.00%	-7.81%	1.73%	1.73%	0.00%	-8.02%	0.00%	-38.30%	0.00%	-56.82%	0.00%	-63.49%	0.00%	-50.00%	0.00%	-52.91%	0.00%	-51.15%	0.00%	-47.85%	0.00%	-41.62%
2002	0.00%	-39.60%	0.00%	-41.88%	0.00%	-45.56%	0.00%	-55.40%	0.00%	-78.13%	0.00%	-92.59%	0.00%	-91.74%	0.00%	-77.52%	0.00%	-75.76%	0.00%	-72.99%	0.00%	-60.42%	0.00%	-48.66%
2003	0.00%	-49.14%	0.00%	-49.14%	1.50%	1.50%	0.00%	-30.66%	0.00%	-54.24%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	0.00%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	0.00%	-48.18%
2004	0.00%	-49.14%	0.00%	-49.14%	1.50%	1.50%	0.00%	-30.66%	0.00%	-54.24%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	0.00%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	0.00%	-48.18%
2005	1.29%	-2.79%	0.35%	0.35%	1.68%	1.68%	1.03%	0.40%	-0.52%	-8.59%	0.00%	-38.30%	0.00%	-44.55%	0.00%	-26.42%	0.00%	-40.72%	0.00%	-41.67%	0.00%	-39.97%	0.00%	-34.08%
2006	0.00%	-34.08%	0.00%	-33.71%	0.00%	-35.35%	0.00%	-41.01%	0.00%	-56.50%	0.00%	-65.57%	0.00%	-66.23%	0.00%	-54.79%	0.00%	-57.64%	0.00%	-51.37%	0.00%	-49.75%	0.00%	-44.74%
2007	0.00%	-43.18%	0.00%	-35.90%	0.00%	-31.55%	0.00%	-50.13%	0.00%	-70.18%	0.00%	-88.89%	0.00%	-88.50%	0.00%	-58.14%	0.00%	-64.94%	0.00%	-68.26%	0.00%	-60.79%	1.58%	-4.55%
2008	1.22%	1.22%	0.53%	0.53%	1.79%	1.79%	0.00%	-8.11%	-0.30%	-8.54%	0.00%	-24.17%	0.00%	-20.58%	-0.74%	-14.54%	0.00%	-31.19%	0.00%	-26.42%	0.00%	-24.69%	1.99%	1.99%
2009	2.45%	2.45%	2.69%	2.69%	0.75%	0.40%	0.00%	-7.92%																

Figure 4-17. Habitat summary table for speckled dace (*Rhinichthys osculus*), Gage site, with no LWD and with a hypothetical withdrawal rate of 2 ft³/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Gage Site

No Wood

Speckled dace

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-100.00%	0.00%	-100.00%	1.57%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.93%	-100.00%	1.48%	-61.25%
1966	7.37%	7.37%	1.99%	-6.06%	8.79%	-16.67%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.25%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.75%	-100.00%
1967	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.60%	-100.00%	3.79%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	8.17%	-100.00%
1968	3.08%	3.08%	3.74%	3.74%	9.92%	9.92%	-3.05%	-48.00%	-1.28%	-100.00%	-0.09%	-100.00%	0.00%	-100.00%	-0.17%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1969	8.09%	-100.00%	11.86%	11.86%	9.99%	9.99%	-2.33%	-72.89%	-2.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1970	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.33%	-100.00%	-4.80%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1971	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.53%	-100.00%	5.70%	-100.00%	0.00%	-100.00%	2.74%	-100.00%
1972	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.42%	-100.00%	0.46%	-100.00%	1.95%	-91.99%	5.07%	-73.11%	8.58%	8.58%
1973	10.36%	10.36%	1.71%	1.71%	2.33%	2.33%	1.71%	1.71%	6.09%	6.09%	-15.80%	-46.96%	-8.39%	-64.24%	-8.97%	-96.54%	-6.84%	-100.00%	-4.17%	-100.00%	-3.60%	-100.00%	0.00%	-100.00%
1974	0.60%	-76.33%	0.00%	-96.54%	0.00%	-96.54%	0.00%	-100.00%	-0.26%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.88%	-100.00%	-1.08%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1975	0.00%	-100.00%	0.00%	-100.00%	8.18%	8.18%	8.21%	8.21%	-2.79%	-100.00%	0.00%	-100.00%	-0.04%	-100.00%	0.00%	-100.00%	-0.09%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1976	0.05%	-100.00%	8.10%	-85.31%	0.00%	-98.20%	0.00%	-100.00%	-0.30%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1977	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.15%	-100.00%	-1.19%	-100.00%	-1.60%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1978	3.44%	-100.00%	6.76%	6.76%	1.83%	1.83%	-0.78%	-100.00%	-0.22%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	5.70%	-100.00%	6.36%	6.36%
1979	4.96%	4.96%	4.92%	4.92%	2.61%	2.61%	7.30%	7.30%	-0.87%	-1.72%	-12.52%	-89.96%	-3.65%	-100.00%	-2.10%	-100.00%	-1.06%	-100.00%	-8.17%	-100.00%	-9.18%	-100.00%	-3.11%	-100.00%
1980	5.38%	-59.84%	0.98%	0.98%	3.57%	3.57%	14.69%	14.69%	-12.73%	-16.20%	-15.69%	-48.54%	-14.16%	-62.98%	-7.83%	-68.12%	-9.64%	-77.12%	-11.75%	-98.27%	-9.32%	-100.00%	-3.11%	-100.00%
1981	0.00%	-100.00%	0.00%	-96.55%	2.12%	-55.63%	-1.72%	-91.35%	-1.95%	-100.00%	-0.13%	-100.00%	-6.85%	-100.00%	-0.13%	-100.00%	-0.57%	-100.00%	-5.06%	-100.00%	-5.80%	-100.00%	1.60%	-100.00%
1982	3.91%	-30.91%	9.03%	9.03%	2.58%	2.58%	10.40%	-37.23%	-4.04%	-100.00%	-2.55%	-100.00%	-0.61%	-100.00%	0.00%	-100.00%	-1.22%	-100.00%	0.00%	-100.00%	-5.78%	-100.00%	10.68%	4.39%
1983	2.91%	2.09%	1.21%	1.21%	2.11%	2.11%	3.91%	3.91%	-4.35%	-23.15%	-8.69%	-100.00%	-7.18%	-100.00%	-2.86%	-100.00%	2.06%	-100.00%	4.38%	-87.72%	-7.94%	-100.00%	3.14%	-0.23%
1984	10.41%	10.41%	0.00%	-87.99%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.56%	-83.19%	2.22%	-100.00%	3.00%	-95.40%	-3.78%	-100.00%	2.29%	2.29%
1985	4.27%	4.27%	3.56%	3.56%	2.50%	2.50%	13.16%	13.16%	-10.55%	-58.17%	-1.93%	-100.00%	-0.26%	-100.00%	-4.29%	-100.00%	-5.68%	-100.00%	-8.16%	-84.29%	10.44%	-13.45%	10.48%	10.48%
1986	0.00%	-59.78%	8.55%	-12.62%	2.63%	2.63%	3.53%	-59.04%	-4.77%	-100.00%	-2.60%	-100.00%	-1.84%	-100.00%	-3.60%	-96.07%	0.12%	-100.00%	-6.54%	-100.00%	-7.30%	-91.22%	-3.87%	-91.22%
1987	5.33%	-68.56%	4.90%	3.42%	7.57%	7.57%	-0.70%	-93.06%	-0.38%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.68%	-100.00%	-3.37%	-100.00%	0.00%	-100.00%
1988	11.45%	-60.34%	10.92%	10.92%	0.00%	-100.00%	3.42%	-100.00%	-2.28%	-100.00%	-1.17%	-100.00%	-0.39%	-100.00%	-0.69%	-100.00%	3.67%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1989	0.54%	-81.57%	10.94%	10.94%	4.83%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1990	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	3.47%	-100.00%
1991	8.07%	-100.00%	0.58%	-100.00%	0.76%	-29.45%	2.01%	2.01%	-1.37%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	3.24%	-100.00%
1992	12.12%	12.12%	7.97%	7.97%	4.85%	4.85%	6.94%	6.94%	-8.31%	-87.99%	0.00%	-100.00%	0.60%	-100.00%	1.14%	-93.09%	0.00%	-100.00%	0.00%	-100.00%	1.60%	-100.00%	8.03%	-49.98%
1993	0.94%	0.94%	2.02%	2.02%	2.80%	2.80%	12.56%	12.56%	-13.77%	-20.57%	-14.89%	-59.78%	-12.78%	-82.92%	-5.34%	-91.02%	-9.84%	-91.22%	-11.10%	-87.29%	7.81%	-54.34%	-2.37%	-26.60%
1994	0.00%	-59.78%	10.05%	-42.99%	8.67%	9.55%	4.09%	-18.78%	-6.02%	-98.24%	-3.50%	-100.00%	-1.20%	-100.00%	-0.85%	-100.00%	-0.26%	-100.00%	-0.43%	-100.00%	-3.69%	-100.00%	2.19%	-83.46%
1995	3.94%	3.94%	7.41%	7.41%	4.80%	4.80%	-4.42%	-24.76%	-7.77%	-94.82%	-5.26%	-100.00%	-0.95%	-100.00%	-0.04%	-100.00%	-3.58%	-100.00%	-1.50%	-100.00%	-0.80%	-100.00%	0.00%	-100.00%
1996	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.69%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1997	8.72%	-100.00%	9.58%	9.58%	6.81%	6.81%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1998	0.00%	-98.22%	4.11%	-52.75%	2.71%	2.71%	3.09%	3.09%	-1.38%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1999	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.57%	-100.00%	-0.17%	-100.00%	1.01%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2000	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	6.62%	-100.00%	8.05%	-86.82%	0.00%	-100.00%
2001	0.00%	-100.00%	0.00%	-96.24%	8.25%	-56.08%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2002	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2003	0.00%	-100.00%	0.00%	-100.00%	8.37%	8.37%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2004	0.00%	-100.00%	0.00%	-100.00%	8.37%	8.37%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2005	6.49%	-7.18%	1.86%	1.86%	8.52%	8.52%	3.06%	-76.90%	-0.52%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2006	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2007	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	6.69%	-62.15%
2008	6.19%	6.19%	2.65%	2.65%	8.77%	-11.88%	0.00%	-100.00%	-0.30%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.13%	-98.04%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	10.01%	-100.00%
2009	12.11%	12.11%	12.98%	5.33%	3.45%	-63.45%	0.00%	-100.00%																

Figure 4-18. Habitat summary table for speckled dace (*Rhinichthys osculus*), Gage site, with no LWD and with a hypothetical withdrawal rate of 10 ft³/sec.

Summary of normalized habitat changes
Hypothetical Withdrawal 2 cfs

Gage Site
With LWD
Speckled dace

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-20.62%	0.00%	-52.63%	0.02%	-47.85%	0.00%	-49.82%	0.00%	-49.14%	0.00%	-46.73%	-0.74%	-3.63%	1.26%	1.26%
1966	0.65%	0.65%	1.20%	1.50%	2.09%	2.09%	0.00%	-10.48%	0.00%	-20.99%	0.00%	-26.95%	0.00%	-36.53%	-0.55%	-14.23%	0.00%	-24.08%	0.00%	-30.06%	0.00%	-28.65%	-0.26%	-19.13%
1967	0.00%	-15.05%	0.00%	-25.43%	0.00%	-23.19%	0.00%	-31.80%	0.00%	-30.06%	0.00%	-36.53%	0.51%	-35.52%	1.99%	-3.14%	0.00%	-25.43%	0.00%	-47.38%	0.00%	-39.59%	-0.47%	-0.47%
1968	1.39%	1.39%	2.35%	2.35%	0.85%	0.85%	1.03%	1.71%	-1.82%	-12.15%	-0.13%	-22.98%	0.00%	-15.60%	-0.11%	-11.08%	0.00%	-14.81%	0.00%	-15.33%	0.00%	-15.33%	0.00%	-12.59%
1969	0.51%	0.51%	-0.35%	-0.35%	0.27%	0.27%	0.68%	0.76%	3.14%	-2.51%	0.00%	-17.57%	0.00%	-19.55%	0.00%	-19.12%	0.00%	-26.80%	0.00%	-26.49%	0.00%	-13.41%	0.00%	-11.97%
1970	0.00%	-12.37%	0.00%	-13.45%	0.00%	-3.67%	0.00%	-12.49%	0.00%	-22.01%	0.00%	-40.70%	0.00%	-46.84%	-0.85%	-36.51%	1.44%	1.38%	0.00%	-32.28%	0.00%	-15.89%	0.00%	-13.01%
1971	0.00%	-12.56%	0.00%	-12.30%	0.00%	-13.24%	0.00%	-37.54%	0.00%	-41.22%	0.00%	-50.89%	0.00%	-50.51%	0.00%	-38.90%	0.19%	-27.48%	0.43%	0.43%	3.36%	-12.21%	0.97%	-1.83%
1972	1.49%	-7.59%	0.00%	-14.22%	0.00%	-23.93%	0.00%	-33.58%	0.00%	-38.56%	0.00%	-35.87%	0.00%	-36.53%	0.52%	-32.78%	0.00%	-49.50%	-0.54%	-25.20%	-0.53%	-0.53%	0.52%	0.52%
1973	-0.70%	-0.70%	1.13%	1.13%	-0.20%	-0.20%	1.32%	1.32%	2.47%	2.47%	-0.65%	-0.65%	2.29%	2.29%	-2.37%	-2.60%	-9.42%	-11.21%	-5.89%	-11.78%	-5.04%	-11.45%	0.00%	-11.13%
1974	2.18%	2.56%	1.28%	-2.48%	0.16%	2.63%	0.00%	-11.87%	-0.38%	-12.74%	0.00%	-21.57%	0.00%	-20.08%	-0.33%	-11.09%	-1.28%	-16.17%	-1.37%	-16.89%	0.00%	-12.02%	0.00%	-11.99%
1975	0.00%	-12.13%	1.06%	2.54%	-2.51%	-2.51%	0.33%	0.33%	-0.51%	-8.18%	0.00%	-17.98%	-1.15%	-16.69%	0.00%	-21.13%	-0.13%	-18.11%	0.00%	-23.19%	0.00%	-24.23%	0.00%	-18.68%
1976	0.02%	-12.75%	0.99%	0.99%	0.00%	3.02%	2.64%	1.51%	-0.43%	-12.42%	0.00%	-29.74%	2.17%	-24.75%	0.00%	-24.38%	0.00%	-36.53%	0.00%	-13.45%	0.00%	-17.00%	0.00%	-28.49%
1977	0.00%	-12.10%	0.00%	-13.66%	0.00%	-12.67%	0.00%	-18.27%	0.00%	-36.70%	0.00%	-49.14%	-0.74%	-40.86%	-1.55%	-42.58%	1.64%	-11.01%	0.00%	-39.34%	0.00%	-47.39%	0.00%	-48.78%
1978	0.15%	-7.04%	-1.12%	-1.12%	-0.72%	-0.72%	1.91%	-6.84%	-0.31%	-12.66%	0.00%	-21.86%	0.00%	-33.58%	0.00%	-50.13%	0.00%	-66.23%	0.00%	-49.28%	1.47%	-22.53%	0.32%	0.32%
1979	3.52%	3.52%	-0.79%	-0.79%	0.52%	0.52%	-1.42%	-1.42%	2.75%	2.75%	6.26%	6.26%	-4.69%	-12.08%	-1.63%	-11.31%	-1.06%	-12.21%	-7.10%	-8.63%	-9.71%	-9.71%	-2.55%	-8.55%
1980	0.78%	0.78%	0.06%	0.06%	-0.48%	-0.48%	-0.05%	-0.05%	1.69%	1.69%	5.99%	5.99%	2.14%	2.14%	-0.55%	-0.55%	-0.58%	-0.64%	-8.57%	-8.57%	-9.17%	-9.17%	-0.71%	-8.83%
1981	1.24%	-5.88%	0.15%	-3.59%	2.14%	2.44%	1.87%	-0.82%	-2.76%	-11.73%	-0.19%	-12.57%	-6.94%	-8.51%	0.42%	-10.61%	-3.08%	-10.36%	-3.29%	-7.71%	-3.75%	-4.95%	0.76%	-5.62%
1982	2.01%	2.01%	-0.90%	-0.90%	-0.32%	-0.32%	1.37%	1.37%	-5.61%	-11.11%	-3.64%	-12.13%	-0.88%	-14.05%	0.44%	-7.43%	-0.47%	-9.71%	0.00%	-21.13%	0.53%	0.53%	-0.20%	-0.20%
1983	0.19%	0.19%	0.87%	0.87%	-0.17%	-0.17%	-0.29%	-0.29%	3.98%	3.98%	-9.99%	-11.04%	-6.28%	-8.44%	-0.47%	-1.53%	-0.39%	-2.82%	2.67%	2.67%	4.91%	4.91%	1.01%	1.01%
1984	1.39%	1.39%	1.96%	2.67%	0.00%	-9.40%	0.00%	-11.18%	0.00%	-21.57%	0.00%	-32.44%	0.00%	-34.06%	0.60%	-8.30%	1.62%	1.62%	2.60%	2.60%	3.22%	1.84%	0.63%	0.63%
1985	2.07%	2.07%	-0.84%	-0.84%	1.74%	1.74%	-0.34%	-0.34%	1.27%	1.27%	-2.75%	-12.24%	-0.38%	-12.67%	-2.50%	-6.89%	-4.24%	-5.23%	0.32%	0.32%	-1.61%	-1.61%	-1.00%	-1.00%
1986	4.02%	6.07%	1.51%	1.51%	0.54%	0.54%	3.84%	3.84%	-3.95%	-11.02%	-3.70%	-12.13%	-2.63%	-12.43%	1.86%	1.86%	0.00%	-25.13%	-7.43%	-10.08%	-3.71%	-3.73%	2.42%	-3.16%
1987	1.82%	2.87%	1.97%	2.89%	1.20%	1.20%	3.43%	3.67%	-0.55%	-12.16%	0.00%	-25.73%	0.00%	-30.22%	0.00%	-15.90%	0.00%	-19.71%	-1.18%	-26.65%	-0.86%	-6.05%	0.00%	-11.64%
1988	-1.45%	-1.45%	0.56%	0.56%	0.00%	3.45%	1.72%	1.72%	0.10%	-8.67%	-1.67%	-12.51%	-0.57%	-14.23%	1.60%	1.60%	1.25%	1.25%	0.00%	-13.72%	0.00%	-18.27%	0.00%	-14.51%
1989	1.27%	0.38%	0.62%	0.62%	1.07%	-2.60%	2.44%	2.72%	0.00%	-25.73%	0.00%	-44.48%	0.00%	-46.53%	0.00%	-26.89%	0.00%	-26.19%	0.00%	-27.88%	0.00%	-28.49%	0.00%	-28.34%
1990	0.00%	-13.65%	0.00%	-12.71%	0.00%	-13.12%	0.00%	-19.50%	0.00%	-35.37%	0.00%	-51.15%	0.00%	-46.27%	1.52%	-36.80%	0.00%	-40.81%	0.00%	-41.24%	0.00%	-30.06%	-0.07%	-2.43%
1991	0.79%	0.79%	0.24%	-7.34%	0.93%	0.93%	1.52%	1.52%	-1.96%	-12.25%	0.00%	-21.72%	0.00%	-28.96%	0.00%	-31.17%	0.00%	-49.14%	0.00%	-47.06%	0.00%	-36.04%	1.10%	-3.78%
1992	-0.04%	-0.04%	-0.64%	-0.64%	0.58%	0.58%	0.46%	0.46%	-3.42%	-3.96%	0.00%	-21.72%	0.28%	-24.82%	1.14%	-3.69%	0.00%	-12.62%	0.00%	-19.40%	-0.03%	-19.05%	0.16%	0.16%
1993	0.05%	0.05%	0.83%	0.83%	0.53%	0.53%	0.98%	0.98%	0.43%	0.43%	3.84%	3.84%	-2.90%	-2.90%	2.04%	1.98%	3.04%	3.04%	-3.37%	-3.37%	-0.71%	-0.71%	1.08%	1.08%
1994	0.78%	1.71%	1.76%	1.76%	4.04%	4.04%	1.00%	1.00%	2.43%	2.43%	-4.97%	-11.97%	-1.72%	-12.28%	0.16%	-11.36%	-0.37%	-12.40%	-0.83%	-12.28%	-0.57%	-9.12%	1.85%	1.85%
1995	2.70%	2.70%	0.65%	0.65%	-0.67%	-0.67%	0.80%	1.06%	-2.02%	-3.68%	-7.40%	-11.66%	-1.36%	-12.33%	-0.06%	-12.30%	-3.85%	-11.06%	-2.14%	-12.24%	-1.14%	-11.99%	0.00%	-11.85%
1996	0.00%	-11.78%	0.00%	-11.87%	0.00%	-12.00%	0.00%	-22.74%	0.00%	-34.23%	0.00%	-40.08%	0.00%	-32.41%	0.00%	-35.05%	0.01%	-19.93%	0.00%	-32.44%	0.00%	-24.08%	0.00%	-16.86%
1997	-0.41%	-0.41%	-0.44%	-0.44%	0.16%	0.16%	0.00%	-12.27%	0.00%	-30.06%	0.00%	-41.99%	0.00%	-44.52%	0.00%	-43.87%	0.00%	-45.85%	0.00%	-46.29%	0.00%	-32.44%	0.00%	-24.98%
1998	2.28%	0.67%	-1.02%	-1.02%	1.04%	1.04%	1.46%	1.46%	1.01%	-9.19%	0.00%	-30.06%	0.00%	-31.80%	0.00%	-36.87%	0.00%	-43.90%	0.00%	-45.15%	0.00%	-27.26%	0.00%	-12.43%
1999	0.00%	-12.66%	0.00%	-15.33%	0.00%	-18.98%	3.00%	3.00%	0.00%	-45.13%	0.00%	-52.08%	-1.49%	-43.33%	0.09%	-15.99%	0.44%	-10.03%	0.00%	-38.21%	0.00%	-38.72%	0.00%	-38.21%
2000	0.00%	-27.88%	0.00%	-27.72%	0.00%	-21.57%	0.00%	-45.87%	0.00%	-60.06%	0.00%	-63.49%	0.00%	-70.42%	0.00%	-64.31%	0.00%	-55.56%	0.00%	-54.20%	-0.27%	-0.27%	0.00%	-15.33%
2001	0.00%	-15.06%	1.43%	-4.64%	0.08%	0.08%	3.57%	3.57%	0.00%	-38.72%	0.00%	-56.82%	0.00%	-63.49%	0.00%	-50.00%	0.00%	-52.91%	0.00%	-51.15%	0.00%	-47.85%	0.00%	-41.81%
2002	0.00%	-39.91%	0.00%	-42.04%	0.00%	-45.60%	0.00%	-55.40%	0.00%	-78.13%	0.00%	-92.59%	0.00%	-91.74%	0.00%	-77.52%	0.00%	-75.76%	0.00%	-72.99%	0.00%	-60.42%	0.00%	-48.66%
2003	0.00%	-49.14%	0.00%	-49.14%	0.63%	0.63%	0.00%	-31.80%	0.00%	-54.26%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	0.00%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	0.00%	-48.18%
2004	0.00%	-49.14%	0.00%	-49.14%	0.63%	0.63%	0.00%	-31.80%	0.00%	-54.26%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	0.00%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	0.00%	-48.18%
2005	0.95%	-7.12%	0.04%	0.04%	-0.73%	-0.73%	1.16%	1.16%	-0.74%	-12.28%	0.00%	-38.72%	0.00%	-44.58%	0.00%	-28.03%	0.00%	-40.94%	0.00%	-41.81%	0.00%	-40.25%	0.00%	-34.88%
2006	0.00%	-34.88%	0.00%	-34.55%	0.00%	-36.04%	0.00%	-41.24%	0.00%	-56.50%	0.00%	-65.57%	0.00%	-66.23%	0.00%	-54.79%	0.00%	-57.64%	0.00%	-51.64%	0.00%	-49.75%	0.00%	-44.75%
2007	0.00%	-43.21%	0.00%	-36.53%	0.00%	-32.61%	0.00%	-50.13%	0.00%	-70.18%	0.00%	-88.89%	0.00%	-88.50%	1.67%	-56.28%	0.00%	-64.94%	0.00%	-68.26%	0.00%	-60.79%	1.29%	0.15%
2008	0.07%	0.07%	0.91%	0.91%	0.98%	0.98%	0.00%	-11.34%	-0.43%	-12.18%	0.00%	-26.04%	-1.24%	-22.35%	-0.30%	-15.43%	0.00%	-32.28%	0.00%	-28.03%	0.00%	-26.49%	0.45%	0.45%
2009	2.02%	2.02%	-0.06%	-0.06%	0.88%	1.36%	0.00%	-10.97%																

Figure 4-19. Habitat summary table for speckled dace (*Rhinichthys osculus*), Gage site, with LWD and a hypothetical withdrawal rate of 2 ft³/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Gage Site
With LWD
Speckled dace

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-100.00%	0.00%	-100.00%	0.12%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	4.31%	-100.00%	6.52%	-49.00%
1966	-1.43%	-1.43%	2.08%	7.23%	11.07%	12.16%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.19%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.82%	-100.00%
1967	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.25%	-100.00%	5.49%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.21%	-100.00%
1968	-3.92%	-3.92%	3.18%	3.18%	2.60%	3.34%	3.63%	-37.57%	-1.82%	-100.00%	-0.13%	-100.00%	0.00%	-100.00%	-1.69%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1969	-0.13%	-100.00%	0.07%	0.07%	-1.22%	-1.22%	11.58%	-68.61%	5.85%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1970	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.01%	-100.00%	-0.05%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1971	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.95%	-100.00%	4.18%	-100.00%	4.01%	-100.00%	8.77%	-100.00%
1972	8.08%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.42%	-100.00%	0.00%	-100.00%	-2.69%	-87.07%	-0.44%	-75.69%	-0.60%	-0.60%
1973	-1.39%	-1.39%	6.09%	6.09%	-1.00%	-1.00%	6.61%	6.61%	6.83%	6.83%	2.26%	-38.62%	-4.29%	-61.17%	-3.00%	-96.55%	-9.53%	-100.00%	-5.89%	-100.00%	-5.04%	-100.00%	0.00%	-100.00%
1974	9.85%	-73.73%	1.59%	-96.63%	0.40%	-96.33%	0.00%	-100.00%	-0.38%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.86%	-100.00%	-1.28%	-100.00%	-2.55%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1975	0.00%	-100.00%	4.19%	-100.00%	-9.84%	-9.84%	2.31%	2.31%	-0.51%	-100.00%	0.00%	-100.00%	-1.13%	-100.00%	0.00%	-100.00%	-0.13%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1976	0.12%	-100.00%	2.58%	-93.44%	0.00%	-98.09%	9.49%	-100.00%	-0.43%	-100.00%	0.00%	-100.00%	2.17%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.85%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1977	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.96%	-100.00%	-1.78%	-100.00%	0.54%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1978	2.58%	-100.00%	-3.52%	-3.52%	-1.85%	-1.85%	2.56%	-100.00%	-0.31%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	3.75%	-100.00%	-3.16%	-7.93%
1979	13.43%	13.43%	-3.59%	-3.59%	2.49%	2.49%	-3.49%	-3.49%	11.89%	11.89%	2.30%	-88.81%	-5.16%	-100.00%	-2.33%	-100.00%	-1.51%	-100.00%	-12.45%	-100.00%	-12.10%	-100.00%	-2.77%	-100.00%
1980	5.48%	-69.02%	0.37%	0.37%	-4.04%	-4.04%	-0.34%	-0.34%	6.79%	6.79%	-7.08%	-45.97%	-6.71%	-61.74%	-4.50%	-72.26%	-1.63%	-76.08%	-14.96%	-98.41%	-11.83%	-100.00%	-3.06%	-100.00%
1981	1.24%	-100.00%	0.60%	-96.56%	6.47%	-44.14%	4.60%	-91.38%	-2.76%	-100.00%	-0.19%	-100.00%	-7.40%	-100.00%	0.85%	-100.00%	-2.42%	-100.00%	-6.69%	-100.00%	-3.25%	-100.00%	1.48%	-100.00%
1982	6.93%	-33.22%	-2.63%	-2.63%	-0.56%	-0.56%	8.54%	-21.29%	-5.61%	-100.00%	-3.64%	-100.00%	-0.88%	-100.00%	2.73%	-100.00%	1.81%	-100.00%	0.00%	-100.00%	-5.37%	-100.00%	0.68%	0.68%
1983	3.91%	5.06%	4.34%	4.34%	-0.86%	-0.86%	-0.62%	-0.62%	17.02%	5.33%	-12.04%	-100.00%	-6.47%	-100.00%	5.12%	-100.00%	2.37%	-100.00%	7.47%	-86.35%	6.18%	-100.00%	11.81%	11.81%
1984	14.10%	14.10%	1.96%	-87.96%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.30%	-85.29%	7.79%	-100.00%	10.75%	-94.74%	6.13%	-100.00%	3.74%	3.74%
1985	5.43%	5.43%	-1.67%	-1.67%	7.04%	7.04%	3.35%	3.35%	12.06%	-48.51%	-2.75%	-100.00%	-0.38%	-100.00%	-3.83%	-100.00%	-6.78%	-100.00%	-4.33%	-84.01%	-4.53%	-29.56%	-1.49%	-1.49%
1986	5.35%	-57.61%	5.85%	-6.91%	1.80%	1.80%	13.07%	-46.33%	-6.61%	-100.00%	-3.70%	-100.00%	-2.63%	-100.00%	0.87%	-96.08%	0.00%	-100.00%	-8.17%	-100.00%	-5.26%	-91.57%	7.33%	-90.82%
1987	7.06%	-62.12%	5.37%	10.44%	3.75%	3.75%	10.95%	-92.27%	-0.55%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.43%	-100.00%	-3.79%	-100.00%	0.00%	-100.00%
1988	-4.22%	-69.54%	1.78%	1.78%	0.00%	-100.00%	9.70%	-100.00%	0.10%	-100.00%	-1.67%	-100.00%	-0.57%	-100.00%	7.92%	-100.00%	9.89%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1989	6.32%	-79.23%	7.92%	7.92%	6.60%	-100.00%	8.91%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1990	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	3.45%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	7.76%	-100.00%
1991	6.39%	-100.00%	1.20%	-100.00%	4.66%	4.66%	7.59%	7.59%	-1.96%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	4.46%	-100.00%
1992	3.62%	3.62%	2.40%	2.40%	2.91%	2.91%	4.68%	-9.37%	-7.74%	-88.74%	0.00%	-100.00%	0.98%	-100.00%	1.17%	-92.51%	0.00%	-100.00%	0.00%	-100.00%	0.42%	-100.00%	-1.35%	-59.39%
1993	0.78%	0.78%	4.19%	4.19%	2.52%	2.52%	5.57%	5.57%	11.18%	-1.19%	-10.34%	-59.64%	-14.07%	-84.00%	-1.99%	-90.38%	-3.92%	-90.62%	-9.91%	-88.11%	1.51%	-68.97%	12.18%	-7.79%
1994	0.78%	-60.92%	8.91%	-35.94%	12.07%	13.13%	11.43%	3.99%	9.11%	-98.10%	-4.97%	-100.00%	-1.72%	-100.00%	-0.33%	-100.00%	-0.37%	-100.00%	-0.43%	-100.00%	-1.53%	-100.00%	11.09%	-80.63%
1995	15.95%	15.95%	4.33%	4.33%	-2.21%	-2.21%	7.87%	-6.77%	-5.24%	-95.04%	-7.40%	-100.00%	-1.36%	-100.00%	-0.06%	-100.00%	-4.74%	-100.00%	-2.14%	-100.00%	-1.14%	-100.00%	0.00%	-100.00%
1996	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.67%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1997	-5.13%	-100.00%	-3.84%	-3.84%	-0.35%	-11.85%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1998	8.45%	-98.17%	-6.40%	-73.31%	5.70%	5.70%	7.71%	7.71%	1.01%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1999	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	11.72%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.29%	-100.00%	0.09%	-100.00%	3.28%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2000	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.66%	-89.25%	0.00%	-100.00%
2001	0.00%	-100.00%	4.67%	-96.23%	1.66%	-56.92%	16.36%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2002	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2003	0.00%	-100.00%	0.00%	-100.00%	2.99%	-2.62%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2004	0.00%	-100.00%	0.00%	-100.00%	2.99%	-2.62%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2005	6.73%	-9.22%	1.88%	1.88%	-1.04%	-1.04%	9.55%	-72.51%	-0.74%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2006	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2007	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	4.43%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	5.25%	-69.39%
2008	-0.76%	-0.76%	4.81%	4.81%	5.29%	-26.34%	0.00%	-100.00%	-0.43%	-100.00%	0.00%	-100.00%	-3.53%	-100.00%	0.71%	-98.09%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.48%	-100.00%
2009	8.02%	8.02%	-0.05%	-0.05%	3.59%	-54.98%	0.00%	-100.00%																

Figure 4-20. Habitat summary table for speckled dace (*Rhinichthys osculus*), Gage site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Braided Site

No Wood

Speckled dace

Hypothetical Withdrawal 2 cfs

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									1.56%	-37.21%	-3.96%	-52.22%	0.50%	-28.01%	12.19%	-44.93%	0.00%	-50.66%	0.70%	-46.73%	0.00%	-25.00%	-3.12%	-3.12%
1966	-1.68%	-3.15%	-0.96%	-3.76%	0.00%	-6.12%	-2.75%	0.62%	0.00%	-30.58%	-1.96%	-30.88%	0.00%	-35.25%	2.43%	-24.94%	0.00%	-39.60%	0.00%	-27.28%	0.00%	-25.45%	-0.73%	-23.15%
1967	0.00%	-24.48%	0.00%	-34.31%	-0.40%	-32.42%	-1.74%	-30.69%	0.00%	-27.28%	0.00%	-35.25%	0.00%	-35.25%	0.00%	-30.58%	-5.40%	-29.06%	-10.07%	-47.71%	0.00%	-40.52%	0.00%	-34.31%
1968	0.47%	0.47%	-0.11%	-0.11%	-0.81%	-1.61%	-14.25%	-18.01%	8.88%	-18.18%	1.10%	-53.79%	0.00%	-25.55%	0.13%	-26.17%	0.01%	-31.47%	0.00%	-33.25%	-0.14%	-25.85%	0.00%	-24.47%
1969	2.36%	-4.89%	-1.49%	-4.59%	-2.16%	-2.93%	-5.36%	-25.76%	7.14%	-10.79%	0.00%	-27.72%	0.00%	-29.37%	1.26%	-27.97%	1.76%	-28.63%	1.73%	-29.60%	-2.18%	-22.87%	0.00%	-18.18%
1970	0.00%	-25.49%	0.00%	-24.11%	0.00%	-9.44%	0.00%	-24.93%	0.00%	-38.44%	0.00%	-40.49%	-0.73%	-48.61%	2.46%	-25.64%	-1.62%	-37.39%	0.00%	-30.05%	0.00%	-23.84%	0.00%	-24.49%
1971	0.00%	-24.61%	0.00%	-25.79%	0.00%	-25.68%	0.00%	-36.45%	0.00%	-40.99%	-2.01%	-50.89%	0.00%	-50.51%	12.15%	-35.63%	0.00%	-36.21%	-3.49%	-30.62%	0.00%	-24.61%	0.00%	-22.92%
1972	0.00%	-24.56%	0.00%	-29.62%	-1.62%	-30.87%	0.00%	-31.64%	0.00%	-38.19%	0.00%	-41.09%	0.00%	-35.25%	0.00%	-35.25%	0.00%	-44.73%	5.29%	-12.21%	12.14%	8.30%	0.25%	-0.01%
1973	-0.22%	-1.53%	0.32%	0.32%	0.45%	0.45%	0.27%	0.27%	-1.62%	-2.20%	-1.47%	-22.88%	-25.49%	-27.53%	26.88%	26.63%	18.62%	-8.11%	-6.54%	-28.12%	-0.70%	-8.69%	4.72%	4.97%
1974	1.85%	-8.80%	0.00%	-1.46%	0.00%	20.36%	0.00%	-18.26%	-0.42%	-23.80%	0.00%	-50.69%	0.00%	-28.14%	2.51%	-22.33%	-1.43%	-23.07%	0.15%	-28.80%	-0.72%	-22.47%	-0.59%	-21.55%
1975	0.00%	-26.13%	0.00%	-13.25%	-0.05%	-0.75%	-2.60%	-7.43%	10.19%	-6.34%	0.00%	-27.72%	-0.07%	-26.24%	0.00%	-37.68%	-0.15%	-33.54%	0.00%	-32.42%	0.00%	-33.30%	0.00%	-26.70%
1976	0.00%	-23.75%	4.59%	-8.05%	0.00%	-4.61%	0.26%	-13.12%	2.37%	-22.21%	0.00%	-26.94%	-1.10%	-36.82%	1.01%	-34.38%	0.02%	-35.25%	0.00%	-24.50%	0.00%	-27.24%	0.00%	-25.32%
1977	0.00%	-13.20%	0.00%	-23.90%	0.00%	-24.11%	0.00%	-28.40%	0.00%	-35.45%	0.00%	-49.14%	0.00%	-47.48%	-7.75%	-57.17%	4.05%	-26.71%	0.00%	-40.65%	-1.50%	-48.18%	0.00%	-48.78%
1978	0.00%	-32.52%	1.42%	-0.40%	-0.43%	-4.65%	0.00%	-4.36%	-0.35%	-24.88%	0.00%	-31.31%	0.00%	-31.64%	0.00%	-50.13%	0.00%	-66.23%	-0.38%	-49.96%	0.00%	-30.43%	6.75%	-2.16%
1979	-1.18%	-1.18%	-0.10%	-0.10%	0.75%	0.75%	-0.08%	-0.08%	-2.51%	-6.84%	-4.57%	-7.99%	1.37%	-22.48%	-1.70%	-23.25%	7.43%	-19.75%	24.49%	12.25%	13.57%	26.72%	0.00%	7.96%
1980	-15.27%	-14.44%	0.23%	0.23%	0.40%	-0.59%	-0.30%	-1.27%	-7.73%	-9.08%	-2.27%	-26.34%	-29.82%	-31.01%	-5.20%	-9.19%	-20.29%	-20.29%	26.37%	26.37%	17.70%	27.14%	0.00%	26.54%
1981	0.00%	22.12%	0.00%	22.58%	-0.16%	-19.50%	-3.62%	-8.00%	-3.06%	-21.70%	-0.92%	-24.54%	-3.88%	-18.89%	0.39%	-21.66%	-3.69%	-27.68%	7.44%	6.80%	-9.70%	-11.83%	-3.41%	-8.83%
1982	1.62%	-4.78%	-1.18%	-5.48%	0.06%	1.25%	-2.83%	-24.48%	0.97%	-8.61%	-4.05%	-26.53%	-0.08%	-31.57%	0.53%	-22.45%	-5.26%	-24.39%	0.00%	-30.70%	0.00%	-24.72%	-0.85%	-0.39%
1983	0.11%	2.28%	0.40%	0.40%	0.07%	0.07%	-0.07%	-0.07%	-5.38%	-13.70%	7.42%	-8.20%	0.28%	-21.61%	2.60%	-13.54%	-2.74%	-26.98%	8.91%	6.61%	27.14%	24.42%	0.24%	-5.81%
1984	-1.77%	-6.34%	-6.43%	4.48%	0.00%	21.87%	-2.63%	0.55%	0.00%	-35.75%	0.00%	-43.34%	0.00%	-39.03%	-2.00%	-12.51%	-3.54%	-26.80%	-2.59%	-4.20%	2.26%	-8.70%	-0.01%	-0.01%
1985	0.05%	0.05%	-0.12%	-0.12%	0.21%	0.21%	-0.64%	-1.36%	-27.22%	-29.67%	-14.39%	-26.03%	-2.17%	-24.49%	-3.35%	-14.81%	-7.88%	-15.66%	0.83%	-10.83%	-19.19%	-29.41%	-1.76%	-8.31%
1986	-0.49%	-22.22%	0.00%	-8.14%	0.58%	0.29%	-10.77%	-20.42%	14.74%	2.13%	-4.12%	-26.56%	-2.98%	-20.97%	-6.63%	-20.36%	1.63%	-30.26%	-9.55%	-29.95%	-1.74%	-5.17%	-24.82%	-13.15%
1987	-13.64%	-21.42%	0.01%	-3.46%	0.22%	-0.77%	3.34%	1.38%	0.04%	-19.69%	-1.72%	-27.06%	0.00%	-27.48%	-1.54%	-23.38%	0.00%	-26.32%	1.73%	-39.16%	0.66%	-11.69%	-17.86%	-11.58%
1988	-2.86%	7.74%	0.00%	-2.49%	-2.61%	-1.54%	0.00%	-13.99%	-3.44%	-22.01%	-1.87%	-25.30%	-0.64%	-24.66%	-4.32%	-13.88%	0.00%	-24.00%	-0.92%	-30.45%	0.00%	-42.12%	0.00%	-22.81%
1989	-0.63%	-16.73%	-1.43%	-3.40%	0.00%	-8.15%	-1.96%	-9.72%	-1.67%	-31.34%	-1.44%	-45.15%	1.09%	-48.17%	-0.43%	-39.10%	1.64%	-42.39%	-1.86%	-34.94%	0.00%	-25.32%	0.00%	-25.12%
1990	0.00%	-22.33%	0.00%	-23.52%	0.00%	-23.25%	0.00%	-29.18%	0.14%	-32.52%	0.00%	-51.15%	0.00%	-48.89%	-0.26%	-45.70%	1.58%	-45.32%	0.00%	-41.32%	0.02%	-32.41%	0.00%	-29.37%
1991	-1.38%	-8.22%	0.00%	-20.40%	-0.05%	-0.05%	-4.36%	-9.93%	-2.19%	-25.94%	0.00%	-31.19%	-3.71%	-36.12%	1.77%	-31.43%	-3.66%	-49.14%	-9.62%	-47.06%	0.00%	-34.64%	0.13%	-30.00%
1992	-0.58%	-0.83%	-0.22%	-0.22%	0.26%	-0.10%	-11.61%	-17.65%	-6.58%	-15.38%	0.00%	-31.19%	2.11%	-29.49%	6.70%	-15.48%	0.00%	-24.36%	0.00%	-46.93%	0.00%	-35.33%	-13.80%	-21.49%
1993	-0.08%	-0.08%	0.71%	0.71%	0.40%	0.40%	-1.34%	-2.93%	-2.87%	-4.64%	-25.20%	-27.75%	-31.20%	-31.20%	23.42%	23.10%	4.79%	3.22%	-1.07%	-14.95%	-6.86%	-6.86%	3.12%	2.72%
1994	0.16%	-27.92%	2.44%	-26.94%	-0.05%	-1.68%	-1.95%	-2.90%	0.81%	-9.28%	-5.52%	-27.27%	-1.92%	-25.86%	0.00%	-22.95%	-0.42%	-25.31%	-2.50%	-25.18%	-4.93%	-18.54%	-16.65%	-23.50%
1995	-4.57%	-1.77%	-0.01%	-0.38%	0.69%	0.69%	-1.91%	-8.93%	1.88%	-0.77%	10.98%	-13.71%	-1.51%	-25.66%	-0.07%	-25.76%	-1.74%	-25.76%	-2.39%	-26.03%	-1.27%	-27.17%	0.00%	-13.17%
1996	0.00%	-12.32%	0.00%	-11.47%	0.00%	-21.17%	0.00%	-32.05%	0.00%	-32.44%	0.00%	-39.49%	1.70%	-42.21%	0.00%	-33.44%	-1.85%	-36.44%	0.00%	-30.66%	0.00%	-33.17%	0.00%	-27.12%
1997	0.00%	-24.03%	0.13%	-2.76%	0.00%	-14.73%	-0.55%	-24.40%	0.00%	-28.69%	0.00%	-41.72%	1.74%	-45.34%	2.90%	-39.39%	-10.68%	-34.54%	7.18%	-37.91%	0.05%	-37.19%	1.60%	-27.18%
1998	-1.60%	-5.61%	3.24%	-12.01%	-0.43%	-0.43%	-0.54%	-0.54%	-7.88%	-19.27%	1.63%	-27.32%	0.00%	-41.42%	1.44%	-35.68%	0.00%	-44.45%	0.00%	-45.15%	-0.12%	-30.35%	0.00%	-25.18%
1999	0.00%	-24.15%	0.00%	-25.85%	0.00%	-31.97%	0.00%	-20.85%	0.00%	-45.12%	0.00%	-52.08%	-1.45%	-47.29%	-0.28%	-28.28%	3.12%	-25.30%	0.00%	-37.26%	0.00%	-37.87%	0.00%	-37.26%
2000	0.00%	-24.53%	0.00%	-28.56%	-0.06%	-30.72%	-1.46%	-46.66%	0.00%	-60.06%	0.00%	-63.49%	0.00%	-70.42%	14.43%	-64.31%	0.00%	-55.56%	-16.77%	-54.20%	-4.72%	-7.64%	0.00%	-25.85%
2001	0.00%	-24.44%	0.00%	-18.91%	1.31%	-6.34%	-1.22%	-7.93%	0.00%	-37.87%	0.00%	-56.82%	0.00%	-61.65%	2.81%	-56.91%	-7.15%	-53.85%	0.00%	-47.09%	0.00%	-42.95%	0.00%	-42.32%
2002	0.00%	-39.28%	0.00%	-42.31%	1.86%	-46.52%	-9.79%	-55.40%	0.00%	-78.13%	0.00%	-92.59%	0.00%	-91.74%	0.00%	-76.68%	0.00%	-75.76%	0.00%	-72.99%	0.00%	-57.63%	-16.63%	-48.66%
2003	0.00%	-45.23%	0.00%	-49.14%	-2.52%	-4.37%	0.00%	-29.46%	0.00%	-47.82%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	-0.68%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	2.46%	-41.75%
2004	0.00%	-45.23%	0.00%	-49.14%	-2.52%	-4.37%	0.00%	-29.46%	0.00%	-47.82%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	-0.68%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	2.46%	-41.75%
2005	3.87%	1.36%	0.35%	0.35%	-0.17%	-1.68%	0.07%	-7.22%	-0.82%	-25.86%	0.00%	-37.87%	0.44%	-45.63%	0.00%	-26.28%	0.00%	-40.50%	0.00%	-41.52%	0.00%	-39.69%	0.00%	-33.24%
2006	0.00%	-33.24%	0.00%	-32.84%	0.02%	-34.46%	0.00%	-40.78%	0.00%	-56.50%	0.00%	-65.57%	0.00%	-66.23%	0.00%	-50.01%	0.00%	-57.64%	0.00%	-50.70%	0.00%	-46.84%	0.00%	-44.02%
2007	0.00%	-46.67%	-1.93%	-48.41%	0.07%	-29.71%	0.00%	-50.13%	0.00%	-70.18%	0.00%	-88.89%	0.00%	-88.50%	0.00%	-58.14%	0.00%	-64.94%	0.00%	-68.26%	0.00%	-60.79%	3.71%	-10.40%
2008	-0.83%	0.26%	0.66%	-2.05%	-0.17%	-18.35%	-2.77%	1.10%	-0.48%	-21.61%	1.62%	-38.69%	0.00%	-40.01%	2.10%	-19.37%	0.05%	-31.59%	0.00%	-28.91%	1.73%	-29.60%	0.00%	-21.21%
2009	-2.03%	-3.45%	-0.95%	-4.27%	0.00%	-28.84%	0.00%	-8.80%																

Figure 4-21. Habitat summary table for speckled dace (*Rhinichthys osculus*), Braided site, with no LWD and with a hypothetical withdrawal rate of 2 ft³/sec.

Braided Site

No Wood

Summary of normalized habitat changes

Speckled dace

Hypothetical Withdrawal 10 cfs

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									1.56%	-100.00%	-3.96%	-100.00%	0.50%	-100.00%	12.19%	-100.00%	0.00%	-100.00%	0.70%	-100.00%	0.00%	-100.00%	-2.42%	-61.51%
1966	-5.44%	-34.20%	-2.61%	-31.81%	0.00%	-41.61%	-2.75%	-100.00%	0.00%	-100.00%	-1.96%	-100.00%	0.00%	-100.00%	1.21%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.33%	-100.00%
1967	0.00%	-100.00%	0.00%	-100.00%	-0.40%	-100.00%	-1.74%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-6.72%	-100.00%	-10.07%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1968	-1.12%	-1.53%	-0.16%	3.71%	-0.84%	-8.24%	-3.93%	-72.02%	9.00%	-100.00%	1.10%	-100.00%	0.00%	-100.00%	0.13%	-100.00%	0.01%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1969	2.36%	-100.00%	-2.21%	-27.25%	-9.64%	-28.82%	-6.85%	-96.96%	7.14%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.26%	-100.00%	1.76%	-100.00%	1.73%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1970	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.73%	-100.00%	-1.49%	-100.00%	-1.62%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1971	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.01%	-100.00%	0.00%	-100.00%	12.15%	-100.00%	0.00%	-100.00%	-5.54%	-95.39%	0.00%	-100.00%	0.00%	-100.00%
1972	0.00%	-100.00%	0.00%	-100.00%	-1.62%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-6.92%	-96.99%	-0.27%	-97.75%	-6.14%	-30.56%
1973	-2.42%	-16.49%	-0.23%	-0.23%	-1.24%	-1.24%	1.33%	4.06%	-15.65%	-53.69%	-21.03%	-78.52%	-20.67%	-76.41%	22.40%	-96.22%	18.45%	-100.00%	-6.54%	-100.00%	-2.33%	-100.00%	1.49%	-100.00%
1974	0.53%	-82.07%	0.00%	-96.38%	0.00%	-96.38%	0.00%	-100.00%	-0.42%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.51%	-100.00%	-1.43%	-100.00%	0.15%	-100.00%	-0.72%	-100.00%	-0.59%	-100.00%
1975	0.00%	-100.00%	0.00%	-100.00%	-0.42%	-8.02%	-8.23%	-79.55%	12.32%	-100.00%	0.00%	-100.00%	-0.07%	-100.00%	0.00%	-100.00%	-0.15%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1976	0.00%	-100.00%	4.13%	-51.78%	0.00%	-98.47%	0.26%	-100.00%	2.37%	-100.00%	0.00%	-100.00%	-1.10%	-100.00%	1.54%	-100.00%	0.02%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1977	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-7.81%	-100.00%	2.87%	-100.00%	0.00%	-100.00%	-1.50%	-100.00%	0.00%	-100.00%
1978	0.00%	-100.00%	0.78%	-10.64%	0.71%	-61.20%	-3.46%	-100.00%	-0.35%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.38%	-100.00%	0.00%	-100.00%	-14.15%	-60.46%
1979	-2.03%	-5.12%	-0.45%	-0.69%	4.02%	4.02%	0.37%	-1.16%	-25.68%	-76.59%	-8.68%	-91.28%	0.80%	-100.00%	-3.31%	-100.00%	6.89%	-100.00%	18.05%	-100.00%	13.15%	-100.00%	0.00%	-100.00%
1980	-15.27%	-84.20%	1.15%	1.15%	1.03%	0.96%	-5.91%	-27.80%	-20.29%	-74.05%	-21.31%	-87.59%	-19.98%	-74.81%	-0.69%	-63.03%	-14.80%	-82.01%	17.02%	-98.10%	13.15%	-100.00%	0.00%	-100.00%
1981	0.00%	-100.00%	0.00%	-98.67%	-0.16%	-66.49%	-2.11%	-92.54%	-3.06%	-100.00%	-0.21%	-100.00%	-4.99%	-100.00%	2.08%	-100.00%	-3.69%	-100.00%	1.07%	-100.00%	-11.83%	-100.00%	-9.23%	-100.00%
1982	0.48%	-29.15%	-1.37%	-19.62%	0.61%	-4.63%	-8.12%	-80.41%	8.50%	-100.00%	-4.05%	-100.00%	-0.08%	-100.00%	2.21%	-100.00%	-1.96%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.89%	-2.88%
1983	0.97%	-13.61%	1.99%	2.37%	0.35%	0.35%	-0.25%	-0.36%	-16.53%	-75.10%	15.69%	-100.00%	0.07%	-100.00%	2.60%	-100.00%	-2.74%	-100.00%	2.32%	-91.68%	23.01%	-100.00%	-23.48%	-71.01%
1984	-1.77%	-27.04%	-6.43%	-88.16%	0.00%	-100.00%	-2.63%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-6.28%	-96.00%	-3.54%	-100.00%	-5.19%	-96.92%	-0.41%	-100.00%	-2.41%	-59.38%
1985	-0.66%	-2.87%	0.55%	-1.23%	1.33%	-0.20%	-4.72%	-23.52%	-17.09%	-77.46%	-3.07%	-100.00%	-0.42%	-100.00%	-1.94%	-100.00%	-7.55%	-100.00%	-4.83%	-87.62%	-17.55%	-74.92%	-17.51%	-73.96%
1986	-2.25%	-68.87%	0.00%	-56.66%	2.94%	-22.23%	-5.31%	-73.22%	14.79%	-100.00%	-4.12%	-100.00%	-2.45%	-100.00%	-6.23%	-97.10%	1.63%	-100.00%	-10.18%	-100.00%	-3.27%	-92.29%	-26.76%	-86.43%
1987	-13.95%	-79.22%	0.01%	-28.47%	-0.40%	-39.24%	3.34%	-93.18%	2.16%	-100.00%	-1.72%	-100.00%	0.00%	-100.00%	0.75%	-100.00%	0.00%	-100.00%	1.73%	-100.00%	1.34%	-100.00%	-20.67%	-100.00%
1988	-3.53%	-57.00%	0.00%	-25.58%	-2.61%	-100.00%	0.00%	-100.00%	-3.44%	-100.00%	-1.87%	-100.00%	-3.21%	-100.00%	-5.15%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1989	-3.42%	-86.54%	-1.43%	-29.65%	0.00%	-100.00%	-1.96%	-100.00%	-1.67%	-100.00%	-1.44%	-100.00%	1.09%	-100.00%	-0.43%	-100.00%	1.64%	-100.00%	-1.86%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1990	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.14%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.26%	-100.00%	1.58%	-100.00%	0.00%	-100.00%	0.02%	-100.00%	-1.42%	-100.00%
1991	-1.38%	-100.00%	0.00%	-100.00%	-0.39%	3.46%	1.93%	-72.06%	-2.19%	-100.00%	0.00%	-100.00%	-3.71%	-100.00%	1.77%	-100.00%	-3.66%	-100.00%	-9.62%	-100.00%	0.00%	-100.00%	-2.09%	-100.00%
1992	-4.27%	-20.43%	-1.89%	-8.93%	1.18%	1.42%	-4.39%	-68.44%	2.16%	-89.20%	0.00%	-100.00%	0.51%	-100.00%	3.49%	-91.39%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-29.99%	-67.21%
1993	-0.48%	-2.96%	3.55%	4.59%	1.94%	9.13%	-12.20%	-42.98%	-18.80%	-93.91%	-18.19%	-94.07%	-18.67%	-86.79%	19.06%	-90.81%	-1.20%	-90.39%	-6.99%	-84.87%	-15.38%	-86.79%	-30.22%	-94.07%
1994	-5.78%	-69.01%	2.44%	-61.47%	-4.31%	-16.87%	-1.33%	-81.46%	1.78%	-98.46%	-5.52%	-100.00%	-1.92%	-100.00%	-0.53%	-100.00%	-0.42%	-100.00%	-0.83%	-100.00%	-1.39%	-100.00%	-30.77%	-71.41%
1995	-12.00%	-19.53%	-1.02%	-2.12%	0.78%	-11.14%	-4.66%	-79.85%	19.79%	-94.57%	10.98%	-100.00%	-1.51%	-100.00%	-0.07%	-100.00%	-2.75%	-100.00%	-2.39%	-100.00%	-1.27%	-100.00%	0.00%	-100.00%
1996	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.70%	-100.00%	0.00%	-100.00%	-1.85%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1997	0.00%	-100.00%	-0.50%	-18.18%	0.00%	-56.98%	-0.55%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.74%	-100.00%	2.90%	-100.00%	-10.68%	-100.00%	1.97%	-100.00%	0.05%	-100.00%	-1.80%	-100.00%
1998	-1.60%	-98.46%	3.24%	-87.01%	3.32%	4.98%	1.54%	-70.37%	0.12%	-100.00%	1.63%	-100.00%	0.00%	-100.00%	1.44%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-1.02%	-100.00%	0.00%	-100.00%
1999	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-4.94%	-100.00%	-0.28%	-100.00%	-2.73%	-92.08%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2000	0.00%	-100.00%	0.00%	-100.00%	-0.06%	-100.00%	-1.46%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	14.43%	-100.00%	0.00%	-100.00%	-16.77%	-100.00%	-1.43%	-94.01%	0.00%	-100.00%
2001	0.00%	-100.00%	0.00%	-96.99%	1.31%	-63.66%	-1.22%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.81%	-100.00%	-7.15%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2002	0.00%	-100.00%	0.00%	-100.00%	1.86%	-100.00%	-9.79%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-16.63%	-100.00%
2003	0.00%	-100.00%	0.00%	-100.00%	-2.52%	-52.31%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.46%	-100.00%
2004	0.00%	-100.00%	0.00%	-100.00%	-2.52%	-52.31%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	2.46%	-100.00%
2005	2.11%	-13.28%	2.04%	-0.08%	-0.76%	-13.63%	0.07%	-88.16%	-0.82%	-100.00%	0.00%	-100.00%	0.44%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2006	0.00%	-100.00%	0.00%	-100.00%	0.02%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2007	0.00%	-100.00%	-1.93%	-100.00%	0.07%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.08%	-74.39%
2008	-2.99%	-43.99%	3.31%	8.62%	-0.17%	-60.62%	-2.77%	-100.00%	-0.48%	-100.00%	1.62%	-100.00%	0.00%	-100.00%	0.66%	-99.81%	0.05%	-100.00%	0.00%	-100.00%	1.73%	-100.00%	0.00%	-100.00%
2009	-3.80%	-36.49%	-2.28%	-37.96%	0.00%	-72.76%	0.00%	-100.00%																

Figure 4-22. Habitat summary table for speckled dace (*Rhinichthys osculus*), Braided site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 2 cfs										Braided Site With LWD Speckled dace														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.54%	-27.34%	-3.96%	-52.22%	2.76%	-34.13%	12.16%	-44.88%	0.00%	-50.23%	0.70%	-46.73%	-2.59%	-0.97%	0.42%	0.42%
1966	2.65%	2.65%	-0.11%	-0.85%	0.78%	0.77%	-1.20%	0.39%	0.00%	-19.10%	-0.67%	-24.59%	0.00%	-34.77%	0.79%	-13.80%	0.00%	-30.24%	0.00%	-26.22%	0.00%	-22.03%	-0.35%	-14.34%
1967	0.00%	-11.27%	0.00%	-24.43%	0.00%	-21.75%	-0.52%	-28.94%	0.00%	-26.22%	0.00%	-34.77%	0.08%	-33.21%	0.12%	-7.16%	-7.60%	-22.57%	-10.01%	-47.63%	0.00%	-40.24%	2.95%	-2.79%
1968	-1.03%	0.89%	-0.19%	-0.19%	3.33%	3.33%	-2.28%	-2.52%	3.08%	-6.29%	0.31%	-47.29%	0.00%	-12.20%	0.06%	-10.67%	0.00%	-19.54%	0.00%	-20.93%	-0.06%	-12.16%	0.00%	-9.46%
1969	0.97%	3.05%	2.35%	2.96%	3.57%	3.57%	-2.48%	-8.96%	3.89%	-3.69%	0.00%	-14.94%	0.00%	-17.35%	0.55%	-16.22%	0.56%	-23.54%	0.56%	-23.60%	-0.98%	-9.00%	0.00%	-7.82%
1970	0.00%	-10.15%	0.00%	-9.58%	0.43%	-2.28%	0.00%	-9.77%	0.00%	-28.48%	0.00%	-40.17%	-0.76%	-47.66%	0.83%	-25.10%	3.14%	-20.25%	0.00%	-29.21%	0.00%	-11.61%	0.00%	-9.57%
1971	0.00%	-9.55%	0.00%	-10.36%	0.00%	-10.83%	0.00%	-36.05%	0.00%	-40.79%	-2.01%	-50.89%	0.00%	-50.51%	11.21%	-33.85%	1.04%	-27.36%	-0.68%	-11.04%	0.00%	-11.01%	-3.01%	-4.28%
1972	0.00%	-10.53%	0.00%	-18.83%	-0.55%	-21.79%	0.00%	-30.92%	0.00%	-37.63%	0.00%	-40.61%	0.00%	-34.77%	0.00%	-34.77%	0.00%	-44.73%	2.20%	-22.28%	0.26%	0.26%	1.49%	0.84%
1973	0.25%	0.25%	0.52%	0.52%	-0.11%	-0.11%	0.04%	0.04%	0.18%	0.18%	0.56%	-3.32%	-5.22%	-5.69%	8.04%	8.61%	7.73%	-2.30%	-3.08%	-12.02%	0.82%	-2.31%	2.09%	2.20%
1974	0.72%	0.45%	0.00%	-0.62%	0.00%	8.71%	0.00%	-8.01%	-0.19%	-9.20%	0.00%	-42.63%	0.00%	-16.75%	1.14%	-8.76%	-0.64%	-11.56%	1.11%	-13.64%	-0.33%	-9.48%	-0.28%	-9.24%
1975	0.00%	-10.66%	-0.36%	-5.52%	2.38%	4.74%	0.80%	0.80%	3.84%	-2.20%	0.00%	-15.04%	-0.03%	-13.79%	0.00%	-27.41%	-0.06%	-23.44%	0.00%	-21.75%	0.00%	-23.00%	0.00%	-14.70%
1976	-2.13%	-5.81%	-2.36%	-3.11%	0.00%	-1.67%	0.30%	-5.62%	1.33%	-8.54%	0.00%	-25.81%	-0.33%	-30.33%	0.29%	-25.04%	0.01%	-34.77%	0.00%	-10.13%	0.00%	-14.23%	0.00%	-24.09%
1977	0.00%	-4.08%	0.00%	-9.13%	0.00%	-9.22%	0.00%	-15.87%	0.00%	-34.98%	0.00%	-49.14%	0.00%	-46.23%	-2.28%	-51.63%	1.78%	-17.58%	0.00%	-40.15%	-0.50%	-47.66%	0.00%	-48.78%
1978	-4.41%	-12.35%	0.43%	0.49%	0.37%	0.37%	0.00%	-2.01%	-0.16%	-9.87%	0.00%	-20.16%	0.00%	-30.92%	0.00%	-50.13%	0.00%	-66.23%	-0.44%	-49.34%	-1.86%	-28.62%	2.87%	3.02%
1979	-1.46%	0.96%	0.43%	0.74%	0.17%	0.17%	0.96%	0.96%	0.36%	1.26%	0.37%	-1.74%	0.99%	-8.59%	-0.89%	-9.98%	3.27%	-7.21%	9.66%	5.67%	5.61%	11.05%	0.00%	3.29%
1980	-0.48%	-0.07%	0.29%	0.29%	0.37%	0.92%	0.05%	0.64%	0.09%	0.59%	2.34%	-5.66%	-8.15%	-8.81%	-4.09%	-5.37%	-3.60%	-3.60%	10.96%	10.96%	7.32%	11.22%	0.00%	10.98%
1981	0.00%	9.15%	0.00%	8.79%	-0.25%	-3.60%	-0.45%	-3.55%	-1.44%	-9.50%	-0.42%	-9.52%	-1.81%	-8.07%	0.16%	-8.99%	-0.58%	-10.67%	3.78%	0.22%	-2.19%	-3.06%	-2.45%	-2.61%
1982	-2.29%	-2.50%	-1.53%	0.77%	1.63%	1.46%	0.62%	0.66%	0.68%	-3.10%	-1.88%	-10.88%	-0.03%	-19.40%	0.24%	-9.08%	-2.39%	-13.55%	0.00%	-19.28%	-4.27%	-0.44%	-1.17%	0.49%
1983	-0.04%	-3.50%	0.32%	0.32%	0.11%	0.11%	0.44%	0.44%	-0.37%	1.45%	3.09%	-2.44%	0.25%	-8.72%	-0.03%	-5.58%	-1.74%	-2.02%	-2.55%	1.83%	-1.62%	3.72%	-3.42%	1.09%
1984	0.27%	0.46%	-2.40%	2.17%	0.00%	9.03%	-1.18%	0.39%	0.00%	-25.26%	0.00%	-42.63%	0.00%	-38.41%	-0.44%	-3.89%	-3.78%	-0.90%	-3.75%	1.25%	0.28%	-2.87%	0.31%	0.31%
1985	0.45%	0.45%	0.31%	0.29%	0.16%	0.16%	1.87%	2.05%	-5.89%	-7.04%	-6.62%	-10.53%	-0.98%	-9.52%	-1.58%	-6.64%	1.08%	-2.20%	2.25%	2.16%	-2.30%	-1.58%	0.59%	0.59%
1986	1.11%	-4.03%	-3.01%	0.55%	0.18%	0.18%	0.89%	-1.48%	6.03%	1.25%	-1.91%	-10.90%	-1.37%	-8.53%	0.96%	-0.13%	0.63%	-21.31%	-2.41%	-11.41%	-0.22%	-0.83%	-8.21%	-2.46%
1987	1.17%	-0.53%	1.70%	1.24%	0.80%	0.81%	1.72%	0.85%	0.25%	-7.71%	-0.56%	-21.33%	0.00%	-26.44%	-0.69%	-14.48%	0.00%	-18.24%	0.56%	-33.98%	2.32%	-2.52%	-6.70%	-3.70%
1988	-1.15%	0.87%	-1.12%	0.94%	-1.18%	-0.33%	-0.71%	-0.33%	-0.79%	-8.92%	-0.85%	-10.03%	-0.29%	-10.54%	-1.28%	1.20%	0.11%	-0.41%	-0.41%	-18.95%	0.00%	-32.03%	0.00%	-10.10%
1989	-0.94%	-5.12%	0.16%	0.16%	1.10%	-1.11%	-0.91%	-4.38%	-0.55%	-23.56%	-0.48%	-44.57%	1.11%	-47.71%	-0.20%	-33.56%	0.53%	-36.65%	-0.60%	-31.21%	0.00%	-24.09%	0.00%	-23.88%
1990	0.00%	-8.50%	0.00%	-8.96%	0.00%	-8.98%	0.00%	-17.29%	0.03%	-31.79%	0.00%	-51.15%	0.00%	-47.38%	0.04%	-43.72%	0.68%	-44.80%	0.00%	-41.20%	0.01%	-31.43%	-5.75%	-14.65%
1991	-4.88%	-3.60%	3.76%	-9.26%	0.01%	0.01%	0.11%	0.11%	-1.01%	-10.49%	0.00%	-19.98%	-1.15%	-33.32%	0.50%	-30.04%	-3.66%	-49.14%	-9.62%	-47.06%	0.00%	-34.12%	-0.41%	-8.20%
1992	0.60%	0.60%	0.36%	2.64%	0.45%	1.06%	0.48%	0.48%	-2.65%	-6.12%	0.00%	-19.98%	0.69%	-24.66%	-4.66%	-6.16%	0.00%	-9.39%	0.00%	-38.30%	0.93%	-23.66%	-6.81%	-5.74%
1993	0.23%	0.55%	0.10%	0.10%	0.04%	0.04%	-0.42%	1.60%	-0.30%	-0.13%	-8.87%	-9.99%	-12.75%	-12.75%	7.30%	6.55%	0.32%	-0.20%	5.69%	0.97%	-4.24%	3.25%	-0.13%	0.43%
1994	0.00%	-9.08%	-1.69%	-2.29%	0.35%	1.45%	-0.07%	-0.35%	0.81%	-3.06%	-2.58%	-11.41%	-0.88%	-10.41%	0.00%	-9.45%	-0.19%	-10.03%	-1.14%	-9.94%	-2.30%	-8.07%	-2.29%	-0.88%
1995	0.51%	0.51%	0.50%	0.50%	0.18%	0.18%	-0.11%	0.43%	1.05%	-0.09%	4.69%	-4.58%	-0.69%	-10.27%	-0.03%	-10.34%	-0.81%	-10.75%	-1.10%	-10.53%	-0.59%	-11.34%	0.00%	-6.18%
1996	0.00%	-5.78%	0.00%	-5.32%	0.00%	-9.03%	0.00%	-21.22%	0.00%	-31.77%	0.00%	-39.27%	0.51%	-39.83%	0.00%	-32.84%	-0.62%	-30.18%	0.00%	-29.84%	0.00%	-22.82%	0.00%	-14.05%
1997	0.31%	-1.72%	0.47%	0.47%	0.59%	0.59%	-0.57%	-9.89%	0.00%	-26.67%	0.00%	-41.63%	0.76%	-44.15%	1.02%	-38.46%	-11.98%	-33.75%	3.05%	-35.73%	0.01%	-36.42%	0.55%	-20.24%
1998	-2.83%	-2.39%	0.17%	0.17%	0.39%	0.39%	0.45%	0.45%	-3.74%	-8.12%	0.46%	-26.23%	0.00%	-40.69%	0.37%	-35.20%	0.00%	-44.14%	0.00%	-45.15%	-0.06%	-23.59%	0.00%	-9.94%
1999	0.00%	-9.24%	0.00%	-12.16%	0.00%	-20.26%	0.75%	-7.71%	0.00%	-45.12%	0.00%	-52.08%	-0.80%	-45.33%	-0.15%	-19.41%	0.92%	-12.02%	0.00%	-36.91%	0.00%	-37.55%	0.00%	-36.91%
2000	0.00%	-23.24%	0.00%	-27.33%	0.00%	-19.40%	-0.49%	-46.14%	0.00%	-60.06%	0.00%	-63.49%	0.00%	-70.42%	6.28%	-64.31%	0.00%	-55.56%	-16.77%	-54.20%	-0.90%	-0.76%	0.00%	-12.16%
2001	0.00%	-11.25%	0.00%	-7.07%	0.43%	0.43%	0.13%	-2.73%	0.00%	-37.55%	0.00%	-56.82%	0.00%	-61.65%	1.92%	-56.86%	-7.15%	-53.85%	0.00%	-47.09%	0.00%	-42.95%	0.00%	-42.10%
2002	0.00%	-39.05%	0.00%	-42.10%	0.93%	-45.99%	-9.79%	-55.40%	0.00%	-78.13%	0.00%	-92.59%	0.00%	-91.74%	0.00%	-76.68%	0.00%	-75.76%	0.00%	-72.99%	0.00%	-57.63%	-16.63%	-48.66%
2003	0.00%	-45.23%	0.00%	-49.14%	0.56%	0.56%	0.00%	-28.57%	0.00%	-47.82%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	-0.68%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	1.37%	-41.75%
2004	0.00%	-45.23%	0.00%	-49.14%	0.56%	0.56%	0.00%	-28.57%	0.00%	-47.82%	0.00%	-82.99%	0.00%	-88.50%	0.00%	-78.13%	-0.68%	-70.92%	0.00%	-76.92%	0.00%	-66.01%	1.37%	-41.75%
2005	-0.02%	-0.02%	3.00%	3.00%	2.81%	2.81%	0.10%	-0.29%	-0.38%	-10.41%	0.00%	-37.55%	0.42%	-45.10%	0.00%	-23.96%	0.00%	-40.34%	0.00%	-41.41%	0.00%	-39.48%	0.00%	-32.63%
2006	0.00%	-32.63%	0.00%	-32.20%	0.01%	-33.91%	0.00%	-40.61%	0.00%	-56.50%	0.00%	-65.57%	0.00%	-66.23%	0.00%	-50.01%	0.00%	-57.64%	-0.61%	-50.70%	0.00%	-46.84%	0.00%	-40.55%
2007	0.00%	-46.65%	-0.60%	-46.74%	0.02%	-28.79%	0.00%	-50.13%	0.00%	-70.18%	0.00%	-88.89%	0.00%	-88.50%	0.00%	-58.14%	0.00%	-64.94%	0.00%	-68.26%	0.00%	-60.79%	1.98%	0.48%
2008	-6.82%	-1.75%	0.18%	-1.68%	0.47%	3.31%	-1.19%	0.60%	-0.22%	-8.93%	0.55%	-30.32%	0.00%	-30.42%	0.92%	-12.53%	0.01%	-30.77%	0.00%	-27.71%	0.56%	-23.60%	-1.24%	-0.80%
2009	0.39%	0.39%	2.76%	3.01%	0.04%	-7.32%	0.00%	-3.66%																

Figure 4-23. Habitat summary table for speckled dace (*Rhinichthys osculus*), Braided site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Braided Site
With LWD
Speckled dace

Summary of normalized habitat changes
Hypothetical Withdrawal 10 cfs

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2
1965									0.54%	-100.00%	-3.96%	-100.00%
1966	4.42%	8.48%	-0.17%	-4.23%	3.38%	-14.83%	-1.20%	-100.00%	0.00%	-100.00%	-0.67%	-100.00%
1967	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.52%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1968	4.17%	6.87%	0.43%	4.50%	4.70%	4.85%	2.61%	-58.30%	4.10%	-100.00%	0.31%	-100.00%
1969	1.74%	-100.00%	5.54%	6.32%	2.23%	7.68%	-1.22%	-95.70%	3.89%	-100.00%	0.00%	-100.00%
1970	0.00%	-100.00%	0.00%	-100.00%	0.43%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1971	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-2.01%	-100.00%
1972	0.00%	-100.00%	0.00%	-100.00%	-0.55%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1973	2.75%	6.30%	1.81%	3.20%	-0.03%	-0.03%	0.16%	0.80%	2.93%	7.38%	-2.29%	-68.06%
1974	0.72%	-76.80%	0.00%	-95.88%	0.00%	-95.88%	0.00%	-100.00%	-0.19%	-100.00%	0.00%	-100.00%
1975	0.00%	-100.00%	0.29%	-100.00%	9.50%	13.51%	3.90%	-56.15%	5.45%	-100.00%	0.00%	-100.00%
1976	-2.28%	-100.00%	-2.51%	-64.20%	0.00%	-98.08%	0.26%	-100.00%	1.33%	-100.00%	0.00%	-100.00%
1977	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1978	-4.63%	-100.00%	1.91%	-0.04%	1.65%	-11.84%	-1.60%	-100.00%	-0.16%	-100.00%	0.00%	-100.00%
1979	2.16%	7.95%	1.84%	5.91%	1.00%	1.00%	4.14%	5.29%	-0.26%	-61.04%	-1.64%	-88.70%
1980	1.54%	-70.67%	1.28%	3.13%	2.19%	3.61%	3.63%	5.57%	0.58%	-58.47%	-2.85%	-81.56%
1981	0.00%	-100.00%	0.00%	-98.51%	0.66%	-50.31%	-0.45%	-90.39%	-1.44%	-100.00%	-0.10%	-100.00%
1982	-2.10%	-21.90%	3.18%	5.22%	2.85%	4.09%	3.38%	-69.22%	4.11%	-100.00%	-1.88%	-100.00%
1983	-4.59%	-3.08%	1.79%	3.11%	1.07%	1.53%	2.69%	3.68%	2.93%	-61.30%	6.54%	-100.00%
1984	3.29%	8.22%	-2.40%	-85.94%	0.00%	-100.00%	-1.18%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1985	2.21%	5.61%	1.57%	1.97%	0.46%	1.55%	1.58%	4.14%	-1.00%	-66.41%	-1.41%	-100.00%
1986	2.52%	-53.96%	-2.03%	-29.25%	0.74%	1.00%	3.25%	-59.66%	6.54%	-100.00%	-1.91%	-100.00%
1987	2.07%	-68.96%	1.85%	1.69%	3.34%	0.71%	1.72%	-91.96%	1.22%	-100.00%	-0.56%	-100.00%
1988	1.15%	-54.52%	2.07%	4.72%	-1.18%	-100.00%	0.10%	-100.00%	-0.79%	-100.00%	-0.85%	-100.00%
1989	-2.98%	-80.70%	2.54%	-0.57%	1.64%	-100.00%	-0.91%	-100.00%	-0.55%	-100.00%	-0.48%	-100.00%
1990	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.03%	-100.00%	0.00%	-100.00%
1991	-5.88%	-100.00%	3.75%	-100.00%	0.07%	0.18%	0.53%	-37.28%	-1.01%	-100.00%	0.00%	-100.00%
1992	3.12%	5.37%	1.51%	3.17%	1.25%	2.34%	2.31%	-34.00%	2.17%	-86.42%	0.00%	-100.00%
1993	1.03%	3.49%	0.50%	1.37%	0.18%	3.35%	4.58%	-2.17%	-0.23%	-90.68%	-4.97%	-91.71%
1994	-1.76%	-55.15%	0.76%	-40.46%	3.49%	4.78%	1.08%	-71.68%	1.83%	-98.07%	-2.58%	-100.00%
1995	1.67%	2.02%	3.08%	4.61%	1.54%	2.49%	2.69%	-69.28%	8.74%	-93.81%	4.69%	-100.00%
1996	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1997	1.14%	-100.00%	3.84%	8.45%	3.06%	-11.24%	-0.57%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1998	-1.82%	-98.08%	0.49%	-78.07%	1.21%	2.44%	1.42%	-30.90%	0.05%	-100.00%	0.46%	-100.00%
1999	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.27%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2000	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.49%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2001	0.00%	-100.00%	0.00%	-96.16%	1.52%	-42.23%	0.13%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2002	0.00%	-100.00%	0.00%	-100.00%	0.93%	-100.00%	-9.79%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2003	0.00%	-100.00%	0.00%	-100.00%	1.87%	-16.94%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2004	0.00%	-100.00%	0.00%	-100.00%	1.87%	-16.94%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2005	1.70%	7.74%	5.13%	5.77%	4.42%	4.94%	0.63%	-83.64%	-0.38%	-100.00%	0.00%	-100.00%
2006	0.00%	-100.00%	0.00%	-100.00%	0.01%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2007	0.00%	-100.00%	-0.60%	-100.00%	0.02%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2008	-4.94%	-24.50%	1.20%	1.20%	3.83%	-28.06%	-1.19%	-100.00%	-0.22%	-100.00%	0.55%	-100.00%
2009	3.04%	0.42%	4.00%	-2.17%	0.04%	-59.79%	0.00%	-100.00%				

Year	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965	1.94%	-100.00%	12.16%	-100.00%	0.00%	-100.00%	0.70%	-100.00%	0.92%	-100.00%	1.47%	-43.95%
1966	0.00%	-100.00%	-0.94%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.87%	-100.00%
1967	0.58%	-100.00%	0.36%	-100.00%	-8.14%	-100.00%	-10.01%	-100.00%	0.00%	-100.00%	5.66%	-100.00%
1968	0.00%	-100.00%	0.06%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1969	0.00%	-100.00%	0.55%	-100.00%	0.56%	-100.00%	0.56%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1970	-2.04%	-100.00%	-0.47%	-100.00%	3.63%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1971	0.00%	-100.00%	11.43%	-100.00%	1.16%	-100.00%	-0.11%	-92.14%	0.00%	-100.00%	-2.51%	-100.00%
1972	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-4.42%	-95.52%	1.03%	-96.12%	1.15%	-1.54%
1973	-1.85%	-64.89%	9.35%	-95.80%	7.66%	-100.00%	-3.08%	-100.00%	0.08%	-100.00%	0.66%	-100.00%
1974	0.00%	-100.00%	1.14%	-100.00%	-0.64%	-100.00%	1.59%	-100.00%	-0.33%	-100.00%	-0.28%	-100.00%
1975	-0.03%	-100.00%	0.00%	-100.00%	-0.06%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1976	-0.33%	-100.00%	0.52%	-100.00%	0.01%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1977	0.00%	-100.00%	-2.29%	-100.00%	1.26%	-100.00%	0.00%	-100.00%	-0.50%	-100.00%	0.00%	-100.00%
1978	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.44%	-100.00%	-1.40%	-100.00%	-0.83%	-26.53%
1979	0.74%	-100.00%	-1.55%	-100.00%	3.03%	-100.00%	7.30%	-100.00%	5.44%	-100.00%	0.00%	-100.00%
1980	-2.71%	-63.01%	0.16%	-56.87%	-1.21%	-74.65%	7.07%	-97.90%	5.44%	-100.00%	0.00%	-100.00%
1981	-2.33%	-100.00%	0.96%	-100.00%	-0.58%	-100.00%	1.05%	-100.00%	-4.33%	-100.00%	-3.94%	-100.00%
1982	-0.03%	-100.00%	1.01%	-100.00%	-0.89%	-100.00%	0.00%	-100.00%	-5.35%	-100.00%	1.52%	1.25%
1983	0.16%	-100.00%	1.20%	-100.00%	-1.19%	-100.00%	-1.71%	-89.43%	-3.12%	-100.00%	-4.85%	-44.57%
1984	0.00%	-100.00%	1.80%	-94.41%	-3.24%	-100.00%	-2.55%	-95.48%	1.14%	-100.00%	2.01%	-17.73%
1985	-0.19%	-100.00%	-1.56%	-100.00%	1.07%	-100.00%	3.11%	-83.17%	-6.19%	-53.44%	2.44%	-50.52%
1986	-1.13%	-100.00%	-0.37%	-95.89%	-0.14%	-100.00%	-2.72%	-100.00%	1.36%	-90.13%	-9.20%	-82.93%
1987	0.00%	-100.00%	0.34%	-100.00%	0.00%	-100.00%	0.56%	-100.00%	2.32%	-100.00%	-8.05%	-100.00%
1988	-1.45%	-100.00%	-2.70%	-100.00%	0.08%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1989	1.11%	-100.00%	-0.20%	-100.00%	0.53%	-100.00%	-0.60%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1990	0.00%	-100.00%	0.04%	-100.00%	0.68%	-100.00%	0.00%	-100.00%	0.01%	-100.00%	-6.93%	-100.00%
1991	-1.15%	-100.00%	0.50%	-100.00%	-3.66%	-100.00%	-9.62%	-100.00%	0.00%	-100.00%	-2.87%	-100.00%
1992	0.04%	-100.00%	-3.69%	-88.88%	0.00%	-100.00%	0.00%	-100.00%	0.93%	-100.00%	-14.57%	-50.43%
1993	-6.18%	-81.58%	5.27%	-89.63%	-0.12%	-88.19%	4.30%	-79.32%	2.51%	-72.69%	-9.02%	-91.49%
1994	-0.88%	-100.00%	-0.25%	-100.00%	-0.19%	-100.00%	-0.38%	-100.00%	-0.65%	-100.00%	-5.17%	-62.48%
1995	-0.69%	-100.00%	-0.03%	-100.00%	-1.28%	-100.00%	-1.10%	-100.00%	-0.59%	-100.00%	0.00%	-100.00%
1996	0.51%	-100.00%	0.00%	-100.00%	-0.62%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
1997	0.76%	-100.00%	1.02%	-100.00%	-11.98%	-100.00%	1.02%	-100.00%	0.01%	-100.00%	-0.67%	-100.00%
1998	0.00%	-100.00%	0.37%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.43%	-100.00%	0.00%	-100.00%
1999	-1.45%	-100.00%	-0.13%	-100.00%	1.05%	-89.75%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2000	0.00%	-100.00%	6.28%	-100.00%	0.00%	-100.00%	-16.77%	-100.00%	3.68%	-89.94%	0.00%	-100.00%
2001	0.00%	-100.00%	1.92%	-100.00%	-7.15%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2002	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-16.63%	-100.00%
2003	0.00%	-100.00%	0.00%	-100.00%	-0.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.37%	-100.00%
2004	0.00%	-100.00%	0.00%	-100.00%	-0.68%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	1.37%	-100.00%
2005	0.42%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2006	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	-0.61%	-100.00%	0.00%	-100.00%	0.00%	-100.00%
2007	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	0.00%	-100.00%	3.47%	-52.50%
2008	0.00%	-100.00%	0.01%	-99.78%	0.01%	-100.00%	0.00%	-100.00%	0.56%	-100.00%	-2.01%	-100.00%
2009												

Figure 4-24. Habitat summary table for speckled dace (*Rhinichthys osculus*), Braided site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Gage Site

No Wood

Longfin Dace

Hypothetical Withdrawal 2 cfs

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965									0.00%	-9.63%	0.00%	-26.94%	0.06%	-25.39%	-0.13%	-26.06%	0.00%	-25.99%	0.00%	-25.30%	0.73%	-0.33%	0.01%	0.01%
1966	0.33%	0.33%	2.63%	3.85%	2.72%	2.72%	0.00%	-3.74%	0.00%	-9.81%	0.00%	-13.85%	0.00%	-20.03%	0.38%	-4.22%	-0.38%	-11.15%	0.00%	-15.89%	0.23%	-14.78%	0.43%	-6.94%
1967	0.00%	-5.65%	0.00%	-12.84%	0.00%	-11.32%	0.00%	-17.02%	0.00%	-15.89%	0.00%	-20.03%	2.46%	2.46%	3.02%	3.02%	0.43%	-11.60%	0.00%	-25.49%	0.00%	-21.88%	0.56%	0.56%
1968	0.06%	0.06%	0.00%	0.00%	0.74%	0.74%	2.26%	3.76%	-0.59%	-3.93%	-0.04%	-11.24%	-0.55%	-5.29%	1.23%	1.21%	0.00%	-5.49%	0.00%	-5.84%	0.00%	-5.84%	0.73%	-2.72%
1969	0.69%	0.69%	1.90%	1.90%	0.97%	0.97%	3.84%	4.73%	3.42%	3.42%	0.00%	-7.43%	0.00%	-8.82%	0.00%	-8.53%	0.00%	-13.75%	0.00%	-13.55%	0.00%	-4.53%	0.00%	-3.91%
1970	0.00%	-3.95%	0.00%	-2.35%	0.00%	0.28%	0.00%	-3.96%	0.00%	-10.52%	0.00%	-22.58%	0.00%	-25.33%	1.14%	-13.13%	2.51%	2.51%	0.00%	-17.33%	0.00%	-6.24%	0.00%	-4.33%
1971	0.00%	-3.97%	0.00%	-3.94%	0.00%	-4.53%	0.00%	-20.65%	0.00%	-22.90%	0.00%	-26.47%	1.46%	-22.16%	0.23%	-1.14%	0.81%	-13.51%	1.26%	1.26%	2.88%	2.88%	3.05%	3.05%
1972	2.48%	2.85%	0.00%	-5.08%	0.00%	-11.82%	0.00%	-18.16%	0.00%	-21.25%	0.31%	-18.31%	0.80%	-18.99%	0.56%	-17.62%	0.37%	-23.72%	2.85%	-2.26%	0.26%	0.26%	1.20%	1.20%
1973	0.88%	0.88%	0.05%	0.05%	0.06%	0.06%	-0.05%	-0.05%	-0.06%	-0.06%	5.02%	5.02%	1.86%	1.86%	-0.58%	-0.66%	-3.21%	-3.82%	-1.94%	-3.89%	-1.69%	-3.85%	0.29%	-2.79%
1974	3.62%	3.84%	0.71%	-0.75%	0.32%	3.05%	0.00%	-3.90%	-0.12%	-4.06%	0.00%	-10.22%	0.00%	-8.45%	0.36%	-4.67%	-0.40%	-6.62%	2.74%	1.71%	1.03%	0.50%	0.00%	-3.91%
1975	0.00%	-3.93%	1.45%	3.26%	0.68%	0.68%	1.06%	1.06%	0.83%	-1.73%	0.00%	-7.72%	0.14%	-3.64%	0.00%	-9.91%	-0.04%	-7.91%	0.00%	-11.32%	0.00%	-12.03%	0.76%	-5.88%
1976	0.01%	-4.17%	0.45%	0.45%	0.00%	4.17%	3.83%	3.33%	-0.14%	-4.03%	0.00%	-15.69%	2.46%	2.46%	0.36%	-5.40%	0.47%	-12.14%	-0.83%	-2.52%	0.00%	-7.03%	0.00%	-14.87%
1977	0.00%	-3.92%	0.00%	-4.73%	0.00%	-3.98%	1.49%	-1.13%	0.00%	-20.13%	0.00%	-25.99%	-0.42%	-22.02%	1.53%	-12.67%	-0.61%	-1.16%	0.00%	-21.70%	0.00%	-25.50%	0.00%	-25.89%
1978	0.73%	-0.96%	0.37%	0.37%	0.07%	0.07%	1.07%	-1.89%	-0.10%	-4.14%	0.00%	-10.42%	0.00%	-18.16%	0.00%	-26.27%	0.00%	-30.10%	0.00%	-25.54%	2.71%	2.71%	0.40%	0.40%
1979	0.31%	0.31%	0.10%	0.10%	0.23%	0.23%	0.43%	0.43%	3.57%	3.57%	3.92%	3.92%	-1.54%	-4.08%	-0.10%	-3.34%	-0.34%	-3.93%	-2.28%	-2.28%	-3.54%	-3.54%	-1.18%	-3.29%
1980	1.00%	1.00%	0.04%	0.04%	0.27%	0.27%	1.45%	1.45%	3.71%	3.71%	3.20%	3.20%	0.91%	0.91%	0.51%	0.51%	1.56%	1.56%	-3.20%	-3.20%	-3.39%	-3.39%	-0.48%	-3.34%
1981	0.70%	-2.04%	0.31%	0.01%	2.68%	3.84%	1.69%	1.82%	-0.91%	-3.88%	-0.06%	-3.97%	-1.12%	-1.30%	0.09%	-3.52%	-0.72%	-3.16%	-0.87%	-2.39%	-0.98%	-1.40%	1.28%	-1.03%
1982	3.01%	3.01%	0.62%	0.62%	0.30%	0.30%	2.46%	2.46%	-1.92%	-3.81%	-1.18%	-3.93%	-0.28%	-5.10%	0.71%	-1.94%	0.77%	-2.09%	0.00%	-9.91%	0.33%	0.33%	0.87%	0.87%
1983	1.22%	1.22%	0.06%	0.06%	0.08%	0.08%	0.08%	0.08%	3.19%	3.19%	-3.45%	-3.81%	-1.37%	-2.12%	0.59%	0.22%	-0.19%	-1.07%	2.82%	2.82%	2.84%	2.84%	1.49%	1.49%
1984	1.66%	1.66%	1.08%	1.33%	0.00%	-3.46%	0.00%	-3.82%	0.00%	-10.22%	0.00%	-17.44%	0.00%	-18.47%	0.79%	-2.30%	2.50%	2.50%	3.10%	3.10%	3.31%	3.31%	0.47%	0.47%
1985	0.07%	0.07%	0.31%	0.31%	0.08%	0.08%	2.61%	2.61%	4.14%	4.14%	-0.89%	-3.94%	-0.62%	-0.75%	-0.48%	-1.16%	-0.78%	-1.12%	1.17%	1.17%	0.70%	0.70%	0.94%	0.94%
1986	2.19%	3.23%	2.16%	2.16%	0.26%	0.26%	3.44%	3.44%	-1.35%	-3.80%	-1.20%	-3.92%	0.26%	-2.27%	2.13%	2.13%	0.89%	-0.14%	-1.82%	-2.27%	-1.47%	-1.47%	2.12%	0.20%
1987	2.16%	2.70%	2.10%	2.72%	0.52%	0.52%	2.91%	4.06%	-0.18%	-3.93%	0.00%	-13.04%	0.02%	-12.64%	-0.17%	-2.41%	0.00%	-8.93%	0.03%	-5.97%	0.29%	-2.22%	0.26%	-3.63%
1988	0.88%	0.88%	0.69%	0.69%	0.00%	3.18%	3.16%	3.16%	2.65%	2.65%	-0.53%	-4.04%	0.54%	0.41%	1.68%	1.68%	2.39%	2.39%	0.00%	-4.83%	0.00%	-7.92%	0.76%	-2.54%
1989	3.61%	4.06%	1.55%	1.55%	2.70%	1.83%	2.82%	3.03%	0.00%	-13.04%	0.00%	-24.39%	0.00%	-25.18%	0.91%	-12.24%	0.00%	-13.34%	0.00%	-14.46%	0.00%	-14.87%	0.00%	-14.77%
1990	0.00%	-4.68%	0.00%	-4.06%	0.00%	-4.32%	0.00%	-8.82%	0.00%	-19.30%	0.00%	-26.54%	0.00%	-24.94%	0.70%	-11.78%	0.00%	-22.52%	0.00%	-22.77%	0.00%	-15.89%	2.80%	2.19%
1991	1.54%	1.54%	0.03%	-2.65%	0.35%	0.35%	0.04%	0.04%	-0.63%	-3.94%	0.00%	-10.32%	0.00%	-15.18%	0.63%	-14.68%	0.00%	-25.99%	0.00%	-25.40%	0.00%	-19.72%	2.15%	2.15%
1992	0.90%	0.90%	0.33%	0.33%	0.23%	0.23%	0.42%	0.42%	-1.63%	-1.82%	0.00%	-10.32%	1.90%	-8.12%	2.74%	2.29%	1.78%	1.78%	0.00%	-8.72%	0.17%	-4.04%	0.77%	0.77%
1993	0.05%	0.05%	0.14%	0.14%	0.17%	0.17%	1.58%	1.58%	4.46%	4.46%	1.80%	1.80%	-1.37%	-1.37%	1.61%	1.59%	1.80%	1.80%	-0.92%	-0.92%	0.23%	0.23%	4.04%	4.04%
1994	0.21%	0.36%	1.48%	1.48%	2.33%	2.59%	3.85%	3.85%	3.78%	3.78%	-1.62%	-3.91%	-0.55%	-3.94%	0.30%	-3.31%	-0.12%	-3.95%	0.20%	-3.16%	0.45%	-1.88%	2.98%	1.79%
1995	0.24%	0.24%	0.31%	0.31%	0.18%	0.18%	3.62%	4.18%	-1.02%	-1.59%	-2.46%	-3.87%	-0.43%	-3.95%	-0.02%	-3.94%	-1.29%	-3.66%	-0.69%	-3.94%	-0.37%	-3.91%	0.00%	-3.90%
1996	0.00%	-3.89%	0.00%	-3.90%	0.00%	-3.91%	0.00%	-11.02%	0.00%	-18.57%	0.00%	-22.23%	0.62%	-15.32%	0.60%	-18.26%	2.69%	-2.19%	0.00%	-17.44%	0.00%	-11.93%	0.00%	-6.93%
1997	0.35%	0.35%	0.68%	0.68%	0.62%	0.62%	0.00%	-3.94%	0.00%	-15.89%	0.00%	-23.39%	0.00%	-24.62%	0.00%	-24.26%	0.00%	-25.03%	0.00%	-25.17%	0.00%	-17.44%	0.81%	-11.41%
1998	3.13%	3.61%	0.38%	0.38%	0.19%	0.19%	0.14%	0.14%	3.40%	0.01%	0.00%	-15.89%	0.00%	-17.02%	0.00%	-20.24%	0.00%	-24.42%	0.00%	-24.83%	0.04%	-13.13%	0.00%	-3.96%
1999	0.00%	-3.98%	0.00%	-5.84%	0.00%	-8.42%	3.63%	3.63%	0.00%	-24.81%	0.00%	-26.79%	0.96%	-8.95%	1.18%	-0.08%	1.18%	1.18%	0.00%	-21.07%	0.00%	-21.39%	0.00%	-21.07%
2000	0.00%	-14.46%	0.00%	-14.36%	0.00%	-10.22%	0.00%	-25.05%	0.00%	-28.76%	0.00%	-29.52%	0.00%	-30.94%	0.18%	-28.91%	0.00%	-27.68%	1.59%	1.59%	1.05%	1.05%	0.00%	-5.84%
2001	0.00%	-5.66%	1.45%	1.83%	2.46%	2.46%	3.92%	3.92%	0.00%	-21.39%	0.00%	-27.99%	0.00%	-29.52%	1.58%	-17.69%	0.00%	-27.01%	0.00%	-26.54%	0.00%	-25.63%	0.00%	-23.12%
2002	0.00%	-22.12%	0.00%	-23.32%	0.00%	-24.80%	0.00%	-27.64%	0.00%	-32.34%	0.00%	-34.57%	0.00%	-34.46%	0.00%	-32.23%	0.00%	-31.93%	0.00%	-31.42%	0.00%	-28.84%	0.00%	-25.86%
2003	0.00%	-25.99%	0.68%	-22.75%	0.64%	0.64%	0.00%	-17.02%	0.00%	-27.29%	0.00%	-33.14%	0.00%	-33.99%	0.00%	-32.34%	0.00%	-31.03%	0.00%	-32.13%	0.00%	-30.05%	0.00%	-25.72%
2004	0.00%	-25.99%	0.68%	-22.75%	0.64%	0.64%	0.00%	-17.02%	0.00%	-27.29%	0.00%	-33.14%	0.00%	-33.99%	0.00%	-32.34%	0.00%	-31.03%	0.00%	-32.13%	0.00%	-30.05%	0.00%	-25.72%
2005	1.23%	1.23%	0.18%	0.18%	0.40%	0.40%	3.72%	3.72%	-0.24%	-3.94%	0.00%	-21.39%	0.63%	-24.12%	1.12%	-6.04%	0.00%	-22.75%	0.00%	-23.28%	0.00%	-22.33%	0.00%	-18.99%
2006	0.00%	-18.99%	0.00%	-18.78%	0.00%	-19.72%	0.00%	-22.81%	0.00%	-27.91%	0.00%	-29.96%	0.00%	-30.10%	0.00%	-27.49%	0.00%	-28.19%	0.00%	-25.57%	0.00%	-26.16%	0.00%	-24.65%
2007	0.00%	-24.13%	0.00%	-20.03%	0.00%	-17.54%	0.00%	-26.27%	0.00%	-30.89%	0.00%	-34.04%	1.35%	-29.49%	2.01%	2.01%	0.00%	-29.83%	0.00%	-30.51%	0.00%	-28.92%	0.96%	0.96%
2008	0.31%	0.31%	0.22%	0.22%	1.13%	1.13%	0.00%	-3.84%	-0.14%	-3.93%	0.00%	-13.24%	-1.00%	-3.98%	-0.01%	-7.01%	0.00%	-17.33%	0.00%	-14.56%	0.00%	-13.55%	0.87%	0.87%
2009	1.60%	1.60%	1.74%	1.74%	0.85%	3.96%	0.00%	-3.79%																

Figure 4-25. Habitat summary table for longfin dace (*Agosia chrysogaster*), Gage site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Gage Site

No Wood

Longfin Dace

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-57.22%	0.00%	-51.18%	0.32%	-49.10%	-0.05%	-53.04%	0.00%	-52.89%	0.00%	-54.15%	4.03%	-46.14%	0.07%	0.07%
1966	1.50%	1.50%	8.64%	23.17%	12.71%	16.14%	0.00%	-59.57%	0.00%	-57.13%	0.00%	-56.78%	0.00%	-56.24%	2.14%	-53.72%	0.67%	-56.57%	0.00%	-56.60%	0.23%	-56.58%	2.32%	-50.57%
1967	0.00%	-57.50%	0.00%	-56.87%	0.00%	-57.00%	0.00%	-56.50%	0.00%	-56.60%	0.00%	-56.24%	11.80%	-38.72%	13.23%	-28.68%	1.42%	-56.26%	0.00%	-53.79%	0.00%	-55.99%	2.76%	2.76%
1968	0.06%	0.06%	-0.03%	-0.03%	3.76%	3.76%	13.74%	0.66%	-0.59%	-58.29%	-0.04%	-57.07%	-1.19%	-57.14%	6.10%	-53.06%	0.00%	-57.53%	0.00%	-57.47%	0.00%	-57.47%	1.53%	-57.16%
1969	3.97%	3.97%	9.77%	9.77%	4.85%	4.85%	15.79%	-25.61%	10.70%	-53.61%	0.00%	-57.33%	0.00%	-57.21%	0.00%	-57.25%	0.00%	-56.79%	0.00%	-56.80%	0.00%	-57.70%	0.00%	-58.49%
1970	0.00%	-58.05%	0.00%	-56.62%	0.00%	-56.48%	0.00%	-57.92%	0.00%	-57.07%	0.00%	-55.98%	0.00%	-54.09%	4.96%	-49.67%	5.62%	-29.54%	0.00%	-56.48%	0.00%	-57.44%	0.00%	-57.87%
1971	0.00%	-57.84%	0.00%	-58.12%	0.00%	-57.89%	0.00%	-56.19%	0.00%	-55.95%	0.00%	-52.02%	4.98%	-49.48%	2.14%	-42.94%	2.74%	-44.63%	6.54%	-4.13%	11.14%	-49.72%	15.36%	-28.71%
1972	10.77%	-43.92%	0.00%	-57.59%	0.00%	-56.95%	0.00%	-56.41%	0.00%	-56.05%	1.63%	-55.57%	1.30%	-55.68%	1.25%	-52.95%	1.40%	-49.57%	8.64%	-33.91%	2.03%	2.03%	7.49%	7.49%
1973	5.16%	5.16%	0.16%	0.16%	0.29%	0.29%	-0.22%	-0.22%	0.12%	0.12%	16.56%	-7.41%	3.09%	-21.98%	2.35%	-53.95%	-3.25%	-59.38%	-1.94%	-58.71%	-1.69%	-59.09%	1.72%	-58.79%
1974	12.48%	-30.85%	0.89%	-56.99%	0.80%	-51.50%	0.00%	-58.61%	-0.12%	-57.77%	0.00%	-57.09%	0.84%	-56.85%	2.89%	-56.23%	-0.40%	-57.64%	10.41%	-46.11%	4.60%	-56.53%	0.00%	-58.46%
1975	0.00%	-58.31%	6.59%	-42.47%	4.00%	4.00%	6.03%	6.03%	0.83%	-58.37%	0.00%	-57.31%	1.42%	-54.86%	0.00%	-57.12%	-0.04%	-57.38%	0.00%	-57.00%	0.00%	-56.94%	2.72%	-56.17%
1976	0.03%	-55.60%	2.92%	-1.75%	0.00%	-52.45%	14.76%	-44.88%	-0.14%	-58.11%	0.00%	-56.62%	8.92%	-47.58%	0.65%	-53.63%	3.62%	-51.93%	-1.63%	-56.58%	0.00%	-57.37%	0.00%	-56.69%
1977	0.00%	-58.35%	0.00%	-57.71%	0.00%	-57.72%	6.63%	-51.84%	0.00%	-56.24%	0.00%	-52.89%	-0.49%	-54.95%	8.50%	-47.85%	2.03%	-53.82%	0.00%	-55.96%	0.00%	-53.79%	0.00%	-53.08%
1978	3.54%	-38.75%	2.07%	2.07%	0.34%	0.34%	1.35%	-59.10%	-0.10%	-57.98%	0.00%	-57.08%	0.00%	-56.41%	0.00%	-52.40%	0.00%	-45.45%	0.00%	-52.02%	13.99%	-20.23%	1.64%	1.64%
1979	1.24%	1.24%	0.81%	0.81%	1.23%	1.23%	2.93%	2.93%	21.25%	21.25%	4.20%	-48.96%	-1.70%	-58.62%	-0.39%	-58.32%	-0.49%	-58.22%	-3.44%	-57.48%	-4.38%	-60.21%	-1.25%	-60.15%
1980	5.59%	5.59%	0.21%	0.21%	1.14%	1.14%	10.11%	10.11%	23.45%	23.45%	-1.65%	-23.01%	-1.31%	-30.15%	2.73%	-38.70%	5.32%	-36.57%	-5.44%	-59.09%	-4.33%	-60.19%	-1.30%	-60.17%
1981	0.70%	-59.63%	1.23%	-53.31%	7.46%	3.34%	4.64%	-51.98%	-0.91%	-58.77%	-0.06%	-57.83%	1.55%	-56.18%	1.03%	-56.58%	0.28%	-54.09%	-1.30%	-54.67%	0.23%	-54.96%	5.64%	-50.94%
1982	17.72%	4.05%	3.35%	3.35%	1.21%	1.21%	14.30%	14.30%	-1.92%	-59.50%	-1.18%	-58.31%	-0.28%	-57.81%	3.46%	-53.18%	4.19%	-54.00%	0.00%	-57.12%	-1.21%	-34.09%	4.94%	4.94%
1983	4.30%	4.88%	0.28%	0.28%	0.38%	0.38%	0.85%	0.85%	19.43%	19.43%	-4.15%	-59.56%	-0.12%	-57.31%	4.70%	-51.94%	4.42%	-33.38%	14.67%	-16.13%	3.56%	-43.76%	9.02%	9.02%
1984	9.90%	9.90%	1.08%	-50.84%	0.00%	-60.19%	0.00%	-59.43%	0.00%	-57.09%	0.00%	-56.47%	0.00%	-56.38%	2.12%	-43.40%	9.01%	-27.29%	12.91%	-23.56%	9.68%	-46.12%	2.56%	2.56%
1985	0.44%	0.44%	1.65%	1.65%	0.47%	0.47%	13.11%	13.11%	21.34%	-5.61%	-0.89%	-58.18%	-0.04%	-56.39%	0.56%	-56.23%	-0.72%	-53.95%	2.45%	-37.03%	4.44%	4.44%	6.43%	6.43%
1986	2.92%	-30.52%	11.47%	11.91%	1.21%	1.21%	20.09%	7.30%	-2.28%	-59.62%	-1.20%	-58.31%	0.87%	-57.30%	5.89%	-40.81%	4.34%	-44.04%	-1.05%	-57.97%	-1.19%	-52.22%	8.52%	-47.82%
1987	8.00%	-15.22%	9.22%	14.67%	2.65%	2.65%	7.06%	-47.58%	-0.18%	-58.27%	0.00%	-56.85%	2.59%	-54.86%	3.27%	-54.10%	0.00%	-57.21%	2.12%	-51.58%	1.54%	-52.57%	0.26%	-58.76%
1988	5.07%	5.07%	4.15%	4.15%	0.00%	-57.11%	13.24%	-33.80%	7.63%	-55.19%	-0.53%	-58.01%	2.80%	-54.79%	9.17%	-4.73%	11.49%	-15.16%	0.00%	-57.61%	0.00%	-57.29%	2.98%	-56.26%
1989	11.35%	-33.66%	9.19%	9.19%	9.50%	-40.44%	8.91%	-48.40%	0.00%	-56.85%	0.00%	-54.96%	0.00%	-54.15%	1.87%	-56.01%	0.00%	-56.82%	0.00%	-56.73%	0.00%	-56.69%	0.00%	-56.70%
1990	0.00%	-57.61%	0.00%	-57.80%	0.00%	-57.72%	0.00%	-57.26%	0.00%	-56.31%	0.00%	-51.89%	0.00%	-54.00%	2.51%	-50.61%	0.00%	-55.74%	0.00%	-55.74%	0.00%	-56.60%	12.48%	-35.85%
1991	9.07%	-6.73%	0.16%	-39.82%	0.83%	-0.14%	0.21%	0.21%	-0.63%	-58.17%	0.00%	-57.08%	0.00%	-56.66%	2.73%	-55.35%	0.00%	-52.89%	0.00%	-53.97%	0.00%	-56.27%	12.98%	-19.73%
1992	4.81%	4.81%	2.27%	2.27%	1.38%	1.38%	1.78%	1.78%	-3.13%	-52.37%	0.00%	-57.08%	6.09%	-46.63%	11.02%	-29.72%	4.89%	-54.70%	0.00%	-57.22%	0.73%	-52.45%	3.47%	-5.47%
1993	0.28%	0.28%	0.70%	0.70%	0.86%	0.86%	8.65%	8.65%	21.97%	17.47%	-3.57%	-32.37%	-5.27%	-49.13%	4.19%	-44.24%	1.48%	-46.11%	-1.56%	-47.91%	2.05%	2.05%	21.22%	21.22%
1994	0.21%	-33.48%	8.68%	8.68%	11.26%	15.30%	19.86%	20.09%	14.14%	-50.56%	-1.62%	-58.49%	-0.55%	-58.14%	1.72%	-57.41%	-0.12%	-58.01%	0.84%	-57.52%	2.76%	-56.46%	10.88%	-38.46%
1995	0.92%	0.92%	2.45%	2.45%	0.95%	0.95%	16.04%	20.74%	-2.12%	-56.33%	-2.46%	-58.85%	-0.43%	-58.09%	-0.02%	-58.12%	-1.58%	-58.68%	-0.69%	-58.18%	-0.37%	-58.47%	0.00%	-58.62%
1996	0.00%	-58.71%	0.00%	-58.61%	0.00%	-58.45%	0.00%	-57.02%	0.00%	-56.37%	0.00%	-56.05%	2.56%	-55.37%	1.03%	-55.88%	11.60%	-42.55%	0.00%	-56.47%	0.00%	-56.94%	0.00%	-57.38%
1997	2.63%	2.63%	4.11%	4.11%	2.74%	2.74%	0.00%	-58.16%	0.00%	-56.60%	0.00%	-55.95%	0.00%	-55.32%	0.00%	-55.40%	0.00%	-54.59%	0.00%	-54.37%	0.00%	-56.47%	1.28%	-56.34%
1998	7.24%	-55.08%	1.49%	1.49%	0.93%	0.93%	0.84%	0.84%	3.40%	-56.94%	0.00%	-56.60%	0.00%	-56.50%	0.00%	-56.23%	0.00%	-55.63%	0.00%	-55.00%	1.08%	-56.29%	0.00%	-57.98%
1999	0.00%	-57.73%	0.00%	-57.47%	0.00%	-57.25%	20.47%	-35.02%	0.00%	-54.99%	0.00%	-51.44%	4.58%	-44.55%	4.28%	-54.36%	4.54%	-45.20%	0.00%	-56.15%	0.00%	-56.13%	0.00%	-56.15%
2000	0.00%	-56.73%	0.00%	-56.73%	0.00%	-57.09%	0.00%	-54.60%	0.00%	-47.88%	0.00%	-46.50%	0.00%	-43.93%	0.86%	-45.58%	0.00%	-49.83%	10.26%	-9.67%	7.65%	7.65%	0.00%	-57.47%
2001	0.00%	-57.50%	6.49%	-47.49%	11.32%	12.78%	13.79%	-49.30%	0.00%	-56.13%	0.00%	-49.27%	0.00%	-46.50%	8.76%	-46.96%	0.00%	-51.05%	0.00%	-51.89%	0.00%	-53.56%	0.00%	-55.66%
2002	0.00%	-56.06%	0.00%	-55.78%	0.00%	-54.45%	0.00%	-49.90%	0.00%	-41.39%	0.00%	-37.34%	0.00%	-37.56%	0.00%	-41.58%	0.00%	-42.14%	0.00%	-43.05%	0.00%	-47.73%	0.00%	-53.14%
2003	0.00%	-52.89%	2.73%	-50.83%	2.99%	2.99%	0.00%	-56.50%	0.00%	-50.32%	0.00%	-39.94%	0.00%	-38.41%	0.00%	-41.39%	0.00%	-43.76%	0.00%	-41.77%	0.00%	-45.53%	0.00%	-53.37%
2004	0.00%	-52.89%	2.73%	-50.83%	2.99%	2.99%	0.00%	-56.50%	0.00%	-50.32%	0.00%	-39.94%	0.00%	-38.41%	0.00%	-41.39%	0.00%	-43.76%	0.00%	-41.77%	0.00%	-45.53%	0.00%	-53.37%
2005	6.58%	6.53%	0.70%	0.70%	2.30%	2.30%	16.78%	-20.09%	-0.24%	-58.14%	0.00%	-56.13%	0.63%	-54.95%	3.06%	-52.40%	0.00%	-56.01%	0.00%	-55.96%	0.00%	-56.04%	0.00%	-56.33%
2006	0.00%	-56.33%	0.00%	-56.35%	0.00%	-56.27%	0.00%	-55.76%	0.00%	-49.41%	0.00%	-45.70%	0.00%	-45.45%	0.00%	-50.17%	0.00%	-48.91%	0.00%	-49.90%	0.00%	-52.59%	0.00%	-55.12%
2007	0.00%	-55.89%	0.00%	-56.24%	0.00%	-56.46%	0.00%	-52.40%	0.00%	-44.02%	0.00%	-38.30%	6.82%	-34.21%	11.04%	-13.34%	0.00%	-45.94%	0.00%	-44.70%	0.00%	-47.91%	5.99%	-6.18%
2008	1.64%	1.64%	1.18%	1.18%	7.62%	7.62%	0.00%	-59.23%	-0.14%	-58.25%	0.00%	-56.83%	-0.80%	-51.50%	0.46%	-56.29%	0.00%	-56.48%	0.00%	-56.72%	0.00%	-56.80%	4.98%	4.98%
2009	9.17%	9.17%	8.69%	8.69%	4.92%	-10.22%	0.00%	-59.69%																

Figure 4-26. Habitat summary table for longfin dace (*Agosia chrysogaster*), Gage site, with no LWD and with a hypothetical withdrawal rate of 10 ft³/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal **2** cfs

Gage Site

With LWD

Longfin Dace

Year	Jan		Feb		Mar		Apr		May		Jun	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-4.89%	0.00%	-12.20%
1966	0.34%	0.34%	1.72%	2.45%	1.44%	1.44%	0.00%	0.02%	0.00%	-4.97%	0.00%	-6.84%
1967	0.00%	-3.03%	0.00%	-6.37%	0.00%	-5.67%	0.00%	-8.30%	0.00%	-7.78%	0.00%	-9.68%
1968	0.42%	0.42%	1.27%	1.27%	0.51%	0.51%	1.48%	2.46%	-0.33%	-2.23%	-0.02%	-5.63%
1969	0.20%	0.20%	0.70%	0.70%	0.71%	0.71%	1.54%	2.01%	1.16%	1.16%	0.00%	-3.86%
1970	0.00%	-2.24%	0.00%	-1.72%	0.00%	-1.09%	0.00%	-2.24%	0.00%	-5.30%	0.00%	-10.83%
1971	0.00%	-2.24%	0.00%	-2.23%	0.00%	-2.51%	0.00%	-9.96%	0.00%	-10.98%	0.00%	-12.11%
1972	1.07%	1.28%	0.00%	-2.76%	0.00%	-5.90%	0.00%	-8.82%	0.00%	-10.22%	0.23%	-8.91%
1973	0.20%	0.20%	0.38%	0.38%	-0.57%	-0.57%	0.33%	0.33%	-0.53%	-0.53%	2.18%	2.18%
1974	1.15%	1.14%	-0.11%	0.71%	0.23%	1.36%	0.00%	-2.22%	-0.07%	-2.28%	0.00%	-5.16%
1975	0.00%	-2.23%	0.89%	1.38%	0.34%	0.34%	0.33%	0.33%	0.50%	-0.25%	0.00%	-4.00%
1976	0.04%	-2.31%	0.63%	0.63%	0.00%	1.17%	1.28%	1.28%	-0.08%	-2.27%	0.00%	-7.69%
1977	0.00%	-2.23%	0.00%	-2.60%	0.00%	-2.25%	0.62%	-0.58%	0.00%	-9.73%	0.00%	-12.01%
1978	0.37%	-0.32%	0.56%	0.56%	-0.15%	-0.15%	-0.16%	-0.41%	-0.06%	-2.32%	0.00%	-5.25%
1979	0.60%	0.60%	0.04%	0.04%	0.25%	0.25%	0.17%	0.17%	2.25%	2.25%	-0.02%	-0.02%
1980	0.76%	0.76%	0.17%	0.17%	0.26%	0.26%	0.06%	0.06%	2.44%	2.44%	0.06%	0.06%
1981	-0.10%	0.30%	0.23%	0.44%	1.74%	2.39%	0.35%	1.18%	-0.52%	-2.21%	-0.03%	-2.24%
1982	1.60%	1.60%	0.05%	0.05%	0.40%	0.40%	1.09%	1.09%	0.31%	-0.79%	-0.67%	-2.23%
1983	0.58%	0.58%	0.21%	0.21%	-0.33%	-0.33%	0.49%	0.49%	2.06%	2.06%	0.20%	-0.01%
1984	0.86%	0.86%	-0.13%	0.17%	0.00%	-1.28%	0.00%	-2.19%	0.00%	-5.16%	0.00%	-8.49%
1985	0.34%	0.34%	0.38%	0.38%	0.59%	0.59%	1.40%	1.40%	2.34%	2.34%	-0.50%	-2.23%
1986	-0.05%	0.14%	0.96%	0.96%	0.22%	0.22%	2.27%	2.27%	-0.07%	-1.41%	-0.68%	-2.23%
1987	0.54%	0.68%	1.41%	1.34%	0.60%	0.60%	0.28%	0.95%	-0.10%	-2.23%	0.00%	-6.47%
1988	0.00%	0.00%	-0.06%	-0.06%	0.00%	-0.09%	1.01%	1.03%	1.16%	1.16%	-0.30%	-2.28%
1989	1.61%	1.55%	0.47%	0.47%	0.93%	0.61%	0.84%	1.15%	0.00%	-6.47%	0.00%	-11.55%
1990	0.00%	-2.57%	0.00%	-2.28%	0.00%	-2.41%	0.00%	-4.51%	0.00%	-9.34%	0.00%	-12.12%
1991	1.05%	1.05%	0.11%	-1.13%	0.95%	0.95%	0.84%	0.84%	-0.36%	-2.23%	0.00%	-5.20%
1992	-0.17%	-0.17%	0.00%	0.00%	0.33%	0.33%	0.84%	0.84%	1.04%	1.19%	0.00%	-5.20%
1993	-0.13%	-0.13%	0.21%	0.21%	0.31%	0.31%	0.39%	0.39%	2.27%	2.27%	0.81%	0.81%
1994	0.58%	1.56%	0.77%	0.77%	1.17%	1.32%	1.98%	1.98%	1.46%	1.46%	-0.92%	-2.22%
1995	0.59%	0.59%	-0.14%	-0.14%	0.05%	0.05%	2.04%	2.41%	1.17%	1.17%	-1.40%	-2.21%
1996	0.00%	-2.22%	0.00%	-2.20%	0.00%	-2.22%	0.00%	-5.53%	0.00%	-9.01%	0.00%	-10.68%
1997	0.09%	0.09%	0.18%	0.18%	0.04%	0.04%	0.00%	-2.23%	0.00%	-7.78%	0.00%	-11.21%
1998	0.51%	0.70%	0.72%	0.72%	0.31%	0.31%	0.50%	0.50%	0.38%	-0.86%	0.00%	-7.78%
1999	0.00%	-2.25%	0.00%	-3.12%	0.00%	-4.32%	2.26%	2.26%	0.00%	-11.74%	0.00%	-12.17%
2000	0.00%	-7.12%	0.00%	-7.08%	0.00%	-5.16%	0.00%	-11.80%	0.00%	-12.56%	0.00%	-12.71%
2001	0.00%	-3.03%	1.07%	1.84%	1.04%	1.04%	0.88%	0.88%	0.00%	-10.30%	0.00%	-12.42%
2002	0.00%	-10.63%	0.00%	-11.15%	0.00%	-11.67%	0.00%	-12.35%	0.00%	-13.20%	0.00%	-13.56%
2003	0.00%	-12.01%	0.47%	-10.98%	0.51%	0.51%	0.00%	-8.30%	0.00%	-12.25%	0.00%	-13.33%
2004	0.00%	-12.01%	0.47%	-10.98%	0.51%	0.51%	0.00%	-8.30%	0.00%	-12.25%	0.00%	-13.33%
2005	0.72%	0.72%	-0.15%	-0.15%	0.02%	0.02%	1.55%	1.55%	-0.13%	-2.23%	0.00%	-10.30%
2006	0.00%	-9.20%	0.00%	-9.11%	0.00%	-9.53%	0.00%	-10.92%	0.00%	-12.40%	0.00%	-12.79%
2007	0.00%	-11.54%	0.00%	-9.68%	0.00%	-8.54%	0.00%	-12.06%	0.00%	-12.95%	0.00%	-13.48%
2008	0.01%	0.01%	0.26%	0.26%	0.60%	0.60%	0.00%	-1.42%	-0.08%	-2.23%	0.00%	-6.56%
2009	0.44%	0.44%	0.62%	0.62%	0.50%	1.79%	0.00%	-1.39%				

Year	Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965	-0.04%	-11.29%	-0.21%	-11.44%	0.00%	-12.01%	0.00%	-11.86%	0.51%	-0.06%	0.39%	0.39%
1966	0.00%	-9.68%	0.08%	-2.29%	0.20%	-5.15%	0.00%	-7.78%	0.00%	-7.36%	0.26%	-3.23%
1967	1.01%	1.01%	1.23%	1.01%	0.38%	-5.96%	0.00%	-11.89%	0.00%	-10.51%	0.28%	0.28%
1968	-0.05%	-1.66%	1.70%	1.70%	0.00%	-2.95%	0.00%	-3.12%	0.00%	-3.12%	0.43%	-1.78%
1969	0.00%	-4.51%	0.00%	-4.37%	0.00%	-6.79%	0.00%	-6.70%	0.00%	-2.51%	0.00%	-2.22%
1970	0.00%	-11.86%	0.79%	-5.68%	0.22%	0.22%	0.00%	-8.44%	0.00%	-3.30%	0.00%	-2.41%
1971	0.56%	-9.88%	0.03%	-0.64%	0.44%	-6.12%	1.05%	1.05%	0.92%	0.92%	1.67%	1.67%
1972	0.28%	-9.43%	0.11%	-8.45%	0.41%	-10.46%	0.90%	-4.49%	-0.04%	-0.04%	0.36%	0.36%
1973	1.26%	1.26%	0.20%	0.16%	-1.84%	-2.20%	-1.11%	-2.22%	-0.97%	-2.20%	0.22%	-1.39%
1974	0.18%	-4.17%	0.56%	-1.97%	-0.22%	-3.49%	1.18%	0.07%	0.61%	-0.51%	0.00%	-2.22%
1975	-0.03%	-2.37%	0.00%	-5.02%	-0.02%	-4.08%	0.00%	-5.67%	0.00%	-6.00%	0.38%	-3.51%
1976	1.15%	1.15%	0.74%	-0.43%	0.41%	-4.96%	-0.47%	-1.42%	0.00%	-3.67%	0.00%	-7.31%
1977	-0.23%	-10.50%	0.91%	-5.51%	-0.18%	-0.18%	0.00%	-10.42%	0.00%	-11.90%	0.00%	-11.98%
1978	0.00%	-8.82%	0.00%	-12.06%	0.00%	-12.81%	0.00%	-11.69%	1.48%	1.48%	0.46%	0.46%
1979	-0.88%	-2.31%	-0.27%	-1.65%	-0.19%	-2.23%	-1.28%	-1.28%	-1.54%	-1.54%	0.74%	-0.45%
1980	1.52%	1.52%	1.38%	1.38%	1.22%	1.21%	-0.98%	-0.98%	-1.17%	-1.17%	0.78%	-0.77%
1981	-0.10%	-0.20%	0.11%	-1.91%	-0.19%	-1.53%	-0.17%	-1.01%	-0.04%	-0.23%	0.49%	-0.72%
1982	-0.16%	-2.77%	0.45%	-0.97%	0.53%	-1.01%	0.00%	-5.02%	0.86%	0.86%	0.16%	0.16%
1983	-0.56%	-0.94%	0.36%	0.27%	0.00%	-0.43%	1.42%	1.42%	-0.25%	-0.25%	0.85%	0.85%
1984	0.00%	-8.96%	0.23%	-1.49%	0.89%	0.89%	1.09%	1.09%	0.80%	0.58%	0.29%	0.29%
1985	-0.04%	-0.06%	0.14%	-0.27%	-0.73%	-0.92%	0.78%	0.78%	-0.57%	-0.57%	-0.31%	-0.31%
1986	0.10%	-1.30%	1.07%	1.07%	0.80%	0.31%	-0.91%	-1.17%	0.23%	0.23%	1.44%	0.85%
1987	0.10%	-5.97%	0.23%	-0.94%	0.00%	-4.56%	0.01%	-2.87%	0.12%	-1.12%	0.84%	-1.29%
1988	0.63%	0.56%	1.43%	1.43%	1.56%	1.56%	0.00%	-2.64%	0.00%	-4.09%	0.44%	-1.82%
1989	0.00%	-11.80%	0.22%	-6.63%	0.00%	-6.61%	0.00%	-7.12%	0.00%	-7.31%	0.00%	-7.26%
1990	0.00%	-11.67%	0.35%	-5.40%	0.00%	-10.78%	0.00%	-10.90%	0.00%	-7.78%	1.19%	0.91%
1991	0.00%	-7.45%	0.36%	-7.45%	0.00%	-12.01%	0.00%	-11.88%	0.00%	-9.53%	1.36%	1.36%
1992	0.52%	-3.82%	0.68%	0.22%	1.25%	1.25%	0.00%	-4.46%	0.27%	-1.92%	0.54%	0.54%
1993	0.97%	0.97%	0.76%	0.76%	0.69%	0.69%	0.65%	0.65%	0.00%	0.00%	2.24%	2.24%
1994	-0.31%	-2.23%	0.28%	-1.74%	-0.07%	-2.24%	0.04%	-2.00%	0.33%	-1.17%	1.07%	0.86%
1995	-0.25%	-2.23%	-0.01%	-2.23%	-0.65%	-2.00%	-0.39%	-2.23%	-0.21%	-2.22%	0.00%	-2.22%
1996	0.44%	-7.75%	0.00%	-9.25%	1.43%	-0.32%	0.00%	-8.49%	0.00%	-5.95%	0.00%	-3.63%
1997	0.00%	-11.70%	0.00%	-11.54%	0.00%	-11.79%	0.00%	-11.82%	0.00%	-8.49%	0.08%	-6.16%
1998	0.00%	-8.30%	0.00%	-9.77%	0.00%	-11.64%	0.00%	-11.75%	0.08%	-6.56%	0.00%	-2.24%
1999	0.06%	-2.91%	0.49%	-0.20%	0.58%	0.58%	0.00%	-10.15%	0.00%	-10.30%	0.00%	-10.15%
2000	0.00%	-12.96%	0.12%	-11.67%	0.00%	-12.35%	0.67%	0.67%	0.37%	0.37%	0.00%	-3.12%
2001	0.00%	-12.71%	1.14%	-7.29%	0.00%	-12.22%	0.00%	-12.12%	0.00%	-11.93%	0.00%	-11.04%
2002	0.00%	-13.54%	0.00%	-13.19%	0.00%	-13.13%	0.00%	-13.05%	0.00%	-12.58%	0.00%	-11.98%
2003	0.00%	-13.47%	0.00%	-13.20%	0.00%	-12.98%	0.00%	-13.17%	0.00%	-12.81%	0.00%	-11.94%
2004	0.00%	-13.47%	0.00%	-13.20%	0.00%	-12.98%	0.00%	-13.17%	0.00%	-12.81%	0.00%	-11.94%
2005	0.00%	-11.68%	0.70%	-0.98%	0.00%	-10.92%	0.00%	-11.16%	0.00%	-10.73%	0.00%	-9.20%
2006	0.00%	-12.81%	0.00%	-12.32%	0.00%	-12.45%	0.00%	-11.45%	0.00%	-12.04%	0.00%	-11.69%
2007	1.22%	-3.47%	0.97%	0.97%	0.00%	-12.76%	0.00%	-12.89%	0.00%	-12.60%	0.56%	0.56%
2008	-0.24%	-1.09%	0.04%	-3.54%	0.00%	-8.44%	0.00%	-7.17%	0.00%	-6.70%	0.23%	0.23%
2009												

Figure 4-27. Habitat summary table for longfin dace (*Agosia chrysogaster*), Gage site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes
Hypothetical Withdrawal 10 cfs

Gage Site
With LWD
Longfin Dace

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-27.98%	0.00%	-23.19%	-0.21%	-21.97%	-0.25%	-24.87%	0.00%	-24.43%	0.00%	-25.37%	2.00%	-17.44%	1.91%	1.91%
1966	0.40%	0.40%	4.96%	9.88%	7.44%	9.36%	0.00%	-28.70%	0.00%	-27.89%	0.00%	-27.56%	0.00%	-27.06%	0.86%	-24.84%	0.85%	-27.10%	0.00%	-27.39%	0.00%	-27.47%	1.30%	-23.04%
1967	0.00%	-28.24%	0.00%	-27.64%	0.00%	-27.76%	0.00%	-27.30%	0.00%	-27.39%	0.00%	-27.06%	4.90%	-13.63%	5.93%	-5.59%	0.44%	-27.32%	0.00%	-25.10%	0.00%	-26.84%	3.20%	3.20%
1968	0.36%	0.36%	4.08%	4.08%	2.60%	2.60%	6.36%	-1.36%	-0.33%	-28.99%	-0.02%	-27.83%	0.27%	-27.08%	4.40%	-23.85%	0.00%	-28.27%	0.00%	-28.21%	0.00%	-28.21%	0.56%	-28.13%
1969	1.64%	1.64%	3.84%	3.84%	2.24%	2.24%	3.50%	-13.28%	5.40%	-25.47%	0.00%	-28.08%	0.00%	-27.97%	0.00%	-28.00%	0.00%	-27.57%	0.00%	-27.58%	0.00%	-28.43%	0.00%	-29.19%
1970	0.00%	-28.76%	0.00%	-27.89%	0.00%	-27.91%	0.00%	-28.64%	0.00%	-27.83%	0.00%	-26.82%	0.00%	-25.33%	2.76%	-21.45%	1.32%	-11.49%	0.00%	-27.28%	0.00%	-28.18%	0.00%	-28.59%
1971	0.00%	-28.57%	0.00%	-28.84%	0.00%	-28.61%	0.00%	-27.01%	0.00%	-26.80%	0.00%	-23.79%	2.22%	-22.02%	2.01%	-15.29%	1.19%	-18.61%	5.12%	5.12%	5.02%	-22.02%	7.20%	-7.41%
1972	4.59%	-16.92%	0.00%	-28.32%	0.00%	-27.72%	0.00%	-27.21%	0.00%	-26.89%	0.64%	-26.63%	0.28%	-26.86%	0.55%	-24.15%	0.06%	-22.43%	2.16%	-9.53%	0.18%	0.18%	2.24%	2.24%
1973	1.42%	1.42%	2.40%	2.40%	-2.84%	-2.84%	1.67%	1.67%	-2.65%	-2.65%	3.89%	-6.66%	3.02%	-7.67%	1.78%	-25.95%	-1.87%	-30.06%	-1.11%	-29.40%	-0.97%	-29.78%	0.87%	-29.56%
1974	3.84%	-13.67%	-0.13%	-27.44%	0.58%	-24.40%	0.00%	-29.30%	-0.07%	-28.49%	0.00%	-27.85%	0.55%	-27.57%	2.39%	-26.93%	-0.22%	-28.37%	3.40%	-20.44%	1.76%	-27.89%	0.00%	-29.16%
1975	0.00%	-29.01%	4.05%	-16.22%	1.45%	1.45%	2.50%	2.50%	1.22%	-28.55%	0.00%	-28.06%	0.09%	-26.30%	0.00%	-27.88%	-0.02%	-28.12%	0.00%	-27.76%	0.00%	-27.71%	0.81%	-27.50%
1976	0.20%	-27.54%	2.16%	1.97%	0.00%	-26.33%	5.52%	-18.49%	-0.08%	-28.82%	0.00%	-27.41%	5.68%	-19.16%	2.28%	-23.38%	2.05%	-23.25%	-0.60%	-26.93%	0.00%	-28.11%	0.00%	-27.48%
1977	0.00%	-29.05%	0.00%	-28.44%	0.00%	-28.45%	3.21%	-23.47%	0.00%	-27.05%	0.00%	-24.43%	-0.27%	-26.06%	3.12%	-20.92%	1.92%	-24.52%	0.00%	-26.82%	0.00%	-25.11%	0.00%	-24.57%
1978	2.02%	-15.28%	2.54%	2.54%	-0.76%	-0.76%	-0.10%	-29.24%	-0.06%	-28.70%	0.00%	-27.84%	0.00%	-27.21%	0.00%	-24.07%	0.00%	-19.35%	0.00%	-23.80%	6.63%	-6.67%	0.24%	0.24%
1979	1.13%	1.13%	1.59%	1.59%	1.18%	1.18%	1.46%	1.46%	12.70%	12.70%	0.06%	-25.18%	-0.97%	-29.32%	0.03%	-28.85%	-0.28%	-28.93%	-1.77%	-27.95%	-2.03%	-30.53%	0.69%	-29.80%
1980	4.14%	4.14%	0.89%	0.89%	1.93%	1.93%	2.85%	2.85%	9.31%	9.31%	0.36%	-10.61%	1.77%	-12.82%	2.48%	-17.19%	2.15%	-16.81%	-2.29%	-29.70%	-1.72%	-30.31%	0.37%	-30.03%
1981	-0.10%	-29.27%	0.91%	-26.06%	4.87%	2.21%	1.20%	-24.92%	-0.52%	-29.46%	-0.03%	-28.56%	1.52%	-27.05%	0.89%	-27.29%	0.57%	-24.54%	-0.03%	-24.86%	0.81%	-25.25%	2.43%	-23.00%
1982	6.21%	4.09%	-0.31%	-0.31%	2.19%	2.19%	6.80%	6.80%	0.31%	-29.18%	-0.67%	-29.01%	-0.16%	-28.53%	1.43%	-24.21%	1.99%	-25.22%	0.00%	-27.88%	0.93%	-10.10%	0.86%	0.86%
1983	0.84%	1.07%	1.03%	1.03%	-1.66%	-1.66%	3.23%	3.23%	12.14%	12.14%	-0.21%	-28.69%	0.17%	-28.17%	3.12%	-22.70%	2.60%	-11.65%	5.92%	-2.09%	1.55%	-13.36%	5.61%	5.61%
1984	5.71%	5.71%	-0.13%	-24.42%	0.00%	-30.36%	0.00%	-30.11%	0.00%	-27.85%	0.00%	-27.27%	0.00%	-27.19%	0.67%	-20.25%	3.91%	-1.76%	5.29%	0.86%	4.01%	-19.26%	1.51%	1.51%
1985	0.46%	0.46%	2.15%	2.15%	3.02%	3.02%	7.26%	7.26%	9.32%	-2.94%	-0.50%	-28.89%	0.63%	-26.94%	1.06%	-26.72%	-0.77%	-24.79%	1.09%	-15.70%	-1.26%	-1.26%	0.00%	0.00%
1986	-0.05%	-14.63%	4.87%	5.02%	1.00%	1.00%	11.95%	6.14%	-0.53%	-29.75%	-0.68%	-29.02%	0.62%	-28.14%	2.89%	-16.15%	2.18%	-17.81%	-0.31%	-28.75%	0.96%	-24.83%	4.50%	-22.39%
1987	3.40%	-3.36%	5.30%	6.25%	2.00%	2.00%	0.29%	-23.76%	-0.10%	-28.98%	0.00%	-27.62%	1.38%	-25.92%	2.24%	-25.02%	0.00%	-27.97%	0.42%	-23.56%	0.47%	-23.91%	0.94%	-28.90%
1988	0.26%	0.26%	-0.14%	-0.14%	0.00%	-28.50%	4.13%	-10.45%	4.13%	-26.15%	-0.30%	-28.72%	1.75%	-25.43%	6.31%	2.70%	5.97%	4.53%	0.00%	-28.35%	0.00%	-28.04%	1.05%	-27.51%
1989	3.65%	-15.54%	3.27%	3.27%	3.43%	-14.45%	2.91%	-20.08%	0.00%	-27.62%	0.00%	-26.01%	0.00%	-25.38%	0.22%	-27.43%	0.00%	-27.60%	0.00%	-27.51%	0.00%	-27.48%	0.00%	-27.48%
1990	0.00%	-28.34%	0.00%	-28.52%	0.00%	-28.45%	0.00%	-28.01%	0.00%	-27.12%	0.00%	-23.70%	0.00%	-25.27%	2.24%	-21.43%	0.00%	-26.63%	0.00%	-26.63%	0.00%	-27.39%	3.34%	-9.69%
1991	6.10%	6.10%	0.53%	-15.57%	4.73%	4.73%	4.22%	4.22%	-0.36%	-28.88%	0.00%	-27.85%	0.00%	-27.45%	0.72%	-26.81%	0.00%	-24.43%	0.00%	-25.24%	0.00%	-27.09%	6.15%	-2.27%
1992	-0.43%	-0.43%	1.70%	1.70%	1.99%	1.99%	2.44%	2.44%	0.42%	-25.25%	0.00%	-27.85%	1.93%	-19.10%	3.61%	-10.91%	3.03%	-25.62%	0.00%	-27.98%	0.57%	-23.85%	0.76%	-2.11%
1993	-0.21%	-0.21%	1.03%	1.03%	1.39%	1.39%	2.40%	2.40%	5.58%	4.77%	0.52%	-14.47%	-1.33%	-23.98%	2.82%	-19.01%	1.30%	-20.26%	0.21%	-22.42%	0.80%	0.80%	8.93%	8.93%
1994	0.58%	-14.77%	4.09%	4.09%	6.26%	8.32%	7.53%	7.76%	5.14%	-24.04%	-0.92%	-29.19%	-0.31%	-28.85%	0.69%	-28.36%	-0.07%	-28.72%	0.13%	-28.50%	1.46%	-27.45%	4.96%	-15.43%
1995	3.26%	3.26%	0.61%	0.61%	-0.47%	-0.47%	5.06%	7.11%	1.61%	-26.64%	-1.40%	-29.54%	-0.25%	-28.80%	-0.01%	-28.83%	-0.82%	-29.32%	-0.39%	-28.89%	-0.21%	-29.17%	0.00%	-29.32%
1996	0.00%	-29.40%	0.00%	-29.29%	0.00%	-29.15%	0.00%	-27.79%	0.00%	-27.18%	0.00%	-26.88%	0.82%	-26.69%	0.00%	-27.14%	5.58%	-16.39%	0.00%	-27.27%	0.00%	-27.71%	0.00%	-28.12%
1997	0.20%	0.20%	0.61%	0.61%	0.95%	0.95%	0.00%	-28.87%	0.00%	-27.39%	0.00%	-26.79%	0.00%	-26.28%	0.00%	-26.34%	0.00%	-25.72%	0.00%	-25.55%	0.00%	-27.27%	0.08%	-27.61%
1998	0.44%	-27.43%	2.08%	2.08%	1.52%	1.52%	2.95%	2.95%	1.02%	-28.34%	0.00%	-27.39%	0.00%	-27.30%	0.00%	-27.04%	0.00%	-26.53%	0.00%	-26.03%	0.41%	-27.25%	0.00%	-28.69%
1999	0.00%	-28.46%	0.00%	-28.21%	0.00%	-28.00%	11.80%	-10.97%	0.00%	-26.02%	0.00%	-23.37%	2.23%	-18.11%	2.10%	-25.41%	2.39%	-17.18%	0.00%	-26.98%	0.00%	-26.95%	0.00%	-26.98%
2000	0.00%	-27.51%	0.00%	-27.52%	0.00%	-27.85%	0.00%	-25.73%	0.00%	-20.92%	0.00%	-20.02%	0.00%	-18.41%	0.58%	-18.83%	0.00%	-22.24%	5.10%	5.10%	3.69%	3.69%	0.00%	-28.21%
2001	0.00%	-28.24%	4.75%	-19.54%	5.45%	6.23%	3.31%	-22.49%	0.00%	-26.95%	0.00%	-21.85%	0.00%	-20.33%	4.25%	-20.00%	0.00%	-23.09%	0.00%	-23.70%	0.00%	-24.93%	0.00%	-26.56%
2002	0.00%	-26.89%	0.00%	-26.65%	0.00%	-25.61%	0.00%	-22.29%	0.00%	-16.90%	0.00%	-14.65%	0.00%	-14.76%	0.00%	-17.01%	0.00%	-17.34%	0.00%	-17.88%	0.00%	-20.82%	0.00%	-24.61%
2003	0.00%	-24.43%	1.17%	-23.55%	1.16%	1.16%	0.00%	-27.30%	0.00%	-22.58%	0.00%	-16.07%	0.00%	-15.22%	0.00%	-16.90%	0.00%	-18.30%	0.00%	-17.12%	0.00%	-19.40%	0.00%	-24.79%
2004	0.00%	-24.43%	1.17%	-23.55%	1.16%	1.16%	0.00%	-27.30%	0.00%	-22.58%	0.00%	-16.07%	0.00%	-15.22%	0.00%	-16.90%	0.00%	-18.30%	0.00%	-17.12%	0.00%	-19.40%	0.00%	-24.79%
2005	4.30%	4.30%	-0.56%	-0.56%	0.55%	0.55%	5.39%	-8.29%	-0.13%	-28.85%	0.00%	-26.95%	0.00%	-26.21%	3.07%	-22.66%	0.00%	-26.84%	0.00%	-26.80%	0.00%	-26.88%	0.00%	-27.14%
2006	0.00%	-27.14%	0.00%	-27.16%	0.00%	-27.09%	0.00%	-26.65%	0.00%	-21.95%	0.00%	-19.50%	0.00%	-19.35%	0.00%	-22.48%	0.00%	-21.61%	0.00%	-22.31%	0.00%	-24.21%	0.00%	-26.12%
2007	0.00%	-26.73%	0.00%	-27.06%	0.00%	-27.26%	0.00%	-24.07%	0.00%	-18.46%	0.00%	-15.16%	4.89%	-5.42%	4.88%	4.12%	0.00%	-19.66%	0.00%	-18.88%	0.00%	-22.23%	2.59%	-0.02%
2008	0.04%	0.04%	1.98%	1.98%	4.70%	4.70%	0.00%	-29.36%	-0.08%	-28.96%	0.00%	-27.61%	-0.16%	-21.99%	0.25%	-27.63%	0.00%	-27.28%	0.00%	-27.50%	0.00%	-27.58%	1.90%	1.90%
2009	3.69%	3.69%	2.27%	2.27%	2.79%	-4.72%	0.00%	-29.80%																

Figure 4-28. Habitat summary table for longfin dace (*Agosia chrysogaster*), Gage site, with LWD and a hypothetical withdrawal rate of 10 ft³/sec.

Summary of normalized habitat changes

Braided Site

No Wood

Longfin Dace

Hypothetical Withdrawal 2 cfs

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.68%	-21.65%	-2.45%	-32.33%	4.15%	-20.74%	7.38%	-27.23%	0.00%	-32.27%	0.45%	-30.14%	-2.90%	-3.85%	-0.21%	-0.21%
1966	-0.97%	-0.97%	0.28%	0.22%	0.24%	1.71%	-1.06%	0.24%	0.00%	-16.54%	-0.79%	-18.42%	0.00%	-23.19%	4.61%	-9.01%	0.00%	-23.62%	0.00%	-17.78%	0.00%	-15.48%	-1.50%	-10.95%
1967	0.00%	-11.43%	0.00%	-19.79%	-0.40%	-18.16%	-0.69%	-19.82%	0.00%	-17.78%	0.00%	-23.19%	-1.05%	-23.19%	0.17%	-4.01%	-4.90%	-17.08%	-6.46%	-30.65%	0.00%	-26.72%	-0.71%	1.04%
1968	0.24%	0.24%	-0.20%	-0.20%	1.65%	1.65%	-6.43%	-7.86%	3.39%	-7.79%	0.51%	-34.29%	0.00%	-12.16%	0.05%	-11.44%	0.00%	-16.80%	0.00%	-17.99%	-0.05%	-12.29%	0.00%	-10.66%
1969	0.52%	-0.18%	6.30%	6.30%	3.26%	3.26%	-2.32%	-11.17%	2.84%	-4.65%	0.00%	-13.99%	0.00%	-15.47%	0.48%	-14.63%	0.71%	-17.39%	0.71%	-17.75%	-0.86%	-9.88%	0.00%	-7.86%
1970	0.00%	-11.13%	0.00%	-10.58%	0.00%	-3.96%	0.00%	-10.87%	0.00%	-22.58%	0.00%	-26.69%	-0.20%	-31.44%	0.79%	-16.81%	-1.22%	-0.22%	0.00%	-19.67%	0.00%	-11.31%	0.00%	-10.66%
1971	0.00%	-10.72%	0.00%	-11.27%	0.00%	-11.52%	0.00%	-24.00%	0.00%	-27.05%	-1.26%	-31.81%	0.00%	-31.66%	7.58%	-22.31%	-1.33%	-14.86%	-1.85%	-6.68%	0.00%	-11.42%	-2.49%	-3.43%
1972	0.00%	-11.19%	0.00%	-15.78%	-0.69%	-17.58%	0.00%	-20.75%	0.00%	-25.13%	0.00%	-27.06%	0.00%	-23.19%	0.00%	-23.19%	0.00%	-27.40%	-1.27%	-3.37%	-0.02%	-0.02%	0.37%	0.37%
1973	0.82%	0.82%	0.00%	0.00%	-0.06%	-0.06%	0.13%	0.13%	0.32%	0.12%	-0.38%	-9.74%	-7.37%	-8.27%	9.76%	9.67%	6.73%	-3.55%	-2.71%	-12.39%	-0.09%	-3.53%	1.83%	1.92%
1974	0.13%	-1.41%	0.00%	-0.54%	0.00%	7.60%	0.00%	-7.87%	-0.17%	-10.33%	0.00%	-31.78%	0.00%	-14.78%	1.00%	-9.68%	-0.56%	-10.70%	2.60%	-10.17%	-0.29%	-9.74%	-0.24%	-9.31%
1975	0.00%	-11.42%	0.00%	-5.46%	-0.19%	-0.97%	2.79%	2.79%	3.95%	-2.81%	0.00%	-14.04%	-0.03%	-12.98%	0.00%	-21.92%	-0.06%	-18.92%	0.00%	-18.16%	0.00%	-18.92%	0.00%	-13.50%
1976	-4.20%	-6.02%	-2.29%	1.06%	0.00%	-1.90%	0.11%	-5.43%	0.94%	-9.66%	0.00%	-17.53%	-0.47%	-22.47%	0.47%	-19.96%	0.01%	-23.19%	0.00%	-11.03%	0.00%	-13.55%	0.00%	-16.43%
1977	0.00%	-5.72%	0.00%	-10.39%	0.00%	-10.50%	0.00%	-14.57%	0.00%	-23.32%	0.00%	-31.12%	0.00%	-30.81%	-2.46%	-36.18%	1.56%	-14.35%	0.00%	-26.77%	-0.67%	-30.88%	0.00%	-30.98%
1978	-3.15%	-2.20%	0.18%	0.55%	0.53%	0.53%	0.00%	-1.77%	-0.14%	-10.83%	0.00%	-17.18%	0.00%	-20.75%	0.00%	-31.51%	0.00%	-37.20%	-0.26%	-31.18%	-1.11%	-18.79%	1.55%	1.55%
1979	-0.41%	-0.41%	0.62%	0.62%	0.31%	0.31%	0.07%	0.07%	0.61%	2.05%	-1.80%	-3.23%	0.54%	-9.65%	-0.70%	-10.11%	2.86%	-8.48%	8.81%	4.06%	4.88%	9.61%	0.00%	2.86%
1980	0.62%	0.84%	0.57%	0.57%	0.77%	-0.03%	-2.70%	3.50%	-2.16%	-2.53%	-0.59%	-11.26%	-12.75%	-13.30%	-2.71%	-4.24%	-5.52%	-5.52%	9.54%	9.54%	6.37%	9.76%	0.00%	9.55%
1981	0.00%	7.96%	0.00%	8.26%	0.35%	-6.54%	-1.30%	-3.29%	-1.27%	-9.47%	-0.37%	-10.69%	-1.59%	-8.21%	0.16%	-9.36%	-1.53%	-12.17%	2.95%	1.98%	-3.16%	-4.50%	-2.01%	-2.98%
1982	-1.57%	-3.45%	-3.41%	-8.40%	0.03%	0.07%	0.85%	1.30%	0.38%	-3.71%	-1.65%	-11.61%	-0.03%	-16.71%	0.21%	-9.69%	-2.10%	-12.05%	0.00%	-16.65%	-6.65%	-2.17%	-3.79%	0.85%
1983	0.23%	-3.78%	0.19%	0.19%	0.14%	0.14%	0.27%	0.27%	-2.25%	-0.84%	2.69%	-3.55%	0.11%	-9.19%	1.05%	-5.87%	-1.89%	-0.08%	-1.62%	3.53%	-3.76%	-1.55%	-5.74%	-1.36%
1984	-0.76%	0.80%	-2.43%	1.83%	0.00%	7.85%	-1.04%	0.22%	0.00%	-20.51%	0.00%	-28.52%	0.00%	-25.67%	0.15%	-3.66%	-3.51%	-0.03%	-2.74%	1.81%	-0.42%	-4.02%	0.14%	0.14%
1985	0.47%	0.47%	0.97%	0.72%	0.57%	0.57%	9.89%	11.44%	-11.73%	-12.82%	-5.82%	-11.38%	-0.86%	-10.66%	-1.39%	-6.36%	-0.78%	-4.34%	-1.61%	-2.34%	0.20%	-1.11%	1.57%	1.57%
1986	-0.13%	-9.52%	-4.42%	0.94%	0.31%	0.31%	-0.05%	-4.27%	5.62%	0.68%	-1.68%	-11.63%	-1.20%	-9.12%	2.08%	-3.59%	0.69%	-17.25%	-4.06%	-13.31%	-0.52%	-2.32%	-9.11%	-3.95%
1987	0.67%	-2.74%	2.52%	2.98%	0.54%	0.35%	1.34%	0.58%	0.06%	-8.44%	-0.70%	-16.03%	0.00%	-17.91%	-0.60%	-11.83%	0.00%	-14.54%	0.71%	-24.52%	-0.16%	-3.26%	-7.13%	-4.52%
1988	1.65%	0.83%	1.14%	0.30%	-1.04%	-0.61%	-0.22%	-1.53%	-1.43%	-9.59%	-0.75%	-11.04%	-0.25%	-11.13%	0.52%	0.08%	0.54%	0.34%	-0.36%	-16.15%	0.00%	-25.06%	0.00%	-10.37%
1989	0.14%	-6.81%	0.18%	0.18%	3.76%	0.63%	-0.80%	-4.05%	-0.70%	-18.36%	-0.65%	-29.37%	0.68%	-31.27%	-0.14%	-24.30%	0.68%	-26.58%	-0.74%	-22.07%	0.00%	-16.43%	0.00%	-16.30%
1990	0.00%	-9.67%	0.00%	-10.22%	0.00%	-10.06%	0.00%	-15.38%	0.06%	-21.33%	0.00%	-31.91%	0.00%	-31.44%	-0.17%	-29.84%	0.77%	-29.82%	0.00%	-27.28%	0.01%	-21.20%	-5.97%	-11.61%
1991	-6.30%	-4.40%	-3.77%	-2.53%	-0.10%	-0.10%	0.35%	0.35%	-0.88%	-11.34%	0.00%	-17.08%	-1.46%	-23.15%	0.73%	-19.96%	-2.32%	-31.12%	-6.19%	-30.27%	0.00%	-22.78%	-1.70%	-6.04%
1992	0.93%	0.93%	1.09%	0.24%	0.42%	2.91%	0.59%	0.59%	-2.64%	-6.15%	0.00%	-17.08%	0.85%	-17.86%	-6.64%	-4.44%	0.00%	-10.61%	0.00%	-28.93%	0.00%	-20.01%	-5.15%	-0.14%
1993	0.54%	0.28%	0.23%	0.23%	0.09%	0.09%	3.54%	2.81%	-0.79%	-1.25%	-11.20%	-12.30%	-13.72%	-13.72%	7.64%	6.65%	0.41%	-0.53%	5.15%	-0.73%	2.30%	-0.49%	0.79%	0.69%
1994	-2.39%	-12.04%	-4.36%	-2.98%	0.52%	1.71%	1.27%	1.18%	0.49%	-3.88%	-2.27%	-11.97%	-0.77%	-11.30%	0.00%	-9.95%	-0.17%	-11.05%	-1.00%	-10.98%	-2.45%	-7.93%	-2.90%	-1.52%
1995	0.36%	0.36%	0.48%	0.48%	-0.05%	-0.05%	-0.52%	-3.58%	0.74%	-0.25%	4.09%	-5.84%	-0.61%	-11.20%	-0.03%	-11.25%	-0.71%	-11.21%	-0.97%	-11.38%	-0.52%	-11.93%	0.00%	-5.44%
1996	0.00%	-5.09%	0.00%	-4.68%	0.00%	-9.16%	0.00%	-17.83%	0.00%	-21.29%	0.00%	-26.05%	0.68%	-27.30%	0.00%	-21.97%	-0.76%	-22.21%	0.00%	-20.07%	0.00%	-18.81%	0.00%	-13.45%
1997	0.44%	0.44%	0.84%	0.84%	0.55%	0.55%	-0.22%	-10.64%	0.00%	-18.39%	0.00%	-27.55%	0.82%	-28.61%	1.30%	-24.84%	-6.80%	-20.62%	2.71%	-22.90%	0.02%	-24.42%	0.69%	-15.99%
1998	-0.66%	-2.31%	0.28%	0.28%	0.34%	0.34%	0.49%	0.49%	-3.21%	-8.34%	0.65%	-17.79%	0.00%	-27.24%	0.59%	-23.48%	0.00%	-29.35%	0.00%	-29.47%	-0.04%	-18.02%	0.00%	-10.98%
1999	0.00%	-10.51%	0.00%	-12.29%	0.00%	-17.38%	0.00%	-9.05%	0.00%	-29.45%	0.00%	-32.27%	-0.19%	-29.96%	-0.11%	-15.86%	3.01%	-8.84%	0.00%	-24.55%	0.00%	-24.96%	0.00%	-24.55%
2000	0.00%	-15.89%	0.00%	-18.59%	-0.10%	-16.71%	-0.66%	-30.24%	0.00%	-35.17%	0.00%	-36.32%	0.00%	-38.49%	5.19%	-36.58%	0.00%	-33.58%	-10.23%	-33.08%	-4.67%	-2.85%	0.00%	-12.29%
2001	0.00%	-11.41%	0.00%	-8.13%	0.87%	0.87%	-0.50%	-3.39%	0.00%	-24.96%	0.00%	-34.03%	0.00%	-34.52%	1.53%	-36.32%	-4.41%	-33.17%	0.00%	-28.49%	0.00%	-26.56%	0.00%	-27.92%
2002	0.00%	-25.91%	0.00%	-27.92%	0.93%	-30.12%	-5.92%	-33.52%	0.00%	-40.68%	0.00%	-44.28%	0.00%	-44.08%	0.00%	-39.37%	0.00%	-40.03%	0.00%	-39.24%	0.00%	-32.70%	-10.57%	-30.93%
2003	0.00%	-27.86%	0.00%	-31.12%	2.73%	2.73%	0.00%	-19.26%	0.00%	-27.61%	0.00%	-41.96%	0.00%	-43.32%	0.00%	-40.68%	-0.37%	-38.63%	0.00%	-40.35%	0.00%	-37.13%	1.19%	-25.48%
2004	0.00%	-27.86%	0.00%	-31.12%	2.73%	2.73%	0.00%	-19.26%	0.00%	-27.61%	0.00%	-41.96%	0.00%	-43.32%	0.00%	-40.68%	-0.37%	-38.63%	0.00%	-40.35%	0.00%	-37.13%	1.19%	-25.48%
2005	2.80%	2.23%	0.15%	0.15%	-0.53%	-0.53%	-1.04%	-2.72%	-0.33%	-11.30%	0.00%	-24.96%	0.29%	-29.88%	0.00%	-16.69%	0.00%	-26.73%	0.00%	-27.41%	0.00%	-26.18%	0.00%	-21.83%
2006	0.00%	-21.83%	0.00%	-21.56%	0.01%	-22.65%	0.00%	-26.82%	0.00%	-33.92%	0.00%	-36.99%	0.00%	-37.20%	0.00%	-29.18%	0.00%	-34.32%	0.00%	-30.54%	0.00%	-28.91%	0.00%	-27.38%
2007	0.00%	-30.83%	-0.75%	-31.67%	0.03%	-19.42%	0.00%	-31.51%	0.00%	-38.41%	0.00%	-43.41%	0.00%	-43.32%	0.00%	-34.50%	0.00%	-36.79%	0.00%	-37.83%	0.00%	-35.42%	-6.61%	0.27%
2008	0.40%	0.40%	0.23%	-3.25%	0.61%	1.19%	-1.08%	0.43%	-0.19%	-9.38%	0.69%	-23.31%	0.69%	-23.28%	0.81%	-10.51%	0.02%	-20.69%	0.00%	-18.83%	0.71%	-17.75%	-1.42%	0.81%
2009	2.00%	2.00%	2.25%	2.90%	-0.17%	-10.56%	0.00%	-3.51%																

Figure 4-29. Habitat summary table for longfin dace (*Agosia chrysogaster*), Braided site, with no LWD and with a hypothetical withdrawal rate of 2 ft³/sec.

Summary of normalized habitat changes

Braided Site

No Wood

Longfin Dace

Hypothetical Withdrawal 10 cfs

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965									0.68%	-68.94%	-2.45%	-61.91%	4.80%	-64.79%	7.38%	-60.63%	0.00%	-63.94%	0.45%	-64.49%	-2.46%	-67.49%	-0.69%	-12.08%
1966	0.22%	-0.68%	0.30%	-11.55%	5.58%	-13.72%	-1.06%	-69.17%	0.00%	-69.06%	-0.79%	-67.72%	0.00%	-66.21%	2.02%	-67.74%	0.00%	-68.87%	0.00%	-66.34%	0.00%	-67.11%	-0.15%	-67.16%
1967	0.00%	-69.44%	0.00%	-68.79%	-0.40%	-68.92%	-0.69%	-66.53%	0.00%	-66.34%	0.00%	-66.21%	0.00%	-66.21%	2.26%	-64.41%	-5.37%	-67.74%	-6.46%	-64.29%	0.00%	-66.16%	3.88%	-60.19%
1968	2.38%	5.98%	1.41%	2.49%	2.18%	4.03%	-1.61%	-47.16%	3.43%	-68.95%	0.51%	-68.62%	0.00%	-69.43%	0.05%	-70.18%	0.00%	-69.47%	0.00%	-69.41%	0.00%	-69.41%	0.00%	-69.75%
1969	1.46%	-59.49%	6.70%	11.46%	4.99%	6.19%	-2.86%	-69.62%	2.84%	-69.81%	0.00%	-69.27%	0.00%	-69.15%	0.48%	-69.03%	0.71%	-67.37%	0.71%	-67.62%	0.00%	-69.64%	0.00%	-70.44%
1970	0.00%	-69.99%	0.00%	-69.71%	0.00%	-70.88%	0.00%	-69.86%	0.00%	-68.99%	0.00%	-66.17%	-0.22%	-65.08%	-0.74%	-65.22%	-1.72%	-59.88%	0.00%	-66.29%	0.00%	-69.37%	0.00%	-69.81%
1971	0.00%	-69.78%	0.00%	-70.07%	0.00%	-69.83%	0.00%	-66.19%	0.00%	-66.13%	-1.26%	-62.51%	0.00%	-62.69%	7.58%	-64.08%	-0.93%	-62.54%	-2.47%	-52.83%	0.00%	-69.42%	-1.76%	-66.55%
1972	0.00%	-69.51%	0.00%	-69.53%	-0.69%	-68.45%	0.00%	-66.27%	0.00%	-66.24%	0.00%	-66.22%	0.00%	-66.21%	0.00%	-66.21%	0.00%	-61.26%	-2.02%	-57.77%	0.07%	-54.30%	3.55%	-6.23%
1973	3.69%	7.73%	-0.16%	-0.16%	-0.23%	-0.23%	0.57%	0.49%	1.81%	3.18%	-8.90%	-53.02%	-5.00%	-49.13%	8.14%	-65.34%	6.67%	-67.96%	-2.71%	-70.65%	-0.73%	-69.55%	0.58%	-69.24%
1974	1.57%	-56.17%	0.00%	-65.88%	0.00%	-65.88%	0.00%	-70.55%	-0.17%	-69.71%	0.00%	-69.02%	0.00%	-69.15%	1.00%	-69.79%	-0.56%	-69.58%	4.31%	-67.36%	-0.29%	-70.34%	-0.24%	-70.40%
1975	0.00%	-70.18%	0.00%	-70.48%	-0.80%	3.01%	7.38%	-27.06%	4.77%	-69.26%	0.00%	-69.24%	-0.03%	-69.35%	0.00%	-69.05%	-0.06%	-69.31%	0.00%	-68.92%	0.00%	-68.86%	0.00%	-69.27%
1976	-4.38%	-65.74%	-2.06%	-34.81%	0.00%	-69.31%	0.11%	-70.61%	0.94%	-69.71%	0.00%	-66.36%	-0.47%	-67.94%	0.66%	-68.65%	0.01%	-66.21%	0.00%	-69.54%	0.00%	-69.30%	0.00%	-66.37%
1977	0.00%	-68.28%	0.00%	-69.65%	0.00%	-69.66%	0.00%	-69.24%	0.00%	-66.20%	0.00%	-63.33%	0.00%	-65.69%	-2.49%	-67.53%	1.11%	-69.13%	0.00%	-66.23%	-0.67%	-64.41%	0.00%	-63.50%
1978	-2.43%	-62.75%	2.13%	4.57%	2.62%	2.12%	-1.40%	-70.16%	-0.14%	-69.93%	0.00%	-69.00%	0.00%	-66.27%	0.00%	-62.87%	0.00%	-56.17%	-0.26%	-62.77%	-0.23%	-65.86%	0.76%	-4.59%
1979	0.60%	0.76%	3.02%	7.63%	1.79%	1.79%	1.23%	5.43%	-5.82%	-48.09%	-3.52%	-63.60%	0.32%	-69.75%	-1.37%	-70.50%	2.65%	-69.16%	6.49%	-67.87%	4.73%	-67.87%	0.00%	-67.87%
1980	1.48%	-40.70%	2.57%	2.10%	2.78%	3.66%	13.82%	18.51%	-7.67%	-48.26%	-8.95%	-61.20%	-8.26%	-49.59%	1.10%	-40.63%	-3.03%	-54.64%	6.16%	-66.62%	4.73%	-67.87%	0.00%	-67.87%
1981	0.00%	-67.87%	0.00%	-67.22%	0.77%	-40.98%	-0.67%	-64.63%	-1.27%	-70.71%	-0.08%	-69.77%	-2.05%	-70.47%	0.84%	-70.15%	-1.53%	-70.54%	0.43%	-69.71%	-4.76%	-71.55%	-4.43%	-70.25%
1982	-2.15%	-11.67%	-3.91%	-7.33%	0.86%	-2.57%	5.37%	-48.75%	3.36%	-69.66%	-1.65%	-70.25%	-0.03%	-69.64%	0.89%	-69.96%	-0.78%	-69.84%	0.00%	-69.05%	-6.80%	-61.56%	-2.35%	0.47%
1983	-6.10%	-2.24%	0.97%	0.91%	-0.06%	-0.06%	0.85%	3.49%	-1.48%	-46.99%	5.69%	-68.03%	0.03%	-69.84%	1.05%	-70.14%	0.81%	-65.92%	1.41%	-59.09%	-6.18%	-66.12%	-4.81%	-26.56%
1984	7.87%	12.63%	-2.43%	-60.23%	0.00%	-67.84%	-1.04%	-69.69%	0.00%	-69.02%	0.00%	-66.30%	0.00%	-66.26%	2.91%	-65.83%	-2.28%	-63.21%	-0.97%	-62.01%	0.63%	-68.88%	2.07%	3.02%
1985	1.65%	2.27%	4.25%	4.17%	2.20%	3.57%	10.14%	17.18%	-7.05%	-52.05%	-1.24%	-70.13%	-0.17%	-69.78%	-0.80%	-70.68%	-1.29%	-70.18%	1.38%	-57.55%	-4.15%	-28.40%	5.16%	-28.83%
1986	-1.14%	-44.31%	-5.68%	-15.77%	1.52%	1.51%	2.65%	-45.70%	5.64%	-68.96%	-1.68%	-70.26%	-0.99%	-70.10%	-1.70%	-66.95%	0.69%	-68.38%	-4.32%	-71.14%	-1.16%	-64.14%	-9.97%	-59.78%
1987	0.59%	-50.44%	3.97%	3.29%	3.12%	7.12%	1.34%	-64.04%	0.90%	-69.87%	-0.70%	-67.70%	0.00%	-66.34%	0.29%	-69.52%	0.00%	-68.52%	0.71%	-67.62%	0.67%	-69.97%	-8.30%	-70.54%
1988	4.41%	-24.40%	2.54%	4.85%	-1.04%	-69.80%	0.91%	-67.55%	-1.43%	-70.74%	-0.75%	-69.95%	-1.27%	-69.66%	-3.94%	-57.38%	-0.29%	-64.29%	0.00%	-69.55%	0.00%	-69.22%	0.00%	-69.46%
1989	-0.13%	-59.35%	4.79%	3.00%	3.35%	-69.55%	-0.80%	-70.32%	-0.70%	-68.13%	-0.65%	-65.44%	0.68%	-65.14%	-0.14%	-67.72%	0.68%	-67.88%	-0.74%	-67.12%	0.00%	-66.37%	0.00%	-66.38%
1990	0.00%	-69.42%	0.00%	-69.61%	0.00%	-69.66%	0.00%	-69.13%	0.06%	-66.27%	0.00%	-62.39%	0.00%	-65.23%	-0.17%	-66.74%	0.77%	-66.15%	0.00%	-66.11%	0.01%	-66.34%	-5.85%	-67.74%
1991	-5.80%	-62.42%	-3.46%	-60.58%	-0.49%	-0.06%	1.73%	-3.35%	-0.88%	-70.12%	0.00%	-69.01%	-1.46%	-66.87%	0.73%	-66.83%	-2.32%	-63.33%	-6.19%	-64.33%	0.00%	-66.22%	-4.52%	-65.27%
1992	4.68%	12.35%	1.06%	2.43%	2.61%	5.65%	2.93%	-16.03%	1.08%	-61.63%	0.00%	-69.01%	0.28%	-67.39%	-4.84%	-54.11%	0.00%	-69.72%	0.00%	-69.15%	0.00%	-69.14%	-7.02%	-13.66%
1993	2.11%	-0.99%	1.16%	3.58%	0.40%	8.28%	2.55%	3.93%	-7.60%	-67.01%	-8.04%	-66.95%	-8.06%	-60.52%	6.77%	-61.67%	-0.33%	-62.33%	2.78%	-55.84%	3.43%	-37.25%	-13.41%	-66.95%
1994	-2.64%	-44.38%	0.01%	-27.08%	4.70%	5.35%	2.20%	-53.70%	0.89%	-69.22%	-2.27%	-70.44%	-0.77%	-70.08%	-0.22%	-70.14%	-0.17%	-69.95%	-0.33%	-69.92%	-0.79%	-70.39%	-6.78%	-43.71%
1995	-0.45%	3.23%	0.86%	4.95%	1.98%	5.10%	-1.62%	-54.07%	7.44%	-64.55%	4.09%	-68.51%	-0.61%	-70.03%	-0.03%	-70.06%	-1.12%	-70.30%	-0.97%	-70.13%	-0.52%	-70.41%	0.00%	-70.56%
1996	0.00%	-70.55%	0.00%	-70.31%	0.00%	-70.39%	0.00%	-68.95%	0.00%	-66.25%	0.00%	-66.14%	0.68%	-66.83%	0.00%	-66.24%	-0.76%	-67.90%	0.00%	-66.29%	0.00%	-68.87%	0.00%	-69.31%
1997	3.89%	-60.07%	4.16%	8.48%	1.96%	-0.08%	-0.22%	-70.10%	0.00%	-66.59%	0.00%	-66.10%	0.82%	-63.88%	1.30%	-63.75%	-6.80%	-60.34%	0.98%	-63.17%	0.02%	-66.30%	-0.55%	-68.56%
1998	-0.66%	-69.27%	1.19%	-43.14%	1.90%	4.94%	2.29%	0.43%	0.05%	-70.28%	0.65%	-66.35%	0.00%	-66.30%	0.59%	-66.21%	0.00%	-66.07%	0.00%	-65.27%	-0.36%	-67.83%	0.00%	-69.92%
1999	0.00%	-69.67%	0.00%	-69.41%	0.00%	-69.18%	0.00%	-70.40%	0.00%	-65.26%	0.00%	-61.97%	-1.29%	-65.15%	-0.11%	-69.75%	3.50%	-61.70%	0.00%	-66.17%	0.00%	-66.16%	0.00%	-66.17%
2000	0.00%	-66.38%	0.00%	-66.39%	-0.10%	-69.02%	-0.66%	-65.14%	0.00%	-58.56%	0.00%	-57.20%	0.00%	-54.65%	5.19%	-56.89%	0.00%	-60.44%	-10.23%	-61.02%	1.99%	-54.50%	0.00%	-69.41%
2001	0.00%	-69.43%	0.00%	-68.23%	3.14%	-29.48%	-0.50%	-70.27%	0.00%	-66.16%	0.00%	-59.90%	0.00%	-55.99%	1.53%	-63.85%	-4.41%	-61.60%	0.00%	-60.50%	0.00%	-61.85%	0.00%	-66.14%
2002	0.00%	-66.14%	0.00%	-66.14%	0.93%	-65.08%	-5.92%	-60.50%	0.00%	-52.07%	0.00%	-47.82%	0.00%	-48.05%	0.00%	-51.34%	0.00%	-52.83%	0.00%	-53.76%	0.00%	-56.74%	-10.57%	-63.56%
2003	0.00%	-61.59%	0.00%	-63.33%	4.67%	2.88%	0.00%	-66.30%	0.00%	-57.74%	0.00%	-50.56%	0.00%	-48.95%	0.00%	-52.07%	-0.37%	-54.47%	0.00%	-52.45%	0.00%	-56.25%	1.19%	-61.03%
2004	0.00%	-61.59%	0.00%	-63.33%	4.67%	2.88%	0.00%	-66.30%	0.00%	-57.74%	0.00%	-50.56%	0.00%	-48.95%	0.00%	-52.07%	-0.37%	-54.47%	0.00%	-52.45%	0.00%	-56.25%	1.19%	-61.03%
2005	2.67%	-2.16%	1.28%	-1.57%	-0.26%	3.16%	-1.10%	-61.21%	-0.33%	-70.08%	0.00%	-66.16%	0.29%	-65.83%	0.00%	-66.65%	0.00%	-66.12%	0.00%	-66.10%	0.00%	-66.13%	0.00%	-66.24%
2006	0.00%	-66.24%	0.00%	-66.25%	0.01%	-66.22%	0.00%	-65.89%	0.00%	-60.03%	0.00%	-56.41%	0.00%	-56.17%	0.00%	-58.34%	0.00%	-59.55%	0.00%	-60.23%	0.00%	-61.72%	0.00%	-64.47%
2007	0.00%	-66.08%	-0.75%	-66.66%	0.03%	-66.31%	0.00%	-62.87%	0.00%	-54.74%	0.00%	-48.84%	0.00%	-48.95%	0.00%	-59.34%	0.00%	-56.65%	0.00%	-55.42%	0.00%	-58.26%	-4.18%	-22.77%
2008	1.62%	4.99%	1.13%	2.44%	3.78%	-18.92%	-1.08%	-69.39%	-0.19%	-70.19%	0.69%	-68.54%	0.69%	-68.75%	0.41%	-68.88%	0.02%	-66.29%	0.00%	-66.38%	0.71%	-67.62%	-1.43%	-59.49%
2009	7.90%	5.69%	4.68%	1.05%	1.22%	-46.68%	0.00%	-69.87%																

Figure 4-30. Habitat summary table for longfin dace (*Agosia chrysogaster*), Braided site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 2 cfs											Braided Site With LWD Longfin Dace													
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.18%	-11.48%	-1.51%	-19.88%	1.50%	-13.30%	2.76%	-16.51%	0.15%	-19.95%	0.29%	-19.03%	-2.51%	0.19%	-1.97%	-1.97%
1966	0.03%	0.03%	0.74%	1.28%	-0.59%	1.42%	-0.46%	0.13%	0.00%	-7.76%	-0.23%	-10.30%	0.00%	-14.72%	2.38%	-4.51%	0.00%	-12.69%	0.00%	-11.06%	-1.22%	-9.30%	-1.60%	-4.63%
1967	0.00%	-4.34%	0.00%	-10.10%	0.00%	-8.93%	-0.16%	-12.21%	0.00%	-11.06%	0.00%	-14.72%	-1.58%	-3.87%	-2.25%	-3.40%	-3.30%	-9.43%	-4.05%	-19.28%	0.00%	-17.06%	1.41%	1.41%
1968	-0.14%	-0.14%	-0.68%	-0.68%	1.80%	1.80%	0.30%	0.78%	0.80%	-2.02%	0.08%	-20.30%	0.71%	-3.35%	2.32%	0.77%	0.00%	-8.07%	0.00%	-8.62%	-0.03%	-4.68%	0.00%	-3.55%
1969	0.64%	1.56%	5.15%	6.05%	4.41%	4.41%	1.69%	2.35%	0.90%	0.43%	0.00%	-5.92%	0.00%	-6.99%	0.23%	-6.48%	0.18%	-9.82%	0.18%	-9.83%	-0.42%	-3.40%	0.00%	-3.16%
1970	0.00%	-3.85%	0.30%	-2.93%	0.01%	0.04%	0.00%	-3.65%	0.00%	-11.93%	0.00%	-17.02%	-0.26%	-19.16%	-5.61%	-9.13%	1.94%	2.14%	0.00%	-12.34%	0.00%	-4.55%	0.00%	-3.57%
1971	0.00%	-3.54%	0.00%	-3.95%	0.00%	-4.13%	0.00%	-15.27%	0.00%	-17.29%	-0.78%	-19.69%	0.00%	-19.63%	-2.12%	-3.70%	-2.54%	-6.86%	0.29%	0.32%	0.43%	-1.37%	-3.27%	1.32%
1972	0.81%	1.24%	0.00%	-7.88%	-0.18%	-8.99%	0.00%	-13.08%	0.00%	-15.93%	0.00%	-17.20%	0.00%	-14.72%	2.11%	-12.93%	0.00%	-16.74%	1.77%	-4.82%	0.31%	0.31%	0.60%	0.60%
1973	0.43%	0.43%	0.07%	0.07%	0.48%	0.48%	0.29%	0.29%	0.31%	0.31%	1.87%	2.01%	-0.53%	0.23%	1.53%	1.89%	3.17%	-0.60%	-1.34%	-4.81%	0.56%	-0.60%	0.88%	0.91%
1974	0.81%	2.92%	0.00%	-0.26%	0.00%	1.29%	0.00%	-3.29%	-0.08%	-3.41%	0.00%	-18.24%	0.00%	-6.78%	0.18%	-2.48%	-0.27%	-4.69%	1.45%	-0.83%	0.70%	-2.28%	-0.12%	-3.73%
1975	0.00%	-4.12%	-0.08%	0.96%	1.28%	2.22%	2.78%	2.78%	0.98%	-0.71%	0.00%	-5.96%	0.61%	-3.52%	0.00%	-11.46%	-0.03%	-9.87%	0.00%	-8.93%	0.00%	-9.47%	0.14%	-5.76%
1976	-4.15%	-2.34%	-1.04%	0.22%	-0.10%	0.19%	1.28%	2.07%	0.78%	-2.98%	0.00%	-10.88%	-0.51%	-9.79%	0.39%	-8.81%	-0.13%	-14.14%	-0.12%	-2.76%	0.00%	-5.60%	0.00%	-10.15%
1977	0.00%	-1.20%	0.00%	-3.34%	0.00%	-3.37%	-0.03%	-3.69%	0.00%	-14.81%	0.00%	-19.42%	0.00%	-19.15%	1.15%	-18.09%	1.95%	-4.45%	0.00%	-17.01%	-0.14%	-19.25%	0.00%	-19.36%
1978	-4.42%	0.42%	0.18%	0.45%	0.28%	0.28%	0.34%	-0.52%	-0.07%	-3.73%	0.00%	-8.23%	0.00%	-13.08%	0.00%	-19.57%	0.00%	-21.62%	-0.18%	-19.08%	0.10%	0.46%	0.38%	2.59%
1979	-1.62%	-1.62%	0.62%	1.22%	0.24%	0.24%	0.60%	0.60%	1.44%	1.76%	0.18%	0.28%	0.56%	-3.11%	-0.52%	-3.90%	1.38%	-2.54%	4.18%	4.44%	2.30%	4.53%	0.00%	1.35%
1980	1.05%	1.58%	0.39%	0.39%	0.56%	1.61%	-3.67%	3.13%	-0.05%	0.79%	1.13%	-0.89%	-0.38%	-0.68%	-2.64%	-2.15%	1.45%	2.04%	4.50%	4.50%	3.00%	4.60%	0.00%	4.50%
1981	0.00%	3.56%	0.00%	1.91%	0.98%	1.61%	0.19%	-0.95%	-0.63%	-3.88%	-0.18%	-3.53%	0.41%	-1.32%	0.58%	-2.31%	-0.29%	-2.23%	1.45%	0.61%	-1.00%	-0.63%	-2.16%	-0.16%
1982	-4.43%	-5.40%	-0.12%	-4.92%	0.08%	1.80%	0.80%	1.63%	0.46%	-1.02%	-0.81%	-4.22%	-0.01%	-8.05%	0.21%	-1.75%	0.26%	-3.85%	0.00%	-7.84%	-6.14%	1.08%	-3.02%	1.20%
1983	0.38%	-4.80%	0.28%	0.28%	0.30%	0.30%	0.66%	0.66%	0.17%	1.43%	1.22%	-0.68%	-0.24%	-2.69%	0.37%	0.75%	-3.40%	1.95%	-3.27%	2.23%	-3.08%	2.00%	-3.15%	1.43%
1984	-1.15%	0.52%	-0.92%	0.43%	0.00%	3.70%	-0.46%	0.34%	0.00%	-10.50%	0.00%	-18.05%	0.00%	-16.26%	-0.68%	-0.99%	-3.76%	-0.63%	-2.43%	2.28%	-1.26%	-0.62%	-0.24%	-0.24%
1985	0.49%	0.49%	0.76%	0.28%	0.37%	0.37%	7.74%	9.38%	0.53%	1.45%	-2.85%	-4.04%	-1.05%	-3.54%	0.08%	-0.21%	0.72%	-0.06%	1.78%	2.77%	-0.56%	-1.69%	0.99%	0.99%
1986	0.42%	-0.37%	-3.40%	1.30%	0.19%	0.19%	0.73%	2.07%	2.16%	0.69%	-0.82%	-4.23%	0.19%	-2.54%	0.03%	1.73%	0.55%	0.51%	-0.04%	-3.31%	0.25%	0.60%	-0.59%	0.83%
1987	0.03%	1.97%	0.91%	2.12%	0.81%	0.39%	0.68%	1.37%	0.15%	-2.90%	-0.18%	-8.91%	0.00%	-11.15%	0.05%	-4.20%	0.00%	-7.61%	-0.14%	-10.84%	0.69%	0.37%	-1.43%	-0.12%
1988	0.10%	0.99%	0.11%	1.03%	-0.33%	-0.04%	0.49%	1.67%	0.94%	-1.68%	-0.37%	-3.78%	2.79%	-0.03%	-2.63%	-1.07%	-0.92%	-0.85%	-0.18%	-7.88%	0.00%	-13.56%	0.00%	-3.88%
1989	0.50%	1.34%	0.65%	0.65%	1.85%	2.58%	2.05%	2.54%	-0.18%	-9.78%	-0.14%	-18.49%	0.47%	-19.64%	-0.09%	-14.20%	0.17%	-15.51%	-0.20%	-13.15%	0.00%	-10.15%	0.00%	-10.06%
1990	0.00%	-3.11%	0.00%	-3.27%	0.00%	-3.33%	0.00%	-6.97%	0.01%	-13.45%	0.00%	-19.73%	0.00%	-19.33%	0.28%	-17.21%	0.23%	-18.94%	0.07%	-17.42%	0.00%	-13.28%	-4.63%	-1.70%
1991	-5.07%	-4.27%	-2.31%	-3.34%	0.07%	0.07%	0.38%	0.38%	-0.73%	-4.02%	0.00%	-8.15%	-0.37%	-14.06%	0.14%	-12.85%	-1.45%	-19.42%	-3.90%	-19.09%	0.00%	-14.45%	-2.12%	1.35%
1992	1.31%	1.31%	0.58%	1.55%	0.43%	3.60%	0.73%	0.73%	-1.31%	-2.42%	0.00%	-8.15%	0.45%	-5.23%	-4.52%	-1.54%	-0.12%	-2.16%	0.00%	-16.38%	-0.48%	-5.65%	-4.76%	0.61%
1993	0.88%	0.87%	0.45%	0.45%	0.29%	0.29%	1.95%	2.77%	0.68%	1.39%	-2.48%	-2.93%	-4.78%	-4.78%	0.53%	1.24%	0.06%	-0.17%	1.12%	1.33%	-1.43%	1.69%	1.10%	1.69%
1994	-1.12%	-2.65%	-4.57%	2.01%	0.40%	1.23%	1.23%	1.45%	1.03%	1.37%	-1.12%	-4.49%	-0.38%	-3.98%	-0.05%	-3.69%	-0.08%	-3.78%	-0.49%	-3.74%	-3.62%	-0.78%	-3.24%	1.80%
1995	0.36%	0.36%	0.73%	0.73%	-0.04%	-0.04%	0.94%	1.74%	0.48%	0.01%	1.95%	-1.49%	-0.30%	-3.91%	-0.01%	-3.94%	-0.35%	-4.23%	-0.47%	-4.04%	-0.26%	-4.46%	0.00%	-2.68%
1996	0.00%	-2.51%	0.00%	-2.30%	0.00%	-3.63%	0.00%	-8.70%	0.00%	-13.44%	0.00%	-16.65%	0.16%	-16.89%	0.00%	-13.90%	-0.03%	-7.34%	0.00%	-12.61%	0.00%	-9.40%	0.00%	-5.53%
1997	0.55%	-0.66%	0.57%	0.57%	0.49%	0.49%	-0.46%	-3.53%	0.00%	-11.24%	0.00%	-17.65%	0.24%	-17.46%	0.28%	-15.21%	-4.43%	-12.22%	1.08%	-13.89%	0.00%	-15.41%	0.08%	-8.42%
1998	-0.06%	1.06%	0.18%	0.18%	-1.57%	-1.57%	-1.45%	-1.45%	-1.18%	-2.56%	0.13%	-11.06%	0.00%	-17.22%	0.09%	-14.91%	0.00%	-18.61%	0.00%	-18.76%	-0.03%	-9.81%	0.50%	-3.26%
1999	0.00%	-3.38%	0.00%	-4.68%	0.00%	-8.29%	-0.83%	1.79%	0.00%	-18.75%	0.00%	-19.86%	2.03%	-10.21%	-0.01%	-7.04%	1.89%	1.99%	0.00%	-15.64%	0.00%	-15.91%	0.00%	-15.64%
2000	0.00%	-9.78%	0.00%	-11.52%	0.00%	-7.89%	-0.14%	-19.00%	0.00%	-20.92%	0.00%	-21.32%	0.00%	-22.05%	1.81%	-21.42%	0.00%	-20.35%	-2.19%	-3.15%	-2.30%	-0.18%	0.00%	-4.68%
2001	0.00%	-4.33%	0.06%	1.30%	2.37%	2.37%	0.55%	0.77%	0.00%	-15.91%	0.00%	-20.51%	0.00%	-20.03%	0.78%	-22.71%	-2.70%	-20.34%	0.00%	-17.27%	0.00%	-16.33%	0.00%	-17.85%
2002	0.00%	-16.55%	0.00%	-17.85%	0.32%	-18.91%	-3.59%	-20.33%	0.00%	-22.76%	0.00%	-23.84%	0.00%	-23.78%	0.00%	-21.88%	0.00%	-22.55%	0.00%	-22.30%	0.00%	-19.11%	-6.61%	-19.34%
2003	0.00%	-17.08%	0.00%	-19.42%	2.52%	2.52%	0.00%	-12.07%	0.00%	-16.29%	0.00%	-23.15%	0.00%	-23.56%	0.00%	-22.76%	-0.21%	-22.10%	0.00%	-22.65%	0.00%	-21.60%	0.44%	-15.53%
2004	0.00%	-17.08%	0.00%	-19.42%	2.52%	2.52%	0.00%	-12.07%	0.00%	-16.29%	0.00%	-23.15%	0.00%	-23.56%	0.00%	-22.76%	-0.21%	-22.10%	0.00%	-22.65%	0.00%	-21.60%	0.44%	-15.53%
2005	0.40%	0.40%	0.00%	0.00%	1.50%	1.50%	0.47%	0.77%	-0.16%	-3.98%	0.00%	-15.91%	0.18%	-18.90%	-0.62%	-9.41%	0.00%	-17.10%	0.00%	-17.56%	0.00%	-16.74%	0.00%	-13.81%
2006	0.00%	-13.81%	0.00%	-13.62%	0.00%	-14.36%	0.00%	-17.12%	0.00%	-20.47%	0.00%	-21.55%	0.00%	-21.62%	0.00%	-17.32%	0.00%	-20.62%	-0.31%	-18.47%	0.00%	-17.75%	0.00%	-15.85%
2007	0.00%	-19.79%	-0.20%	-19.83%	0.00%	-12.16%	0.00%	-19.57%	0.00%	-22.03%	0.00%	-23.59%	0.00%	-23.56%	1.07%	-4.39%	0.00%	-21.48%	0.00%	-21.84%	0.00%	-21.01%	-4.11%	0.67%
2008	-6.33%	-1.15%	0.38%	-3.19%	0.60%	1.91%	-0.46%	0.10%	-0.09%	-3.49%	0.18%	-12.71%	0.93%	-8.47%	0.31%	-5.18%	0.00%	-13.01%	0.00%	-11.69%	0.18%	-9.83%	-2.62%	-2.46%
2009	2.51%	2.51%	3.70%	3.82%	0.16%	1.42%	0.00%	-1.27%																

Figure 4-31. Habitat summary table for longfin dace (*Agosia chrysogaster*), Braided site, with LWD and a hypothetical withdrawal rate of 2 ft³/sec.

Summary of normalized habitat changes																								
Hypothetical Withdrawal	10 cfs								Braided Site With LWD Longfin Dace															
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.18%	-43.82%	-1.51%	-38.08%	2.44%	-38.10%	2.89%	-36.80%	0.15%	-39.92%	0.29%	-40.73%	-0.36%	-34.93%	-0.18%	0.04%
1966	2.17%	5.66%	1.35%	3.04%	2.72%	3.84%	-0.46%	-43.86%	0.00%	-43.83%	-0.23%	-43.15%	0.00%	-42.44%	1.41%	-38.62%	0.00%	-43.67%	0.00%	-42.47%	-0.33%	-42.81%	-0.24%	-37.47%
1967	0.00%	-44.17%	0.00%	-43.60%	0.00%	-43.72%	-0.16%	-42.55%	0.00%	-42.47%	0.00%	-42.44%	1.49%	-29.61%	0.45%	-26.61%	-3.52%	-43.18%	-4.05%	-40.49%	0.00%	-42.43%	4.72%	-14.23%
1968	-0.61%	1.79%	1.56%	4.33%	2.97%	5.28%	1.58%	-22.77%	1.85%	-43.63%	0.08%	-43.63%	1.15%	-43.35%	3.16%	-42.02%	0.00%	-44.19%	0.00%	-44.14%	0.00%	-44.14%	0.00%	-44.44%
1969	2.05%	-14.44%	6.96%	14.20%	3.86%	9.89%	5.13%	-39.66%	2.71%	-43.33%	0.00%	-44.02%	0.00%	-43.91%	0.23%	-43.81%	0.18%	-42.91%	0.18%	-43.03%	0.00%	-44.35%	0.00%	-45.06%
1970	0.00%	-44.66%	0.30%	-44.03%	0.01%	-43.98%	0.00%	-44.54%	0.00%	-43.78%	0.00%	-42.44%	-0.67%	-40.75%	-5.68%	-39.58%	1.81%	-28.94%	0.00%	-42.46%	0.00%	-44.11%	0.00%	-44.50%
1971	0.00%	-44.47%	0.00%	-44.73%	0.00%	-44.52%	0.00%	-42.44%	0.00%	-42.43%	-0.78%	-38.68%	0.00%	-38.87%	0.19%	-33.12%	-1.87%	-30.01%	0.89%	-11.23%	1.29%	-42.50%	-0.28%	-30.62%
1972	3.25%	-39.37%	0.00%	-44.25%	-0.18%	-43.47%	0.00%	-42.45%	0.00%	-42.45%	0.00%	-42.45%	0.00%	-42.44%	2.11%	-41.23%	-2.93%	-37.43%	-3.69%	-29.24%	1.07%	-6.49%	2.95%	-7.03%
1973	2.96%	5.35%	-1.22%	-1.22%	-1.34%	-1.34%	1.40%	-0.33%	3.01%	5.73%	3.18%	-27.40%	2.41%	-24.56%	3.48%	-41.14%	3.15%	-42.89%	-1.34%	-45.26%	0.25%	-43.93%	0.28%	-44.00%
1974	2.18%	-29.60%	0.00%	-41.58%	0.00%	-41.58%	0.00%	-45.17%	-0.08%	-44.41%	0.00%	-43.80%	0.00%	-43.91%	1.05%	-44.02%	-0.27%	-44.29%	3.31%	-37.50%	1.41%	-44.12%	-0.12%	-45.03%
1975	0.00%	-44.83%	1.38%	-40.79%	4.75%	12.35%	4.64%	6.37%	2.32%	-44.00%	0.00%	-43.99%	1.32%	-42.94%	0.00%	-43.82%	-0.03%	-44.06%	0.00%	-43.72%	0.00%	-43.66%	0.14%	-43.94%
1976	-4.32%	-35.51%	-1.10%	-15.19%	-0.10%	-42.66%	3.40%	-40.47%	0.78%	-44.23%	0.00%	-42.47%	1.56%	-41.29%	1.73%	-42.56%	0.68%	-42.05%	0.52%	-43.66%	0.00%	-44.05%	0.00%	-42.47%
1977	0.00%	-43.16%	0.00%	-44.35%	0.00%	-44.37%	1.57%	-42.41%	0.00%	-42.44%	0.00%	-39.52%	0.00%	-41.60%	3.00%	-40.00%	2.53%	-42.20%	0.00%	-42.45%	-0.14%	-40.47%	0.00%	-39.69%
1978	-3.02%	-25.91%	2.10%	0.89%	1.35%	0.38%	-0.35%	-44.62%	-0.07%	-44.60%	0.00%	-43.79%	0.00%	-42.45%	0.00%	-39.04%	0.00%	-32.65%	-0.18%	-38.74%	1.68%	-30.40%	-0.45%	2.69%
1979	-0.20%	4.47%	2.22%	6.18%	1.16%	1.16%	3.57%	6.57%	4.23%	-20.69%	0.59%	-38.89%	0.45%	-44.28%	-0.55%	-45.06%	1.28%	-43.92%	4.03%	-41.53%	2.23%	-42.82%	0.00%	-42.82%
1980	3.69%	-3.73%	1.68%	2.64%	2.07%	3.58%	7.19%	8.72%	2.05%	-23.23%	0.34%	-35.63%	1.20%	-25.79%	-0.24%	-22.33%	2.55%	-29.82%	2.91%	-41.99%	2.23%	-42.82%	0.00%	-42.82%
1981	0.00%	-42.82%	0.00%	-42.43%	2.86%	-15.77%	0.36%	-39.93%	-0.63%	-45.31%	-0.04%	-44.47%	0.85%	-43.88%	0.94%	-44.11%	0.34%	-43.23%	1.54%	-42.44%	-1.50%	-42.73%	0.62%	-41.08%
1982	-5.24%	-2.69%	1.19%	0.38%	0.97%	2.14%	4.58%	-20.06%	2.01%	-44.16%	-0.81%	-44.89%	-0.01%	-44.35%	1.17%	-42.88%	0.54%	-43.49%	0.00%	-43.82%	-7.23%	-22.22%	-3.19%	4.71%
1983	-5.08%	-3.35%	0.98%	0.31%	1.39%	1.96%	3.19%	6.48%	3.91%	-19.62%	2.69%	-42.95%	0.80%	-44.09%	2.24%	-41.81%	-0.59%	-30.77%	-0.20%	-24.68%	-1.59%	-30.58%	-4.16%	-4.87%
1984	2.91%	6.73%	-0.92%	-37.64%	0.00%	-42.80%	-0.46%	-44.26%	0.00%	-43.80%	0.00%	-42.46%	0.00%	-42.45%	1.27%	-38.52%	-2.68%	-23.13%	-1.22%	-24.02%	1.50%	-37.21%	1.02%	1.77%
1985	1.39%	3.30%	1.61%	2.33%	1.22%	2.72%	9.15%	11.71%	3.25%	-25.43%	-0.61%	-44.78%	-0.98%	-44.47%	0.30%	-43.84%	0.73%	-41.68%	3.10%	-28.38%	-4.31%	-0.69%	4.31%	3.09%
1986	1.34%	-22.75%	-4.12%	3.59%	1.29%	0.63%	4.03%	-19.43%	2.83%	-43.68%	-0.82%	-44.90%	0.30%	-44.32%	-1.11%	-35.23%	-1.00%	-37.46%	0.03%	-44.43%	2.56%	-38.77%	-1.03%	-35.40%
1987	2.27%	-23.72%	3.36%	5.28%	4.17%	7.51%	1.16%	-39.74%	0.57%	-44.48%	-0.18%	-43.11%	0.00%	-42.47%	1.44%	-43.11%	0.00%	-43.61%	1.91%	-40.70%	2.61%	-40.79%	-2.02%	-43.98%
1988	3.93%	1.12%	2.80%	7.57%	-0.33%	-44.19%	2.63%	-31.61%	1.66%	-44.04%	-0.37%	-44.62%	2.04%	-42.06%	-5.67%	-13.22%	0.14%	-25.87%	0.00%	-44.27%	0.00%	-43.98%	0.00%	-44.19%
1989	1.83%	-29.95%	4.28%	3.71%	2.84%	-38.97%	2.13%	-41.50%	-0.18%	-43.28%	-0.14%	-41.56%	0.47%	-41.24%	-0.09%	-43.14%	0.17%	-43.16%	-0.20%	-42.80%	0.00%	-42.47%	0.00%	-42.47%
1990	0.00%	-44.16%	0.00%	-44.32%	0.00%	-44.37%	0.00%	-43.89%	0.01%	-42.45%	0.00%	-38.56%	0.00%	-41.01%	0.97%	-41.69%	0.23%	-42.35%	0.07%	-42.39%	0.00%	-42.47%	-6.26%	-32.77%
1991	-6.29%	-21.42%	-2.36%	-39.70%	0.05%	4.17%	1.91%	3.71%	-0.43%	-44.77%	0.00%	-43.79%	-0.37%	-42.69%	0.14%	-42.69%	-1.45%	-39.52%	-3.90%	-40.56%	0.00%	-42.45%	-4.82%	-26.92%
1992	6.34%	10.62%	0.70%	3.79%	2.61%	4.18%	3.38%	8.04%	1.15%	-38.49%	0.00%	-43.79%	3.68%	-39.76%	-4.07%	-26.87%	1.34%	-43.67%	0.00%	-43.92%	0.11%	-41.11%	-6.24%	0.15%
1993	1.89%	3.10%	2.24%	2.64%	1.42%	4.47%	4.27%	10.63%	3.54%	-38.46%	-0.69%	-40.91%	-1.84%	-36.81%	1.60%	-37.14%	0.98%	-37.08%	2.93%	-30.74%	4.58%	5.52%	2.77%	-37.06%
1994	-1.12%	-23.71%	-0.62%	-7.27%	2.50%	5.73%	4.16%	-26.45%	3.17%	-42.26%	-1.12%	-45.06%	-0.38%	-44.74%	-0.11%	-44.79%	-0.08%	-44.62%	-0.16%	-44.59%	-1.24%	-43.56%	-5.46%	-22.30%
1995	2.20%	2.85%	1.46%	5.22%	2.24%	3.70%	3.01%	-27.68%	3.67%	-40.60%	1.95%	-43.36%	-0.30%	-44.70%	-0.01%	-44.72%	-0.55%	-44.94%	-0.47%	-44.78%	-0.26%	-45.04%	0.00%	-45.18%
1996	0.00%	-45.17%	0.00%	-44.95%	0.00%	-45.03%	0.00%	-43.74%	0.00%	-42.45%	0.00%	-42.43%	0.16%	-42.72%	0.00%	-42.45%	0.42%	-39.75%	0.00%	-42.46%	0.00%	-43.67%	0.00%	-44.06%
1997	1.67%	-14.56%	4.35%	9.49%	2.39%	6.29%	-0.46%	-44.60%	0.00%	-42.58%	0.00%	-42.43%	0.24%	-39.72%	0.28%	-39.70%	-4.43%	-36.34%	0.34%	-38.98%	0.00%	-42.46%	-0.28%	-43.58%
1998	0.61%	-43.01%	0.16%	2.09%	-0.23%	0.25%	0.29%	-0.21%	0.71%	-44.54%	0.13%	-42.47%	0.00%	-42.46%	0.09%	-42.44%	0.00%	-42.25%	0.00%	-41.56%	-0.18%	-43.13%	0.37%	-44.32%
1999	0.00%	-44.38%	0.00%	-44.14%	0.00%	-43.94%	4.46%	-39.30%	0.00%	-41.55%	0.00%	-38.14%	4.85%	-34.63%	0.69%	-43.73%	2.73%	-31.18%	0.00%	-42.44%	0.00%	-42.44%	0.00%	-42.44%
2000	0.00%	-42.47%	0.00%	-42.47%	0.00%	-43.80%	-0.14%	-41.26%	0.00%	-34.84%	0.00%	-33.59%	0.00%	-31.32%	1.81%	-33.30%	0.00%	-36.63%	1.89%	-23.82%	1.98%	-14.38%	0.00%	-44.14%
2001	0.00%	-44.16%	2.52%	-40.07%	5.18%	1.83%	1.62%	-42.04%	0.00%	-42.44%	0.00%	-36.11%	0.00%	-32.50%	0.78%	-39.99%	-2.70%	-37.77%	0.00%	-36.69%	0.00%	-38.02%	0.00%	-42.43%
2002	0.00%	-42.43%	0.00%	-42.43%	0.32%	-41.19%	-3.59%	-36.69%	0.00%	-29.13%	0.00%	-25.75%	0.00%	-25.92%	0.00%	-28.53%	0.00%	-29.77%	0.00%	-30.55%	0.00%	-33.17%	-6.61%	-39.75%
2003	0.00%	-37.76%	0.00%	-39.52%	3.60%	7.23%	0.00%	-42.46%	0.00%	-34.07%	0.00%	-27.90%	0.00%	-26.62%	0.00%	-29.13%	-0.21%	-31.16%	0.00%	-29.45%	0.00%	-32.72%	0.44%	-37.21%
2004	0.00%	-37.76%	0.00%	-39.52%	3.60%	7.23%	0.00%	-42.46%	0.00%	-34.07%	0.00%	-27.90%	0.00%	-26.62%	0.00%	-29.13%	-0.21%	-31.16%	0.00%	-29.45%	0.00%	-32.72%	0.44%	-37.21%
2005	2.96%	8.16%	1.83%	0.78%	2.81%	7.40%	3.09%	-31.31%	-0.16%	-44.74%	0.00%	-42.44%	0.18%	-42.00%	0.74%	-42.18%	0.00%	-42.43%	0.00%	-42.43%	0.00%	-42.43%	0.00%	-42.45%
2006	0.00%	-42.45%	0.00%	-42.45%	0.00%	-42.45%	0.00%	-42.18%	0.00%	-36.24%	0.00%	-32.87%	0.00%	-32.65%	0.00%	-34.64%	0.00%	-35.78%	-0.31%	-36.43%	0.00%	-37.89%	0.00%	-39.67%
2007	0.00%	-42.42%	-0.20%	-42.62%	0.00%	-42.46%	0.00%	-39.04%	0.00%	-31.39%	0.00%	-26.54%	0.00%	-26.62%	5.00%	-22.35%	0.00%	-33.09%	0.00%	-31.99%	0.00%	-34.56%	-3.64%	0.33%
2008	-4.49%	3.00%	1.81%	2.86%	3.06%	7.62%	-0.46%	-44.02%	-0.09%	-44.84%	0.18%	-43.47%	0.89%	-40.96%	-0.09%	-43.86%	0.00%	-42.46%	0.00%	-42.47%	0.18%	-43.03%	-4.70%	-27.18%
2009	5.52%	10.90%	6.59%	11.34%	1.40%	-20.63%	0.00%	-44.30%																

Figure 4-32. Habitat summary table for longfin dace (*Agosia chrysogaster*), Braided site, with LWD and a hypothetical withdrawal rate of 10 ft³/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 2 cfs										Gage Site No Wood Roundtail chub														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-10.46%	0.00%	-25.67%	0.08%	-24.06%	0.00%	-24.88%	0.00%	-24.81%	0.00%	-24.18%	0.31%	-1.15%	0.30%	0.30%
1966	0.41%	0.41%	2.76%	3.97%	2.67%	2.67%	0.00%	-5.28%	0.00%	-10.64%	0.00%	-14.12%	0.00%	-19.51%	-0.05%	-5.70%	0.00%	-12.46%	0.00%	-15.90%	0.00%	-15.10%	0.50%	-7.56%
1967	0.00%	-7.06%	0.00%	-13.24%	0.00%	-11.93%	0.00%	-16.88%	0.00%	-15.90%	0.00%	-19.51%	2.05%	1.70%	2.89%	2.39%	0.00%	-13.24%	0.00%	-24.35%	0.00%	-21.14%	0.80%	0.80%
1968	0.11%	0.11%	-0.02%	-0.02%	0.87%	0.87%	2.37%	3.95%	-0.83%	-5.52%	-0.06%	-11.85%	0.00%	-7.41%	0.49%	0.46%	0.00%	-6.92%	0.00%	-7.23%	0.00%	-7.23%	0.00%	-5.65%
1969	0.69%	0.69%	1.90%	1.90%	1.18%	1.18%	3.32%	4.12%	2.77%	2.67%	0.00%	-8.59%	0.00%	-9.78%	0.00%	-9.53%	0.00%	-14.04%	0.00%	-13.86%	0.00%	-6.09%	0.00%	-5.48%
1970	0.00%	-5.56%	0.00%	-5.14%	0.00%	-1.29%	0.00%	-5.59%	0.00%	-11.24%	0.00%	-21.75%	0.00%	-24.21%	0.98%	-14.33%	2.22%	2.22%	0.00%	-17.15%	0.00%	-7.56%	0.00%	-5.90%
1971	0.00%	-5.60%	0.00%	-5.55%	0.00%	-6.07%	0.00%	-20.06%	0.00%	-22.03%	0.00%	-25.25%	0.98%	-22.99%	0.02%	-3.21%	0.72%	-14.03%	1.23%	1.23%	2.56%	2.56%	3.04%	3.04%
1972	2.43%	2.61%	0.00%	-6.57%	0.00%	-12.37%	0.00%	-17.88%	0.00%	-20.58%	0.35%	-18.58%	0.00%	-19.51%	0.15%	-17.55%	0.42%	-23.12%	1.47%	-4.93%	0.29%	0.29%	1.33%	1.33%
1973	0.96%	0.96%	0.06%	0.06%	-0.28%	-0.28%	0.08%	0.08%	-0.22%	-0.22%	4.05%	4.05%	1.14%	1.14%	-1.54%	-1.65%	-4.47%	-5.32%	-2.72%	-5.44%	-2.36%	-5.37%	0.31%	-4.49%
1974	3.37%	3.59%	0.36%	-4.14%	0.34%	2.40%	0.00%	-5.46%	-0.17%	-5.69%	0.00%	-10.98%	0.00%	-10.12%	0.08%	-5.23%	-0.56%	-7.86%	1.42%	-2.00%	0.35%	-4.91%	0.00%	-5.49%
1975	0.00%	-5.52%	1.43%	3.06%	0.87%	0.87%	1.22%	1.22%	-1.84%	-5.34%	0.00%	-8.84%	-0.07%	-5.68%	0.00%	-10.72%	-0.06%	-8.97%	0.00%	-11.93%	0.00%	-12.54%	0.73%	-8.13%
1976	-0.01%	-5.69%	0.48%	0.48%	0.00%	3.80%	3.37%	2.52%	-0.19%	-5.62%	0.00%	-15.72%	2.12%	-2.22%	-0.39%	-10.68%	0.37%	-13.85%	-1.41%	-5.92%	0.00%	-8.24%	0.00%	-15.01%
1977	0.00%	-5.51%	0.00%	-6.26%	0.00%	-5.62%	1.24%	-2.48%	0.00%	-19.60%	0.00%	-24.81%	-0.49%	-21.43%	1.13%	-16.30%	-1.46%	-4.06%	0.00%	-20.98%	0.00%	-24.36%	0.00%	-24.72%
1978	0.74%	-1.69%	0.52%	0.52%	0.42%	0.42%	0.00%	-5.15%	-0.14%	-5.73%	0.00%	-11.15%	0.00%	-17.88%	0.00%	-25.06%	0.00%	-28.53%	0.00%	-24.43%	2.84%	2.84%	0.47%	0.47%
1979	0.35%	0.35%	0.45%	0.45%	0.31%	0.31%	0.52%	0.52%	3.67%	3.67%	3.73%	3.73%	-2.16%	-5.61%	-0.72%	-5.47%	-0.48%	-5.53%	-3.70%	-3.70%	-4.93%	-4.93%	-1.96%	-4.90%
1980	1.11%	1.11%	0.18%	0.18%	0.49%	0.49%	1.54%	1.54%	3.89%	3.89%	2.28%	2.28%	0.05%	0.05%	-0.32%	-0.32%	0.03%	0.00%	-4.68%	-4.68%	-4.90%	-4.90%	-0.93%	-4.90%
1981	0.39%	-4.53%	0.33%	-0.85%	2.74%	3.88%	1.50%	-0.99%	-1.28%	-5.43%	-0.08%	-5.60%	-2.07%	-2.32%	0.04%	-5.02%	-1.12%	-4.52%	-1.52%	-3.61%	-2.07%	-2.73%	1.35%	-1.80%
1982	3.10%	3.10%	0.71%	0.71%	0.31%	0.31%	2.47%	2.47%	-2.67%	-5.29%	-1.65%	-5.52%	-0.39%	-6.56%	0.52%	-3.13%	0.66%	-3.30%	0.00%	-10.72%	-0.24%	-0.24%	0.67%	0.67%
1983	1.01%	1.01%	0.30%	0.30%	-0.12%	-0.12%	0.07%	0.07%	3.10%	3.10%	-4.78%	-5.29%	-2.70%	-3.72%	0.00%	-0.49%	-0.63%	-1.81%	2.48%	2.48%	2.76%	2.76%	1.43%	1.43%
1984	1.62%	1.62%	1.05%	-1.97%	0.00%	-4.97%	0.00%	-5.31%	0.00%	-10.98%	0.00%	-17.24%	0.00%	-18.15%	0.37%	-3.97%	2.39%	2.39%	3.18%	3.18%	2.96%	1.73%	0.18%	0.18%
1985	0.24%	0.24%	0.41%	0.41%	0.16%	0.16%	2.37%	2.37%	3.97%	3.97%	-1.25%	-5.54%	-1.26%	-5.68%	-1.28%	-2.57%	-1.73%	-2.20%	0.03%	0.03%	0.65%	0.65%	0.89%	0.89%
1986	2.14%	2.75%	2.12%	2.12%	0.35%	0.35%	3.35%	3.35%	-1.81%	-5.27%	-1.68%	-5.51%	-0.29%	-4.82%	1.46%	1.46%	0.44%	-1.13%	-2.79%	-3.48%	-2.75%	-2.75%	1.60%	-1.37%
1987	2.09%	2.48%	2.14%	2.75%	0.75%	0.75%	2.74%	3.83%	-0.25%	-5.52%	0.00%	-13.42%	-0.12%	-14.44%	-0.60%	-3.40%	0.00%	-9.88%	-0.08%	-6.60%	-0.07%	-2.86%	0.00%	-5.41%
1988	0.94%	0.94%	0.81%	0.81%	0.00%	-1.16%	3.05%	3.05%	2.17%	-1.34%	-0.75%	-5.64%	-0.25%	-4.42%	1.67%	1.67%	2.19%	2.19%	0.00%	-6.31%	0.00%	-9.01%	0.72%	-5.46%
1989	3.30%	3.73%	1.57%	1.57%	1.97%	0.25%	2.57%	2.67%	0.00%	-13.42%	0.00%	-23.37%	0.00%	-24.08%	0.27%	-13.88%	0.00%	-13.68%	0.00%	-14.65%	0.00%	-15.01%	0.00%	-14.92%
1990	0.00%	-6.22%	0.00%	-5.68%	0.00%	-5.92%	0.00%	-9.77%	0.00%	-18.87%	0.00%	-25.32%	0.00%	-23.87%	0.64%	-13.44%	0.00%	-21.71%	0.00%	-21.94%	0.00%	-15.90%	2.49%	1.68%
1991	1.61%	1.61%	0.04%	-3.67%	-0.05%	-0.05%	0.03%	0.03%	-0.89%	-5.54%	0.00%	-11.07%	0.00%	-15.28%	0.54%	-15.65%	0.00%	-24.81%	0.00%	-24.27%	0.00%	-19.24%	2.32%	2.32%
1992	1.14%	1.14%	0.38%	0.38%	0.37%	0.37%	0.60%	0.60%	-3.09%	-3.34%	0.00%	-11.07%	1.68%	-11.07%	2.41%	0.48%	1.22%	-3.53%	0.00%	-9.69%	0.17%	-5.38%	0.60%	0.60%
1993	0.12%	0.12%	0.09%	0.09%	0.22%	0.22%	1.64%	1.64%	3.94%	3.94%	0.08%	0.08%	-2.68%	-2.68%	0.44%	0.41%	1.37%	1.37%	-2.33%	-2.33%	0.36%	0.36%	3.82%	3.82%
1994	0.00%	-0.72%	1.50%	1.50%	2.22%	2.50%	3.61%	3.61%	3.43%	3.43%	-2.27%	-5.48%	-0.78%	-5.55%	0.33%	-4.71%	-0.17%	-5.57%	0.04%	-5.16%	0.31%	-3.78%	2.21%	-0.07%
1995	0.34%	0.34%	0.37%	0.37%	0.27%	0.27%	3.45%	4.04%	-3.51%	-4.28%	-3.44%	-5.42%	-0.61%	-5.56%	-0.03%	-5.55%	-1.86%	-5.18%	-0.97%	-5.54%	-0.52%	-5.49%	0.00%	-5.46%
1996	0.00%	-5.44%	0.00%	-5.46%	0.00%	-5.49%	0.00%	-11.67%	0.00%	-18.24%	0.00%	-21.44%	0.40%	-16.91%	0.00%	-18.69%	2.38%	-5.98%	0.00%	-17.24%	0.00%	-12.46%	0.00%	-8.16%
1997	0.41%	0.41%	0.71%	0.71%	0.85%	0.85%	0.00%	-5.54%	0.00%	-15.90%	0.00%	-22.46%	0.00%	-23.56%	0.00%	-23.24%	0.00%	-23.94%	0.00%	-24.06%	0.00%	-17.24%	0.00%	-12.98%
1998	2.77%	-0.36%	0.57%	0.57%	0.24%	0.24%	0.20%	0.20%	-0.90%	-5.46%	0.00%	-15.90%	0.00%	-16.88%	0.00%	-19.69%	0.00%	-23.38%	0.00%	-23.75%	0.00%	-14.30%	0.00%	-5.58%
1999	0.00%	-5.62%	0.00%	-7.23%	0.00%	-9.43%	3.68%	3.68%	0.00%	-23.74%	0.00%	-25.54%	0.72%	-11.62%	0.80%	-4.01%	0.64%	-1.02%	0.00%	-20.43%	0.00%	-20.70%	0.00%	-20.43%
2000	0.00%	-14.65%	0.00%	-14.57%	0.00%	-10.98%	0.00%	-23.95%	0.00%	-27.32%	0.00%	-28.01%	0.00%	-29.28%	0.17%	-27.73%	0.00%	-26.35%	1.73%	1.73%	1.22%	1.22%	0.00%	-7.23%
2001	0.00%	-7.07%	1.48%	1.34%	2.56%	2.56%	3.63%	3.37%	0.00%	-20.70%	0.00%	-26.63%	0.00%	-28.01%	1.60%	-20.17%	0.00%	-25.74%	0.00%	-25.32%	0.00%	-24.48%	0.00%	-22.23%
2002	0.00%	-21.35%	0.00%	-22.41%	0.00%	-23.73%	0.00%	-26.32%	0.00%	-30.53%	0.00%	-32.52%	0.00%	-32.42%	0.00%	-30.44%	0.00%	-30.17%	0.00%	-29.72%	0.00%	-27.40%	0.00%	-24.69%
2003	0.00%	-24.81%	0.00%	-24.81%	0.74%	0.74%	0.00%	-16.88%	0.00%	-26.00%	0.00%	-31.25%	0.00%	-32.00%	0.00%	-30.53%	0.00%	-29.37%	0.00%	-30.35%	0.00%	-28.49%	0.00%	-24.56%
2004	0.00%	-24.81%	0.00%	-24.81%	0.74%	0.74%	0.00%	-16.88%	0.00%	-26.00%	0.00%	-31.25%	0.00%	-32.00%	0.00%	-30.53%	0.00%	-29.37%	0.00%	-30.35%	0.00%	-28.49%	0.00%	-24.56%
2005	1.19%	1.19%	0.25%	0.25%	0.45%	0.45%	3.56%	3.56%	-0.33%	-5.55%	0.00%	-20.70%	0.00%	-23.55%	0.69%	-10.24%	0.00%	-21.91%	0.00%	-22.37%	0.00%	-21.53%	0.00%	-18.60%
2006	0.00%	-18.60%	0.00%	-18.42%	0.00%	-19.24%	0.00%	-21.96%	0.00%	-26.56%	0.00%	-28.41%	0.00%	-28.53%	0.00%	-26.18%	0.00%	-26.81%	0.00%	-24.49%	0.00%	-24.97%	0.00%	-23.59%
2007	0.00%	-23.12%	0.00%	-19.51%	0.00%	-17.33%	0.00%	-25.06%	0.00%	-29.24%	0.00%	-32.05%	1.05%	-30.47%	2.13%	2.13%	0.00%	-28.29%	0.00%	-28.90%	0.00%	-27.47%	1.03%	1.03%
2008	0.35%	0.35%	0.27%	0.27%	1.11%	1.11%	0.00%	-5.35%	-0.19%	-5.53%	0.00%	-13.60%	-1.72%	-6.14%	-0.24%	-8.07%	0.00%	-17.15%	0.00%	-14.74%	0.00%	-13.86%	0.97%	0.97%
2009	1.63%	1.63%	1.75%	1.75%	0.83%	3.55%	0.00%	-5.26%																

Figure 4-33. Habitat summary table for roundtail chub (*Gila robusta*), Gage site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Gage Site

No Wood

Roundtail chub

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2
1965									0.00%	-55.51%	0.00%	-48.78%
1966	1.59%	1.59%	8.35%	21.16%	12.24%	15.74%	0.00%	-58.94%	0.00%	-55.37%	0.00%	-54.86%
1967	0.00%	-55.93%	0.00%	-54.99%	0.00%	-55.18%	0.00%	-54.45%	0.00%	-54.59%	0.00%	-54.06%
1968	0.08%	0.08%	-0.85%	-0.85%	4.42%	4.42%	12.63%	-6.88%	-0.83%	-57.07%	-0.06%	-55.28%
1969	4.26%	4.26%	9.59%	9.59%	5.93%	5.93%	14.27%	-30.12%	7.24%	-54.61%	0.00%	-55.68%
1970	0.00%	-56.73%	0.00%	-55.84%	0.00%	-56.53%	0.00%	-56.53%	0.00%	-55.28%	0.00%	-53.68%
1971	0.00%	-56.42%	0.00%	-56.84%	0.00%	-56.50%	0.00%	-53.97%	0.00%	-53.64%	0.00%	-49.62%
1972	10.37%	-45.30%	0.00%	-56.05%	0.00%	-55.12%	0.00%	-54.30%	0.00%	-53.81%	0.71%	-53.79%
1973	5.34%	5.34%	-0.11%	-0.11%	-1.42%	-1.42%	0.44%	0.44%	-0.63%	-0.63%	8.63%	-14.60%
1974	11.72%	-32.99%	0.36%	-57.72%	0.85%	-52.75%	0.00%	-57.53%	-0.17%	-56.31%	0.00%	-55.32%
1975	0.00%	-57.10%	6.41%	-44.23%	5.21%	5.21%	6.61%	6.61%	-1.84%	-58.47%	0.00%	-55.64%
1976	-0.04%	-54.26%	2.61%	-2.91%	0.00%	-53.73%	13.27%	-46.40%	-0.19%	-56.81%	0.00%	-54.62%
1977	0.00%	-57.16%	0.00%	-56.23%	0.00%	-56.25%	5.94%	-51.84%	0.00%	-54.04%	0.00%	-50.50%
1978	3.60%	-39.87%	2.79%	2.79%	2.15%	2.15%	-0.63%	-59.32%	-0.14%	-56.63%	0.00%	-55.30%
1979	1.20%	1.20%	1.60%	1.60%	1.71%	1.71%	3.72%	3.72%	21.14%	21.14%	-0.92%	-50.46%
1980	5.92%	5.92%	0.83%	0.83%	2.06%	2.06%	9.83%	9.83%	21.06%	18.61%	-6.27%	-27.34%
1981	0.39%	-59.71%	1.33%	-53.88%	7.57%	-3.79%	2.74%	-53.13%	-1.28%	-57.76%	-0.08%	-56.41%
1982	16.67%	3.27%	3.80%	3.80%	1.43%	1.43%	14.44%	14.44%	-2.67%	-58.80%	-1.65%	-57.10%
1983	3.89%	4.23%	0.63%	0.63%	0.01%	0.01%	1.03%	1.03%	19.56%	19.56%	-5.76%	-58.89%
1984	9.34%	9.34%	1.05%	-52.28%	0.00%	-59.86%	0.00%	-58.70%	0.00%	-55.32%	0.00%	-54.39%
1985	0.70%	0.70%	2.16%	2.16%	0.81%	0.81%	11.88%	11.88%	20.03%	-12.08%	-1.25%	-56.92%
1986	2.40%	-34.05%	11.61%	11.96%	1.84%	1.84%	19.81%	0.10%	-3.16%	-58.98%	-1.68%	-57.11%
1987	7.88%	-19.01%	9.22%	13.80%	3.76%	3.76%	6.50%	-49.28%	-0.25%	-57.05%	0.00%	-54.96%
1988	5.32%	5.32%	4.71%	4.71%	0.00%	-57.77%	12.34%	-35.32%	2.76%	-56.01%	-0.75%	-56.67%
1989	10.14%	-36.64%	9.33%	9.33%	7.20%	-41.95%	8.09%	-49.68%	0.00%	-54.96%	0.00%	-52.60%
1990	0.00%	-56.08%	0.00%	-56.36%	0.00%	-56.25%	0.00%	-55.57%	0.00%	-54.15%	0.00%	-49.49%
1991	9.40%	-7.83%	0.21%	-38.33%	-0.26%	-0.26%	0.15%	0.15%	-0.89%	-56.91%	0.00%	-55.31%
1992	5.97%	5.97%	2.61%	2.61%	2.04%	2.04%	2.51%	2.51%	-5.14%	-52.94%	0.00%	-55.31%
1993	0.33%	0.33%	0.44%	0.44%	1.09%	1.09%	8.95%	8.95%	14.79%	8.87%	-8.06%	-35.77%
1994	0.00%	-36.28%	8.39%	8.39%	10.83%	14.78%	18.31%	18.48%	11.15%	-51.91%	-2.27%	-57.37%
1995	1.47%	1.47%	3.03%	3.03%	1.25%	1.25%	14.38%	11.60%	-5.00%	-56.89%	-3.44%	-57.88%
1996	0.00%	-57.68%	0.00%	-57.53%	0.00%	-57.31%	0.00%	-55.22%	0.00%	-54.25%	0.00%	-53.77%
1997	2.80%	2.80%	4.20%	4.20%	3.83%	3.83%	0.00%	-56.88%	0.00%	-54.59%	0.00%	-53.62%
1998	4.85%	-56.07%	2.20%	2.20%	1.22%	1.22%	1.11%	1.11%	-0.90%	-57.55%	0.00%	-54.59%
1999	0.00%	-56.26%	0.00%	-55.88%	0.00%	-55.55%	20.51%	-37.08%	0.00%	-52.60%	0.00%	-49.04%
2000	0.00%	-54.78%	0.00%	-54.79%	0.00%	-55.32%	0.00%	-52.22%	0.00%	-45.49%	0.00%	-44.12%
2001	0.00%	-55.92%	6.82%	-48.53%	11.88%	13.44%	11.99%	-50.52%	0.00%	-53.88%	0.00%	-46.87%
2002	0.00%	-53.78%	0.00%	-53.45%	0.00%	-52.08%	0.00%	-47.50%	0.00%	-39.08%	0.00%	-35.12%
2003	0.00%	-50.50%	0.00%	-50.50%	3.41%	3.41%	0.00%	-54.45%	0.00%	-47.92%	0.00%	-37.66%
2004	0.00%	-50.50%	0.00%	-50.50%	3.41%	3.41%	0.00%	-54.45%	0.00%	-47.92%	0.00%	-37.66%
2005	6.19%	5.93%	1.06%	1.06%	2.63%	2.63%	15.78%	-24.21%	-0.33%	-56.86%	0.00%	-53.88%
2006	0.00%	-54.19%	0.00%	-54.22%	0.00%	-54.10%	0.00%	-53.46%	0.00%	-47.01%	0.00%	-43.32%
2007	0.00%	-53.52%	0.00%	-54.06%	0.00%	-54.38%	0.00%	-50.00%	0.00%	-41.67%	0.00%	-36.06%
2008	1.84%	1.84%	1.37%	1.37%	7.99%	7.99%	0.00%	-58.43%	-0.19%	-57.01%	0.00%	-54.93%
2009	8.93%	8.93%	8.52%	8.52%	4.99%	-16.13%	0.00%	-59.07%				

Year	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965	0.41%	-46.79%	0.00%	-50.94%	0.00%	-50.50%	0.00%	-51.75%	2.64%	-45.87%	0.55%	0.55%
1966	0.00%	-54.06%	1.61%	-52.53%	0.00%	-55.10%	0.00%	-54.59%	0.00%	-54.71%	2.54%	-49.29%
1967	10.99%	-39.17%	12.09%	-29.50%	0.00%	-54.99%	0.00%	-51.40%	0.00%	-53.73%	3.96%	3.82%
1968	-0.63%	-55.92%	3.42%	-53.80%	0.00%	-55.97%	0.00%	-55.88%	0.00%	-55.88%	0.00%	-56.38%
1969	0.00%	-55.50%	0.00%	-55.55%	0.00%	-54.87%	0.00%	-54.90%	0.00%	-56.22%	0.00%	-57.37%
1970	0.00%	-51.70%	4.58%	-47.52%	3.05%	-28.53%	0.00%	-54.41%	0.00%	-55.83%	0.00%	-56.46%
1971	2.89%	-48.36%	1.64%	-42.62%	1.74%	-43.84%	6.15%	-4.97%	8.85%	-50.91%	13.89%	-30.39%
1972	0.00%	-54.06%	0.75%	-51.23%	0.47%	-47.62%	5.18%	-33.67%	2.42%	2.42%	7.42%	7.42%
1973	0.41%	-25.75%	0.89%	-54.34%	-4.52%	-58.64%	-2.72%	-57.68%	-2.36%	-58.23%	0.86%	-58.44%
1974	0.00%	-55.50%	1.72%	-55.69%	-0.56%	-56.13%	5.43%	-47.27%	0.62%	-57.02%	0.00%	-57.32%
1975	0.55%	-53.88%	0.00%	-55.36%	-0.06%	-55.74%	0.00%	-55.18%	0.00%	-55.09%	1.33%	-55.09%
1976	6.05%	-48.87%	-1.55%	-54.07%	3.38%	-50.82%	-2.96%	-55.98%	0.00%	-55.73%	0.00%	-54.72%
1977	-0.59%	-52.79%	6.62%	-48.29%	0.16%	-54.07%	0.00%	-53.70%	0.00%	-51.40%	0.00%	-50.68%
1978	0.00%	-54.30%	0.00%	-50.00%	0.00%	-43.08%	0.00%	-49.66%	14.36%	-23.20%	1.76%	1.76%
1979	-2.38%	-57.56%	-1.37%	-57.47%	-0.68%	-56.98%	-5.89%	-57.37%	-6.10%	-59.82%	-2.06%	-59.87%
1980	-4.33%	-33.31%	0.73%	-39.39%	2.28%	-39.16%	-7.78%	-58.87%	-6.19%	-59.87%	-2.06%	-59.87%
1981	-0.47%	-56.20%	0.99%	-55.51%	-0.21%	-53.29%	-2.71%	-54.25%	-1.63%	-55.08%	5.47%	-50.96%
1982	-0.39%	-56.38%	2.99%	-52.62%	3.58%	-53.31%	0.00%	-55.36%	-2.87%	-36.80%	4.23%	4.23%
1983	-1.95%	-57.00%	3.00%	-52.39%	4.18%	-34.56%	12.01%	-20.80%	0.92%	-43.99%	8.44%	8.44%
1984	0.00%	-54.26%	1.27%	-42.34%	7.66%	-28.98%	10.96%	-26.16%	6.15%	-47.21%	0.84%	0.84%
1985	-1.91%	-56.42%	-1.22%	-56.25%	-2.85%	-53.98%	-0.84%	-38.87%	4.18%	4.18%	6.25%	6.25%
1986	-0.29%	-56.58%	3.21%	-42.43%	2.29%	-44.54%	-2.73%	-57.55%	-3.22%	-52.78%	7.00%	-48.81%
1987	1.84%	-53.74%	2.57%	-53.74%	0.00%	-55.50%	1.22%	-50.61%	0.18%	-52.36%	0.00%	-57.91%
1988	0.72%	-55.21%	8.47%	-9.69%	10.30%	-19.86%	0.00%	-56.09%	0.00%	-55.62%	1.36%	-55.36%
1989	0.00%	-51.76%	0.27%	-54.78%	0.00%	-54.92%	0.00%	-54.78%	0.00%	-54.72%	0.00%	-54.74%
1990	0.00%	-51.63%	1.93%	-49.51%	0.00%	-53.44%	0.00%	-53.44%	0.00%	-54.59%	11.82%	-36.85%
1991	0.00%	-54.68%	1.05%	-54.02%	0.00%	-50.50%	0.00%	-51.58%	0.00%	-54.10%	12.35%	-21.18%
1992	4.77%	-47.03%	7.85%	-30.57%	2.20%	-55.38%	0.00%	-55.51%	0.68%	-51.09%	3.37%	-5.30%
1993	-8.02%	-49.99%	1.65%	-45.80%	-1.20%	-47.45%	-4.25%	-48.77%	2.44%	2.44%	19.72%	15.72%
1994	-0.78%	-56.86%	1.01%	-56.41%	-0.17%	-56.67%	0.17%	-56.40%	1.76%	-56.04%	8.71%	-39.42%
1995	-0.61%	-56.79%	-0.03%	-56.82%	-2.27%	-57.66%	-0.97%	-56.92%	-0.52%	-57.33%	0.00%	-57.55%
1996	0.40%	-54.24%	0.00%	-54.18%	8.48%	-44.20%	0.00%	-54.39%	0.00%	-55.10%	0.00%	-55.74%
1997	0.00%	-52.93%	0.00%	-53.03%	0.00%	-52.21%	0.00%	-51.98%	0.00%	-54.39%	0.00%	-55.03%
1998	0.00%	-54.45%	0.00%	-54.03%	0.00%	-53.25%	0.00%	-52.61%	0.00%	-54.83%	0.00%	-56.62%
1999	3.72%	-44.43%	2.97%	-54.48%	2.83%	-45.86%	0.00%	-53.92%	0.00%	-53.88%	0.00%	-53.92%
2000	0.00%	-41.58%	0.61%	-43.46%	0.00%	-47.43%	10.54%	-10.17%	8.42%	8.42%	0.00%	-55.88%
2001	0.00%	-44.12%	6.48%	-46.83%	0.00%	-48.65%	0.00%	-49.49%	0.00%	-51.16%	0.00%	-53.34%
2002	0.00%	-35.33%	0.00%	-39.27%	0.00%	-39.82%	0.00%	-40.71%	0.00%	-45.34%	0.00%	-50.74%
2003	0.00%	-36.16%	0.00%	-39.08%	0.00%	-41.41%	0.00%	-39.45%	0.00%	-43.16%	0.00%	-50.98%
2004	0.00%	-36.16%	0.00%	-39.08%	0.00%	-41.41%	0.00%	-39.45%	0.00%	-43.16%	0.00%	-50.98%
2005	0.00%	-52.86%	1.83%	-52.37%	0.00%	-53.70%	0.00%	-53.63%	0.00%	-53.76%	0.00%	-54.19%
2006	0.00%	-43.08%	0.00%	-47.78%	0.00%	-46.51%	0.00%	-47.61%	0.00%	-50.19%	0.00%	-52.74%
2007	2.25%	-34.72%	11.65%	-13.78%	0.00%	-43.56%	0.00%	-42.34%	0.00%	-45.65%	6.30%	-7.15%
2008	-2.02%	-51.26%	-0.08%	-55.09%	0.00%	-54.41%	0.00%	-54.76%	0.00%	-54.90%	5.30%	4.73%
2009												

Figure 4-34. Habitat summary table for roundtail chub (*Gila robusta*), Gage site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes
Hypothetical Withdrawal 2 cfs

Gage Site
With LWD
Roundtail chub

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965									0.00%	-6.48%	0.00%	-21.72%	-0.12%	-19.93%	0.00%	-21.09%	0.00%	-21.10%	0.00%	-20.64%	0.34%	0.08%	0.12%	0.12%
1966	0.50%	0.50%	2.18%	3.12%	0.67%	0.67%	0.00%	-1.12%	0.00%	-6.64%	0.00%	-10.41%	0.00%	-16.09%	0.38%	-1.69%	0.06%	-6.69%	0.00%	-12.30%	0.37%	-11.12%	0.29%	-3.97%
1967	0.00%	-2.72%	0.00%	-9.47%	0.00%	-8.05%	0.00%	-13.34%	0.00%	-12.30%	0.00%	-16.09%	2.26%	-3.96%	1.57%	1.41%	0.44%	-7.83%	0.00%	-20.76%	0.00%	-17.76%	-0.62%	-0.62%
1968	-1.16%	-1.16%	-0.84%	-0.84%	-0.32%	-0.32%	1.87%	3.12%	-0.17%	-1.13%	-0.01%	-7.99%	-0.23%	-1.30%	0.90%	0.89%	0.00%	-2.56%	0.00%	-2.90%	0.00%	-2.90%	0.48%	-0.33%
1969	-0.08%	-0.08%	-0.86%	-0.86%	0.13%	0.48%	2.31%	2.91%	2.05%	2.05%	0.00%	-4.40%	0.00%	-5.71%	0.00%	-5.43%	0.00%	-10.32%	0.00%	-10.13%	0.00%	-1.66%	0.00%	-1.12%
1970	0.00%	-1.13%	0.00%	-0.39%	0.00%	0.81%	0.00%	-1.13%	0.00%	-7.30%	0.00%	-18.40%	0.00%	-20.66%	0.57%	-11.80%	0.52%	0.52%	0.00%	-13.62%	0.00%	-3.27%	0.00%	-1.48%
1971	0.00%	-1.13%	0.00%	-1.13%	0.00%	-1.68%	0.00%	-16.66%	0.00%	-18.69%	0.00%	-21.42%	0.87%	-17.98%	0.11%	-13.54%	0.25%	-13.29%	0.45%	0.45%	1.36%	1.36%	1.50%	1.50%
1972	1.23%	1.34%	0.00%	-2.18%	0.00%	-8.53%	0.00%	-14.38%	0.00%	-17.19%	0.27%	-14.45%	0.54%	-14.41%	0.12%	-13.96%	0.00%	-21.17%	0.92%	-9.93%	-0.46%	-0.46%	0.95%	0.95%
1973	1.76%	1.76%	1.25%	1.25%	-0.05%	-0.05%	0.19%	0.19%	2.34%	2.34%	2.88%	2.88%	0.90%	0.90%	0.41%	0.38%	-0.94%	-1.12%	-0.56%	-1.12%	-0.49%	-1.12%	0.27%	-0.65%
1974	1.88%	1.97%	0.34%	-0.16%	0.28%	1.86%	0.00%	-1.12%	-0.03%	-1.21%	0.00%	-7.02%	0.18%	-5.01%	0.46%	-2.95%	-0.11%	-3.66%	1.75%	1.75%	0.94%	0.92%	0.00%	-1.12%
1975	0.00%	-1.13%	0.62%	1.59%	0.98%	2.66%	1.68%	2.03%	0.68%	-0.06%	0.00%	-4.67%	0.06%	-1.48%	0.00%	-6.74%	-0.01%	-4.87%	0.00%	-8.05%	0.00%	-8.71%	0.55%	-3.55%
1976	0.06%	-1.33%	0.46%	0.46%	0.00%	2.38%	2.00%	1.87%	-0.04%	-1.21%	0.00%	-12.11%	0.96%	0.96%	-0.07%	-0.74%	0.48%	-10.20%	-0.34%	-0.81%	0.00%	-4.02%	0.00%	-11.35%
1977	0.00%	-1.13%	0.00%	-1.86%	0.00%	-1.13%	0.94%	0.27%	0.00%	-16.19%	0.00%	-21.10%	-0.12%	-17.65%	0.95%	-13.49%	0.13%	-0.05%	0.00%	-17.59%	0.00%	-20.77%	0.00%	-21.03%
1978	0.29%	-0.12%	-0.13%	-0.13%	-0.20%	-0.20%	0.51%	-0.34%	-0.03%	-1.30%	0.00%	-7.21%	0.00%	-14.38%	0.00%	-21.28%	0.00%	-23.73%	0.00%	-20.58%	1.59%	1.59%	0.19%	0.19%
1979	-0.05%	-0.05%	-1.27%	-1.27%	-1.03%	-1.03%	0.04%	0.04%	2.55%	2.55%	1.87%	1.87%	-0.44%	-1.30%	0.01%	-0.67%	-0.10%	-1.13%	-0.72%	-0.72%	-1.06%	-1.06%	-0.42%	-1.05%
1980	-0.16%	-0.16%	0.87%	0.87%	-1.24%	-1.24%	-0.32%	-0.32%	3.08%	3.08%	1.49%	1.49%	0.34%	0.34%	-0.01%	-0.02%	0.98%	0.98%	-1.00%	-1.00%	-1.05%	-1.05%	-0.20%	-1.05%
1981	0.34%	-0.57%	0.28%	0.66%	2.12%	2.97%	0.97%	0.93%	-0.26%	-1.12%	-0.02%	-1.13%	0.19%	0.14%	0.18%	-0.85%	-0.29%	-0.96%	-0.47%	-0.89%	-0.35%	-0.47%	0.59%	-0.02%
1982	1.66%	1.83%	-0.25%	-0.25%	0.32%	0.32%	0.52%	0.52%	-0.56%	-1.12%	-0.34%	-1.13%	-0.08%	-2.22%	0.15%	-0.57%	0.45%	-0.34%	0.00%	-6.74%	0.92%	0.76%	0.78%	0.78%
1983	1.94%	1.94%	-0.60%	-0.60%	0.08%	0.08%	0.80%	0.80%	2.20%	2.20%	-1.01%	-1.12%	-0.03%	-0.24%	0.26%	0.16%	0.42%	0.23%	1.65%	1.65%	1.68%	1.68%	-0.41%	-0.41%
1984	0.08%	0.08%	0.51%	0.60%	0.00%	-1.07%	0.00%	-1.12%	0.00%	-7.02%	0.00%	-13.72%	0.26%	-13.55%	0.20%	-0.87%	0.64%	0.64%	1.76%	1.76%	1.74%	1.74%	1.03%	1.03%
1985	1.82%	1.82%	-1.35%	-1.35%	-0.77%	-0.77%	-0.28%	-0.28%	2.88%	2.88%	-0.25%	-1.13%	-0.04%	-0.04%	0.02%	-0.17%	-0.27%	-0.36%	0.69%	0.69%	-2.14%	-2.14%	1.75%	1.75%
1986	1.03%	1.49%	0.78%	0.78%	1.77%	1.77%	2.76%	2.76%	-0.39%	-1.12%	-0.34%	-1.13%	0.31%	-0.53%	0.81%	0.81%	0.00%	-3.30%	-0.28%	-0.41%	-0.29%	-0.29%	1.57%	1.04%
1987	0.38%	0.58%	0.76%	1.25%	1.14%	1.14%	1.53%	2.38%	-0.05%	-1.13%	0.00%	-9.66%	0.15%	-8.82%	0.24%	-0.74%	0.00%	-5.82%	-0.02%	-5.56%	0.09%	-1.32%	0.31%	-0.81%
1988	0.04%	0.04%	1.59%	1.59%	0.00%	1.73%	1.46%	1.46%	1.51%	1.51%	-0.15%	-1.21%	0.41%	0.37%	0.72%	0.72%	1.29%	1.29%	0.00%	-1.99%	0.00%	-4.86%	0.54%	-0.39%
1989	2.16%	2.34%	0.18%	0.18%	0.72%	0.66%	1.11%	1.26%	0.00%	-9.66%	0.00%	-19.93%	0.00%	-20.53%	0.54%	-9.20%	0.00%	-9.94%	0.00%	-10.98%	0.00%	-11.35%	0.00%	-11.26%
1990	0.00%	-2.06%	0.00%	-1.21%	0.00%	-1.46%	0.00%	-5.71%	0.00%	-15.43%	0.00%	-21.46%	0.00%	-20.29%	0.05%	-9.55%	0.00%	-18.21%	0.00%	-18.52%	0.00%	-12.30%	1.14%	1.01%
1991	0.56%	0.56%	0.15%	-0.35%	0.10%	0.10%	0.99%	0.99%	-0.18%	-1.13%	0.00%	-7.11%	0.00%	-11.64%	0.50%	-11.63%	0.00%	-21.10%	0.00%	-20.71%	0.00%	-15.81%	2.02%	2.02%
1992	-0.94%	-0.94%	1.88%	1.88%	-0.61%	-0.61%	1.56%	1.56%	-0.63%	-0.68%	0.00%	-7.11%	0.55%	-7.41%	0.67%	0.67%	1.04%	1.04%	0.00%	-5.61%	-0.06%	-3.07%	1.86%	1.86%
1993	0.06%	0.06%	0.33%	0.33%	-1.22%	-1.22%	0.31%	0.31%	2.94%	2.94%	0.68%	0.68%	-0.53%	-0.53%	0.67%	0.67%	0.58%	0.58%	0.55%	0.55%	2.12%	2.12%	2.53%	2.53%
1994	0.00%	-0.06%	0.14%	0.14%	0.93%	0.93%	2.10%	2.10%	2.35%	2.35%	-0.47%	-1.12%	-0.16%	-1.13%	0.25%	-0.76%	-0.03%	-1.13%	0.21%	-0.75%	0.57%	-0.15%	2.24%	2.24%
1995	0.00%	0.00%	-0.69%	-0.69%	0.78%	0.78%	2.63%	3.09%	-0.45%	-0.61%	-0.71%	-1.12%	-0.12%	-1.13%	-0.15%	-0.99%	-0.38%	-1.06%	-0.20%	-1.13%	-0.11%	-1.12%	0.00%	-1.12%
1996	0.00%	-1.12%	0.00%	-1.12%	0.00%	-1.12%	0.00%	-7.77%	0.00%	-14.76%	0.00%	-18.09%	0.66%	-11.50%	0.49%	-13.90%	0.35%	-2.20%	0.00%	-13.72%	0.00%	-8.62%	0.00%	-3.93%
1997	1.61%	1.56%	1.04%	1.21%	0.23%	1.25%	0.00%	-1.13%	0.00%	-12.30%	0.00%	-19.14%	0.00%	-20.18%	0.00%	-19.86%	0.00%	-20.46%	0.00%	-20.55%	0.00%	-13.72%	0.88%	-7.60%
1998	1.67%	1.87%	-1.51%	-1.51%	0.24%	0.24%	0.59%	0.59%	1.72%	1.20%	0.00%	-12.30%	0.00%	-13.34%	0.00%	-16.28%	0.00%	-20.03%	0.00%	-20.33%	0.20%	-9.23%	0.18%	-1.03%
1999	0.00%	-1.13%	0.00%	-2.90%	0.00%	-5.33%	2.74%	2.74%	0.00%	-20.31%	0.00%	-21.62%	0.53%	-15.03%	0.66%	0.31%	0.41%	-1.45%	0.00%	-17.04%	0.00%	-17.33%	0.00%	-17.04%
2000	0.00%	-10.98%	0.00%	-10.88%	0.00%	-6.95%	0.00%	-20.47%	0.00%	-22.89%	0.00%	-23.37%	0.00%	-24.24%	0.00%	-23.48%	0.00%	-22.20%	0.66%	-13.49%	1.03%	1.03%	0.00%	-2.90%
2001	0.00%	-2.72%	1.30%	1.38%	3.15%	3.33%	1.88%	1.88%	0.00%	-17.33%	0.00%	-22.40%	0.00%	-23.37%	1.10%	-15.41%	0.00%	-21.76%	0.00%	-21.46%	0.00%	-20.86%	0.00%	-18.85%
2002	0.00%	-17.99%	0.00%	-19.05%	0.00%	-20.22%	0.00%	-22.17%	0.00%	-25.10%	0.00%	-26.42%	0.00%	-26.35%	0.00%	-25.03%	0.00%	-24.85%	0.00%	-24.54%	0.00%	-22.94%	0.00%	-21.01%
2003	0.00%	-21.10%	0.60%	-17.87%	0.75%	2.06%	0.00%	-13.34%	0.00%	-21.91%	0.00%	-25.58%	0.00%	-26.08%	0.00%	-25.10%	0.00%	-24.30%	0.00%	-24.97%	0.00%	-23.70%	0.00%	-20.91%
2004	0.00%	-21.10%	0.60%	-17.87%	0.75%	2.06%	0.00%	-13.34%	0.00%	-21.91%	0.00%	-25.58%	0.00%	-26.08%	0.00%	-25.10%	0.00%	-24.30%	0.00%	-24.97%	0.00%	-23.70%	0.00%	-20.91%
2005	0.55%	0.55%	0.62%	0.62%	1.58%	1.58%	1.82%	1.82%	-0.07%	-1.13%	0.00%	-17.33%	0.70%	-18.35%	0.40%	-3.48%	0.00%	-18.56%	0.00%	-19.04%	0.00%	-18.18%	0.00%	-15.14%
2006	0.00%	-15.14%	0.00%	-14.95%	0.00%	-15.81%	0.00%	-18.59%	0.00%	-22.35%	0.00%	-23.64%	0.00%	-23.73%	0.00%	-22.08%	0.00%	-22.52%	0.00%	-20.33%	0.00%	-21.21%	0.00%	-20.18%
2007	0.00%	-19.80%	0.00%	-16.09%	0.00%	-13.81%	0.00%	-21.28%	0.00%	-24.22%	0.00%	-26.11%	0.00%	-26.08%	0.84%	-19.82%	0.00%	-23.56%	0.00%	-23.98%	0.00%	-22.99%	2.02%	2.02%
2008	2.39%	2.39%	-0.16%	-0.16%	0.96%	1.65%	0.00%	-1.12%	-0.04%	-1.13%	0.00%	-9.84%	-0.66%	-2.20%	0.05%	-4.52%	0.00%	-13.62%	0.00%	-11.07%	0.00%	-10.13%	-0.51%	-0.51%
2009	0.73%	0.73%	0.63%	0.63%	0.35%	2.18%	0.00%	-1.12%																

Figure 4-35. Habitat summary table for roundtail chub (*Gila robusta*), Gage site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes
Hypothetical Withdrawal 10 cfs

Gage Site
With LWD
Roundtail chub

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-46.37%	0.00%	-41.26%	-0.58%	-40.45%	0.00%	-42.39%	0.00%	-42.94%	0.00%	-44.17%	2.07%	-42.53%	0.51%	-28.18%
1966	3.18%	3.18%	6.38%	14.79%	3.84%	6.27%	0.00%	-47.24%	0.00%	-46.33%	0.00%	-46.21%	0.00%	-46.03%	1.51%	-45.37%	1.10%	-45.13%	0.00%	-46.15%	0.37%	-45.98%	1.44%	-44.59%
1967	0.00%	-46.47%	0.00%	-46.24%	0.00%	-46.29%	0.00%	-46.11%	0.00%	-46.15%	0.00%	-46.03%	8.73%	-38.22%	5.26%	-39.16%	1.81%	-45.27%	0.00%	-43.82%	0.00%	-45.88%	-3.25%	-40.36%
1968	-7.32%	-7.32%	-4.17%	-4.17%	-2.70%	-1.58%	9.04%	-0.57%	-0.17%	-46.75%	-0.01%	-46.31%	-0.77%	-45.46%	4.02%	-42.12%	0.00%	-46.47%	0.00%	-46.45%	0.00%	-46.45%	1.74%	-45.59%
1969	-0.34%	-31.25%	-3.04%	-3.04%	0.15%	1.36%	8.63%	-21.01%	6.66%	-42.63%	0.00%	-46.40%	0.00%	-46.36%	0.00%	-46.37%	0.00%	-46.21%	0.00%	-46.22%	0.00%	-46.53%	0.00%	-46.82%
1970	0.00%	-46.66%	0.00%	-45.46%	0.00%	-45.15%	0.00%	-46.61%	0.00%	-46.31%	0.00%	-45.90%	0.00%	-44.12%	4.55%	-38.95%	0.60%	-34.48%	0.00%	-46.11%	0.00%	-46.44%	0.00%	-46.60%
1971	0.00%	-46.59%	0.00%	-46.69%	0.00%	-46.60%	0.00%	-46.01%	0.00%	-45.89%	0.00%	-42.08%	3.20%	-39.79%	0.88%	-42.61%	0.99%	-44.04%	2.47%	-31.61%	6.04%	-39.91%	6.51%	-37.86%
1972	4.92%	-39.29%	0.00%	-46.50%	0.00%	-46.27%	0.00%	-46.08%	0.00%	-45.89%	1.35%	-45.23%	1.92%	-44.94%	-0.01%	-43.35%	-0.45%	-42.76%	0.65%	-29.25%	1.36%	-21.49%	5.19%	5.19%
1973	8.74%	8.74%	6.35%	6.35%	-0.24%	-0.24%	0.96%	0.96%	10.76%	10.76%	9.46%	-6.93%	2.05%	-17.63%	2.94%	-42.02%	-0.95%	-47.16%	-0.56%	-46.90%	-0.49%	-47.05%	1.32%	-46.45%
1974	6.50%	-27.04%	0.42%	-45.12%	0.71%	-40.84%	0.00%	-46.87%	-0.03%	-46.56%	0.00%	-46.32%	1.13%	-45.74%	2.39%	-45.02%	-0.11%	-46.51%	6.43%	-40.91%	3.54%	-44.92%	0.00%	-46.81%
1975	0.00%	-46.75%	2.51%	-34.84%	3.01%	3.47%	13.10%	14.82%	0.68%	-46.54%	0.00%	-46.40%	0.29%	-44.69%	0.00%	-46.33%	-0.01%	-46.42%	0.00%	-46.29%	0.00%	-46.26%	1.89%	-45.39%
1976	0.29%	-44.97%	3.96%	-28.44%	0.00%	-42.30%	7.52%	-36.98%	-0.04%	-46.68%	0.00%	-46.15%	6.53%	-36.83%	1.43%	-41.51%	2.25%	-42.24%	-1.03%	-45.50%	0.00%	-46.42%	0.00%	-46.18%
1977	0.00%	-46.77%	0.00%	-46.54%	0.00%	-46.54%	4.01%	-41.39%	0.00%	-46.02%	0.00%	-42.94%	-0.13%	-44.62%	4.27%	-40.19%	2.11%	-42.33%	0.00%	-45.83%	0.00%	-43.83%	0.00%	-43.12%
1978	1.10%	-36.82%	-0.44%	-8.11%	-1.03%	-1.03%	0.62%	-46.94%	-0.03%	-46.64%	0.00%	-46.31%	0.00%	-46.08%	0.00%	-42.45%	0.00%	-35.83%	0.00%	-42.01%	8.77%	-26.17%	3.57%	3.57%
1979	11.46%	11.46%	-6.09%	-6.09%	-2.93%	-2.93%	2.53%	2.53%	16.69%	16.69%	2.66%	-39.24%	-0.49%	-46.87%	0.18%	-46.60%	-0.14%	-46.72%	-1.36%	-45.56%	-1.31%	-47.48%	-0.44%	-47.49%
1980	2.09%	-20.75%	5.43%	5.43%	-5.32%	-5.32%	-1.37%	-1.37%	14.56%	14.56%	-0.13%	-16.07%	0.55%	-21.73%	1.11%	-30.55%	3.12%	-29.47%	-1.66%	-46.52%	-1.33%	-47.49%	-0.44%	-47.49%
1981	0.34%	-47.24%	1.11%	-41.88%	6.11%	0.58%	2.66%	-40.91%	-0.26%	-46.92%	-0.02%	-46.58%	2.75%	-44.29%	1.28%	-44.94%	-0.62%	-43.27%	-1.21%	-43.56%	0.51%	-43.73%	2.23%	-42.24%
1982	6.01%	-6.05%	-1.81%	-1.81%	-1.56%	-1.56%	3.87%	3.87%	-0.56%	-47.20%	-0.34%	-46.75%	-0.08%	-46.57%	1.46%	-42.77%	2.06%	-43.43%	0.00%	-46.33%	5.05%	-38.25%	4.25%	4.25%
1983	11.02%	11.02%	-0.78%	-0.78%	0.38%	0.38%	0.18%	0.18%	15.08%	15.08%	-1.22%	-47.22%	1.21%	-45.42%	3.24%	-40.46%	2.15%	-36.28%	6.44%	-27.23%	3.23%	-42.76%	0.33%	0.33%
1984	4.00%	4.00%	0.51%	-39.94%	0.00%	-47.49%	0.00%	-47.17%	0.00%	-46.32%	0.00%	-46.10%	1.00%	-45.37%	-0.58%	-34.75%	1.94%	-40.83%	9.00%	-29.68%	6.83%	-41.13%	-0.19%	-0.19%
1985	11.43%	11.43%	-4.68%	-4.68%	-2.82%	-2.82%	-1.30%	-1.30%	13.99%	-5.03%	-0.25%	-46.71%	0.89%	-44.30%	1.08%	-44.24%	-1.07%	-43.81%	0.63%	-34.79%	-7.80%	-7.80%	3.30%	3.30%
1986	1.37%	-22.71%	2.89%	3.05%	8.31%	8.31%	14.23%	4.51%	-0.67%	-47.25%	-0.34%	-46.76%	1.13%	-45.81%	-1.07%	-42.05%	0.35%	-42.71%	0.64%	-45.98%	0.64%	-40.43%	5.73%	-37.38%
1987	1.75%	-16.71%	3.37%	6.05%	6.02%	9.84%	3.40%	-38.15%	-0.05%	-46.74%	0.00%	-46.23%	1.97%	-43.95%	3.22%	-42.39%	0.00%	-46.36%	0.13%	-43.42%	-0.04%	-43.72%	0.31%	-46.80%
1988	6.25%	-11.84%	9.15%	9.84%	0.00%	-45.81%	4.65%	-40.76%	4.86%	-43.77%	-0.15%	-46.65%	1.88%	-43.41%	2.51%	-39.38%	3.57%	-38.40%	0.00%	-46.50%	0.00%	-46.39%	2.24%	-45.14%
1989	5.99%	-31.16%	3.24%	3.24%	2.19%	-34.59%	3.42%	-38.92%	0.00%	-46.23%	0.00%	-44.96%	0.00%	-44.17%	1.36%	-45.49%	0.00%	-46.22%	0.00%	-46.19%	0.00%	-46.18%	0.00%	-46.18%
1990	0.00%	-46.50%	0.00%	-46.57%	0.00%	-46.54%	0.00%	-46.38%	0.00%	-46.05%	0.00%	-41.96%	0.00%	-44.00%	1.38%	-40.51%	0.00%	-45.58%	0.00%	-45.65%	0.00%	-46.15%	5.27%	-38.74%
1991	4.52%	-33.35%	0.75%	-40.51%	0.77%	0.77%	6.13%	6.13%	-0.18%	-46.71%	0.00%	-46.32%	0.00%	-46.17%	1.57%	-45.04%	0.00%	-42.94%	0.00%	-44.00%	0.00%	-46.03%	9.75%	-34.50%
1992	-3.50%	-3.50%	10.48%	11.55%	2.51%	2.51%	7.20%	7.20%	-1.07%	-40.71%	0.00%	-46.32%	1.41%	-39.61%	4.51%	-33.61%	4.21%	-43.01%	0.00%	-46.37%	-0.21%	-44.80%	0.23%	-29.69%
1993	0.58%	0.58%	1.45%	1.45%	-5.40%	-5.40%	3.79%	3.79%	12.15%	10.95%	-1.06%	-23.69%	-1.68%	-37.80%	1.92%	-36.16%	0.29%	-37.45%	-0.80%	-38.74%	2.36%	-20.18%	12.87%	12.87%
1994	0.00%	-24.25%	6.09%	6.09%	9.31%	11.43%	10.06%	10.22%	8.31%	-40.32%	-0.47%	-46.82%	-0.16%	-46.69%	1.20%	-46.03%	-0.03%	-46.65%	0.59%	-46.28%	1.91%	-44.82%	8.03%	-29.89%
1995	2.80%	2.80%	1.71%	1.71%	5.61%	5.98%	9.28%	14.17%	-0.77%	-44.42%	-0.71%	-46.95%	-0.12%	-46.68%	0.13%	-46.61%	-0.46%	-46.90%	-0.20%	-46.71%	-0.11%	-46.81%	0.00%	-46.87%
1996	0.00%	-46.90%	0.00%	-46.87%	0.00%	-46.81%	0.00%	-46.30%	0.00%	-46.07%	0.00%	-45.96%	2.36%	-44.72%	1.58%	-45.20%	4.24%	-37.15%	0.00%	-46.10%	0.00%	-46.27%	0.00%	-46.42%
1997	0.52%	-40.20%	1.24%	1.57%	1.65%	7.70%	0.00%	-46.70%	0.00%	-46.15%	0.00%	-45.93%	0.00%	-45.34%	0.00%	-45.40%	0.00%	-44.62%	0.00%	-44.40%	0.00%	-46.10%	1.74%	-45.31%
1998	3.65%	-44.15%	-5.35%	-29.66%	2.96%	2.96%	2.35%	2.35%	2.16%	-45.62%	0.00%	-46.15%	0.00%	-46.11%	0.00%	-46.02%	0.00%	-45.65%	0.00%	-45.02%	1.28%	-45.38%	0.88%	-46.17%
1999	0.00%	-46.55%	0.00%	-46.45%	0.00%	-46.37%	14.33%	-27.77%	0.00%	-45.01%	0.00%	-41.52%	2.49%	-40.29%	2.37%	-43.12%	2.35%	-39.52%	0.00%	-45.99%	0.00%	-45.99%	0.00%	-45.99%
2000	0.00%	-46.19%	0.00%	-46.19%	0.00%	-46.27%	0.00%	-44.63%	0.00%	-38.10%	0.00%	-36.80%	0.00%	-34.43%	-0.10%	-36.51%	0.00%	-39.96%	3.59%	-34.09%	5.89%	-24.02%	0.00%	-46.45%
2001	0.00%	-46.46%	6.03%	-36.11%	11.75%	-3.37%	7.00%	-39.51%	0.00%	-45.99%	0.00%	-39.42%	0.00%	-36.80%	5.17%	-38.24%	0.00%	-41.14%	0.00%	-41.96%	0.00%	-43.59%	0.00%	-45.60%
2002	0.00%	-45.96%	0.00%	-45.74%	0.00%	-44.46%	0.00%	-40.03%	0.00%	-32.12%	0.00%	-28.54%	0.00%	-28.73%	0.00%	-32.29%	0.00%	-32.80%	0.00%	-33.62%	0.00%	-37.96%	0.00%	-43.18%
2003	0.00%	-42.94%	2.36%	-40.60%	3.66%	2.83%	0.00%	-46.11%	0.00%	-40.42%	0.00%	-30.82%	0.00%	-29.47%	0.00%	-32.12%	0.00%	-34.27%	0.00%	-32.46%	0.00%	-35.90%	0.00%	-43.41%
2004	0.00%	-42.94%	2.36%	-40.60%	3.66%	2.83%	0.00%	-46.11%	0.00%	-40.42%	0.00%	-30.82%	0.00%	-29.47%	0.00%	-32.12%	0.00%	-34.27%	0.00%	-32.46%	0.00%	-35.90%	0.00%	-43.41%
2005	5.01%	5.01%	2.67%	3.19%	6.59%	7.71%	7.29%	-21.31%	-0.07%	-46.69%	0.00%	-45.99%	2.24%	-44.02%	1.76%	-41.60%	0.00%	-45.95%	0.00%	-45.93%	0.00%	-45.96%	0.00%	-46.06%
2006	0.00%	-46.06%	0.00%	-46.06%	0.00%	-46.03%	0.00%	-45.69%	0.00%	-39.56%	0.00%	-36.06%	0.00%	-35.83%	0.00%	-40.29%	0.00%	-39.08%	0.00%	-39.89%	0.00%	-42.63%	0.00%	-45.13%
2007	0.00%	-45.90%	0.00%	-46.03%	0.00%	-46.10%	0.00%	-42.45%	0.00%	-34.51%	0.00%	-29.38%	0.00%	-29.47%	3.60%	-36.68%	0.00%	-36.28%	0.00%	-35.14%	0.00%	-37.82%	7.59%	-22.26%
2008	8.20%	8.20%	-0.49%	-0.49%	3.54%	7.84%	0.00%	-47.10%	-0.04%	-46.73%	0.00%	-46.23%	-1.92%	-42.27%	0.25%	-45.39%	0.00%	-46.11%	0.00%	-46.19%	0.00%	-46.22%	-1.63%	-29.36%
2009	1.84%	1.84%	2.78%	2.78%	2.32%	-11.35%	0.00%	-47.27%																

Figure 4-36. Habitat summary table for roundtail chub (*Gila robusta*), Gage site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Braided Site

No Wood

Hypothetical Withdrawal 2 cfs

Roundtail chub

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.87%	-26.40%	-3.06%	-40.28%	5.16%	-24.95%	9.28%	-34.21%	0.00%	-39.71%	0.55%	-36.93%	-2.23%	-13.83%	-0.42%	-0.42%
1966	-1.01%	-1.01%	-1.11%	-4.24%	0.00%	-3.60%	-1.36%	0.31%	0.00%	-20.37%	-1.02%	-22.49%	0.00%	-28.14%	1.22%	-16.72%	0.00%	-28.73%	0.00%	-21.59%	0.00%	-18.90%	1.00%	-15.05%
1967	0.00%	-14.36%	0.00%	-24.19%	-0.49%	-22.27%	-0.90%	-24.07%	0.00%	-21.59%	0.00%	-28.14%	0.00%	-28.14%	0.00%	-20.37%	-5.75%	-20.89%	-7.93%	-37.61%	0.00%	-32.42%	0.00%	-24.19%
1968	0.20%	0.20%	-0.57%	-0.57%	1.27%	1.27%	-8.02%	-9.87%	4.35%	-9.95%	0.65%	-41.37%	0.00%	-15.24%	0.07%	-14.49%	0.01%	-20.69%	0.00%	-22.12%	-0.07%	-15.41%	0.00%	-13.54%
1969	0.40%	0.05%	1.69%	1.61%	2.43%	2.43%	-2.92%	-14.03%	3.63%	-5.91%	0.00%	-17.39%	0.00%	-19.12%	0.62%	-18.11%	0.92%	-21.22%	0.91%	-21.67%	-1.10%	-12.57%	0.00%	-9.94%
1970	0.00%	-14.11%	0.00%	-13.42%	0.00%	-5.00%	0.00%	-13.79%	0.00%	-27.50%	0.00%	-32.39%	-0.29%	-38.43%	1.06%	-20.55%	-2.68%	-23.87%	0.00%	-23.87%	0.00%	-14.18%	0.00%	-13.53%
1971	0.00%	-13.62%	0.00%	-14.28%	0.00%	-14.55%	0.00%	-29.13%	0.00%	-32.81%	-1.56%	-39.48%	0.00%	-39.25%	9.35%	-27.51%	0.80%	-28.14%	-4.15%	-16.02%	0.00%	-14.38%	0.00%	-13.19%
1972	0.00%	-14.12%	0.00%	-19.41%	-0.88%	-21.54%	0.00%	-25.18%	0.00%	-30.49%	0.00%	-32.83%	0.00%	-28.14%	0.00%	-28.14%	0.00%	-34.28%	-1.36%	-8.32%	0.33%	0.33%	0.48%	0.48%
1973	0.53%	0.53%	-0.03%	-0.03%	-0.10%	-0.10%	0.16%	0.16%	0.52%	0.28%	-0.54%	-12.29%	-13.87%	-14.96%	12.66%	12.54%	8.73%	-4.56%	-3.44%	-15.63%	-0.16%	-4.54%	2.34%	2.47%
1974	0.94%	-5.28%	0.00%	-0.70%	0.00%	9.81%	0.00%	-9.95%	-0.21%	-13.13%	0.00%	-38.38%	0.00%	-18.27%	1.27%	-12.29%	-0.72%	-13.39%	0.07%	-18.62%	-0.37%	-12.33%	-0.31%	-11.78%
1975	0.00%	-14.46%	0.00%	-6.92%	0.47%	0.03%	2.21%	2.21%	5.06%	-3.58%	0.00%	-17.44%	-0.04%	-16.17%	0.00%	-26.73%	-0.07%	-23.12%	0.00%	-22.27%	0.00%	-23.16%	0.00%	-16.77%
1976	-2.61%	-7.53%	-2.94%	-1.73%	0.00%	-2.41%	0.14%	-6.88%	1.20%	-12.26%	0.00%	-21.29%	-0.61%	-27.34%	0.59%	-24.38%	0.01%	-28.14%	0.00%	-13.95%	0.00%	-16.88%	0.00%	-19.96%
1977	0.00%	-7.33%	0.00%	-13.21%	0.00%	-13.34%	0.00%	-18.07%	0.00%	-28.30%	0.00%	-38.42%	0.00%	-37.55%	-3.30%	-43.88%	2.01%	-17.65%	0.00%	-32.47%	-0.87%	-37.89%	0.00%	-38.20%
1978	-0.76%	-19.32%	0.43%	0.59%	0.64%	0.64%	0.00%	-2.25%	-0.18%	-13.74%	0.00%	-21.13%	0.00%	-25.18%	0.00%	-39.02%	0.00%	-48.13%	-0.31%	-38.67%	0.00%	-24.14%	-2.26%	-3.59%
1979	-0.59%	-0.59%	1.69%	2.18%	0.35%	0.35%	0.39%	0.39%	-2.97%	-6.33%	-2.30%	-4.12%	0.69%	-12.27%	-0.89%	-12.78%	3.68%	-10.82%	11.44%	5.30%	6.34%	12.49%	0.00%	3.72%
1980	0.67%	0.62%	0.85%	0.85%	1.14%	1.14%	-2.62%	2.09%	-5.33%	-5.97%	-0.84%	-14.20%	-16.27%	-16.95%	-3.26%	-6.33%	-10.78%	-10.78%	12.38%	12.38%	8.27%	12.68%	0.00%	12.40%
1981	0.00%	10.33%	0.00%	10.70%	-0.06%	-10.43%	-1.70%	-4.18%	-1.61%	-11.96%	-0.47%	-13.58%	-2.02%	-10.38%	0.20%	-11.86%	-1.93%	-15.37%	3.76%	3.44%	-5.34%	-6.51%	-1.80%	-4.66%
1982	-1.90%	-2.08%	-5.53%	-7.65%	0.02%	0.12%	-1.39%	-13.17%	0.49%	-4.71%	-2.10%	-14.70%	-0.04%	-20.58%	0.27%	-12.30%	-2.68%	-14.96%	0.00%	-20.50%	-4.51%	-9.20%	-3.97%	-0.11%
1983	0.09%	-0.84%	0.18%	0.18%	0.27%	0.27%	0.68%	0.68%	-3.10%	-7.65%	3.49%	-4.56%	0.14%	-11.69%	1.34%	-7.44%	-1.43%	-14.95%	4.61%	3.45%	9.26%	7.78%	-1.94%	-2.56%
1984	-0.75%	-3.10%	-3.13%	2.32%	0.00%	10.20%	-1.33%	0.28%	0.00%	-25.05%	0.00%	-34.59%	0.00%	-31.14%	-1.39%	-7.24%	0.28%	-12.95%	-1.32%	-2.15%	1.18%	-4.52%	0.23%	0.23%
1985	0.86%	0.86%	1.66%	1.21%	0.96%	0.96%	5.20%	5.93%	-14.77%	-16.13%	-7.41%	-14.41%	-1.10%	-13.54%	-1.76%	-8.03%	-4.19%	-8.56%	0.70%	-5.39%	0.23%	-4.39%	0.86%	0.86%
1986	-0.18%	-11.99%	-3.61%	-1.54%	0.33%	0.33%	-5.86%	-10.96%	7.23%	0.88%	-2.13%	-14.72%	-1.53%	-11.56%	-3.55%	-11.12%	0.89%	-21.15%	-5.11%	-16.74%	-0.71%	-2.92%	-13.67%	-7.33%
1987	-7.88%	-11.92%	0.48%	-0.89%	0.81%	0.47%	1.70%	0.73%	0.06%	-10.73%	-0.91%	-19.58%	0.00%	-21.75%	-0.77%	-14.49%	0.00%	-17.86%	0.91%	-29.77%	0.34%	-6.09%	-9.10%	-5.80%
1988	1.14%	0.67%	1.07%	0.59%	-1.32%	-0.78%	0.00%	-7.54%	-1.82%	-12.11%	-0.96%	-14.00%	-0.32%	-14.05%	-0.67%	-0.23%	0.00%	-13.24%	-0.46%	-19.89%	0.00%	-30.44%	0.00%	-13.08%
1989	0.06%	-9.60%	0.19%	0.19%	0.00%	-4.31%	-1.02%	-5.13%	-0.89%	-22.44%	-0.84%	-35.81%	0.83%	-38.20%	-0.19%	-29.51%	0.88%	-32.23%	-0.96%	-26.82%	0.00%	-19.96%	0.00%	-19.80%
1990	0.00%	-12.31%	0.00%	-12.99%	0.00%	-12.79%	0.00%	-19.01%	0.08%	-25.89%	0.00%	-39.64%	0.00%	-38.44%	-0.22%	-36.17%	0.98%	-36.19%	0.00%	-33.09%	0.01%	-25.73%	0.00%	-19.12%
1991	-7.16%	-5.08%	-0.94%	-3.78%	-0.21%	-0.21%	0.60%	0.60%	-1.12%	-14.36%	0.00%	-21.00%	-1.91%	-28.10%	0.94%	-24.26%	-2.86%	-38.42%	-7.60%	-37.14%	0.00%	-27.64%	0.17%	-20.08%
1992	0.96%	0.96%	0.98%	0.48%	0.76%	3.84%	0.99%	0.99%	-3.36%	-7.84%	0.00%	-21.00%	1.10%	-21.78%	-4.81%	-8.69%	0.00%	-13.48%	0.00%	-34.99%	0.00%	-24.48%	-13.05%	-8.83%
1993	0.64%	0.18%	0.30%	0.30%	0.10%	0.10%	1.81%	1.40%	-2.34%	-3.00%	-14.00%	-15.38%	-17.19%	-17.19%	11.20%	11.04%	2.62%	1.81%	-1.19%	-8.24%	2.04%	0.32%	1.13%	0.98%
1994	0.06%	-15.15%	0.24%	-8.96%	0.21%	-0.24%	-1.87%	-2.22%	0.58%	-4.94%	-2.88%	-15.13%	-0.99%	-14.32%	0.00%	-12.61%	-0.21%	-14.01%	-1.28%	-13.93%	-2.57%	-10.04%	-5.04%	-8.85%
1995	0.63%	0.63%	0.87%	0.87%	-0.30%	-0.30%	-1.37%	-5.20%	0.95%	-0.33%	5.28%	-7.49%	-0.78%	-14.20%	-0.04%	-14.26%	-0.90%	-14.19%	-1.23%	-14.41%	-0.66%	-15.08%	0.00%	-6.90%
1996	0.00%	-6.45%	0.00%	-5.95%	0.00%	-11.59%	0.00%	-21.89%	0.00%	-25.84%	0.00%	-31.60%	0.89%	-33.11%	0.00%	-26.66%	-0.98%	-27.01%	0.00%	-24.37%	0.00%	-23.03%	0.00%	-16.76%
1997	0.00%	-13.71%	0.42%	0.42%	0.72%	0.72%	-0.28%	-13.48%	0.00%	-22.36%	0.00%	-33.43%	1.06%	-35.27%	1.69%	-30.64%	-8.50%	-26.00%	3.58%	-28.45%	0.03%	-29.63%	0.88%	-19.51%
1998	-0.83%	-2.93%	0.55%	0.55%	0.33%	0.33%	0.63%	0.63%	-4.08%	-10.55%	0.85%	-21.61%	0.00%	-33.04%	0.77%	-28.49%	0.00%	-35.63%	0.00%	-35.93%	-0.05%	-22.01%	0.00%	-13.93%
1999	0.00%	-13.36%	0.00%	-15.41%	0.00%	-21.38%	0.00%	-11.44%	0.00%	-35.91%	0.00%	-40.20%	-0.31%	-36.72%	-0.14%	-19.37%	1.62%	-16.88%	0.00%	-29.79%	0.00%	-30.28%	0.00%	-29.79%
2000	0.00%	-19.31%	0.00%	-22.57%	-0.13%	-20.56%	-0.85%	-36.93%	0.00%	-44.79%	0.00%	-46.67%	0.00%	-50.31%	7.06%	-47.11%	0.00%	-42.23%	-12.82%	-41.45%	-1.71%	-0.17%	0.00%	-15.41%
2001	0.00%	-14.34%	0.00%	-10.30%	0.61%	-3.29%	-0.63%	-4.29%	0.00%	-30.28%	0.00%	-42.96%	0.00%	-44.71%	1.93%	-44.70%	-5.50%	-41.41%	0.00%	-35.82%	0.00%	-33.11%	0.00%	-33.88%
2002	0.00%	-31.44%	0.00%	-33.87%	1.18%	-36.80%	-7.45%	-42.14%	0.00%	-54.12%	0.00%	-60.69%	0.00%	-60.32%	0.00%	-52.64%	0.00%	-52.97%	0.00%	-51.60%	0.00%	-42.15%	-13.03%	-38.13%
2003	0.00%	-34.78%	0.00%	-38.42%	1.96%	1.96%	0.00%	-23.38%	0.00%	-35.35%	0.00%	-56.41%	0.00%	-58.90%	0.00%	-54.12%	-0.48%	-50.56%	0.00%	-53.54%	0.00%	-48.01%	1.55%	-31.93%
2004	0.00%	-34.78%	0.00%	-38.42%	1.96%	1.96%	0.00%	-23.38%	0.00%	-35.35%	0.00%	-56.41%	0.00%	-58.90%	0.00%	-54.12%	-0.48%	-50.56%	0.00%	-53.54%	0.00%	-48.01%	1.55%	-31.93%
2005	2.55%	2.34%	0.23%	0.23%	-0.05%	-0.05%	-0.06%	-3.78%	-0.42%	-14.32%	0.00%	-30.28%	0.35%	-36.34%	0.00%	-20.31%	0.00%	-32.43%	0.00%	-33.26%	0.00%	-31.77%	0.00%	-26.49%
2006	0.00%	-26.49%	0.00%	-26.17%	0.01%	-27.49%	0.00%	-32.58%	0.00%	-42.77%	0.00%	-47.78%	0.00%	-48.13%	0.00%	-37.21%	0.00%	-43.43%	0.00%	-38.46%	0.00%	-36.06%	0.00%	-33.75%
2007	0.00%	-37.41%	-0.98%	-38.38%	0.04%	-23.58%	0.00%	-39.02%	0.00%	-50.18%	0.00%	-59.07%	0.00%	-58.90%	0.00%	-43.71%	0.00%	-47.44%	0.00%	-49.19%	0.00%	-45.19%	-6.07%	-1.41%
2008	0.57%	0.57%	0.41%	-4.15%	0.35%	-9.73%	-1.38%	0.55%	-0.25%	-11.89%	0.88%	-28.34%	0.00%	-28.95%	1.04%	-12.93%	0.03%	-25.12%	0.00%	-22.86%	0.91%	-21.67%	-3.47%	-10.59%
2009	-1.05%	-1.96%	-0.85%	-3.23%	0.00%	-15.69%	0.00%	-4.48%																

Figure 4-37. Habitat summary table for roundtail chub (*Gila robusta*), Braided site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes																								
Hypothetical Withdrawal 10 cfs										Braided Site No Wood Roundtail chub														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.87%	-82.31%	-3.06%	-77.13%	4.71%	-80.91%	9.28%	-76.17%	0.00%	-78.64%	0.55%	-79.03%	-3.12%	-82.99%	-1.23%	-26.91%
1966	1.14%	0.57%	-3.05%	-21.61%	0.00%	-27.08%	-1.36%	-82.48%	0.00%	-82.39%	-1.02%	-81.41%	0.00%	-80.27%	0.61%	-82.72%	0.00%	-82.25%	0.00%	-80.37%	0.00%	-80.95%	0.68%	-82.98%
1967	0.00%	-82.67%	0.00%	-82.20%	-0.49%	-82.29%	-0.90%	-80.52%	0.00%	-80.37%	0.00%	-80.27%	0.00%	-80.27%	0.00%	-82.39%	-6.37%	-81.42%	-7.93%	-78.89%	0.00%	-80.23%	0.00%	-82.20%
1968	3.71%	10.89%	2.94%	5.17%	3.53%	5.16%	-2.05%	-55.91%	4.41%	-82.32%	0.65%	-82.07%	0.00%	-82.67%	0.07%	-83.21%	0.01%	-82.69%	0.00%	-82.65%	0.00%	-82.65%	0.00%	-82.89%
1969	1.97%	-82.47%	1.99%	-8.38%	5.15%	6.09%	-3.62%	-81.63%	3.63%	-82.94%	0.00%	-82.55%	0.00%	-82.46%	0.62%	-82.37%	0.92%	-81.15%	0.91%	-81.33%	0.00%	-82.81%	0.00%	-83.39%
1970	0.00%	-83.07%	0.00%	-82.86%	0.00%	-83.70%	0.00%	-82.97%	0.00%	-82.35%	0.00%	-80.24%	-0.29%	-79.47%	-0.96%	-79.64%	-2.48%	-81.63%	0.00%	-80.33%	0.00%	-82.62%	0.00%	-82.94%
1971	0.00%	-82.92%	0.00%	-83.12%	0.00%	-82.96%	0.00%	-80.25%	0.00%	-80.21%	-1.56%	-77.58%	0.00%	-77.71%	9.35%	-78.76%	0.80%	-80.27%	-3.13%	-75.52%	0.00%	-82.65%	0.00%	-82.71%
1972	0.00%	-82.72%	0.00%	-82.73%	-0.88%	-81.95%	0.00%	-80.31%	0.00%	-80.29%	0.00%	-80.28%	0.00%	-80.27%	0.00%	-80.27%	0.00%	-76.65%	-1.36%	-77.08%	0.69%	-78.23%	2.13%	-8.79%
1973	2.59%	3.73%	-0.47%	-0.47%	-0.43%	-0.43%	0.73%	1.37%	3.17%	-20.49%	-11.24%	-62.62%	-11.06%	-60.47%	10.55%	-78.41%	8.65%	-81.58%	-3.44%	-83.54%	-0.98%	-82.76%	0.74%	-82.53%
1974	-0.32%	-68.19%	0.00%	-78.85%	0.00%	-78.85%	0.00%	-83.47%	-0.21%	-82.86%	0.00%	-82.37%	0.00%	-82.46%	1.27%	-82.92%	-0.72%	-82.77%	0.07%	-82.45%	-0.37%	-83.32%	-0.31%	-83.36%
1975	0.00%	-83.21%	0.00%	-83.42%	1.35%	3.75%	3.62%	-53.13%	6.12%	-82.54%	0.00%	-82.53%	-0.04%	-82.61%	0.00%	-82.39%	-0.07%	-82.58%	0.00%	-82.29%	0.00%	-82.25%	0.00%	-82.55%
1976	-2.93%	-81.49%	-2.68%	-49.74%	0.00%	-82.02%	0.14%	-83.51%	1.20%	-82.87%	0.00%	-80.38%	-0.61%	-81.57%	0.85%	-82.09%	0.01%	-80.27%	0.00%	-82.74%	0.00%	-82.57%	0.00%	-80.39%
1977	0.00%	-81.82%	0.00%	-82.82%	0.00%	-82.83%	0.00%	-82.53%	0.00%	-80.26%	0.00%	-78.18%	0.00%	-79.91%	-3.33%	-81.31%	1.42%	-82.44%	0.00%	-80.28%	-0.87%	-78.98%	0.00%	-78.31%
1978	-0.21%	-81.55%	1.97%	-1.29%	3.15%	-11.07%	-1.78%	-83.19%	-0.18%	-83.02%	0.00%	-82.35%	0.00%	-80.31%	0.00%	-77.84%	0.00%	-72.67%	-0.31%	-77.79%	0.00%	-80.36%	-5.88%	-31.19%
1979	1.20%	2.14%	5.91%	14.19%	2.01%	2.01%	2.14%	7.30%	-17.55%	-61.77%	-4.48%	-75.27%	0.41%	-82.90%	-1.73%	-83.44%	3.41%	-82.47%	8.44%	-81.52%	6.15%	-81.52%	0.00%	-81.52%
1980	2.03%	-62.78%	3.65%	3.64%	4.83%	5.11%	0.18%	-15.46%	-12.21%	-58.28%	-11.32%	-71.97%	-10.68%	-58.83%	-0.60%	-51.46%	-7.76%	-66.31%	7.99%	-79.97%	6.15%	-81.52%	0.00%	-81.52%
1981	0.00%	-81.52%	0.00%	-80.60%	-0.06%	-50.10%	-0.90%	-76.48%	-1.61%	-83.58%	-0.11%	-82.91%	-2.61%	-83.41%	1.07%	-83.19%	-1.93%	-83.46%	0.54%	-82.86%	-6.51%	-84.40%	-4.87%	-83.61%
1982	-2.52%	-21.75%	-5.74%	-14.30%	1.28%	-3.24%	-4.06%	-64.53%	4.29%	-82.83%	-2.10%	-83.25%	-0.04%	-82.82%	1.13%	-83.05%	-1.00%	-82.96%	0.00%	-82.39%	-7.64%	-82.05%	-2.79%	-1.87%
1983	-4.79%	1.71%	0.92%	0.54%	0.70%	0.70%	2.61%	6.11%	-8.88%	-59.05%	7.38%	-81.63%	0.04%	-82.96%	1.34%	-83.18%	-1.43%	-83.38%	1.29%	-75.13%	4.31%	-81.52%	-14.30%	-48.70%
1984	-0.31%	-14.90%	-3.13%	-71.87%	0.00%	-81.49%	-1.33%	-82.85%	0.00%	-82.37%	0.00%	-80.34%	0.00%	-80.30%	-3.78%	-80.25%	0.28%	-83.09%	-2.67%	-80.49%	-0.21%	-83.35%	3.66%	-13.30%
1985	2.62%	4.77%	7.28%	8.56%	3.45%	6.41%	2.56%	-12.22%	-8.96%	-61.51%	-1.58%	-83.17%	-0.21%	-82.92%	-1.02%	-83.56%	-4.01%	-83.75%	-2.25%	-71.60%	-5.20%	-53.17%	-1.33%	-53.66%
1986	-0.85%	-52.66%	-5.57%	-38.63%	1.80%	1.49%	-2.68%	-57.12%	7.25%	-82.32%	-2.13%	-83.26%	-1.26%	-83.15%	-3.21%	-81.09%	0.89%	-81.89%	-5.45%	-83.88%	-1.51%	-76.06%	-14.73%	-71.40%
1987	-8.00%	-63.62%	1.35%	-11.00%	4.43%	-4.00%	1.70%	-76.39%	1.14%	-82.98%	-0.91%	-81.40%	0.00%	-80.36%	0.38%	-82.73%	0.00%	-82.00%	0.91%	-81.33%	0.70%	-83.40%	-10.58%	-83.47%
1988	0.62%	-47.23%	2.64%	-2.13%	-1.32%	-82.93%	0.00%	-84.01%	-1.82%	-83.60%	-0.96%	-83.04%	-1.62%	-82.83%	-5.04%	-81.08%	0.00%	-82.90%	0.00%	-82.75%	0.00%	-82.51%	0.00%	-82.68%
1989	-2.19%	-71.22%	-0.53%	-13.55%	0.00%	-83.63%	-1.02%	-83.31%	-0.89%	-81.71%	-0.84%	-79.73%	0.83%	-79.51%	-0.19%	-81.41%	0.88%	-81.53%	-0.96%	-80.96%	0.00%	-80.39%	0.00%	-80.39%
1990	0.00%	-82.66%	0.00%	-82.79%	0.00%	-82.83%	0.00%	-82.44%	0.08%	-80.31%	0.00%	-77.49%	0.00%	-79.59%	-0.22%	-80.67%	0.98%	-80.23%	0.00%	-80.19%	0.01%	-80.37%	-0.70%	-82.46%
1991	-5.52%	-83.07%	-0.55%	-80.22%	-1.05%	-0.55%	3.02%	-29.14%	-1.12%	-83.16%	0.00%	-82.36%	-1.91%	-80.77%	0.94%	-80.74%	-2.86%	-78.18%	-7.60%	-78.91%	0.00%	-80.27%	-0.92%	-82.41%
1992	4.36%	-3.02%	1.84%	3.35%	3.88%	9.34%	4.75%	-42.87%	1.33%	-73.14%	0.00%	-82.36%	0.35%	-81.16%	-4.99%	-71.75%	0.00%	-82.88%	0.00%	-82.46%	0.00%	-82.45%	-17.51%	-41.17%
1993	1.64%	-2.88%	1.48%	5.89%	0.41%	13.19%	-3.44%	-26.58%	-10.83%	-78.83%	-10.06%	-78.62%	-10.14%	-71.22%	9.11%	-73.92%	-0.45%	-74.12%	-4.06%	-69.25%	4.90%	-63.20%	-16.76%	-78.62%
1994	-3.29%	-52.74%	1.22%	-42.33%	-2.56%	-10.74%	-1.64%	-65.84%	1.09%	-81.96%	-2.88%	-83.39%	-0.99%	-83.14%	-0.28%	-83.18%	-0.21%	-83.04%	-0.43%	-83.02%	-0.72%	-83.36%	-13.10%	-53.52%
1995	1.47%	3.37%	1.85%	4.54%	2.80%	8.22%	-2.77%	-64.04%	9.59%	-77.28%	5.28%	-81.99%	-0.78%	-83.10%	-0.04%	-83.12%	-1.42%	-83.29%	-1.23%	-83.17%	-0.66%	-83.37%	0.00%	-83.48%
1996	0.00%	-83.47%	0.00%	-83.30%	0.00%	-83.36%	0.00%	-82.31%	0.00%	-80.30%	0.00%	-80.21%	0.89%	-80.74%	0.00%	-80.29%	-0.98%	-81.55%	0.00%	-80.33%	0.00%	-82.25%	0.00%	-82.58%
1997	0.00%	-82.89%	4.23%	0.26%	3.29%	-27.56%	-0.28%	-83.15%	0.00%	-80.56%	0.00%	-80.19%	1.06%	-78.61%	1.69%	-78.51%	-8.50%	-75.96%	1.26%	-78.12%	0.03%	-80.33%	-0.73%	-82.03%
1998	-0.83%	-81.99%	2.00%	-66.59%	2.17%	7.22%	3.04%	-25.10%	0.06%	-83.28%	0.85%	-80.37%	0.00%	-80.34%	0.77%	-80.27%	0.00%	-80.17%	0.00%	-79.60%	-0.47%	-81.49%	0.00%	-83.02%
1999	0.00%	-82.84%	0.00%	-82.65%	0.00%	-82.48%	0.00%	-83.36%	0.00%	-79.59%	0.00%	-77.18%	-1.79%	-79.61%	-0.14%	-82.89%	-1.26%	-75.75%	0.00%	-80.24%	0.00%	-80.23%	0.00%	-80.24%
2000	0.00%	-80.40%	0.00%	-80.40%	-0.13%	-82.37%	-0.85%	-79.51%	0.00%	-74.57%	0.00%	-73.50%	0.00%	-71.44%	7.06%	-73.25%	0.00%	-76.02%	-12.82%	-76.47%	0.63%	-76.36%	0.00%	-82.65%
2001	0.00%	-82.67%	0.00%	-80.71%	0.61%	-47.90%	-0.63%	-83.27%	0.00%	-80.23%	0.00%	-75.61%	0.00%	-72.53%	1.93%	-78.57%	-5.50%	-76.90%	0.00%	-76.07%	0.00%	-77.09%	0.00%	-80.22%
2002	0.00%	-80.22%	0.00%	-80.21%	1.18%	-79.47%	-7.45%	-76.07%	0.00%	-69.27%	0.00%	-65.54%	0.00%	-65.75%	0.00%	-68.65%	0.00%	-69.92%	0.00%	-70.70%	0.00%	-73.14%	-13.03%	-78.35%
2003	0.00%	-76.90%	0.00%	-78.18%	6.31%	-25.80%	0.00%	-80.34%	0.00%	-73.93%	0.00%	-67.97%	0.00%	-66.56%	0.00%	-69.27%	-0.48%	-71.29%	0.00%	-69.60%	0.00%	-72.74%	1.55%	-76.47%
2004	0.00%	-76.90%	0.00%	-78.18%	6.31%	-25.80%	0.00%	-80.34%	0.00%	-73.93%	0.00%	-67.97%	0.00%	-66.56%	0.00%	-69.27%	-0.48%	-71.29%	0.00%	-69.60%	0.00%	-72.74%	1.55%	-76.47%
2005	2.45%	-2.06%	2.03%	-2.19%	1.43%	4.46%	-0.06%	-72.41%	-0.42%	-83.14%	0.00%	-80.23%	0.35%	-80.00%	0.00%	-80.60%	0.00%	-80.20%	0.00%	-80.19%	0.00%	-80.21%	0.00%	-80.29%
2006	0.00%	-80.29%	0.00%	-80.30%	0.01%	-80.28%	0.00%	-80.04%	0.00%	-75.71%	0.00%	-72.87%	0.00%	-72.67%	0.00%	-74.40%	0.00%	-75.34%	0.00%	-75.86%	0.00%	-76.99%	0.00%	-79.08%
2007	0.00%	-80.17%	-0.98%	-80.61%	0.04%	-80.34%	0.00%	-77.84%	0.00%	-71.51%	0.00%	-66.46%	0.00%	-66.56%	0.00%	-75.18%	0.00%	-73.06%	0.00%	-72.07%	0.00%	-74.34%	-3.93%	-47.69%
2008	2.36%	-16.91%	3.01%	3.34%	0.35%	-44.02%	-1.38%	-82.64%	-0.25%	-83.21%	0.88%	-82.01%	0.00%	-82.32%	0.52%	-82.20%	0.03%	-80.33%	0.00%	-80.40%	0.91%	-81.33%	-3.15%	-82.52%
2009	-2.99%	-23.34%	-2.43%	-24.91%	0.00%	-56.68%	0.00%	-82.98%																

Figure 4-38. Habitat summary table for roundtail chub (*Gila robusta*), Braided site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Braided Site

With LWD

Roundtail chub

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.17%	-18.51%	-2.91%	-38.39%	1.24%	-26.30%	8.81%	-32.51%	1.51%	-36.75%	0.53%	-35.34%	0.93%	0.37%	-3.41%	-3.41%
1966	-1.22%	-2.73%	-0.85%	-3.00%	0.00%	0.92%	0.00%	2.50%	0.00%	-11.82%	-0.18%	-17.56%	0.00%	-26.71%	0.35%	-9.31%	0.56%	-19.74%	0.00%	-20.11%	0.41%	-16.59%	-0.05%	-10.76%
1967	0.00%	-4.67%	0.00%	-16.63%	-0.17%	-14.14%	-0.17%	-22.06%	0.00%	-20.11%	0.00%	-26.71%	0.21%	-26.56%	-2.69%	-8.63%	-6.94%	-15.89%	-7.55%	-35.92%	0.00%	-30.93%	-0.18%	-10.46%
1968	0.10%	0.10%	-1.12%	-1.12%	-3.60%	-3.49%	-2.71%	-0.80%	0.88%	1.58%	0.15%	-34.89%	2.62%	-2.37%	0.72%	0.52%	0.00%	-11.41%	0.00%	-12.61%	-0.01%	-5.42%	-0.19%	-1.35%
1969	-0.57%	-0.07%	0.44%	-1.42%	-0.72%	-0.72%	-2.38%	-0.06%	0.04%	0.20%	0.00%	-8.00%	0.00%	-10.22%	0.07%	-9.54%	0.17%	-17.23%	0.17%	-17.05%	-0.13%	-2.41%	0.00%	-1.57%
1970	0.00%	-2.48%	-0.22%	-1.49%	0.00%	-0.36%	0.00%	-2.46%	0.00%	-19.52%	0.00%	-30.87%	-0.79%	-35.06%	-1.97%	-21.02%	-0.65%	-16.68%	0.00%	-22.42%	0.00%	-5.15%	0.00%	-2.41%
1971	0.00%	-2.44%	0.00%	-2.49%	0.00%	-3.40%	0.00%	-27.70%	0.00%	-31.35%	-1.49%	-37.67%	0.00%	-37.45%	7.98%	-25.28%	0.67%	-23.27%	0.95%	-5.22%	-1.49%	-3.50%	0.74%	-2.05%
1972	0.70%	-0.99%	0.00%	-10.81%	-0.17%	-14.73%	0.00%	-23.74%	0.00%	-28.91%	0.00%	-31.21%	0.00%	-26.71%	-0.32%	-26.71%	0.00%	-32.64%	-0.85%	-17.49%	0.11%	0.11%	-0.15%	-0.43%
1973	0.73%	0.73%	0.32%	0.32%	0.79%	0.79%	0.52%	0.52%	0.23%	0.23%	0.94%	2.60%	1.69%	2.44%	-0.02%	-0.06%	0.99%	-1.01%	-0.43%	-2.58%	1.52%	0.74%	0.02%	-0.29%
1974	0.00%	0.22%	0.29%	1.94%	-0.47%	0.92%	-0.58%	0.84%	-0.03%	-2.35%	0.00%	-30.94%	-0.60%	-9.12%	-1.17%	-4.15%	-0.09%	-4.78%	1.19%	-8.63%	1.54%	-0.07%	-0.04%	-1.87%
1975	0.00%	-2.48%	0.59%	-0.81%	0.14%	-0.21%	1.23%	0.92%	1.10%	2.59%	0.00%	-8.13%	0.14%	-5.19%	0.00%	-18.56%	-0.01%	-14.96%	0.00%	-14.22%	0.00%	-15.34%	1.50%	-6.24%
1976	-0.60%	-0.74%	-0.63%	-0.23%	0.09%	2.09%	0.85%	1.31%	1.86%	-0.12%	0.00%	-19.79%	-0.52%	-21.80%	0.56%	-16.56%	-0.09%	-26.71%	0.31%	-3.17%	0.00%	-7.34%	0.00%	-18.47%
1977	0.00%	-1.54%	0.00%	-2.40%	-0.17%	-2.43%	0.02%	-8.43%	0.00%	-26.88%	0.00%	-36.70%	0.00%	-35.21%	0.00%	-37.55%	0.03%	-9.97%	0.00%	-30.85%	-0.32%	-35.92%	0.00%	-36.50%
1978	1.08%	-7.48%	0.96%	1.12%	0.40%	0.40%	0.64%	2.00%	0.73%	0.92%	0.00%	-12.78%	0.00%	-23.74%	0.00%	-37.25%	0.00%	-45.46%	-0.33%	-36.52%	-0.11%	-21.77%	1.47%	2.21%
1979	-2.50%	-2.50%	0.40%	0.74%	0.34%	0.34%	0.31%	0.31%	-2.43%	-2.20%	-0.83%	0.49%	0.48%	-1.40%	-1.47%	1.29%	0.44%	-2.00%	0.81%	0.35%	1.37%	2.07%	1.97%	2.40%
1980	0.27%	0.35%	0.44%	0.44%	0.47%	0.63%	-0.15%	-0.50%	0.76%	0.71%	0.22%	1.41%	2.29%	3.48%	0.42%	0.58%	2.14%	1.71%	1.82%	1.82%	1.00%	1.50%	1.11%	2.53%
1981	1.70%	3.26%	0.05%	0.65%	0.27%	1.15%	-1.07%	1.14%	1.17%	-0.53%	-0.06%	-2.44%	-0.16%	-0.36%	0.34%	0.10%	-0.03%	-1.25%	1.10%	0.26%	1.04%	0.91%	-0.23%	0.04%
1982	-0.66%	-0.35%	-1.09%	-4.59%	-0.13%	2.46%	-1.73%	1.01%	2.98%	4.43%	-0.26%	-2.52%	0.50%	-10.51%	-0.60%	-1.93%	0.22%	-5.56%	0.55%	-11.49%	-1.41%	1.42%	0.23%	0.32%
1983	0.25%	0.56%	0.19%	0.19%	0.25%	0.25%	0.56%	0.56%	1.43%	2.18%	1.91%	2.93%	0.98%	0.43%	0.13%	-0.98%	-1.40%	-0.98%	-0.16%	-0.83%	0.26%	1.17%	-0.67%	0.86%
1984	-1.52%	0.64%	0.35%	0.50%	0.00%	1.38%	0.05%	0.91%	0.00%	-16.87%	0.00%	-32.76%	0.00%	-29.51%	-0.33%	0.45%	1.63%	1.65%	2.35%	1.93%	-0.83%	-0.91%	-0.91%	-0.91%
1985	0.44%	0.44%	0.47%	0.47%	0.39%	0.39%	-0.09%	-0.13%	0.93%	1.01%	3.25%	1.60%	0.23%	-1.16%	0.09%	-0.10%	1.63%	2.38%	3.94%	5.26%	0.28%	-2.49%	-2.12%	1.75%
1986	-0.29%	0.66%	0.11%	-0.97%	0.28%	0.28%	-1.30%	2.07%	1.28%	2.70%	-0.26%	-2.52%	1.41%	1.69%	-0.90%	-0.71%	0.17%	-14.54%	0.58%	0.27%	0.96%	1.30%	1.90%	3.61%
1987	0.21%	0.94%	-0.10%	-0.59%	0.19%	-0.72%	-1.38%	0.94%	2.27%	0.39%	-0.17%	-15.13%	0.00%	-20.28%	0.24%	-6.92%	0.00%	-11.65%	0.17%	-25.21%	1.32%	0.51%	1.68%	1.92%
1988	1.25%	-0.03%	0.00%	-2.98%	0.00%	-1.32%	0.23%	0.77%	1.48%	2.40%	-0.12%	-2.47%	-0.25%	-2.35%	-3.85%	-3.36%	-2.53%	-3.20%	-0.06%	-10.81%	0.00%	-22.01%	-0.04%	-3.14%
1989	-0.41%	-1.75%	-0.09%	-1.33%	0.61%	2.02%	-0.29%	1.80%	-0.17%	-16.52%	-0.31%	-33.96%	0.85%	-36.24%	-0.38%	-24.39%	0.17%	-27.10%	-0.17%	-23.41%	0.00%	-18.47%	0.00%	-18.30%
1990	0.00%	-2.45%	0.00%	-2.36%	0.00%	-2.28%	0.00%	-10.21%	1.48%	-23.30%	0.00%	-37.81%	0.00%	-35.87%	-0.50%	-33.41%	0.47%	-34.39%	0.00%	-31.67%	0.00%	-24.12%	-1.41%	-7.03%
1991	-2.69%	-1.58%	0.53%	-2.26%	-0.01%	-0.01%	0.47%	0.47%	0.09%	0.98%	0.00%	-12.62%	-0.34%	-25.23%	0.64%	-23.69%	-2.73%	-36.70%	-7.27%	-35.53%	0.00%	-26.22%	0.66%	-8.98%
1992	0.88%	0.78%	-0.17%	-0.17%	0.36%	1.54%	0.38%	0.38%	1.59%	3.21%	0.47%	-12.21%	0.13%	-18.13%	0.24%	-4.33%	0.38%	-0.68%	0.00%	-27.26%	-0.03%	-15.54%	-1.93%	4.26%
1993	1.41%	0.25%	0.66%	0.66%	0.37%	0.37%	-0.18%	-1.35%	0.85%	1.37%	0.88%	0.88%	2.84%	2.84%	1.02%	1.37%	1.07%	2.14%	2.73%	3.54%	0.23%	0.61%	-1.52%	-1.08%
1994	0.00%	2.64%	0.82%	1.94%	0.08%	-0.70%	-3.10%	-0.73%	-0.58%	0.92%	-0.36%	-2.55%	-0.12%	-2.49%	-0.51%	-0.82%	0.24%	-2.17%	0.64%	-1.08%	0.62%	0.99%	-0.44%	1.89%
1995	0.28%	0.28%	-0.44%	-0.64%	0.13%	0.13%	0.07%	0.86%	-0.20%	1.67%	0.61%	-1.47%	-0.09%	-2.48%	0.07%	-1.19%	-0.11%	-2.36%	-0.15%	-2.50%	-0.08%	-2.54%	0.00%	-0.86%
1996	0.00%	-0.80%	0.00%	-0.74%	0.00%	-1.86%	0.00%	-13.74%	0.00%	-24.40%	0.00%	-30.18%	-0.84%	-30.22%	0.00%	-25.23%	-0.18%	-21.76%	0.00%	-22.90%	0.00%	-15.18%	0.00%	-7.18%
1997	-0.46%	-1.30%	0.32%	-0.96%	0.00%	1.05%	0.00%	2.65%	0.00%	-20.25%	0.00%	-32.00%	0.51%	-32.99%	0.65%	-28.74%	-8.71%	-24.28%	0.97%	-25.63%	0.01%	-27.97%	-1.26%	-13.43%
1998	0.22%	1.46%	-0.06%	-0.06%	-2.34%	-2.34%	-2.20%	-2.20%	1.78%	2.34%	0.17%	-20.12%	0.00%	-31.26%	0.16%	-27.05%	0.00%	-33.86%	0.00%	-34.42%	1.01%	-16.00%	1.35%	-0.46%
1999	0.00%	-2.43%	0.00%	-5.42%	0.13%	-11.43%	0.38%	-2.17%	0.00%	-34.40%	0.00%	-38.32%	0.10%	-33.34%	-0.50%	-8.82%	-0.62%	-8.35%	0.00%	-28.36%	0.00%	-28.86%	0.00%	-28.36%
2000	0.00%	-17.81%	0.00%	-20.96%	0.00%	-11.09%	-0.32%	-35.05%	0.00%	-42.46%	0.00%	-44.15%	0.00%	-47.40%	2.14%	-44.55%	0.00%	-40.16%	-12.20%	-39.45%	1.09%	1.81%	0.00%	-5.42%
2001	0.00%	-4.34%	0.00%	1.53%	0.00%	0.59%	-0.47%	0.25%	0.00%	-28.86%	0.00%	-40.82%	0.00%	-42.22%	1.39%	-42.69%	-5.24%	-39.45%	0.00%	-34.06%	0.00%	-31.55%	0.00%	-32.36%
2002	0.00%	-30.02%	0.00%	-32.36%	0.66%	-34.91%	-7.08%	-40.08%	0.00%	-50.76%	0.00%	-56.50%	0.00%	-56.18%	0.00%	-49.32%	0.00%	-49.75%	0.00%	-48.55%	0.00%	-39.84%	-12.45%	-36.43%
2003	0.00%	-33.14%	-0.73%	-36.70%	0.60%	0.60%	0.00%	-21.93%	0.00%	-33.47%	0.00%	-52.77%	0.00%	-54.95%	0.00%	-50.76%	-0.45%	-47.62%	0.00%	-50.25%	0.00%	-45.35%	0.94%	-30.39%
2004	0.00%	-33.14%	-0.73%	-36.70%	0.60%	0.60%	0.00%	-21.93%	0.00%	-33.47%	0.00%	-52.77%	0.00%	-54.95%	0.00%	-50.76%	-0.45%	-47.62%	0.00%	-50.25%	0.00%	-45.35%	0.94%	-30.39%
2005	0.59%	-0.18%	-0.41%	-0.41%	-0.33%	-0.33%	-0.32%	1.30%	0.20%	-1.64%	0.00%	-28.86%	0.32%	-34.51%	0.95%	-17.34%	0.00%	-31.01%	0.00%	-31.84%	0.00%	-30.35%	0.00%	-25.06%
2006	0.00%	-25.06%	0.00%	-24.73%	0.00%	-26.05%	0.00%	-31.14%	0.00%	-40.65%	0.00%	-45.15%	0.00%	-45.46%	0.00%	-35.27%	0.00%	-41.24%	-0.52%	-36.56%	0.00%	-34.36%	0.00%	-30.16%
2007	0.00%	-35.87%	-0.17%	-35.73%	0.01%	-22.10%	0.00%	-37.25%	0.00%	-47.28%	0.00%	-55.10%	0.00%	-54.95%	0.00%	-41.50%	0.00%	-44.85%	0.00%	-46.41%	0.00%	-42.83%	-2.05%	-9.11%
2008	-1.79%	-1.14%	0.57%	-3.90%	0.65%	-0.42%	0.00%	2.21%	0.41%	-1.55%	0.17%	-21.59%	-0.91%	-20.98%	1.46%	-6.23%	0.01%	-23.62%	0.00%	-21.25%	0.17%	-17.05%	0.33%	-0.31%
2009	-0.84%	-1.24%	-0.13%	1.18%	0.00%	1.04%	0.00%	2.40%																

Figure 4-39. Habitat summary table for roundtail chub (*Gila robusta*), Braided site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 10 cfs										Braided Site With LWD Roundtail chub														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.17%	-77.36%	-2.91%	-73.52%	1.05%	-74.93%	8.81%	-72.45%	1.51%	-74.70%	0.53%	-75.62%	0.70%	-76.64%	-1.17%	-39.88%
1966	-5.50%	-0.42%	-2.43%	-4.17%	0.00%	-5.23%	0.00%	-76.31%	0.00%	-77.38%	-0.18%	-77.16%	0.00%	-76.91%	0.63%	-77.31%	0.94%	-76.95%	0.00%	-76.94%	0.78%	-76.89%	0.37%	-77.37%
1967	0.00%	-77.43%	0.00%	-77.35%	-0.17%	-77.35%	-0.17%	-76.97%	0.00%	-76.94%	0.00%	-76.91%	0.21%	-76.86%	-1.04%	-76.57%	-7.01%	-77.15%	-7.55%	-75.44%	0.00%	-76.90%	0.23%	-75.68%
1968	-0.90%	1.07%	1.12%	3.97%	-1.97%	-2.32%	-3.82%	-40.16%	2.41%	-76.57%	0.15%	-77.30%	2.75%	-76.70%	0.20%	-76.82%	0.00%	-77.43%	0.00%	-77.42%	0.00%	-77.42%	0.03%	-77.21%
1969	0.83%	-75.97%	0.14%	-3.82%	-0.23%	-2.02%	-2.38%	-72.32%	-0.51%	-76.96%	0.00%	-77.41%	0.00%	-77.39%	0.07%	-77.38%	0.17%	-77.11%	0.17%	-77.15%	0.00%	-77.45%	0.00%	-77.54%
1970	0.00%	-77.49%	-0.22%	-77.19%	0.00%	-76.24%	0.00%	-77.47%	0.00%	-77.38%	0.00%	-76.90%	-1.16%	-75.45%	-2.14%	-75.17%	0.38%	-76.77%	0.00%	-76.93%	0.00%	-77.42%	0.00%	-77.47%
1971	0.00%	-77.47%	0.00%	-77.50%	0.00%	-77.47%	0.00%	-76.91%	0.00%	-76.90%	-1.49%	-74.01%	0.00%	-74.16%	8.53%	-74.98%	2.29%	-75.83%	0.96%	-68.90%	0.93%	-77.19%	2.16%	-76.13%
1972	0.03%	-76.76%	0.00%	-77.44%	-0.17%	-77.29%	0.00%	-76.92%	0.00%	-76.92%	0.00%	-76.91%	0.00%	-76.91%	-1.46%	-76.91%	0.00%	-72.98%	-0.10%	-72.85%	0.13%	-73.48%	-2.56%	-5.60%
1973	0.48%	-3.57%	-1.55%	-1.55%	-2.09%	-2.09%	2.58%	0.72%	1.67%	-7.88%	4.20%	-47.52%	3.84%	-45.60%	-0.25%	-73.64%	0.98%	-77.26%	-0.43%	-77.57%	1.42%	-77.09%	-0.90%	-77.32%
1974	-0.79%	-56.88%	0.13%	-72.83%	-0.47%	-73.39%	-0.58%	-77.02%	-0.03%	-77.46%	0.00%	-77.38%	-1.08%	-77.23%	-1.06%	-77.26%	-0.09%	-77.44%	-0.03%	-77.12%	1.04%	-77.09%	-0.04%	-77.54%
1975	0.00%	-77.51%	0.59%	-76.68%	0.26%	-4.34%	-1.05%	-47.59%	2.56%	-76.36%	0.00%	-77.40%	-0.11%	-77.00%	0.00%	-77.38%	-0.01%	-77.41%	0.00%	-77.37%	0.00%	-77.36%	0.75%	-77.01%
1976	-0.90%	-76.06%	-0.89%	-46.00%	0.09%	-74.48%	-0.78%	-76.89%	2.01%	-76.96%	0.00%	-76.94%	-0.81%	-77.15%	0.91%	-77.15%	0.00%	-76.91%	-0.03%	-77.37%	0.00%	-77.41%	0.00%	-76.95%
1977	0.00%	-77.30%	0.00%	-77.45%	-0.17%	-77.45%	-1.45%	-77.31%	0.00%	-76.91%	0.00%	-74.68%	0.00%	-76.32%	0.88%	-76.42%	-0.81%	-77.26%	0.00%	-76.92%	-0.32%	-75.44%	0.00%	-74.82%
1978	0.96%	-75.50%	1.52%	-9.20%	1.57%	-21.34%	-0.90%	-76.59%	3.39%	-76.71%	0.00%	-77.38%	0.00%	-76.92%	0.00%	-74.30%	0.00%	-68.64%	-0.33%	-74.08%	0.35%	-76.68%	2.00%	-25.93%
1979	-1.66%	-0.36%	1.30%	3.80%	1.66%	1.39%	1.57%	2.57%	-1.34%	-43.43%	4.39%	-66.53%	0.76%	-77.30%	3.72%	-76.67%	0.40%	-77.39%	-0.46%	-77.25%	1.35%	-77.11%	1.97%	-76.81%
1980	1.76%	-54.61%	2.09%	2.31%	1.58%	2.42%	-3.27%	-6.29%	0.46%	-38.93%	7.21%	-58.97%	3.54%	-42.70%	0.73%	-42.71%	4.25%	-54.34%	1.32%	-75.52%	0.76%	-77.24%	1.11%	-77.00%
1981	1.70%	-76.46%	0.05%	-75.90%	0.06%	-31.77%	-2.95%	-67.86%	1.17%	-77.27%	-0.01%	-77.46%	1.16%	-77.04%	-0.71%	-77.02%	-1.44%	-77.12%	0.88%	-77.20%	0.10%	-77.31%	0.57%	-77.26%
1982	-2.29%	-24.57%	-0.64%	-2.02%	0.12%	-0.46%	-2.17%	-50.10%	5.16%	-76.25%	-0.26%	-77.52%	0.50%	-77.33%	0.55%	-77.26%	-0.43%	-77.26%	0.55%	-77.26%	-2.91%	-76.01%	-0.43%	1.27%
1983	0.46%	1.60%	0.96%	-0.26%	1.25%	1.25%	2.58%	3.96%	2.02%	-42.18%	5.41%	-76.24%	2.29%	-76.73%	-1.89%	-77.45%	-1.25%	-76.52%	-0.80%	-67.93%	2.41%	-75.64%	0.87%	-33.36%
1984	-2.27%	4.33%	0.35%	-64.44%	0.00%	-77.20%	0.05%	-77.26%	0.00%	-77.38%	0.00%	-76.93%	0.00%	-76.92%	0.61%	-72.20%	2.20%	-76.19%	1.60%	-72.92%	0.95%	-77.08%	0.47%	-21.73%
1985	1.28%	0.88%	1.41%	1.86%	1.53%	2.47%	-1.31%	-5.87%	2.10%	-46.38%	4.00%	-76.56%	-0.47%	-77.17%	-0.67%	-77.33%	2.72%	-76.76%	6.32%	-62.16%	2.93%	-42.41%	1.85%	-39.09%
1986	0.00%	-34.24%	0.11%	-20.06%	1.66%	0.46%	-1.96%	-40.49%	2.19%	-76.76%	-0.26%	-77.52%	3.69%	-76.62%	1.24%	-73.29%	0.17%	-77.28%	2.67%	-76.85%	1.22%	-68.32%	3.65%	-61.12%
1987	0.21%	-49.86%	-0.10%	-0.11%	1.91%	-16.83%	-2.24%	-69.39%	2.40%	-76.97%	-0.17%	-77.16%	0.00%	-76.94%	-1.00%	-76.97%	0.00%	-77.28%	0.17%	-77.15%	0.76%	-77.26%	4.09%	-76.32%
1988	1.07%	-43.14%	0.00%	-1.34%	0.00%	-76.46%	0.07%	-76.98%	3.74%	-76.60%	-0.12%	-77.48%	0.64%	-77.17%	-3.00%	-75.50%	-3.46%	-76.47%	0.00%	-77.44%	0.00%	-77.40%	-0.53%	-77.29%
1989	-3.09%	-59.68%	-2.53%	0.61%	0.61%	-75.94%	-2.51%	-76.70%	-0.17%	-77.24%	-0.31%	-76.27%	0.85%	-76.03%	0.36%	-77.07%	0.17%	-77.19%	-0.17%	-77.07%	0.00%	-76.95%	0.00%	-76.95%
1990	0.00%	-77.42%	0.00%	-77.44%	0.00%	-77.45%	0.00%	-77.39%	1.48%	-76.59%	0.00%	-73.92%	0.00%	-75.89%	-0.17%	-77.00%	0.47%	-76.85%	0.00%	-76.89%	0.00%	-76.94%	0.64%	-76.59%
1991	-1.27%	-75.89%	0.53%	-77.41%	-0.47%	6.12%	2.35%	-28.75%	1.05%	-76.70%	0.00%	-77.38%	-0.34%	-77.03%	0.64%	-76.91%	-2.73%	-74.68%	-7.27%	-75.49%	0.00%	-76.91%	-0.27%	-76.57%
1992	-2.19%	-1.50%	-0.06%	0.12%	1.89%	3.17%	-1.18%	-33.52%	3.36%	-64.36%	0.47%	-77.27%	0.02%	-77.09%	-1.37%	-67.07%	1.66%	-77.05%	0.00%	-77.39%	0.32%	-77.29%	-4.57%	-33.70%
1993	1.56%	1.13%	3.30%	2.88%	1.78%	5.44%	-2.95%	-9.71%	2.62%	-67.77%	7.21%	-68.08%	3.83%	-59.66%	1.56%	-68.93%	1.14%	-66.71%	4.85%	-59.22%	3.63%	-57.16%	1.09%	-68.77%
1994	0.00%	-34.09%	1.01%	-31.33%	-0.21%	-2.60%	-2.95%	-51.24%	2.28%	-74.91%	-0.36%	-77.54%	-0.12%	-77.50%	1.48%	-77.17%	0.28%	-77.42%	1.37%	-77.16%	1.35%	-76.96%	-6.39%	-44.57%
1995	-1.92%	2.25%	-1.49%	-1.18%	1.66%	2.99%	-2.51%	-49.01%	2.80%	-71.15%	0.61%	-77.32%	-0.09%	-77.49%	1.33%	-77.20%	-0.18%	-77.53%	-0.15%	-77.51%	-0.08%	-77.54%	0.00%	-77.56%
1996	0.00%	-77.56%	0.00%	-77.53%	0.00%	-77.54%	0.00%	-77.37%	0.00%	-76.92%	0.00%	-76.90%	0.17%	-77.01%	0.00%	-76.92%	-0.18%	-77.18%	0.00%	-76.93%	0.00%	-77.36%	0.00%	-77.41%
1997	-2.01%	-75.96%	0.11%	-2.18%	0.00%	-19.91%	0.00%	-76.36%	0.00%	-76.98%	0.00%	-76.89%	0.51%	-74.88%	0.65%	-74.85%	-8.71%	-72.06%	0.71%	-73.98%	0.01%	-76.93%	-0.85%	-77.07%
1998	-1.91%	-74.59%	-0.56%	-64.23%	-0.32%	-0.86%	0.19%	-28.67%	2.61%	-76.34%	0.17%	-76.94%	0.00%	-76.93%	0.16%	-76.91%	0.00%	-76.78%	0.00%	-76.25%	0.97%	-76.96%	1.44%	-77.02%
1999	0.00%	-77.45%	0.00%	-77.42%	0.00%	-77.12%	-1.22%	-77.11%	0.00%	-76.24%	0.00%	-73.57%	0.69%	-74.92%	1.80%	-76.51%	1.24%	-68.61%	0.00%	-76.90%	0.00%	-76.90%	0.00%	-76.90%
2000	0.00%	-76.95%	0.00%	-76.95%	0.00%	-77.11%	-0.32%	-76.04%	0.00%	-70.70%	0.00%	-69.54%	0.00%	-67.30%	2.14%	-69.27%	0.00%	-72.29%	-12.20%	-72.78%	-0.08%	-69.82%	0.00%	-77.42%
2001	0.00%	-77.35%	0.00%	-72.63%	-0.04%	-32.64%	-3.30%	-76.58%	0.00%	-76.90%	0.00%	-71.84%	0.00%	-68.49%	1.39%	-75.09%	-5.24%	-73.26%	0.00%	-72.35%	0.00%	-73.47%	0.00%	-76.90%
2002	0.00%	-76.90%	0.00%	-76.90%	0.66%	-75.99%	-7.08%	-72.35%	0.00%	-64.98%	0.00%	-61.02%	0.00%	-61.24%	0.00%	-64.32%	0.00%	-65.68%	0.00%	-66.51%	0.00%	-69.14%	-12.45%	-74.87%
2003	0.00%	-73.26%	-0.03%	-74.68%	1.67%	-23.47%	0.00%	-76.93%	0.00%	-70.00%	0.00%	-63.59%	0.00%	-62.09%	0.00%	-64.98%	-0.45%	-67.15%	0.00%	-65.33%	0.00%	-68.71%	0.94%	-72.79%
2004	0.00%	-73.26%	-0.03%	-74.68%	1.67%	-23.47%	0.00%	-76.93%	0.00%	-70.00%	0.00%	-63.59%	0.00%	-62.09%	0.00%	-64.98%	-0.45%	-67.15%	0.00%	-65.33%	0.00%	-68.71%	0.94%	-72.79%
2005	-2.12%	-0.42%	1.00%	-2.43%	0.70%	1.08%	-2.75%	-62.10%	0.20%	-77.30%	0.00%	-76.90%	0.32%	-76.59%	0.95%	-76.77%	0.00%	-76.89%	0.00%	-76.89%	0.00%	-76.90%	0.00%	-76.92%
2006	0.00%	-76.92%	0.00%	-76.92%	0.00%	-76.92%	0.00%	-76.71%	0.00%	-71.95%	0.00%	-68.85%	0.00%	-68.64%	0.00%	-70.52%	0.00%	-71.55%	-0.52%	-72.12%	0.00%	-73.36%	0.00%	-74.90%
2007	0.00%	-76.88%	-0.17%	-76.99%	0.01%	-76.93%	0.00%	-74.30%	0.00%	-67.38%	0.00%	-61.99%	0.00%	-62.09%	0.00%	-71.37%	0.00%	-69.06%	0.00%	-67.98%	0.00%	-70.45%	-3.86%	-43.34%
2008	-2.28%	-17.92%	2.69%	5.00%	0.65%	-25.21%	0.00%	-76.61%	0.41%	-77.41%	0.17%	-77.31%	-0.59%	-77.32%	1.67%	-76.81%	0.01%	-76.93%	0.00%	-76.95%	0.17%	-77.15%	1.64%	-76.95%
2009	-3.65%	-2.34%	-1.41%	-3.96%	0.00%	-39.72%	0.00%	-76.81%																

Figure 4-40. Habitat summary table for roundtail chub (*Gila robusta*), Braided site, with LWD and a hypothetical withdrawal rate of 10 ft³/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Gage Site

No Wood

Fathead minnow

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-2.42%	0.00%	-23.97%	0.62%	-20.68%	0.89%	-17.05%	0.00%	-23.22%	1.39%	-20.24%	6.55%	6.80%	0.30%	0.30%
1966	0.01%	0.01%	2.07%	3.05%	2.24%	2.24%	0.00%	9.63%	0.00%	-1.66%	0.00%	-9.40%	0.66%	-14.55%	2.62%	3.26%	1.67%	2.43%	0.87%	-10.04%	1.18%	-6.87%	2.21%	2.33%
1967	0.00%	1.17%	0.00%	-7.87%	0.00%	-5.32%	0.00%	-12.57%	0.00%	-11.93%	0.00%	-16.65%	3.58%	3.58%	3.24%	3.24%	2.16%	-0.43%	0.00%	-22.81%	0.83%	-16.95%	0.40%	0.40%
1968	0.05%	0.05%	0.03%	0.03%	0.31%	0.31%	1.78%	2.95%	6.03%	9.51%	0.44%	-5.20%	5.09%	5.50%	7.03%	7.03%	0.05%	0.77%	0.69%	1.11%	1.13%	2.06%	2.54%	4.12%
1969	0.26%	0.26%	1.50%	1.50%	0.67%	0.67%	3.84%	4.59%	6.40%	6.40%	0.84%	0.41%	1.43%	-1.03%	1.57%	2.03%	1.38%	-4.09%	1.31%	-4.84%	3.38%	4.39%	0.00%	2.33%
1970	0.00%	2.32%	0.00%	3.50%	0.00%	7.45%	0.00%	2.38%	0.00%	-4.71%	0.00%	-18.88%	3.97%	-10.76%	3.33%	-8.16%	3.00%	3.00%	0.00%	-12.92%	0.37%	1.31%	0.85%	2.66%
1971	0.00%	2.33%	0.00%	2.31%	0.00%	1.94%	0.00%	-15.98%	0.00%	-19.97%	0.00%	-23.61%	2.02%	-14.23%	5.03%	5.05%	2.58%	-7.60%	0.75%	0.75%	6.68%	6.68%	2.27%	2.27%
1972	2.51%	5.27%	0.00%	1.32%	0.00%	-6.68%	0.00%	-14.31%	0.09%	-17.95%	0.98%	-9.33%	2.22%	-4.31%	1.23%	-14.00%	0.19%	-20.81%	3.57%	3.57%	0.15%	0.15%	0.69%	0.69%
1973	1.01%	1.01%	-0.21%	-0.21%	0.02%	0.02%	0.01%	0.01%	-0.29%	-0.29%	4.41%	4.41%	7.18%	7.18%	7.61%	7.61%	3.25%	3.27%	1.53%	2.34%	4.90%	4.96%	0.17%	3.08%
1974	4.43%	4.89%	1.37%	9.29%	0.24%	6.77%	0.75%	7.49%	0.00%	2.31%	0.36%	-4.19%	2.23%	-1.07%	3.50%	1.94%	0.74%	0.62%	5.09%	5.09%	5.56%	5.62%	0.42%	2.68%
1975	0.00%	2.36%	1.18%	4.30%	0.34%	0.34%	1.04%	1.04%	8.96%	8.96%	0.91%	0.21%	2.64%	3.53%	0.68%	-1.18%	0.39%	-1.81%	0.00%	-6.10%	1.77%	-3.78%	2.56%	1.36%
1976	-0.01%	1.72%	0.19%	0.19%	0.00%	5.66%	4.54%	4.54%	3.49%	7.15%	0.08%	-10.38%	6.09%	6.09%	6.94%	6.96%	3.82%	-1.61%	2.47%	3.55%	0.00%	-1.12%	0.00%	-8.91%
1977	0.00%	2.71%	0.00%	2.55%	0.00%	2.34%	1.40%	4.33%	0.00%	-16.06%	0.00%	-23.22%	0.23%	-19.03%	4.93%	4.95%	4.61%	4.61%	0.66%	-16.84%	0.00%	-22.82%	0.00%	-23.14%
1978	1.19%	3.71%	0.57%	0.57%	0.58%	0.58%	1.95%	8.27%	8.66%	9.70%	0.11%	-4.53%	1.49%	-7.88%	0.00%	-23.44%	0.00%	-26.45%	0.00%	-22.56%	2.01%	2.01%	0.26%	0.26%
1979	0.25%	0.25%	0.27%	0.27%	0.18%	0.18%	0.44%	0.44%	3.00%	3.00%	7.60%	7.60%	4.65%	4.65%	7.96%	7.96%	1.54%	2.53%	3.84%	3.84%	4.08%	4.08%	6.61%	8.84%
1980	0.77%	0.77%	0.38%	0.38%	0.47%	0.47%	0.81%	0.81%	2.93%	2.93%	7.81%	7.81%	9.09%	9.09%	7.86%	7.86%	7.23%	7.23%	6.44%	6.44%	5.34%	6.16%	6.02%	7.19%
1981	1.25%	9.04%	0.20%	4.62%	2.24%	3.17%	2.91%	8.71%	1.64%	3.42%	2.39%	3.35%	4.80%	4.80%	4.01%	4.90%	2.89%	4.10%	3.80%	3.80%	6.49%	6.76%	1.23%	2.81%
1982	2.45%	2.45%	0.49%	0.49%	0.59%	0.59%	1.94%	1.94%	5.98%	9.96%	1.33%	2.35%	2.32%	3.66%	2.95%	4.07%	2.17%	3.32%	1.54%	-1.25%	6.30%	6.30%	0.20%	0.20%
1983	0.67%	0.67%	0.32%	0.32%	0.28%	0.28%	0.24%	0.24%	2.90%	2.90%	9.56%	9.56%	5.26%	5.26%	5.81%	5.92%	1.21%	1.78%	2.14%	2.14%	6.02%	6.02%	1.11%	1.11%
1984	1.41%	1.41%	2.14%	8.51%	0.00%	5.73%	0.00%	5.77%	0.00%	-2.40%	0.17%	-13.17%	3.17%	-2.89%	4.48%	4.89%	2.64%	2.64%	2.30%	2.30%	5.44%	5.44%	0.01%	0.01%
1985	-0.01%	-0.01%	0.06%	0.06%	0.33%	0.33%	1.86%	1.86%	3.42%	3.42%	9.67%	9.67%	5.43%	5.44%	6.33%	6.34%	3.45%	3.69%	6.82%	6.82%	0.27%	0.27%	0.58%	0.58%
1986	4.41%	7.92%	1.50%	1.50%	0.26%	0.26%	2.98%	2.98%	4.70%	8.58%	2.42%	3.10%	7.31%	7.31%	5.63%	5.63%	3.61%	3.98%	5.16%	5.16%	8.48%	8.48%	7.70%	7.70%
1987	2.60%	5.21%	1.65%	2.88%	0.36%	0.36%	4.84%	5.79%	3.97%	5.59%	1.61%	-5.77%	1.19%	-2.88%	3.24%	4.07%	0.07%	-2.99%	2.33%	0.70%	3.66%	3.52%	8.73%	8.91%
1988	0.38%	0.38%	0.25%	0.25%	0.00%	7.75%	3.55%	3.55%	7.69%	7.69%	0.68%	2.32%	6.11%	6.20%	0.89%	0.89%	1.49%	1.49%	1.83%	2.93%	0.23%	-1.74%	0.45%	2.48%
1989	3.56%	4.51%	1.18%	1.18%	3.92%	4.08%	4.34%	5.95%	0.00%	-6.22%	0.00%	-21.79%	0.00%	-22.38%	0.74%	-6.32%	0.01%	-8.74%	0.19%	-9.67%	0.00%	-10.81%	0.00%	-9.20%
1990	0.00%	0.82%	0.00%	2.13%	0.00%	2.29%	0.00%	-2.44%	6.98%	-0.81%	5.89%	-17.62%	0.51%	-20.65%	1.98%	-8.39%	0.21%	-18.79%	0.11%	-19.80%	0.24%	-10.79%	2.20%	2.66%
1991	1.11%	1.11%	-0.01%	1.55%	0.14%	0.14%	0.15%	0.15%	7.42%	9.46%	0.44%	-4.11%	0.00%	-10.93%	2.10%	-7.56%	0.85%	-21.47%	0.00%	-22.75%	0.83%	-14.82%	1.62%	1.62%
1992	0.53%	0.53%	0.16%	0.16%	0.15%	0.15%	0.26%	0.26%	6.44%	9.92%	4.66%	2.00%	5.60%	5.17%	2.74%	2.74%	7.13%	7.13%	0.00%	-2.93%	0.09%	1.37%	2.46%	2.46%
1993	0.16%	0.16%	-0.08%	-0.08%	-0.04%	-0.04%	1.00%	1.00%	3.78%	3.78%	9.28%	9.28%	9.63%	9.63%	7.04%	7.04%	7.59%	7.59%	8.60%	8.60%	0.05%	0.05%	3.33%	3.33%
1994	4.13%	10.55%	1.21%	1.21%	1.97%	2.16%	3.17%	3.17%	5.77%	5.77%	1.79%	2.44%	1.25%	2.68%	2.34%	3.78%	2.32%	3.38%	2.79%	3.53%	4.74%	4.91%	4.67%	4.67%
1995	0.33%	0.33%	0.15%	0.15%	0.13%	0.13%	2.96%	3.40%	9.88%	9.88%	2.97%	3.30%	1.15%	2.33%	3.28%	4.32%	1.29%	2.63%	1.11%	2.67%	0.17%	2.32%	0.00%	2.33%
1996	0.00%	2.69%	0.00%	3.03%	0.00%	3.03%	0.00%	-4.60%	0.00%	-14.68%	0.00%	-19.24%	2.74%	-4.10%	1.09%	-6.49%	4.68%	4.68%	0.00%	-13.29%	0.23%	-6.18%	0.23%	-0.57%
1997	0.04%	0.04%	0.30%	0.30%	0.62%	0.62%	0.00%	9.97%	0.00%	-10.51%	0.00%	-20.16%	0.83%	-21.16%	0.21%	-21.27%	0.00%	-22.44%	0.55%	-20.06%	0.00%	-13.44%	5.02%	6.04%
1998	4.39%	7.00%	0.55%	0.55%	0.06%	0.06%	0.04%	0.04%	7.41%	7.41%	0.43%	-9.94%	0.42%	-12.48%	0.93%	-12.72%	0.18%	-21.15%	0.71%	-21.67%	2.64%	-1.79%	2.63%	3.74%
1999	0.00%	2.30%	0.00%	1.03%	0.00%	1.37%	2.99%	2.99%	0.00%	-21.17%	0.00%	-23.86%	2.93%	3.57%	3.63%	4.52%	4.75%	4.75%	2.80%	-11.28%	0.00%	-18.38%	0.00%	-17.45%
2000	0.00%	-10.26%	0.00%	-9.93%	0.00%	-3.47%	0.00%	-22.47%	0.00%	-25.40%	0.00%	-26.00%	0.00%	-27.09%	0.88%	-23.03%	1.43%	-23.31%	1.34%	1.34%	0.99%	0.99%	1.73%	3.16%
2001	0.00%	2.01%	1.13%	7.42%	1.78%	1.78%	5.61%	5.61%	0.00%	-15.17%	0.00%	-24.81%	1.80%	-12.54%	2.14%	-9.83%	0.00%	-24.03%	0.00%	-23.66%	0.00%	-22.93%	0.00%	-20.46%
2002	0.00%	-19.35%	0.00%	-20.72%	0.00%	-22.16%	0.00%	-24.53%	0.00%	-28.16%	0.00%	-29.84%	0.00%	-29.75%	0.00%	-28.08%	0.00%	-27.85%	0.00%	-27.46%	0.00%	-25.47%	0.00%	-23.11%
2003	0.00%	-23.22%	0.47%	-1.33%	0.39%	0.39%	0.00%	6.25%	0.00%	-24.21%	0.00%	-28.77%	0.00%	-29.40%	0.00%	-28.16%	0.00%	-27.16%	0.00%	-28.00%	0.82%	-23.41%	0.00%	-23.00%
2004	0.00%	-23.22%	0.47%	-1.33%	0.39%	0.39%	0.00%	6.25%	0.00%	-24.21%	0.00%	-28.77%	0.00%	-29.40%	0.00%	-28.16%	0.00%	-27.16%	0.00%	-28.00%	0.82%	-23.41%	0.00%	-23.00%
2005	1.45%	1.45%	0.09%	0.09%	0.16%	0.16%	3.65%	3.65%	0.27%	4.51%	0.14%	-16.42%	2.43%	-5.74%	4.54%	5.50%	0.00%	-19.39%	0.00%	-20.37%	0.00%	-19.37%	0.00%	-15.73%
2006	0.00%	-15.68%	0.00%	-15.48%	0.00%	-14.40%	0.00%	-19.18%	0.00%	-24.74%	0.00%	-26.34%	0.61%	-20.33%	1.11%	-17.37%	1.63%	-23.21%	0.00%	-22.22%	0.00%	-23.36%	0.00%	-22.11%
2007	0.00%	-20.90%	0.00%	-12.43%	0.00%	-12.51%	0.00%	-23.44%	0.00%	-27.05%	0.00%	-29.44%	4.02%	4.02%	1.29%	1.29%	0.00%	-26.24%	0.00%	-26.76%	1.28%	-23.05%	0.70%	0.70%
2008	0.09%	0.09%	0.49%	0.49%	0.99%	0.99%	0.00%	9.46%	2.15%	3.87%	0.08%	-7.48%	3.41%	3.87%	2.65%	0.93%	0.57%	-12.24%	0.23%	-10.18%	0.22%	-7.89%	0.43%	0.43%
2009	1.19%	1.19%	1.10%	1.10%	0.73%	3.67%	0.00%	8.84%																

Figure 4-41. Habitat summary table for fathead minnow (*Pimephales promelas*), Gage site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Gage Site

No Wood

Fathead minnow

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-48.16%	0.00%	-45.55%	3.14%	-42.33%	2.84%	-45.10%	0.00%	-47.26%	3.11%	-46.90%	19.81%	-15.03%	1.49%	1.49%
1966	-0.28%	-0.28%	7.01%	23.23%	10.98%	13.60%	0.00%	-34.19%	0.00%	-47.71%	0.00%	-49.46%	0.78%	-48.54%	9.40%	-37.75%	4.21%	-44.01%	0.99%	-48.55%	6.98%	-44.93%	7.34%	-37.18%
1967	0.00%	-48.71%	0.00%	-49.23%	0.00%	-48.75%	0.00%	-49.30%	0.00%	-49.63%	0.00%	-49.80%	23.06%	-2.40%	22.11%	7.26%	7.03%	-41.64%	0.00%	-48.15%	0.97%	-48.69%	1.84%	1.84%
1968	0.88%	0.88%	-0.86%	-0.86%	1.58%	1.58%	12.97%	22.25%	7.28%	-39.54%	0.44%	-48.66%	13.03%	-38.04%	21.23%	-23.18%	0.05%	-48.66%	0.93%	-48.58%	1.41%	-47.95%	6.89%	-41.52%
1969	2.07%	2.07%	7.79%	7.79%	3.38%	3.38%	22.61%	26.57%	33.25%	-18.32%	0.84%	-48.06%	1.80%	-47.98%	7.28%	-44.74%	4.03%	-46.56%	3.61%	-47.11%	5.56%	-45.54%	0.00%	-48.11%
1970	0.00%	-48.34%	0.00%	-40.05%	0.00%	-22.31%	0.00%	-47.90%	0.00%	-48.91%	0.00%	-49.47%	11.97%	-40.50%	11.25%	-29.18%	19.78%	-3.46%	0.00%	-49.30%	0.37%	-48.31%	0.85%	-47.96%
1971	0.00%	-48.25%	0.00%	-48.65%	0.00%	-48.75%	0.00%	-48.99%	0.00%	-49.95%	0.00%	-46.39%	10.29%	-32.84%	17.79%	-15.65%	10.85%	-32.74%	4.56%	4.56%	34.01%	-10.90%	14.45%	2.71%
1972	11.69%	-2.76%	0.00%	-48.94%	0.00%	-49.19%	0.00%	-49.59%	0.09%	-49.72%	4.07%	-45.37%	5.78%	-42.37%	4.76%	-43.41%	1.09%	-42.68%	23.59%	-5.61%	1.38%	1.38%	4.48%	4.48%
1973	4.44%	4.44%	-0.97%	-0.97%	0.12%	0.12%	0.09%	0.09%	-1.23%	-1.23%	35.67%	35.67%	24.44%	6.24%	18.99%	-28.26%	3.98%	-46.50%	1.53%	-47.85%	6.25%	-44.34%	1.14%	-44.36%
1974	15.59%	7.80%	1.71%	-28.88%	0.61%	-15.97%	0.75%	-40.60%	0.00%	-48.50%	0.36%	-48.81%	6.52%	-43.62%	9.20%	-39.04%	0.74%	-48.21%	28.61%	-10.16%	19.84%	-31.73%	0.42%	-47.97%
1975	0.00%	-48.29%	5.54%	1.72%	2.39%	2.39%	5.86%	5.86%	26.91%	-28.15%	0.91%	-47.99%	6.38%	-42.09%	3.06%	-47.39%	0.39%	-48.84%	0.00%	-49.17%	2.77%	-47.48%	9.55%	-39.88%
1976	-0.03%	-46.97%	1.16%	1.16%	0.00%	-13.71%	18.73%	-2.81%	4.09%	-43.17%	0.08%	-48.87%	28.27%	-9.05%	16.41%	-28.45%	10.22%	-33.97%	5.94%	-42.20%	0.00%	-49.09%	0.00%	-48.55%
1977	0.00%	-46.91%	0.00%	-47.30%	0.00%	-47.96%	6.68%	-29.87%	0.00%	-49.38%	0.00%	-47.26%	0.27%	-48.44%	20.10%	-16.99%	13.49%	-31.27%	0.84%	-48.69%	0.00%	-48.16%	0.00%	-47.44%
1978	2.85%	-22.31%	3.10%	3.10%	2.44%	2.44%	5.06%	-35.13%	20.30%	-36.19%	0.11%	-48.88%	4.54%	-45.82%	0.00%	-46.76%	0.00%	-39.93%	0.00%	-46.23%	10.50%	10.50%	1.20%	1.20%
1979	0.79%	0.79%	1.28%	1.28%	1.16%	1.16%	2.83%	2.83%	17.23%	17.23%	50.97%	-8.81%	6.35%	-45.53%	22.60%	-34.98%	1.77%	-47.73%	9.97%	-41.36%	4.14%	-45.44%	6.61%	-42.09%
1980	4.38%	4.38%	1.54%	1.54%	1.98%	1.98%	6.51%	6.51%	23.95%	23.95%	39.97%	21.54%	22.00%	3.18%	17.33%	-17.96%	27.72%	-12.22%	8.65%	-42.97%	6.03%	-44.45%	6.95%	-43.17%
1981	1.25%	-37.52%	0.80%	-31.02%	6.29%	18.75%	8.27%	-21.09%	2.65%	-46.01%	2.93%	-47.12%	13.58%	-34.82%	11.42%	-39.91%	5.37%	-41.26%	7.16%	-37.84%	16.07%	-30.89%	4.92%	-29.69%
1982	18.13%	18.13%	2.74%	2.74%	2.80%	2.80%	11.29%	11.29%	11.37%	-38.92%	1.33%	-47.81%	3.98%	-46.65%	6.57%	-36.18%	8.00%	-37.16%	4.23%	-46.80%	13.50%	-5.20%	1.82%	1.82%
1983	3.85%	6.75%	1.37%	1.37%	1.74%	1.74%	1.55%	1.55%	16.28%	16.28%	27.18%	-34.41%	15.99%	-37.14%	20.84%	-23.07%	3.83%	-21.98%	15.47%	3.96%	33.14%	-3.99%	7.22%	7.22%
1984	8.85%	8.85%	2.14%	-17.82%	0.00%	-44.70%	0.00%	-44.70%	0.00%	-47.86%	0.17%	-49.38%	7.32%	-42.65%	17.98%	-26.27%	18.75%	10.09%	12.49%	12.49%	33.17%	-4.93%	0.22%	0.22%
1985	0.16%	0.16%	1.08%	1.08%	1.48%	1.48%	10.37%	10.37%	24.86%	24.86%	15.00%	-40.69%	13.15%	-35.56%	14.90%	-34.10%	11.91%	-33.44%	29.28%	-6.96%	2.47%	2.47%	4.47%	4.47%
1986	5.88%	12.03%	7.78%	8.11%	1.32%	1.32%	16.64%	16.64%	5.14%	-41.82%	3.56%	-46.65%	23.41%	-34.14%	25.77%	-0.45%	15.89%	-12.66%	12.65%	-39.93%	17.66%	-28.93%	26.77%	-14.30%
1987	8.21%	22.56%	7.08%	20.02%	1.78%	1.78%	16.65%	-6.43%	3.97%	-44.23%	1.61%	-47.94%	3.31%	-42.33%	6.80%	-36.29%	0.07%	-48.93%	8.56%	-38.19%	10.05%	-32.58%	18.67%	-35.82%
1988	2.41%	2.41%	1.68%	1.68%	0.00%	-22.73%	17.62%	14.43%	29.01%	-23.02%	0.68%	-48.33%	17.44%	-30.38%	5.60%	5.60%	11.46%	11.46%	2.25%	-47.79%	0.23%	-48.89%	2.68%	-43.65%
1989	13.41%	3.66%	7.35%	7.35%	16.42%	-5.67%	14.32%	-9.99%	0.00%	-48.19%	0.00%	-49.27%	0.00%	-48.40%	5.02%	-44.13%	0.01%	-49.40%	0.19%	-49.23%	0.00%	-49.62%	0.00%	-48.78%
1990	0.00%	-48.74%	0.00%	-48.70%	0.00%	-48.36%	0.00%	-48.42%	14.44%	-40.81%	7.92%	-42.00%	2.03%	-47.25%	9.34%	-33.30%	0.21%	-49.20%	0.11%	-49.70%	0.24%	-48.95%	13.47%	2.45%
1991	6.61%	6.61%	-0.07%	-33.04%	0.77%	0.77%	0.43%	0.43%	9.20%	-38.18%	0.44%	-48.71%	0.00%	-49.50%	8.86%	-41.43%	2.28%	-46.05%	0.00%	-48.34%	1.09%	-48.90%	11.20%	7.26%
1992	2.93%	2.93%	1.03%	1.03%	0.76%	0.76%	0.87%	0.87%	8.34%	-29.53%	5.79%	-45.44%	22.17%	-19.04%	21.39%	1.83%	25.33%	-25.76%	0.00%	-49.04%	0.40%	-44.87%	3.82%	-1.80%
1993	0.18%	0.18%	-1.05%	-1.05%	-0.18%	-0.18%	6.16%	6.16%	32.33%	32.33%	34.70%	6.17%	14.72%	-27.98%	25.91%	-8.82%	24.02%	-14.92%	21.99%	-23.44%	0.42%	0.42%	24.39%	24.39%
1994	4.13%	0.20%	7.51%	7.51%	9.80%	12.91%	22.54%	23.56%	32.90%	-12.08%	2.05%	-47.37%	1.49%	-48.03%	5.73%	-43.28%	3.78%	-46.67%	8.38%	-43.73%	11.66%	-37.53%	27.31%	-8.48%
1995	1.35%	1.35%	1.42%	1.42%	0.51%	0.51%	19.84%	25.29%	18.54%	-28.45%	3.76%	-46.49%	1.15%	-48.20%	6.73%	-43.41%	1.29%	-47.88%	1.11%	-48.12%	0.17%	-48.32%	0.00%	-48.08%
1996	0.00%	-47.83%	0.00%	-47.25%	0.00%	-47.23%	0.00%	-48.55%	0.00%	-49.55%	0.00%	-49.97%	9.48%	-40.08%	4.63%	-43.72%	23.96%	-2.54%	0.00%	-49.45%	0.23%	-48.85%	0.23%	-48.87%
1997	0.80%	0.80%	2.43%	2.43%	2.57%	2.57%	0.00%	-38.63%	0.00%	-48.82%	0.00%	-49.79%	1.21%	-49.08%	0.21%	-49.44%	0.00%	-48.96%	3.23%	-46.97%	0.00%	-49.54%	15.65%	-34.62%
1998	12.05%	-20.17%	2.14%	2.14%	0.29%	0.29%	0.06%	0.06%	35.52%	-23.27%	0.43%	-48.49%	0.54%	-49.24%	3.58%	-47.30%	0.18%	-49.50%	0.80%	-48.97%	4.21%	-43.47%	4.21%	-43.09%
1999	0.00%	-48.84%	0.00%	-48.68%	0.00%	-45.83%	17.11%	13.24%	0.00%	-48.64%	0.00%	-45.81%	13.43%	-17.13%	14.24%	-32.46%	17.26%	-17.27%	6.07%	-45.85%	0.00%	-49.98%	0.00%	-49.62%
2000	0.00%	-49.57%	0.00%	-49.44%	0.00%	-45.80%	0.00%	-48.98%	0.00%	-42.30%	0.00%	-40.95%	0.00%	-38.47%	2.19%	-38.66%	1.66%	-43.28%	8.40%	8.40%	6.48%	6.48%	1.93%	-46.91%
2001	0.00%	-48.15%	4.79%	-15.72%	8.51%	9.55%	24.51%	-8.23%	0.00%	-48.02%	0.00%	-43.66%	7.27%	-32.20%	9.50%	-25.77%	0.00%	-45.42%	0.00%	-46.26%	0.00%	-47.92%	0.00%	-49.84%
2002	0.00%	-50.10%	0.00%	-50.00%	0.00%	-48.77%	0.00%	-44.28%	0.00%	-36.04%	0.00%	-32.23%	0.00%	-32.43%	0.00%	-36.22%	0.00%	-36.76%	0.00%	-37.62%	0.00%	-42.15%	0.00%	-47.50%
2003	0.00%	-47.26%	1.90%	-21.89%	1.63%	1.63%	0.00%	-38.38%	0.00%	-44.67%	0.00%	-34.66%	0.00%	-33.22%	0.00%	-36.04%	0.00%	-38.30%	0.00%	-36.40%	4.07%	-37.57%	0.00%	-47.74%
2004	0.00%	-47.26%	1.90%	-21.89%	1.63%	1.63%	0.00%	-38.38%	0.00%	-44.67%	0.00%	-34.66%	0.00%	-33.22%	0.00%	-36.04%	0.00%	-38.30%	0.00%	-36.40%	4.07%	-37.57%	0.00%	-47.74%
2005	7.97%	7.97%	0.71%	0.71%	0.83%	0.83%	21.88%	27.18%	0.27%	-45.26%	0.14%	-48.78%	8.63%	-38.70%	15.45%	-28.83%	0.00%	-49.72%	0.00%	-49.99%	0.00%	-49.98%	0.00%	-49.91%
2006	0.00%	-49.88%	0.00%	-49.90%	0.00%	-48.65%	0.00%	-49.31%	0.00%	-43.80%	0.00%	-40.17%	4.59%	-34.94%	4.95%	-39.39%	2.33%	-41.99%	0.00%	-43.94%	0.00%	-46.95%	0.00%	-49.47%
2007	0.00%	-49.77%	0.00%	-47.26%	0.00%	-48.94%	0.00%	-46.76%	0.00%	-38.55%	0.00%	-33.12%	13.50%	1.65%	6.90%	6.90%	0.00%	-40.41%	0.00%	-39.21%	2.12%	-42.34%	3.94%	3.94%
2008	0.55%	0.55%	2.55%	2.55%	6.28%	6.28%	0.00%	-39.84%	4.07%	-45.88%	0.08%	-48.77%	7.52%	-32.41%	9.86%	-42.27%	0.67%	-48.91%	0.28%	-49.39%	0.22%	-48.80%	2.65%	2.65%
2009	7.56%	7.56%	6.21%	6.21%	4.02%	27.99%	0.00%	-42.09%																

Figure 4-42. Habitat summary table for fathead minnow (*Pimephales promelas*), Gage site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes
Hypothetical Withdrawal 2 cfs

Gage Site
With LWD
Fathead minnow

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2
1965									0.00%	-0.81%	0.00%	-27.50%
1966	0.49%	0.49%	0.45%	1.06%	0.64%	0.64%	0.00%	7.12%	0.00%	0.58%	0.00%	-9.98%
1967	0.00%	2.85%	0.00%	-8.03%	0.00%	-4.67%	0.00%	-13.48%	0.00%	-13.01%	0.00%	-18.52%
1968	-0.85%	-0.85%	0.56%	0.56%	-0.04%	-0.04%	0.39%	0.64%	4.84%	7.62%	0.72%	-4.51%
1969	0.10%	0.10%	0.02%	0.02%	0.36%	0.43%	4.78%	5.67%	4.62%	4.62%	1.39%	2.63%
1970	0.00%	3.82%	0.00%	3.54%	0.00%	4.15%	0.00%	3.89%	0.00%	-4.12%	0.00%	-20.83%
1971	0.00%	3.84%	0.00%	3.79%	0.00%	3.50%	0.00%	-17.16%	0.00%	-22.42%	0.00%	-27.02%
1972	1.49%	3.25%	0.00%	2.76%	0.00%	-6.63%	0.00%	-15.70%	0.15%	-19.96%	0.71%	-11.24%
1973	0.69%	0.69%	0.42%	0.42%	-0.47%	-0.47%	0.11%	0.11%	0.78%	0.78%	7.86%	7.86%
1974	3.50%	3.75%	0.79%	6.57%	0.05%	5.06%	0.53%	6.49%	0.00%	3.81%	0.58%	-3.42%
1975	0.00%	3.85%	0.23%	2.46%	0.80%	0.83%	0.41%	0.41%	6.20%	6.20%	1.51%	2.47%
1976	0.05%	3.11%	0.32%	0.32%	0.00%	4.94%	2.64%	2.64%	3.16%	6.41%	0.13%	-10.61%
1977	0.00%	4.15%	0.00%	4.03%	0.00%	3.87%	0.52%	3.60%	0.00%	-17.54%	0.00%	-26.52%
1978	-0.02%	2.84%	2.14%	2.14%	0.45%	0.45%	1.14%	6.12%	6.55%	7.36%	0.19%	-3.88%
1979	2.72%	2.72%	-0.81%	-0.81%	0.39%	0.39%	-0.30%	-0.30%	1.22%	1.22%	4.72%	4.72%
1980	0.37%	0.37%	0.25%	0.25%	-0.72%	-0.72%	-0.23%	-0.23%	0.66%	0.66%	4.70%	4.70%
1981	0.74%	6.93%	0.04%	4.82%	0.81%	1.03%	2.11%	6.53%	1.55%	4.52%	2.79%	4.38%
1982	1.00%	1.45%	-0.23%	-0.23%	0.16%	0.16%	0.27%	0.27%	4.72%	7.87%	2.20%	3.89%
1983	1.16%	1.16%	0.49%	0.49%	-0.20%	-0.20%	-0.14%	-0.14%	1.44%	1.44%	7.07%	7.07%
1984	0.76%	0.76%	1.22%	5.52%	0.00%	5.68%	0.00%	5.70%	0.00%	-0.44%	0.28%	-14.23%
1985	0.96%	0.96%	-0.70%	-0.70%	1.00%	1.00%	-0.09%	-0.09%	2.79%	2.79%	7.69%	7.69%
1986	2.49%	4.74%	-0.08%	-0.08%	0.37%	0.37%	1.06%	1.06%	3.98%	7.13%	3.29%	4.32%
1987	1.28%	2.88%	0.75%	2.06%	0.59%	0.59%	3.28%	4.15%	3.32%	5.61%	1.11%	-5.89%
1988	1.22%	1.22%	0.67%	0.67%	0.00%	4.27%	2.11%	2.11%	5.63%	5.63%	1.13%	3.83%
1989	3.52%	4.03%	0.12%	0.12%	2.54%	2.57%	3.10%	4.18%	0.00%	-5.21%	0.00%	-24.73%
1990	0.00%	1.99%	0.00%	3.65%	0.00%	3.82%	0.00%	-1.45%	5.70%	-2.59%	4.82%	-21.77%
1991	0.59%	0.59%	0.08%	2.09%	0.66%	0.66%	0.62%	0.62%	5.83%	7.46%	0.72%	-3.24%
1992	-0.31%	-0.31%	-0.24%	-0.24%	0.83%	0.83%	0.53%	0.53%	5.07%	7.83%	5.03%	4.38%
1993	-0.12%	-0.12%	0.23%	0.23%	-0.58%	-0.58%	0.93%	0.93%	4.90%	4.90%	6.47%	6.47%
1994	3.17%	8.16%	1.22%	1.22%	1.11%	1.14%	2.68%	2.68%	4.65%	4.65%	2.89%	3.98%
1995	0.48%	0.48%	0.46%	0.46%	-0.12%	-0.12%	2.50%	2.59%	7.30%	7.30%	3.89%	4.45%
1996	0.00%	4.04%	0.00%	4.23%	0.00%	4.23%	0.00%	-3.65%	0.00%	-16.10%	0.00%	-21.60%
1997	-0.50%	-0.50%	1.41%	1.41%	0.15%	0.78%	0.00%	7.86%	0.00%	-10.72%	0.00%	-22.52%
1998	4.26%	6.03%	-0.73%	-0.73%	0.85%	0.85%	0.54%	0.54%	5.56%	5.56%	0.70%	-9.78%
1999	0.00%	3.76%	0.00%	2.72%	0.00%	1.06%	0.94%	0.94%	0.00%	-22.88%	0.00%	-27.35%
2000	0.00%	-11.06%	0.00%	-10.57%	0.00%	-3.63%	0.00%	-25.54%	0.00%	-29.40%	0.00%	-30.20%
2001	0.00%	3.20%	0.46%	4.97%	-0.13%	-0.13%	4.17%	4.17%	0.00%	-15.51%	0.00%	-28.60%
2002	0.00%	-21.81%	0.00%	-23.44%	0.00%	-25.18%	0.00%	-28.24%	0.00%	-33.16%	0.00%	-35.51%
2003	0.00%	-26.52%	0.10%	-2.20%	0.14%	0.14%	0.00%	4.49%	0.00%	-27.84%	0.00%	-34.00%
2004	0.00%	-26.52%	0.10%	-2.20%	0.14%	0.14%	0.00%	4.49%	0.00%	-27.84%	0.00%	-34.00%
2005	0.17%	0.17%	-0.50%	-0.50%	-0.65%	-0.65%	2.31%	2.31%	0.41%	5.06%	0.23%	-17.51%
2006	0.00%	-17.49%	0.00%	-17.27%	0.00%	-15.08%	0.00%	-21.06%	0.00%	-28.52%	0.00%	-30.66%
2007	0.00%	-23.35%	0.00%	-12.68%	0.00%	-13.12%	0.00%	-26.80%	0.00%	-31.63%	0.00%	-34.95%
2008	0.20%	0.20%	0.10%	0.10%	0.48%	0.61%	0.00%	7.59%	1.74%	4.55%	0.13%	-7.18%
2009	0.56%	0.56%	0.49%	0.49%	0.18%	3.55%	0.00%	7.25%				

Year	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965	0.31%	-24.18%	0.73%	-23.76%	0.00%	-26.52%	1.55%	-22.98%	4.82%	5.12%	0.13%	0.13%
1966	1.04%	-15.20%	2.39%	3.93%	1.68%	2.15%	1.42%	-9.96%	1.06%	-7.11%	1.30%	2.63%
1967	3.00%	3.00%	1.47%	1.47%	2.53%	0.49%	0.00%	-25.99%	0.93%	-18.41%	-0.31%	-0.31%
1968	4.43%	5.10%	5.30%	5.30%	0.08%	2.10%	0.73%	2.16%	1.14%	3.24%	1.98%	4.54%
1969	1.64%	0.27%	1.37%	2.67%	1.29%	-4.47%	1.52%	-4.63%	3.29%	4.94%	0.00%	3.85%
1970	3.28%	-14.68%	3.08%	-9.29%	1.71%	1.71%	0.00%	-13.88%	0.61%	3.43%	0.68%	3.87%
1971	2.15%	-16.08%	3.61%	3.64%	1.90%	-8.05%	0.25%	0.25%	4.44%	4.44%	1.26%	1.26%
1972	2.61%	-5.86%	1.17%	-15.06%	0.09%	-22.92%	3.87%	0.37%	-0.28%	-0.28%	0.44%	0.44%
1973	5.03%	5.03%	6.56%	6.56%	4.39%	4.43%	2.54%	3.88%	4.30%	5.30%	0.04%	4.07%
1974	1.82%	-1.42%	3.36%	2.72%	0.81%	2.13%	3.90%	3.90%	5.01%	5.11%	0.34%	4.02%
1975	2.13%	3.99%	0.57%	-0.95%	0.64%	-0.77%	0.00%	-5.95%	1.46%	-3.53%	2.13%	2.07%
1976	4.35%	4.35%	5.64%	5.67%	3.28%	-1.99%	2.41%	4.14%	0.00%	-0.15%	0.00%	-8.64%
1977	0.38%	-21.57%	4.18%	3.55%	4.19%	4.19%	1.00%	-17.99%	0.00%	-26.00%	0.00%	-26.41%
1978	1.72%	-8.79%	0.00%	-26.80%	0.00%	-30.81%	0.00%	-25.79%	0.44%	0.44%	0.09%	0.09%
1979	5.13%	5.13%	6.41%	6.41%	2.35%	3.98%	4.32%	4.32%	4.29%	4.86%	5.28%	7.25%
1980	6.83%	6.83%	6.03%	6.03%	5.97%	5.97%	6.04%	6.04%	4.77%	5.90%	4.83%	6.43%
1981	4.91%	4.91%	3.23%	4.68%	3.34%	4.79%	4.24%	4.24%	5.25%	5.61%	0.54%	2.97%
1982	2.34%	4.55%	2.87%	4.65%	2.28%	4.10%	1.24%	-1.31%	4.13%	4.13%	-0.25%	-0.25%
1983	5.03%	5.03%	4.68%	4.84%	1.15%	1.98%	1.79%	1.79%	3.04%	3.04%	0.61%	0.61%
1984	2.56%	-5.09%	3.42%	4.04%	1.64%	1.64%	0.64%	0.64%	3.63%	3.63%	0.16%	0.16%
1985	4.89%	4.91%	5.34%	5.36%	3.69%	4.07%	4.48%	4.48%	-1.10%	-1.10%	-0.29%	-0.29%
1986	5.43%	5.43%	3.55%	3.55%	2.80%	3.31%	4.95%	4.95%	6.71%	6.71%	5.88%	5.88%
1987	1.21%	-2.56%	2.97%	4.30%	0.11%	-2.16%	1.61%	0.24%	3.14%	3.66%	6.98%	7.23%
1988	5.25%	5.39%	0.34%	0.34%	1.12%	1.12%	2.28%	4.16%	0.38%	-0.68%	0.57%	3.85%
1989	0.58%	-24.92%	1.36%	-5.72%	0.02%	-9.18%	0.32%	-10.10%	0.00%	-11.73%	0.00%	-9.21%
1990	0.55%	-23.91%	1.53%	-9.30%	0.33%	-20.87%	0.18%	-22.04%	0.39%	-11.28%	2.63%	3.27%
1991	0.00%	-11.77%	1.82%	-8.87%	0.66%	-24.96%	0.00%	-25.90%	0.66%	-16.37%	0.51%	0.51%
1992	3.97%	3.81%	2.13%	2.13%	5.50%	5.50%	0.00%	-2.19%	0.05%	2.38%	3.53%	3.53%
1993	7.66%	7.66%	4.25%	4.25%	4.90%	4.90%	6.17%	6.17%	0.02%	0.02%	2.76%	2.76%
1994	1.66%	4.01%	2.04%	4.39%	2.68%	4.42%	3.27%	4.49%	4.28%	4.55%	3.02%	3.02%
1995	1.90%	3.84%	3.43%	5.15%	1.73%	3.93%	1.43%	4.00%	0.29%	3.83%	0.00%	3.86%
1996	2.20%	-4.72%	1.17%	-7.46%	2.76%	2.76%	0.00%	-14.42%	0.38%	-5.76%	0.38%	0.69%
1997	0.65%	-24.00%	0.33%	-23.74%	0.00%	-25.51%	0.45%	-23.28%	0.00%	-14.68%	3.85%	5.33%
1998	0.65%	-13.37%	0.93%	-14.37%	0.29%	-23.45%	0.78%	-23.99%	2.14%	-1.22%	2.12%	4.21%
1999	4.53%	4.53%	3.11%	4.52%	3.81%	3.81%	2.79%	-12.45%	0.00%	-20.62%	0.00%	-19.31%
2000	0.00%	-31.68%	0.54%	-28.23%	0.29%	-28.08%	0.22%	0.22%	0.69%	0.69%	1.96%	4.34%
2001	0.97%	-22.10%	1.07%	-11.90%	0.00%	-27.58%	0.00%	-27.09%	0.00%	-26.14%	0.00%	-23.15%
2002	0.00%	-35.38%	0.00%	-33.05%	0.00%	-32.72%	0.00%	-32.19%	0.00%	-29.49%	0.00%	-26.38%
2003	0.00%	-34.89%	0.00%	-33.16%	0.00%	-31.79%	0.00%	-32.94%	0.42%	-29.05%	0.00%	-26.23%
2004	0.00%	-34.89%	0.00%	-33.16%	0.00%	-31.79%	0.00%	-32.94%	0.42%	-29.05%	0.00%	-26.23%
2005	2.36%	-9.40%	3.48%	4.73%	0.00%	-21.60%	0.00%	-22.89%	0.00%	-21.75%	0.00%	-17.57%
2006	0.64%	-27.63%	1.31%	-22.74%	0.93%	-28.14%	0.00%	-25.52%	0.00%	-26.69%	0.00%	-25.09%
2007	2.44%	-18.07%	0.12%	0.12%	0.00%	-30.52%	0.00%	-31.24%	0.00%	-29.58%	0.60%	0.60%
2008	3.21%	3.92%	2.33%	0.85%	0.53%	-13.13%	0.37%	-10.97%	0.36%	-7.68%	0.09%	0.09%
2009												

Figure 4-43. Habitat summary table for fathead minnow (*Pimephales promelas*), Gage site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes
Hypothetical Withdrawal 10 cfs

Gage Site
With LWD
Fathead minnow

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-53.93%	0.00%	-52.25%	2.16%	-48.83%	1.98%	-51.62%	0.00%	-53.96%	3.23%	-53.51%	14.40%	-33.97%	0.43%	-7.87%
1966	1.79%	1.79%	5.34%	22.46%	4.44%	5.37%	0.00%	-43.58%	0.00%	-53.26%	0.00%	-55.81%	1.23%	-54.51%	8.43%	-46.28%	3.67%	-51.16%	1.63%	-54.50%	5.36%	-52.21%	4.58%	-44.59%
1967	0.00%	-54.73%	0.00%	-55.48%	0.00%	-54.80%	0.00%	-55.58%	0.00%	-56.05%	0.00%	-56.29%	12.46%	-27.31%	10.07%	-22.01%	7.58%	-48.83%	0.00%	-54.85%	1.16%	-54.90%	-0.35%	-16.86%
1968	-4.00%	-4.00%	0.79%	0.79%	-0.26%	-0.02%	12.57%	22.66%	6.21%	-47.00%	0.72%	-54.66%	11.26%	-46.60%	17.87%	-36.02%	0.08%	-54.67%	1.12%	-54.72%	1.56%	-53.97%	5.21%	-48.95%
1969	-0.30%	-3.48%	0.04%	0.04%	-0.20%	0.06%	19.02%	11.85%	24.96%	-33.15%	1.39%	-53.78%	2.19%	-54.02%	5.97%	-51.69%	3.20%	-53.16%	3.79%	-53.37%	5.61%	-51.73%	0.00%	-53.86%
1970	0.00%	-54.20%	0.00%	-48.55%	0.00%	-36.91%	0.00%	-53.57%	0.00%	-55.03%	0.00%	-55.82%	11.49%	-48.41%	8.26%	-41.15%	11.10%	-23.25%	0.00%	-55.58%	0.61%	-54.15%	0.68%	-53.99%
1971	0.00%	-54.06%	0.00%	-54.65%	0.00%	-54.79%	0.00%	-55.14%	0.00%	-56.50%	0.00%	-53.09%	8.56%	-43.10%	12.62%	-35.37%	8.64%	-38.43%	3.69%	-6.09%	23.64%	-29.70%	9.36%	-16.58%
1972	8.39%	-27.14%	0.00%	-55.06%	0.00%	-55.42%	0.00%	-56.00%	0.15%	-56.18%	3.87%	-52.68%	5.89%	-49.49%	3.47%	-50.02%	0.67%	-50.07%	15.69%	-18.60%	-0.73%	-0.73%	6.39%	6.39%
1973	3.01%	3.01%	2.54%	2.54%	-2.33%	-2.33%	0.57%	0.57%	4.00%	4.00%	33.66%	33.66%	17.39%	-0.66%	16.17%	-37.83%	5.62%	-51.94%	2.54%	-53.48%	6.03%	-50.40%	1.44%	-50.50%
1974	11.47%	-10.63%	0.99%	-38.89%	0.13%	-29.82%	0.53%	-47.78%	0.00%	-54.43%	0.58%	-54.88%	6.18%	-50.98%	9.61%	-46.60%	0.81%	-54.20%	21.78%	-27.19%	18.39%	-41.12%	0.34%	-53.84%
1975	0.00%	-54.14%	2.51%	-22.66%	-1.70%	-1.66%	2.14%	2.14%	19.52%	-40.14%	1.51%	-53.69%	6.93%	-48.06%	2.61%	-53.91%	0.64%	-54.92%	0.00%	-55.40%	2.64%	-53.81%	8.13%	-47.41%
1976	0.24%	-53.08%	0.58%	-19.36%	0.00%	-29.22%	11.64%	-25.16%	3.72%	-49.54%	0.13%	-54.97%	22.18%	-28.03%	14.11%	-39.89%	9.11%	-43.96%	5.53%	-49.93%	0.00%	-55.28%	0.00%	-54.50%
1977	0.00%	-52.26%	0.00%	-52.76%	0.00%	-53.63%	3.81%	-40.22%	0.00%	-55.69%	0.00%	-53.96%	0.43%	-55.00%	15.32%	-33.56%	11.15%	-42.00%	1.30%	-54.75%	0.00%	-54.86%	0.00%	-54.15%
1978	0.62%	-28.07%	4.44%	-1.39%	1.66%	1.66%	3.21%	-44.44%	16.27%	-44.82%	0.19%	-54.97%	4.17%	-52.39%	0.00%	-53.47%	0.00%	-46.52%	0.00%	-52.91%	2.40%	-14.74%	-1.55%	-1.55%
1979	6.27%	6.27%	-3.79%	-3.79%	2.24%	2.24%	-1.62%	-1.62%	8.60%	8.60%	34.04%	-24.95%	7.96%	-51.25%	19.71%	-43.81%	2.72%	-53.39%	9.88%	-47.62%	4.39%	-51.17%	5.28%	-48.78%
1980	1.04%	1.04%	-1.45%	-1.45%	-2.40%	-2.40%	-0.67%	-0.67%	24.97%	24.97%	31.28%	13.63%	19.10%	-3.49%	14.61%	-25.55%	23.23%	-19.64%	9.61%	-48.84%	5.91%	-50.46%	5.57%	-49.54%
1981	0.74%	-45.81%	0.18%	-39.23%	2.30%	11.96%	6.44%	-31.35%	2.44%	-51.66%	3.27%	-53.12%	12.92%	-43.46%	9.65%	-47.60%	5.72%	-47.12%	8.02%	-46.07%	11.99%	-41.92%	2.78%	-41.83%
1982	6.04%	4.31%	-1.41%	-1.41%	0.97%	0.97%	2.29%	2.29%	9.45%	-46.56%	2.20%	-53.42%	4.25%	-52.79%	5.91%	-45.31%	7.40%	-45.95%	3.44%	-53.54%	16.74%	-28.83%	-0.58%	-0.58%
1983	2.84%	4.55%	2.46%	2.46%	-0.99%	-0.99%	-1.17%	-1.17%	6.30%	6.30%	23.28%	-43.69%	14.44%	-45.50%	17.20%	-36.36%	1.63%	-29.37%	10.77%	-2.25%	21.13%	-30.19%	4.79%	4.79%
1984	5.34%	5.34%	1.22%	-28.45%	0.00%	-50.64%	0.00%	-50.64%	0.00%	-53.49%	0.28%	-55.70%	6.22%	-50.24%	12.25%	-32.81%	12.69%	-17.51%	5.31%	-8.70%	22.12%	-29.15%	0.92%	0.92%
1985	3.19%	3.19%	-2.09%	-2.09%	5.28%	5.28%	2.27%	2.27%	18.53%	18.53%	14.30%	-47.79%	12.43%	-44.40%	13.16%	-43.39%	9.98%	-43.91%	21.50%	-17.24%	-2.87%	-2.87%	-1.58%	-1.58%
1986	3.32%	2.37%	1.36%	1.81%	1.78%	2.03%	8.36%	8.36%	4.55%	-48.58%	4.67%	-52.27%	20.62%	-43.56%	17.86%	-26.67%	11.86%	-34.63%	12.61%	-47.36%	15.10%	-36.88%	19.99%	-26.62%
1987	3.30%	5.45%	4.11%	14.02%	2.23%	2.98%	10.34%	-22.84%	3.32%	-50.44%	1.11%	-54.31%	3.51%	-49.92%	6.37%	-45.12%	0.11%	-55.05%	6.93%	-45.20%	8.67%	-43.38%	14.42%	-44.53%
1988	2.75%	2.75%	2.85%	2.85%	0.00%	-37.66%	10.61%	-22.92%	22.22%	-36.14%	1.13%	-54.18%	14.41%	-41.00%	3.82%	-16.88%	7.14%	-19.54%	2.94%	-53.74%	0.38%	-54.99%	2.42%	-50.87%
1989	12.96%	-11.93%	1.48%	1.48%	9.78%	-21.91%	9.39%	-28.96%	0.00%	-53.98%	0.00%	-55.94%	0.58%	-54.76%	4.76%	-51.11%	0.02%	-55.72%	0.32%	-55.49%	0.00%	-56.04%	0.00%	-54.85%
1990	0.00%	-54.80%	0.00%	-54.72%	0.00%	-54.23%	0.00%	-54.31%	12.65%	-48.30%	7.30%	-49.53%	1.86%	-54.15%	7.86%	-44.20%	0.33%	-55.63%	0.18%	-56.15%	0.39%	-55.08%	9.64%	-23.96%
1991	3.08%	-10.13%	0.40%	-39.87%	3.62%	3.62%	3.12%	3.12%	7.62%	-46.10%	0.72%	-54.74%	0.00%	-55.87%	8.06%	-49.42%	2.12%	-52.99%	0.00%	-55.04%	1.03%	-55.34%	6.26%	-19.16%
1992	2.01%	2.01%	0.37%	0.37%	4.62%	4.62%	2.59%	2.59%	7.05%	-35.81%	6.90%	-51.17%	15.28%	-32.84%	15.34%	-16.58%	20.93%	-37.86%	0.00%	-55.21%	-0.16%	-51.10%	6.25%	-19.45%
1993	-0.23%	-0.23%	1.13%	1.13%	-1.98%	-1.98%	4.60%	4.60%	31.37%	31.37%	28.52%	-0.72%	14.32%	-33.01%	18.87%	-24.68%	18.31%	-28.56%	17.12%	-30.20%	-0.24%	-0.24%	18.89%	18.89%
1994	3.17%	-4.50%	6.67%	6.67%	4.42%	6.23%	17.10%	17.72%	24.79%	-28.03%	3.33%	-52.80%	2.05%	-53.92%	5.74%	-50.11%	4.31%	-52.64%	8.19%	-50.58%	10.99%	-45.52%	16.06%	-20.34%
1995	4.66%	4.66%	3.87%	3.87%	0.58%	0.58%	18.43%	22.64%	14.49%	-37.70%	5.21%	-51.94%	1.90%	-54.00%	6.85%	-49.85%	1.73%	-53.71%	1.43%	-54.06%	0.29%	-54.17%	0.00%	-53.81%
1996	0.00%	-53.64%	0.00%	-53.15%	0.00%	-53.12%	0.00%	-54.50%	0.00%	-55.94%	0.00%	-56.53%	8.47%	-48.25%	4.52%	-51.03%	19.65%	-24.13%	0.00%	-55.80%	0.38%	-54.94%	0.38%	-54.96%
1997	-3.21%	-19.66%	1.19%	1.19%	1.14%	2.72%	0.00%	-46.37%	0.00%	-54.89%	0.00%	-56.27%	1.22%	-55.74%	0.33%	-55.89%	0.00%	-55.65%	2.67%	-54.01%	0.00%	-55.93%	12.05%	-43.77%
1998	9.24%	-33.89%	-2.93%	-2.93%	3.80%	3.80%	2.54%	2.54%	25.61%	-37.09%	0.70%	-54.42%	0.83%	-55.52%	3.13%	-53.92%	0.29%	-55.86%	1.17%	-55.28%	3.63%	-50.22%	3.63%	-49.67%
1999	0.00%	-54.92%	0.00%	-54.69%	0.00%	-52.51%	7.00%	-17.27%	0.00%	-54.63%	0.00%	-52.51%	10.97%	-35.80%	11.17%	-42.75%	12.05%	-33.16%	6.19%	-52.29%	0.00%	-56.54%	0.00%	-56.03%
2000	0.00%	-55.96%	0.00%	-55.78%	0.00%	-52.77%	0.00%	-55.67%	0.00%	-48.95%	0.00%	-47.57%	0.00%	-44.99%	1.37%	-45.62%	0.29%	-50.76%	2.53%	-16.29%	2.91%	-5.05%	2.30%	-52.51%
2001	0.00%	-54.27%	1.31%	-30.86%	0.23%	0.39%	15.27%	-28.53%	0.00%	-53.74%	0.00%	-50.34%	5.56%	-41.48%	7.84%	-38.31%	0.00%	-52.12%	0.00%	-52.97%	0.00%	-54.62%	0.00%	-56.49%
2002	0.00%	-56.72%	0.00%	-56.65%	0.00%	-55.46%	0.00%	-50.97%	0.00%	-42.44%	0.00%	-38.35%	0.00%	-38.57%	0.00%	-42.63%	0.00%	-43.19%	0.00%	-44.11%	0.00%	-48.80%	0.00%	-54.21%
2003	0.00%	-53.96%	0.40%	-35.72%	0.84%	0.84%	0.00%	-46.35%	0.00%	-51.37%	0.00%	-40.97%	0.00%	-39.43%	0.00%	-42.44%	0.00%	-44.82%	0.00%	-42.82%	2.47%	-45.28%	0.00%	-54.44%
2004	0.00%	-53.96%	0.40%	-35.72%	0.84%	0.84%	0.00%	-46.35%	0.00%	-51.37%	0.00%	-40.97%	0.00%	-39.43%	0.00%	-42.44%	0.00%	-44.82%	0.00%	-42.82%	2.47%	-45.28%	0.00%	-54.44%
2005	1.32%	-0.82%	-2.09%	-2.09%	-1.76%	-1.76%	14.40%	5.73%	0.41%	-51.17%	0.23%	-54.84%	7.79%	-47.15%	11.47%	-40.77%	0.00%	-56.18%	0.00%	-56.55%	0.00%	-56.54%	0.00%	-56.45%
2006	0.00%	-56.41%	0.00%	-56.42%	0.00%	-54.65%	0.00%	-55.59%	0.00%	-50.48%	0.00%	-46.76%	4.31%	-44.06%	5.70%	-47.63%	0.93%	-49.52%	0.00%	-50.57%	0.00%	-53.66%	0.00%	-56.16%
2007	0.00%	-56.24%	0.00%	-53.16%	0.00%	-55.06%	0.00%	-53.47%	0.00%	-45.08%	0.00%	-39.32%	9.72%	-23.77%	1.72%	-13.16%	0.00%	-47.01%	0.00%	-45.77%	0.00%	-48.65%	3.70%	-9.78%
2008	1.57%	1.57%	1.29%	1.29%	1.61%	4.41%	0.00%	-47.20%	3.30%	-52.16%	0.13%	-54.81%	6.49%	-43.52%	8.35%	-49.34%	0.70%	-55.20%	0.46%	-55.72%	0.36%	-54.86%	1.38%	-10.60%
2009	3.46%	3.46%	0.37%	0.37%	0.96%	20.85%	0.00%	-48.78%																

Figure 4-44. Habitat summary table for fathead minnow (*Pimephales promelas*), Gage site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Braided Site

No Wood

Fathead minnow

Hypothetical Withdrawal 2 cfs

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.77%	-23.48%	-2.72%	-35.88%	7.02%	-21.02%	-1.79%	-27.74%	0.00%	-35.76%	0.50%	-33.20%	-7.64%	1.23%	1.00%	1.00%
1966	-3.21%	-3.21%	3.58%	10.02%	3.79%	8.37%	-0.54%	0.12%	0.00%	-18.12%	-0.80%	-20.30%	0.00%	-25.58%	-0.19%	-10.19%	-0.32%	-25.38%	0.00%	-19.82%	-4.43%	-17.70%	-5.41%	-10.71%
1967	0.00%	-11.68%	0.00%	-22.06%	-0.77%	-19.52%	-0.83%	-22.05%	0.00%	-19.82%	0.00%	-25.58%	-6.84%	-15.42%	-5.07%	-12.52%	-6.30%	-18.74%	-7.14%	-33.81%	0.00%	-29.39%	-2.64%	-2.64%
1968	-0.34%	-0.34%	3.33%	3.33%	3.60%	3.60%	0.68%	7.06%	1.72%	-8.42%	0.75%	-37.36%	-3.09%	-11.17%	1.28%	-1.09%	0.00%	-17.49%	0.00%	-19.15%	-0.03%	-12.93%	0.97%	-9.60%
1969	2.86%	0.36%	9.15%	9.15%	4.64%	4.64%	20.93%	27.15%	3.21%	0.58%	0.00%	-15.01%	0.00%	-16.82%	0.25%	-16.07%	0.81%	-19.51%	0.80%	-19.89%	-0.44%	-9.57%	0.00%	-6.21%
1970	0.00%	-10.42%	0.00%	-10.34%	0.46%	-1.63%	0.00%	-10.45%	0.00%	-24.77%	0.00%	-29.38%	-0.48%	-34.81%	-6.04%	-18.61%	4.08%	8.69%	0.00%	-21.83%	0.00%	-11.45%	0.00%	-10.27%
1971	0.00%	-10.46%	0.00%	-10.41%	0.00%	-11.20%	0.00%	-26.45%	0.00%	-29.73%	-1.39%	-35.25%	0.00%	-35.06%	-3.90%	-3.59%	-4.76%	-11.99%	-1.26%	-2.38%	6.05%	2.27%	-7.55%	3.17%
1972	-1.67%	2.72%	0.00%	-15.79%	-0.78%	-19.50%	0.00%	-22.98%	0.00%	-27.73%	0.00%	-29.83%	0.00%	-25.58%	3.99%	-22.61%	-0.52%	-29.74%	-3.86%	2.91%	-0.53%	-0.53%	0.79%	0.79%
1973	0.98%	0.98%	0.74%	0.74%	-0.34%	-0.34%	-0.06%	-0.06%	0.76%	0.40%	22.97%	19.48%	-3.95%	-1.20%	6.02%	5.47%	3.37%	-4.93%	-1.42%	-10.31%	-0.28%	-3.55%	0.94%	0.98%
1974	3.09%	6.08%	0.00%	-0.28%	-0.45%	0.96%	0.00%	-5.84%	-0.09%	-10.07%	0.00%	-34.72%	0.00%	-15.84%	1.65%	-8.17%	-0.29%	-9.95%	3.03%	-0.95%	0.06%	-7.85%	-0.13%	-7.35%
1975	0.00%	-10.28%	0.19%	4.14%	-1.89%	-4.72%	3.93%	3.93%	2.02%	-3.29%	0.00%	-15.10%	5.82%	-4.95%	0.00%	-23.98%	-0.03%	-19.80%	0.00%	-20.08%	0.00%	-21.00%	0.00%	-14.20%
1976	-8.51%	-6.32%	-1.14%	0.50%	-0.67%	0.81%	7.94%	13.64%	0.48%	-9.24%	0.00%	-19.57%	-2.15%	-7.77%	0.00%	-12.71%	-0.49%	-22.20%	-0.02%	-6.48%	0.00%	-14.48%	0.00%	-18.39%
1977	0.00%	-7.32%	0.00%	-10.37%	0.00%	-10.48%	-2.53%	-3.94%	0.00%	-25.73%	0.00%	-34.40%	0.00%	-34.28%	5.99%	-25.49%	6.70%	-2.57%	0.00%	-29.51%	-1.02%	-34.21%	0.00%	-34.22%
1978	-9.77%	0.39%	-2.23%	0.47%	0.40%	0.40%	0.00%	-0.92%	-0.07%	-10.16%	0.00%	-18.90%	0.00%	-22.98%	0.00%	-34.88%	0.00%	-41.98%	-0.26%	-34.75%	0.71%	12.19%	-5.80%	-5.80%
1979	1.97%	-1.11%	0.44%	0.44%	0.04%	0.04%	-1.26%	-1.26%	8.58%	11.15%	-1.09%	-1.85%	0.28%	-8.81%	-0.37%	-8.09%	1.46%	-8.86%	7.36%	7.45%	2.44%	4.82%	0.00%	1.43%
1980	-6.72%	-1.28%	0.05%	0.05%	0.59%	0.18%	-4.30%	6.40%	-0.68%	8.53%	-0.91%	-7.11%	1.38%	0.80%	-8.91%	-6.21%	2.52%	4.84%	4.79%	4.79%	3.19%	4.89%	0.00%	4.78%
1981	0.00%	3.99%	0.37%	0.53%	5.98%	7.73%	-0.96%	-1.82%	-0.67%	-7.32%	-0.19%	-10.43%	4.57%	0.12%	-0.58%	-7.48%	-0.11%	-4.79%	2.50%	1.46%	-4.11%	-1.96%	-7.81%	2.61%
1982	-4.96%	-11.81%	4.21%	-0.87%	-0.05%	-0.93%	1.58%	6.57%	0.20%	-3.51%	-0.86%	-10.38%	-0.02%	-17.00%	3.43%	-2.46%	0.91%	-6.35%	0.00%	-18.25%	-13.77%	-2.44%	-2.10%	0.82%
1983	0.80%	-11.68%	0.54%	0.54%	0.40%	0.40%	0.13%	0.13%	-1.49%	4.23%	1.35%	-4.70%	-0.50%	-6.99%	4.69%	4.76%	-2.91%	7.07%	-1.68%	11.11%	-9.16%	-4.15%	-10.46%	-1.08%
1984	-1.31%	1.19%	-1.34%	0.83%	0.00%	3.93%	-0.54%	0.11%	0.00%	-22.48%	0.00%	-31.50%	0.00%	-28.35%	-3.07%	-3.06%	-11.98%	-5.66%	-7.17%	0.73%	-3.68%	-0.20%	0.10%	0.10%
1985	0.37%	2.60%	0.91%	0.06%	0.43%	0.43%	18.37%	21.02%	3.71%	9.03%	-3.02%	-10.40%	1.29%	-6.26%	1.10%	0.44%	-0.24%	-2.38%	-6.53%	-1.96%	1.92%	-1.02%	2.94%	2.94%
1986	-0.19%	-5.92%	-3.78%	2.90%	0.05%	0.05%	6.05%	10.56%	2.87%	-0.36%	-0.87%	-10.38%	-0.63%	-8.16%	1.66%	7.45%	6.69%	6.54%	-1.17%	-9.31%	0.69%	1.45%	4.15%	3.80%
1987	-3.42%	2.36%	2.88%	12.72%	0.03%	-0.21%	1.64%	1.25%	-0.02%	-7.63%	-0.80%	-17.63%	0.00%	-19.96%	-0.58%	-6.53%	0.00%	-15.21%	-3.57%	-16.70%	-4.14%	0.01%	0.16%	1.92%
1988	4.05%	0.96%	2.84%	-0.29%	-0.54%	-0.32%	0.08%	9.23%	3.14%	-3.19%	-0.39%	-10.42%	6.58%	1.41%	2.47%	0.59%	2.99%	3.28%	-0.19%	-16.37%	0.00%	-27.13%	1.01%	-9.34%
1989	5.28%	12.32%	-0.03%	-0.03%	2.13%	7.90%	3.70%	3.48%	-0.79%	-20.48%	-0.99%	-32.47%	0.77%	-34.53%	0.70%	-26.23%	0.80%	-29.41%	-0.82%	-24.56%	0.00%	-18.39%	0.00%	-18.24%
1990	0.00%	-9.91%	0.00%	-10.22%	0.00%	-9.78%	0.00%	-16.73%	0.10%	-23.62%	0.00%	-35.37%	0.00%	-35.10%	-1.63%	-26.07%	1.11%	-32.88%	0.00%	-29.95%	0.02%	-23.55%	-0.93%	5.34%
1991	-5.59%	-4.60%	-10.86%	-2.74%	-0.04%	-0.04%	0.18%	0.18%	-0.46%	-10.36%	0.00%	-18.77%	-1.62%	-25.70%	0.97%	-22.44%	-2.56%	-34.40%	-6.82%	-33.37%	0.00%	-25.15%	-6.24%	4.51%
1992	0.54%	0.93%	3.07%	0.02%	0.06%	2.86%	0.72%	0.72%	-1.47%	-3.44%	0.00%	-18.77%	1.32%	-3.95%	-11.95%	0.80%	-2.79%	-6.74%	0.00%	-31.33%	-2.93%	-10.39%	-1.59%	-0.17%
1993	0.20%	-0.09%	-0.09%	-0.09%	-0.13%	-0.13%	7.34%	4.52%	7.29%	14.81%	-6.07%	-6.71%	-7.82%	-7.82%	-1.78%	2.84%	-0.18%	-0.83%	2.16%	5.76%	6.69%	-3.12%	9.40%	12.96%
1994	-6.27%	-7.44%	-5.30%	-0.13%	1.28%	3.92%	9.92%	11.80%	2.52%	5.04%	-1.18%	-10.35%	-0.40%	-10.41%	0.27%	-8.39%	-0.09%	-10.43%	-0.52%	-10.44%	-7.57%	-1.43%	-8.06%	2.02%
1995	0.41%	0.41%	0.73%	0.73%	-1.08%	-1.08%	7.85%	13.51%	0.33%	-0.18%	2.07%	-6.76%	-0.32%	-10.42%	1.27%	-9.27%	-0.37%	-9.56%	-0.50%	-10.40%	-0.27%	-10.35%	0.00%	-2.85%
1996	0.00%	-2.66%	0.00%	-2.44%	0.00%	-7.36%	0.00%	-19.69%	0.00%	-23.55%	0.00%	-28.64%	0.83%	-30.07%	0.00%	-24.28%	-0.12%	-6.29%	0.00%	-22.27%	0.00%	-20.87%	0.00%	-14.35%
1997	0.10%	0.10%	0.99%	0.99%	0.50%	0.50%	-0.11%	-9.65%	0.00%	-20.48%	0.00%	-30.24%	1.18%	-31.99%	1.96%	-27.73%	-7.25%	-23.24%	2.32%	-24.68%	0.03%	-27.02%	0.78%	-17.77%
1998	1.23%	0.35%	0.49%	0.10%	1.04%	1.04%	1.17%	1.17%	-1.67%	-6.87%	0.84%	-19.84%	0.00%	-30.11%	0.84%	-25.89%	0.00%	-32.21%	0.00%	-32.39%	0.00%	-20.17%	0.69%	-9.35%
1999	0.00%	-10.48%	0.00%	-12.93%	0.00%	-18.84%	2.26%	10.83%	0.00%	-32.37%	0.00%	-35.82%	8.12%	-13.39%	0.61%	-12.11%	-1.33%	4.53%	0.00%	-27.03%	0.00%	-27.47%	0.00%	-27.03%
2000	0.00%	-17.82%	0.00%	-20.76%	-0.48%	-18.36%	-1.00%	-33.44%	0.00%	-39.41%	0.00%	-40.86%	0.00%	-43.63%	5.04%	-41.20%	0.00%	-37.42%	-7.75%	-5.54%	-8.36%	-3.04%	0.00%	-12.93%
2001	0.00%	-11.68%	0.07%	2.81%	1.02%	1.02%	2.43%	1.13%	0.00%	-27.47%	0.00%	-37.99%	0.00%	-38.98%	6.81%	-35.88%	-4.89%	-36.85%	0.00%	-31.75%	0.00%	-29.49%	0.00%	-30.69%
2002	0.00%	-28.49%	0.00%	-30.68%	1.29%	-33.31%	-6.60%	-37.35%	0.00%	-46.47%	0.00%	-51.23%	0.00%	-50.97%	0.00%	-45.07%	0.00%	-45.62%	0.00%	-44.60%	0.00%	-36.84%	-11.67%	-34.16%
2003	0.00%	-30.95%	0.00%	-34.40%	3.26%	3.26%	0.00%	-21.39%	0.00%	-31.02%	0.00%	-48.14%	0.00%	-49.95%	0.00%	-46.47%	-0.42%	-43.82%	0.00%	-46.04%	0.00%	-41.89%	1.62%	-28.35%
2004	0.00%	-30.95%	0.00%	-34.40%	3.26%	3.26%	0.00%	-21.39%	0.00%	-31.02%	0.00%	-48.14%	0.00%	-49.95%	0.00%	-46.47%	-0.42%	-43.82%	0.00%	-46.04%	0.00%	-41.89%	1.62%	-28.35%
2005	-0.02%	6.57%	0.50%	0.50%	-1.69%	-3.24%	-0.72%	2.94%	-0.17%	-10.41%	0.00%	-27.47%	0.32%	-32.98%	1.16%	-12.26%	0.00%	-29.37%	0.00%	-30.10%	0.00%	-28.78%	0.00%	-24.13%
2006	0.00%	-24.13%	0.00%	-23.84%	0.02%	-25.01%	0.00%	-29.49%	0.00%	-37.85%	0.00%	-41.72%	0.00%	-41.98%	0.00%	-32.72%	0.00%	-38.36%	0.00%	-34.05%	0.00%	-32.10%	0.00%	-31.33%
2007	0.00%	-33.82%	-0.83%	-34.93%	0.05%	-21.58%	0.00%	-34.88%	0.00%	-43.53%	0.00%	-50.07%	0.00%	-49.95%	3.76%	-3.54%	0.00%	-41.46%	0.00%	-42.79%	-1.95%	-39.32%	-6.71%	-0.86%
2008	0.17%	0.17%	0.02%	-0.46%	0.75%	1.29%	-0.55%	0.22%	-0.10%	-8.13%	0.78%	-25.90%	3.89%	-9.49%	0.41%	-11.13%	0.03%	-22.95%	0.00%	-21.01%	0.80%	-19.89%	0.19%	2.10%
2009	2.87%	2.87%	2.29%	3.64%	-0.24%	9.55%	0.00%	-1.82%																

Figure 4-45. Habitat summary table for fathead minnow (*Pimephales promelas*), Braided site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Braided Site

No Wood

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Fathead minnow

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.77%	-74.99%	-2.72%	-68.71%	10.04%	-67.69%	-0.31%	-66.34%	0.00%	-70.62%	0.50%	-71.05%	-7.46%	-66.65%	2.75%	2.94%
1966	-2.05%	-5.16%	10.27%	16.11%	15.27%	39.81%	-0.54%	-75.18%	0.00%	-75.14%	-0.80%	-73.99%	0.00%	-72.64%	-4.81%	-69.39%	0.95%	-74.82%	0.00%	-72.81%	-2.81%	-73.52%	-2.60%	-66.94%
1967	0.00%	-75.30%	0.00%	-75.03%	-0.77%	-74.91%	-0.83%	-72.99%	0.00%	-72.81%	0.00%	-72.64%	1.97%	-57.58%	1.31%	-54.18%	-6.55%	-73.96%	-7.14%	-70.88%	0.00%	-72.57%	0.84%	-40.18%
1968	0.98%	2.83%	4.77%	1.23%	2.26%	5.06%	14.34%	-36.44%	1.75%	-75.09%	0.75%	-74.72%	-0.64%	-74.89%	6.58%	-73.10%	0.00%	-75.31%	0.00%	-75.28%	0.00%	-75.28%	0.97%	-75.19%
1969	2.08%	-41.73%	8.57%	25.04%	7.22%	4.77%	28.25%	-63.15%	6.60%	-74.21%	0.00%	-75.22%	0.00%	-75.17%	0.25%	-75.13%	0.81%	-73.78%	0.80%	-74.00%	0.00%	-75.38%	0.00%	-75.71%
1970	0.00%	-75.53%	0.00%	-75.41%	0.46%	-75.80%	0.00%	-75.47%	0.00%	-75.11%	0.00%	-72.59%	-0.48%	-71.68%	-5.99%	-70.97%	1.21%	-44.00%	0.00%	-72.75%	0.00%	-75.27%	0.00%	-75.45%
1971	0.00%	-75.44%	0.00%	-75.56%	0.00%	-75.46%	0.00%	-72.61%	0.00%	-72.54%	-1.39%	-69.26%	0.00%	-69.42%	-0.71%	-62.50%	-4.88%	-60.05%	0.80%	-40.50%	8.18%	-71.32%	2.09%	-57.57%
1972	8.30%	-69.05%	0.00%	-75.33%	-0.78%	-74.67%	0.00%	-72.72%	0.00%	-72.68%	0.00%	-72.66%	0.00%	-72.64%	3.99%	-71.55%	-6.50%	-67.79%	-4.65%	-42.65%	-0.63%	-35.92%	8.08%	-4.81%
1973	4.60%	13.39%	0.06%	1.17%	0.34%	0.34%	-0.35%	0.92%	3.12%	2.91%	20.05%	-42.45%	7.09%	-39.48%	8.49%	-70.54%	3.34%	-74.69%	-1.42%	-75.81%	-0.61%	-75.40%	0.30%	-75.21%
1974	9.26%	-48.42%	0.00%	-72.06%	0.00%	-72.06%	0.00%	-75.76%	-0.09%	-75.41%	0.00%	-75.12%	0.00%	-75.17%	1.65%	-75.16%	-0.29%	-75.35%	9.02%	-64.85%	0.06%	-75.62%	-0.13%	-75.70%
1975	0.00%	-75.61%	7.72%	-67.16%	-6.89%	-3.87%	10.41%	22.08%	2.44%	-75.22%	0.00%	-75.21%	7.56%	-72.81%	0.00%	-75.13%	-0.03%	-75.24%	0.00%	-75.08%	0.00%	-75.06%	0.00%	-75.22%
1976	-8.64%	-69.84%	-1.38%	-25.71%	-0.67%	-73.81%	18.34%	-66.89%	0.48%	-75.41%	0.00%	-72.83%	10.44%	-68.37%	4.39%	-71.82%	4.56%	-71.40%	2.09%	-73.99%	0.00%	-75.24%	0.00%	-72.86%
1977	0.00%	-74.82%	0.00%	-75.38%	0.00%	-75.39%	7.71%	-71.76%	0.00%	-72.63%	0.00%	-70.00%	0.00%	-72.30%	10.84%	-67.66%	9.75%	-71.63%	0.00%	-72.67%	-1.02%	-71.05%	0.00%	-70.15%
1978	-5.35%	-56.81%	1.28%	3.16%	1.31%	-2.11%	-0.73%	-75.60%	-0.07%	-75.50%	0.00%	-75.12%	0.00%	-72.72%	0.00%	-69.58%	0.00%	-63.39%	-0.26%	-69.60%	14.29%	-54.15%	-3.13%	-1.15%
1979	1.24%	-2.13%	3.04%	6.73%	0.37%	0.37%	-1.84%	2.40%	30.13%	-22.69%	-2.00%	-67.87%	0.16%	-75.43%	-0.71%	-75.74%	1.36%	-75.18%	6.80%	-72.55%	2.37%	-74.66%	0.00%	-74.66%
1980	6.17%	-4.15%	0.47%	-0.28%	2.39%	0.74%	28.20%	40.56%	13.39%	-38.80%	-5.88%	-64.10%	2.54%	-46.15%	-6.02%	-41.10%	8.20%	-51.26%	3.09%	-73.25%	2.37%	-74.66%	0.00%	-74.66%
1981	0.00%	-74.66%	1.14%	-73.45%	14.67%	-14.89%	-0.63%	-69.05%	-0.67%	-75.83%	-0.04%	-75.43%	3.50%	-73.92%	0.54%	-75.06%	3.09%	-72.64%	4.02%	-72.15%	1.64%	-72.50%	4.39%	-69.03%
1982	-10.95%	1.13%	0.12%	-2.30%	0.21%	-1.09%	18.69%	-13.99%	1.73%	-75.39%	-0.86%	-75.64%	-0.02%	-75.38%	6.75%	-72.18%	1.51%	-74.08%	0.00%	-75.13%	-12.57%	-54.63%	1.62%	2.87%
1983	-14.78%	-10.92%	2.79%	3.90%	0.47%	1.83%	-0.88%	2.43%	23.95%	-14.51%	2.86%	-74.72%	0.86%	-75.25%	10.65%	-70.18%	10.02%	-58.20%	14.60%	-44.16%	-9.41%	-65.42%	-8.93%	4.55%
1984	14.46%	33.56%	-1.34%	-65.36%	0.00%	-74.65%	-0.54%	-75.40%	0.00%	-75.12%	0.00%	-72.76%	0.00%	-72.70%	1.82%	-64.62%	-14.21%	-52.93%	-7.63%	-48.03%	-0.97%	-66.80%	1.18%	2.56%
1985	0.33%	3.42%	3.61%	2.06%	1.05%	3.05%	18.18%	38.33%	14.98%	-39.94%	-0.65%	-75.58%	2.46%	-74.32%	3.53%	-73.90%	1.36%	-71.54%	-1.88%	-51.04%	-3.56%	2.22%	9.25%	17.53%
1986	-0.67%	-44.90%	-1.31%	13.56%	0.39%	0.13%	26.92%	-16.67%	2.87%	-75.10%	-0.87%	-75.64%	-0.51%	-75.57%	-3.89%	-61.84%	-0.11%	-65.41%	-1.27%	-75.77%	2.78%	-67.14%	3.66%	-59.81%
1987	6.66%	-32.61%	15.38%	22.99%	1.37%	7.57%	1.64%	-69.25%	0.42%	-75.49%	-0.80%	-74.02%	0.00%	-72.81%	3.51%	-73.79%	0.00%	-74.59%	5.08%	-70.15%	5.16%	-70.68%	-0.14%	-74.70%
1988	6.81%	11.96%	2.88%	4.49%	-0.54%	-75.45%	10.19%	-56.37%	3.63%	-74.78%	-0.39%	-75.51%	8.14%	-71.96%	-4.61%	-41.53%	8.77%	-56.68%	0.00%	-75.34%	0.00%	-75.21%	1.01%	-75.05%
1989	15.04%	-54.46%	8.26%	22.38%	2.64%	-64.91%	4.82%	-71.32%	-0.79%	-74.43%	-0.99%	-71.98%	0.77%	-71.69%	0.70%	-73.82%	0.80%	-74.21%	-0.82%	-73.54%	0.00%	-72.86%	0.00%	-72.86%
1990	0.00%	-75.29%	0.00%	-75.36%	0.00%	-75.39%	0.00%	-75.17%	0.10%	-72.72%	0.00%	-69.15%	0.00%	-71.94%	2.18%	-70.42%	1.11%	-72.61%	0.00%	-72.51%	0.02%	-72.81%	-9.24%	-59.48%
1991	-5.89%	-46.82%	-10.88%	-53.35%	-0.18%	-1.09%	0.91%	0.02%	-0.46%	-75.58%	0.00%	-75.12%	-1.62%	-73.31%	0.97%	-73.24%	-2.56%	-70.00%	-6.82%	-70.90%	0.00%	-72.65%	-5.75%	-52.73%
1992	5.12%	19.98%	1.75%	2.88%	2.55%	5.98%	2.78%	7.42%	0.32%	-66.04%	0.00%	-75.12%	19.78%	-65.59%	-3.52%	-45.18%	2.35%	-74.39%	0.00%	-75.18%	-2.24%	-71.56%	-4.07%	4.48%
1993	0.24%	-0.90%	-0.45%	1.59%	-0.69%	4.23%	2.12%	15.06%	14.38%	-64.53%	-4.42%	-70.55%	-4.79%	-63.25%	5.37%	-62.76%	1.99%	-62.94%	9.10%	-53.25%	2.45%	-0.72%	23.13%	-60.04%
1994	-6.27%	-45.00%	6.81%	-1.00%	12.08%	34.50%	22.26%	-37.92%	9.65%	-71.99%	-1.18%	-75.71%	-0.40%	-75.57%	0.16%	-75.52%	-0.09%	-75.51%	-0.17%	-75.49%	-5.29%	-73.50%	-1.07%	-39.50%
1995	2.73%	3.94%	0.70%	7.89%	1.05%	4.21%	15.23%	-44.77%	3.71%	-70.64%	2.07%	-74.92%	-0.32%	-75.54%	1.27%	-75.24%	-0.58%	-75.66%	-0.50%	-75.58%	-0.27%	-75.70%	0.00%	-75.77%
1996	0.00%	-75.76%	0.00%	-75.66%	0.00%	-75.70%	0.00%	-75.09%	0.00%	-72.70%	0.00%	-72.55%	0.83%	-73.21%	0.00%	-72.68%	3.59%	-67.97%	0.00%	-72.75%	0.00%	-75.06%	0.00%	-75.24%
1997	5.42%	-40.95%	5.84%	12.08%	1.12%	10.12%	-0.11%	-75.57%	0.00%	-73.04%	0.00%	-72.50%	1.18%	-70.67%	1.96%	-70.51%	-7.25%	-67.38%	1.38%	-69.65%	0.03%	-72.76%	0.10%	-74.62%
1998	1.23%	-73.95%	-2.50%	-11.01%	1.28%	3.10%	2.05%	1.94%	0.03%	-75.65%	0.84%	-72.82%	0.00%	-72.76%	0.84%	-72.64%	0.00%	-72.46%	0.00%	-71.75%	-0.16%	-74.19%	1.21%	-75.20%
1999	0.00%	-75.39%	0.00%	-75.28%	0.00%	-75.19%	30.01%	-60.57%	0.00%	-71.74%	0.00%	-68.76%	14.81%	-63.17%	1.08%	-74.19%	0.77%	-51.16%	0.00%	-72.60%	0.00%	-72.58%	0.00%	-72.60%
2000	0.00%	-72.87%	0.00%	-72.88%	-0.48%	-75.12%	-1.00%	-71.71%	0.00%	-65.63%	0.00%	-64.36%	0.00%	-61.95%	5.04%	-64.07%	0.00%	-67.36%	3.96%	-50.32%	5.11%	-29.31%	0.00%	-75.28%
2001	0.00%	-75.29%	12.16%	-66.98%	15.99%	22.18%	7.71%	-71.54%	0.00%	-72.58%	0.00%	-66.87%	0.00%	-63.22%	9.13%	-68.39%	-4.89%	-68.43%	0.00%	-67.42%	0.00%	-68.66%	0.00%	-72.55%
2002	0.00%	-72.55%	0.00%	-72.55%	1.29%	-71.66%	-6.60%	-67.42%	0.00%	-59.48%	0.00%	-55.32%	0.00%	-55.55%	0.00%	-58.78%	0.00%	-60.22%	0.00%	-61.10%	0.00%	-63.93%	-11.67%	-70.21%
2003	0.00%	-68.42%	0.00%	-70.00%	2.84%	8.44%	0.00%	-72.76%	0.00%	-64.86%	0.00%	-58.01%	0.00%	-56.44%	0.00%	-59.48%	-0.42%	-61.78%	0.00%	-59.85%	0.00%	-63.47%	1.62%	-67.91%
2004	0.00%	-68.42%	0.00%	-70.00%	2.84%	8.44%	0.00%	-72.76%	0.00%	-64.86%	0.00%	-58.01%	0.00%	-56.44%	0.00%	-59.48%	-0.42%	-61.78%	0.00%	-59.85%	0.00%	-63.47%	1.62%	-67.91%
2005	13.18%	2.22%	1.35%	1.17%	-3.77%	1.01%	10.38%	-53.12%	-0.17%	-75.57%	0.00%	-72.58%	0.32%	-72.33%	7.84%	-70.98%	0.00%	-72.53%	0.00%	-72.50%	0.00%	-72.54%	0.00%	-72.68%
2006	0.00%	-72.68%	0.00%	-72.69%	0.02%	-72.66%	0.00%	-72.32%	0.00%	-66.99%	0.00%	-63.62%	0.00%	-63.39%	0.00%	-65.43%	0.00%	-66.55%	0.00%	-67.18%	0.00%	-68.54%	0.00%	-71.51%
2007	0.00%	-72.47%	-0.83%	-73.09%	0.05%	-72.77%	0.00%	-69.58%	0.00%	-62.03%	0.00%	-56.33%	0.00%	-56.44%	13.35%	-47.16%	0.00%	-63.84%	0.00%	-62.68%	0.68%	-65.12%	-3.30%	9.73%
2008	0.63%	4.17%	0.68%	0.68%	5.22%	21.91%	-0.55%	-75.28%	-0.10%	-75.61%	0.78%	-74.82%	4.21%	-69.48%	0.28%	-74.75%	0.03%	-72.75%	0.00%	-72.87%	0.80%	-74.00%	-2.16%	-39.39%
2009	13.23%	40.38%	5.77%	19.25%	2.29%	-28.84%	0.00%	-75.47%																

Figure 4-46. Habitat summary table for fathead minnow (*Pimephales promelas*), Braided site, with no LWD and with a hypothetical withdrawal rate of 10 ft³/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 2 cfs										Braided Site With LWD Fathead minnow														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.12%	-10.82%	-1.50%	-19.80%	3.78%	-9.85%	-2.69%	-7.42%	0.54%	-19.51%	0.28%	-18.95%	-6.47%	0.20%	-3.53%	-3.53%
1966	-3.34%	-3.34%	3.48%	9.63%	3.56%	7.09%	-0.46%	0.10%	0.00%	-7.05%	-0.17%	-9.89%	0.00%	-14.63%	-0.67%	-5.39%	-0.42%	-11.73%	0.00%	-10.94%	-4.84%	-7.50%	-3.55%	-2.22%
1967	0.00%	-3.61%	0.00%	-9.42%	0.00%	-8.23%	-0.10%	-12.04%	0.00%	-10.94%	0.00%	-14.62%	-5.66%	-13.53%	-7.29%	-13.01%	-3.31%	-9.03%	-4.02%	-19.18%	0.00%	-16.96%	-0.23%	1.27%
1968	0.06%	0.06%	-0.31%	-0.31%	-1.57%	-1.57%	0.73%	6.56%	1.47%	-1.58%	0.02%	-19.72%	-2.01%	-4.42%	-0.88%	-3.22%	0.00%	-7.37%	0.00%	-7.86%	-0.02%	-3.90%	0.00%	-2.86%
1969	0.83%	0.32%	6.70%	6.70%	2.55%	2.55%	19.57%	20.66%	1.62%	-0.94%	0.00%	-5.17%	0.00%	-6.26%	0.21%	-5.77%	0.12%	-9.47%	0.12%	-9.42%	-0.38%	-2.70%	0.00%	-2.66%
1970	0.00%	-3.04%	0.00%	-2.80%	0.00%	-1.78%	0.00%	-2.84%	0.00%	-11.24%	0.00%	-16.93%	-0.22%	-18.69%	-9.02%	-4.31%	-1.73%	6.99%	0.00%	-12.23%	0.00%	-3.88%	0.00%	-2.78%
1971	0.00%	-2.74%	0.00%	-3.14%	0.00%	-3.33%	0.00%	-15.18%	0.00%	-17.20%	-0.77%	-19.60%	-1.61%	-19.55%	-2.55%	-3.16%	-3.04%	-5.61%	1.57%	1.63%	5.23%	5.23%	-6.56%	3.78%
1972	-1.69%	1.93%	0.00%	-7.27%	-0.12%	-8.40%	0.00%	-12.97%	0.00%	-15.82%	0.00%	-17.10%	0.00%	-14.63%	4.20%	-10.38%	-0.41%	-13.33%	-2.79%	4.45%	0.06%	0.06%	0.91%	0.91%
1973	0.92%	0.92%	0.51%	0.51%	1.17%	1.17%	0.82%	0.82%	0.43%	0.23%	17.78%	10.84%	-4.45%	-3.15%	4.13%	3.39%	2.86%	-0.25%	-1.21%	-4.00%	-0.73%	-1.63%	0.80%	0.84%
1974	1.38%	3.10%	0.00%	-0.23%	0.00%	3.27%	0.00%	-2.81%	-0.07%	-2.63%	0.00%	-17.57%	0.00%	-6.10%	0.59%	-2.42%	-0.25%	-4.13%	0.53%	0.37%	-0.13%	-3.13%	-0.11%	-3.13%
1975	0.00%	-3.31%	-0.19%	3.20%	-0.15%	-0.75%	2.47%	2.47%	1.72%	-0.48%	0.00%	-5.21%	5.58%	1.32%	0.00%	-10.76%	-0.02%	-9.24%	0.00%	-8.23%	0.00%	-8.79%	0.00%	-5.19%
1976	-6.97%	-1.90%	-1.15%	0.91%	0.00%	-0.85%	6.63%	11.26%	0.41%	-2.58%	0.00%	-10.76%	-2.02%	-1.16%	-0.89%	-2.35%	-1.13%	-9.85%	-0.21%	-1.96%	0.00%	-4.84%	0.00%	-10.02%
1977	0.00%	-0.66%	0.00%	-2.55%	0.00%	-2.57%	-2.19%	-0.82%	0.00%	-14.72%	0.00%	-19.34%	0.00%	-18.96%	3.94%	-6.98%	6.03%	1.53%	0.00%	-16.89%	-0.08%	-19.13%	0.00%	-19.28%
1978	-7.52%	1.43%	0.18%	0.35%	0.31%	0.31%	0.00%	-0.78%	-0.06%	-2.94%	0.00%	-7.52%	0.00%	-12.97%	0.00%	-19.49%	0.00%	-21.52%	-0.18%	-18.94%	-0.01%	11.08%	-6.17%	-6.17%
1979	-3.53%	-3.53%	0.49%	0.49%	0.49%	0.49%	0.17%	0.17%	8.17%	10.04%	-1.25%	-1.89%	0.24%	-2.71%	-0.31%	-3.37%	1.25%	-1.87%	4.79%	4.79%	2.08%	4.09%	0.00%	1.22%
1980	2.22%	5.50%	0.29%	0.29%	0.74%	0.17%	-2.03%	3.57%	-0.62%	8.37%	-1.97%	-8.23%	-3.22%	-3.48%	-8.62%	-5.85%	1.26%	2.75%	4.06%	4.06%	2.71%	4.15%	0.00%	4.06%
1981	0.00%	3.38%	0.00%	2.08%	5.69%	7.29%	-1.39%	-1.73%	-0.57%	-3.29%	-0.16%	-2.73%	2.48%	0.94%	-1.16%	-3.56%	0.08%	-1.01%	2.46%	3.54%	-3.06%	-1.70%	-6.64%	1.85%
1982	-4.48%	-10.08%	0.72%	-8.92%	-0.08%	3.55%	1.24%	5.46%	0.17%	-1.25%	-0.73%	-3.41%	-0.01%	-7.34%	3.63%	1.14%	0.52%	-1.77%	0.00%	-7.12%	-13.26%	-2.09%	-1.90%	2.61%
1983	1.48%	-12.25%	0.31%	0.31%	0.49%	0.49%	0.76%	0.76%	-0.19%	5.04%	1.15%	-0.34%	0.05%	-2.83%	4.25%	3.90%	-3.27%	6.02%	-2.43%	8.76%	-9.28%	-6.44%	-7.56%	0.41%
1984	-0.50%	0.94%	-1.35%	0.50%	0.00%	3.34%	-0.46%	0.09%	0.00%	-9.80%	0.00%	-17.92%	0.00%	-16.15%	-1.97%	-0.06%	-11.00%	-5.96%	-6.23%	0.91%	-3.49%	-1.07%	0.15%	0.15%
1985	0.68%	0.68%	0.74%	0.39%	0.60%	0.60%	10.48%	11.91%	3.62%	8.52%	-2.58%	-3.23%	1.29%	-1.10%	0.09%	-0.49%	-0.56%	-2.20%	-4.85%	-1.30%	1.30%	-1.76%	1.95%	1.95%
1986	-0.42%	-6.71%	-3.02%	2.96%	0.41%	0.41%	4.59%	9.13%	2.44%	0.58%	-0.74%	-3.42%	-0.53%	-2.65%	1.77%	6.28%	6.34%	7.18%	-1.83%	-4.72%	-0.23%	0.25%	0.96%	3.41%
1987	-4.22%	-0.09%	2.96%	11.73%	0.54%	0.23%	0.44%	0.10%	-0.12%	-2.57%	-0.12%	-8.54%	1.02%	-10.12%	-1.89%	-4.11%	0.00%	-7.15%	-2.40%	-5.59%	-4.84%	0.40%	-0.61%	0.59%
1988	1.72%	1.08%	1.05%	0.39%	-0.46%	-0.27%	0.06%	7.14%	-0.64%	-3.39%	-0.33%	-2.98%	4.56%	3.26%	-2.68%	-2.74%	-0.08%	-0.41%	-0.16%	-7.22%	0.00%	-12.84%	0.00%	-3.21%
1989	5.19%	12.78%	0.16%	0.16%	1.26%	5.26%	2.27%	1.41%	-0.12%	-9.26%	-0.08%	-18.36%	0.47%	-19.50%	-0.09%	-13.79%	0.11%	-15.05%	-0.14%	-12.86%	0.00%	-10.02%	0.00%	-9.93%
1990	0.00%	-2.41%	0.00%	-2.49%	0.00%	-2.58%	0.00%	-6.24%	0.00%	-13.34%	0.00%	-19.64%	0.00%	-19.11%	-1.70%	-10.16%	0.17%	-18.81%	0.17%	-17.24%	0.00%	-13.15%	-1.18%	4.43%
1991	-5.49%	-4.09%	-9.67%	0.08%	-0.01%	-0.01%	0.71%	0.71%	-0.39%	-3.21%	0.00%	-7.44%	-0.25%	-13.82%	0.07%	-12.81%	-1.44%	-19.34%	-3.89%	-19.01%	0.00%	-14.35%	-5.07%	3.98%
1992	0.74%	0.74%	0.77%	0.10%	0.48%	2.75%	0.59%	0.59%	-1.65%	-3.43%	0.00%	-7.44%	1.32%	1.00%	-7.48%	-1.54%	-3.02%	-2.52%	0.00%	-15.71%	-2.30%	-1.37%	-5.03%	1.81%
1993	0.86%	0.47%	0.93%	0.93%	0.66%	0.66%	3.76%	3.20%	7.22%	11.14%	-5.32%	-5.97%	-7.62%	-7.62%	-2.20%	1.16%	-1.35%	-2.09%	2.30%	5.54%	1.97%	-0.19%	8.76%	11.96%
1994	-5.27%	-8.31%	-4.65%	0.71%	1.00%	2.82%	9.02%	10.55%	1.92%	1.75%	-1.01%	-3.68%	-0.34%	-3.17%	0.00%	-3.01%	-0.07%	-2.98%	-0.44%	-2.93%	-6.90%	-1.86%	-7.15%	0.07%
1995	0.51%	0.51%	-0.51%	1.01%	-0.21%	-0.21%	7.57%	13.09%	0.17%	-0.25%	1.76%	-0.99%	-0.27%	-3.10%	0.42%	-2.71%	-0.32%	-3.48%	-0.43%	-3.23%	-0.23%	-3.64%	0.00%	-2.43%
1996	0.00%	-2.27%	0.00%	-2.08%	0.00%	-3.04%	0.00%	-7.99%	0.00%	-13.34%	0.00%	-16.56%	0.10%	-16.66%	0.00%	-13.80%	0.74%	-1.23%	0.00%	-12.50%	0.00%	-8.71%	0.00%	-4.76%
1997	0.32%	0.32%	0.82%	0.82%	0.36%	0.36%	-0.10%	-3.04%	0.00%	-11.06%	0.00%	-17.57%	0.18%	-17.28%	0.18%	-15.07%	-4.47%	-12.11%	0.94%	-13.75%	0.00%	-15.28%	0.12%	-8.21%
1998	-0.29%	-1.03%	0.22%	0.22%	-3.26%	-3.26%	-3.09%	-3.09%	-1.43%	-2.68%	0.07%	-10.94%	0.00%	-17.09%	0.04%	-14.81%	0.00%	-18.49%	0.00%	-18.69%	-0.03%	-9.35%	0.00%	-2.93%
1999	0.00%	-2.58%	0.00%	-3.90%	0.00%	-7.56%	2.39%	9.55%	0.00%	-18.67%	0.00%	-19.78%	8.09%	6.24%	0.57%	-5.79%	-2.57%	2.49%	0.00%	-15.55%	0.00%	-15.82%	0.00%	-15.55%
2000	0.00%	-9.65%	0.00%	-11.39%	0.00%	-7.18%	-0.08%	-18.88%	0.00%	-20.83%	0.00%	-21.23%	0.00%	-21.95%	2.69%	-21.32%	0.00%	-20.26%	-4.74%	-3.45%	-5.77%	-4.36%	0.00%	-3.90%
2001	0.00%	-3.60%	0.77%	2.11%	0.71%	0.71%	0.61%	-1.82%	0.00%	-15.82%	0.00%	-20.42%	0.00%	-19.94%	4.98%	-16.32%	-2.69%	-20.25%	0.00%	-17.20%	0.00%	-16.26%	0.00%	-17.74%
2002	0.00%	-16.47%	0.00%	-17.75%	0.27%	-18.78%	-3.58%	-20.24%	0.00%	-22.64%	0.00%	-23.72%	0.00%	-23.66%	0.00%	-21.77%	0.00%	-22.44%	0.00%	-22.19%	0.00%	-19.03%	-6.58%	-19.26%
2003	0.00%	-17.01%	0.03%	-19.31%	2.22%	2.22%	0.00%	-11.96%	0.00%	-16.22%	0.00%	-23.03%	0.00%	-23.44%	0.00%	-22.64%	-0.21%	-22.00%	0.00%	-22.54%	0.00%	-21.50%	0.39%	-15.47%
2004	0.00%	-17.01%	0.03%	-19.31%	2.22%	2.22%	0.00%	-11.96%	0.00%	-16.22%	0.00%	-23.03%	0.00%	-23.44%	0.00%	-22.64%	-0.21%	-22.00%	0.00%	-22.54%	0.00%	-21.50%	0.39%	-15.47%
2005	1.41%	1.41%	0.10%	0.10%	-0.30%	-0.30%	-0.08%	2.96%	-0.15%	-3.17%	0.00%	-15.82%	0.18%	-18.78%	1.22%	-0.82%	0.00%	-17.02%	0.00%	-17.48%	0.00%	-16.65%	0.00%	-13.71%
2006	0.00%	-13.70%	0.00%	-13.52%	0.00%	-14.26%	0.00%	-17.03%	0.00%	-20.38%	0.00%	-21.45%	0.00%	-21.52%	0.00%	-17.25%	0.00%	-20.53%	-0.38%	-18.39%	0.00%	-17.67%	0.00%	-15.49%
2007	0.00%	-19.71%	-0.14%	-19.62%	0.00%	-12.05%	0.00%	-19.49%	0.00%	-21.92%	0.00%	-23.47%	2.88%	-6.98%	3.04%	6.03%	0.00%	-21.38%	0.00%	-21.73%	-6.01%	-14.11%	-5.85%	-1.27%
2008	0.37%	0.37%	0.82%	-3.36%	0.54%	2.27%	-0.47%	0.19%	-0.09%	-2.85%	0.12%	-12.10%	3.85%	-0.65%	0.20%	-4.78%	0.00%	-12.89%	0.00%	-11.55%	0.12%	-9.42%	-0.63%	0.63%
2009	1.65%	1.65%	2.50%	3.39%	-0.14%	8.86%	0.00%	-1.55%																

Figure 4-47. Habitat summary table for fathead minnow (*Pimephales promelas*), Braided site, with LWD and a hypothetical withdrawal rate of 2 ft³/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 10 cfs										Braided Site With LWD Fathead minnow														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.12%	-43.25%	-1.50%	-37.91%	8.62%	-35.22%	-1.66%	-29.80%	0.54%	-39.48%	0.28%	-40.56%	-6.48%	-28.27%	-1.36%	-1.76%
1966	-0.19%	-0.81%	10.12%	8.47%	12.13%	33.39%	-0.46%	-43.33%	0.00%	-43.24%	-0.17%	-42.75%	0.00%	-42.25%	-5.11%	-33.31%	0.32%	-42.91%	0.00%	-42.25%	-3.69%	-41.02%	-1.68%	-28.17%
1967	0.00%	-43.55%	0.00%	-43.03%	0.00%	-43.14%	-0.10%	-42.30%	0.00%	-42.25%	0.00%	-42.25%	0.67%	-13.54%	-2.69%	-7.84%	-3.51%	-42.78%	-4.02%	-40.31%	0.00%	-42.24%	3.79%	7.46%
1968	-1.25%	1.38%	3.20%	4.38%	-0.72%	0.83%	13.81%	-18.49%	1.49%	-43.16%	0.02%	-43.11%	0.00%	-43.54%	3.40%	-42.27%	0.00%	-43.57%	0.00%	-43.52%	0.00%	-43.52%	0.00%	-43.80%
1969	1.82%	6.61%	7.98%	20.66%	3.20%	4.36%	22.04%	-28.79%	1.62%	-43.65%	0.00%	-43.41%	0.00%	-43.31%	0.21%	-43.22%	0.12%	-42.54%	0.12%	-42.63%	0.00%	-43.71%	0.00%	-44.37%
1970	0.00%	-44.00%	0.00%	-43.77%	0.00%	-44.75%	0.00%	-43.89%	0.00%	-43.19%	0.00%	-42.25%	-0.51%	-40.30%	-9.05%	-38.93%	-3.50%	0.01%	0.00%	-42.25%	0.00%	-43.49%	0.00%	-43.85%
1971	0.00%	-43.83%	0.00%	-44.06%	0.00%	-43.87%	0.00%	-42.25%	0.00%	-42.25%	-0.77%	-38.52%	0.00%	-38.70%	-2.58%	-22.22%	-2.40%	-20.09%	5.23%	-2.76%	4.38%	-38.46%	1.53%	-16.34%
1972	6.44%	-34.02%	0.00%	-43.62%	-0.12%	-42.96%	0.00%	-42.25%	0.00%	-42.24%	0.00%	-42.25%	0.00%	-42.25%	4.22%	-39.38%	-6.66%	-34.20%	-3.26%	-12.97%	0.65%	1.40%	7.49%	-12.82%
1973	3.96%	10.00%	-2.00%	-2.00%	-2.85%	-2.85%	2.80%	1.20%	2.55%	3.23%	11.29%	-20.90%	4.24%	-17.95%	4.69%	-39.92%	2.84%	-42.38%	-1.21%	-44.55%	-1.01%	-44.03%	0.25%	-43.39%
1974	5.92%	-25.24%	0.00%	-41.02%	0.00%	-41.02%	0.00%	-44.46%	-0.07%	-43.77%	0.00%	-43.21%	0.00%	-43.31%	0.59%	-43.74%	-0.25%	-43.66%	5.43%	-26.41%	-0.13%	-44.29%	-0.11%	-44.34%
1975	0.00%	-44.16%	6.69%	-31.31%	-0.72%	2.80%	7.73%	16.58%	2.08%	-43.40%	0.00%	-43.39%	5.55%	-39.87%	0.00%	-43.23%	-0.02%	-43.44%	0.00%	-43.14%	0.00%	-43.09%	0.00%	-43.41%
1976	-7.12%	-35.39%	-1.18%	5.14%	0.00%	-43.58%	15.61%	-30.58%	0.41%	-43.77%	0.00%	-42.25%	7.35%	-33.21%	2.77%	-38.33%	4.86%	-39.02%	1.53%	-41.64%	0.00%	-43.44%	0.00%	-42.25%
1977	0.00%	-42.63%	0.00%	-43.72%	0.00%	-43.73%	6.90%	-38.17%	0.00%	-42.25%	0.00%	-39.35%	0.00%	-41.35%	8.72%	-31.74%	6.71%	-38.29%	0.00%	-42.24%	-0.08%	-40.27%	0.00%	-39.53%
1978	-3.29%	-12.64%	1.84%	4.41%	1.52%	1.11%	-0.62%	-44.14%	-0.06%	-43.94%	0.00%	-43.20%	0.00%	-42.25%	0.00%	-38.88%	0.00%	-32.50%	-0.18%	-38.54%	14.20%	-3.75%	-0.97%	1.37%
1979	-2.05%	-1.56%	1.79%	4.92%	2.34%	2.34%	1.27%	3.98%	28.18%	-0.36%	-2.02%	-39.81%	0.14%	-43.80%	-0.61%	-44.43%	1.16%	-43.32%	3.96%	-39.70%	2.01%	-42.32%	0.00%	-42.32%
1980	11.20%	-4.71%	1.20%	1.20%	2.33%	3.45%	16.57%	24.16%	5.79%	-21.29%	-7.19%	-39.83%	-1.08%	-27.34%	-6.24%	-24.18%	4.42%	-26.93%	2.62%	-41.48%	2.01%	-42.32%	0.00%	-42.32%
1981	0.00%	-42.32%	0.00%	-41.90%	13.56%	1.90%	-1.11%	-40.76%	-0.57%	-44.60%	-0.04%	-43.82%	0.76%	-42.31%	-0.58%	-43.94%	2.99%	-39.46%	2.34%	-38.40%	2.74%	-39.17%	3.46%	-33.03%
1982	-9.51%	-0.25%	0.70%	-7.34%	0.43%	-4.06%	15.18%	13.51%	1.48%	-43.73%	-0.73%	-44.21%	-0.01%	-43.71%	5.05%	-38.55%	1.09%	-41.84%	0.00%	-43.23%	-15.69%	-6.09%	-3.09%	4.54%
1983	-12.93%	-10.60%	1.54%	1.43%	2.44%	2.44%	3.15%	5.60%	21.62%	9.18%	2.43%	-42.44%	0.01%	-43.88%	8.11%	-35.48%	8.71%	-9.14%	12.84%	0.51%	-10.81%	-26.33%	-4.94%	5.80%
1984	10.22%	26.45%	-1.35%	-37.34%	0.00%	-42.30%	-0.46%	-43.75%	0.00%	-43.21%	0.00%	-42.25%	0.00%	-42.25%	1.51%	-30.93%	-13.35%	-3.43%	-7.22%	-0.07%	-1.91%	-28.77%	2.63%	3.50%
1985	1.96%	2.78%	2.19%	2.45%	2.32%	3.72%	10.14%	23.94%	12.34%	-18.40%	-0.55%	-44.11%	1.58%	-42.88%	2.17%	-41.85%	0.40%	-38.18%	-1.92%	-18.73%	-4.59%	-0.31%	6.49%	13.35%
1986	-0.42%	-27.48%	1.57%	13.33%	2.20%	1.86%	24.33%	4.94%	2.45%	-43.17%	-0.74%	-44.22%	-0.44%	-44.09%	-3.96%	-24.72%	-0.27%	-25.82%	-1.95%	-44.96%	1.07%	-38.40%	0.55%	-33.92%
1987	4.41%	-8.72%	14.84%	18.79%	3.00%	7.40%	0.44%	-39.88%	0.25%	-43.98%	-0.12%	-42.70%	1.02%	-41.66%	0.92%	-42.67%	0.00%	-43.11%	5.05%	-34.83%	3.80%	-36.46%	-1.14%	-42.98%
1988	4.80%	9.82%	3.15%	5.38%	-0.46%	-43.84%	9.04%	-11.97%	-0.64%	-44.62%	-0.33%	-43.97%	5.62%	-39.64%	-6.39%	1.33%	5.02%	-3.78%	0.00%	-43.64%	0.00%	-43.37%	0.00%	-43.56%
1989	14.36%	-27.24%	6.65%	17.82%	0.80%	-27.17%	2.66%	-38.98%	-0.12%	-42.81%	-0.08%	-41.36%	0.47%	-41.03%	-0.09%	-42.73%	0.11%	-42.73%	-0.14%	-42.47%	0.00%	-42.25%	0.00%	-42.25%
1990	0.00%	-43.54%	0.00%	-43.68%	0.00%	-43.73%	0.00%	-43.30%	0.00%	-42.25%	0.00%	-38.40%	0.00%	-40.75%	1.03%	-36.59%	0.17%	-42.14%	0.17%	-42.14%	0.00%	-42.25%	-9.01%	-16.13%
1991	-5.70%	0.58%	-8.94%	-10.78%	-0.03%	9.83%	3.54%	7.71%	-0.39%	-44.10%	0.00%	-43.21%	-0.25%	-42.39%	0.07%	-42.40%	-1.44%	-39.35%	-3.89%	-40.39%	0.00%	-42.25%	-4.49%	-3.93%
1992	4.03%	13.07%	0.48%	1.84%	3.16%	5.12%	2.71%	6.86%	-0.24%	-38.58%	0.00%	-43.21%	16.64%	-28.74%	-3.22%	-12.85%	-0.34%	-43.70%	0.00%	-43.32%	-2.10%	-36.74%	-7.52%	5.92%
1993	2.46%	2.24%	3.23%	3.25%	3.28%	8.05%	3.33%	12.67%	6.75%	-36.19%	-4.01%	-42.25%	-5.05%	-38.22%	3.27%	-32.75%	-0.55%	-34.27%	9.21%	-23.57%	3.83%	5.55%	16.99%	-27.76%
1994	-5.27%	-27.77%	3.77%	4.79%	9.87%	30.00%	17.83%	-13.28%	3.50%	-41.76%	-1.01%	-44.37%	-0.34%	-44.07%	-0.10%	-44.12%	-0.07%	-43.97%	-0.15%	-43.94%	-4.68%	-40.79%	-1.19%	-16.53%
1995	-3.15%	1.63%	-0.60%	3.96%	1.86%	3.82%	12.57%	-22.80%	3.05%	-40.20%	1.76%	-42.81%	-0.27%	-44.03%	0.42%	-43.81%	-0.50%	-44.25%	-0.43%	-44.11%	-0.23%	-44.35%	0.00%	-44.48%
1996	0.00%	-44.46%	0.00%	-44.26%	0.00%	-44.33%	0.00%	-43.16%	0.00%	-42.25%	0.00%	-42.25%	0.10%	-42.44%	0.00%	-42.25%	3.70%	-32.01%	0.00%	-42.25%	0.00%	-43.09%	0.00%	-43.44%
1997	4.88%	8.93%	4.65%	10.30%	1.03%	6.92%	-0.10%	-44.09%	0.00%	-42.33%	0.00%	-42.25%	0.18%	-39.48%	0.18%	-39.48%	-4.47%	-36.14%	0.28%	-38.74%	0.00%	-42.25%	-0.56%	-43.23%
1998	-0.29%	-43.55%	0.44%	3.16%	-0.66%	0.59%	-0.12%	-0.25%	0.02%	-44.24%	0.07%	-42.25%	0.00%	-42.25%	0.04%	-42.25%	0.00%	-42.05%	0.00%	-41.39%	-0.16%	-42.70%	0.00%	-43.94%
1999	0.00%	-43.74%	0.00%	-43.52%	0.00%	-43.34%	26.54%	-18.37%	0.00%	-41.38%	0.00%	-37.97%	12.50%	-22.41%	-0.27%	-42.66%	-1.03%	-16.39%	0.00%	-42.25%	0.00%	-42.25%	0.00%	-42.25%
2000	0.00%	-42.25%	0.00%	-42.25%	0.00%	-43.21%	-0.08%	-41.05%	0.00%	-34.68%	0.00%	-33.43%	0.00%	-31.17%	2.69%	-33.15%	0.00%	-36.47%	5.63%	2.18%	2.63%	15.88%	0.00%	-43.52%
2001	0.00%	-43.54%	12.18%	-33.92%	13.08%	28.50%	5.31%	-38.99%	0.00%	-42.25%	0.00%	-35.95%	0.00%	-32.34%	8.90%	-34.94%	-2.69%	-37.60%	0.00%	-36.53%	0.00%	-37.86%	0.00%	-42.23%
2002	0.00%	-42.25%	0.00%	-42.24%	0.27%	-40.99%	-3.58%	-36.53%	0.00%	-28.98%	0.00%	-25.62%	0.00%	-25.79%	0.00%	-28.39%	0.00%	-29.62%	0.00%	-30.40%	0.00%	-33.02%	-6.58%	-39.59%
2003	0.00%	-37.60%	0.03%	-39.33%	3.32%	6.35%	0.00%	-42.25%	0.00%	-33.92%	0.00%	-27.76%	0.00%	-26.49%	0.00%	-28.98%	-0.21%	-31.01%	0.00%	-29.30%	0.00%	-32.57%	0.39%	-37.05%
2004	0.00%	-37.60%	0.03%	-39.33%	3.32%	6.35%	0.00%	-42.25%	0.00%	-33.92%	0.00%	-27.76%	0.00%	-26.49%	0.00%	-28.98%	-0.21%	-31.01%	0.00%	-29.30%	0.00%	-32.57%	0.39%	-37.05%
2005	5.76%	-4.69%	1.69%	-0.79%	0.81%	3.81%	9.02%	-24.60%	-0.15%	-44.07%	0.00%	-42.25%	0.17%	-41.79%	7.07%	-36.54%	0.00%	-42.25%	0.00%	-42.25%	0.00%	-42.25%	0.00%	-42.25%
2006	0.00%	-42.25%	0.00%	-42.25%	0.00%	-42.25%	0.00%	-42.00%	0.00%	-36.08%	0.00%	-32.72%	0.00%	-32.50%	0.00%	-34.48%	0.00%	-35.62%	-0.38%	-36.27%	0.00%	-37.72%	0.00%	-39.30%
2007	0.00%	-42.25%	-0.14%	-42.36%	0.00%	-42.25%	0.00%	-38.88%	0.00%	-31.24%	0.00%	-26.40%	12.85%	-10.69%	11.12%	8.68%	0.00%	-32.93%	0.00%	-31.84%	-2.53%	-28.76%	-6.95%	5.86%
2008	1.56%	5.13%	3.92%	6.52%	4.70%	18.70%	-0.47%	-43.51%	-0.09%	-44.16%	0.12%	-42.93%	3.54%	-34.80%	-0.16%	-43.31%	0.00%	-42.25%	0.00%	-42.25%	0.12%	-42.63%	-0.65%	5.70%
2009	8.59%	29.10%	4.98%	15.99%	1.96%	-9.88%	0.00%	-43.90%																

Figure 4-48. Habitat summary table for fathead minnow (*Pimephales promelas*), Braided site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Gage Site

No Wood

Yellow Bullhead

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2
1965									0.00%	-9.79%	0.00%	-26.84%
1966	0.16%	0.16%	2.36%	3.43%	2.21%	2.21%	0.00%	-4.05%	0.00%	-9.98%	0.00%	-13.94%
1967	0.00%	-5.89%	0.00%	-12.94%	0.00%	-11.45%	0.00%	-17.06%	0.00%	-15.95%	0.00%	-20.02%
1968	-0.02%	-0.02%	-0.08%	-0.08%	0.42%	0.42%	2.03%	3.37%	-0.63%	-4.19%	-0.04%	-11.37%
1969	0.32%	0.32%	1.41%	1.41%	0.63%	0.63%	3.15%	3.91%	2.19%	2.10%	0.00%	-7.64%
1970	0.00%	-4.22%	0.00%	-3.85%	0.00%	-0.95%	0.00%	-4.23%	0.00%	-10.66%	0.00%	-22.53%
1971	0.00%	-4.24%	0.00%	-4.21%	0.00%	-4.79%	0.00%	-20.63%	0.00%	-22.84%	0.00%	-26.38%
1972	2.06%	2.15%	0.00%	-5.33%	0.00%	-11.95%	0.00%	-18.18%	0.00%	-21.22%	0.30%	-18.92%
1973	0.91%	0.91%	-0.04%	-0.04%	-0.25%	-0.25%	-0.01%	-0.01%	-0.22%	-0.22%	4.10%	4.10%
1974	2.97%	3.14%	0.00%	-3.51%	0.30%	1.97%	0.00%	-4.16%	-0.13%	-4.33%	0.00%	-10.37%
1975	0.00%	-4.19%	1.22%	2.61%	0.27%	0.27%	0.83%	0.83%	-1.41%	-4.09%	0.00%	-7.92%
1976	-0.01%	-4.36%	0.22%	0.22%	0.00%	3.41%	2.81%	2.11%	-0.15%	-4.29%	0.00%	-15.75%
1977	0.00%	-4.19%	0.00%	-4.99%	0.00%	-4.25%	1.00%	-1.79%	0.00%	-20.12%	0.00%	-25.90%
1978	0.57%	-1.19%	0.56%	0.56%	0.29%	0.29%	0.00%	-3.97%	-0.11%	-4.40%	0.00%	-10.57%
1979	0.32%	0.32%	-0.12%	-0.12%	0.16%	0.16%	0.36%	0.36%	3.10%	3.10%	2.49%	2.49%
1980	0.74%	0.74%	0.19%	0.19%	0.18%	0.18%	1.14%	1.14%	3.33%	3.33%	1.26%	1.26%
1981	0.00%	-3.80%	0.29%	-0.49%	2.33%	3.32%	1.26%	-0.88%	-0.97%	-4.14%	-0.06%	-4.24%
1982	2.51%	2.51%	0.41%	0.41%	0.39%	0.39%	1.97%	1.97%	-2.05%	-4.06%	-1.26%	-4.19%
1983	0.67%	0.67%	0.16%	0.16%	-0.19%	-0.19%	-0.01%	-0.01%	2.63%	2.63%	-3.67%	-4.06%
1984	1.23%	1.23%	0.50%	-2.24%	0.00%	-3.85%	0.00%	-4.07%	0.00%	-10.37%	0.00%	-17.46%
1985	0.00%	0.00%	0.09%	0.09%	-0.06%	-0.06%	1.95%	1.95%	3.56%	3.56%	-0.95%	-4.20%
1986	1.73%	1.52%	1.53%	1.53%	0.16%	0.16%	2.82%	2.82%	-1.37%	-4.05%	-1.28%	-4.19%
1987	1.75%	2.01%	1.65%	2.10%	0.36%	0.36%	2.33%	3.34%	-0.19%	-4.19%	0.00%	-13.14%
1988	0.50%	0.50%	0.35%	0.35%	0.00%	-1.44%	2.45%	2.45%	1.80%	-0.53%	-0.57%	-4.31%
1989	2.99%	3.34%	1.15%	1.15%	1.78%	0.48%	2.23%	2.28%	0.00%	-13.14%	0.00%	-24.32%
1990	0.00%	-4.94%	0.00%	-4.33%	0.00%	-4.59%	0.00%	-9.00%	0.00%	-19.30%	0.00%	-26.45%
1991	1.11%	1.11%	0.01%	-2.29%	-0.13%	-0.13%	-0.01%	-0.01%	-0.67%	-4.20%	0.00%	-10.47%
1992	0.65%	0.65%	0.07%	0.07%	0.05%	0.05%	0.19%	0.19%	-2.52%	-2.72%	0.00%	-10.47%
1993	-0.03%	-0.03%	-0.01%	-0.01%	0.04%	0.04%	1.10%	1.10%	3.76%	3.76%	-0.63%	-0.63%
1994	0.00%	-0.90%	1.09%	1.09%	1.84%	2.06%	3.24%	3.24%	3.04%	3.04%	-1.73%	-4.17%
1995	0.16%	0.16%	0.08%	0.08%	0.00%	0.00%	3.13%	3.63%	-2.77%	-3.37%	-2.62%	-4.13%
1996	0.00%	-4.15%	0.00%	-4.16%	0.00%	-4.17%	0.00%	-11.16%	0.00%	-18.58%	0.00%	-22.18%
1997	0.16%	0.16%	0.40%	0.40%	0.36%	0.36%	0.00%	-4.21%	0.00%	-15.95%	0.00%	-23.32%
1998	2.54%	-0.36%	0.19%	0.19%	0.13%	0.13%	0.07%	0.07%	-0.69%	-4.16%	0.00%	-15.95%
1999	0.00%	-4.25%	0.00%	-6.08%	0.00%	-8.60%	3.08%	3.08%	0.00%	-24.73%	0.00%	-26.70%
2000	0.00%	-14.54%	0.00%	-14.44%	0.00%	-10.37%	0.00%	-24.97%	0.00%	-28.65%	0.00%	-29.41%
2001	0.00%	-5.90%	1.29%	1.01%	1.91%	1.91%	3.15%	2.87%	0.00%	-21.35%	0.00%	-27.89%
2002	0.00%	-22.08%	0.00%	-23.26%	0.00%	-24.72%	0.00%	-27.54%	0.00%	-32.20%	0.00%	-34.42%
2003	0.00%	-25.90%	0.00%	-25.90%	0.36%	0.36%	0.00%	-17.06%	0.00%	-27.19%	0.00%	-33.00%
2004	0.00%	-25.90%	0.00%	-25.90%	0.36%	0.36%	0.00%	-17.06%	0.00%	-27.19%	0.00%	-33.00%
2005	1.23%	1.23%	0.21%	0.21%	0.06%	0.06%	3.07%	3.07%	-0.25%	-4.21%	0.00%	-21.35%
2006	0.00%	-18.99%	0.00%	-18.79%	0.00%	-19.71%	0.00%	-22.76%	0.00%	-27.81%	0.00%	-29.85%
2007	0.00%	-24.05%	0.00%	-20.02%	0.00%	-17.57%	0.00%	-26.17%	0.00%	-30.76%	0.00%	-33.89%
2008	0.10%	0.10%	0.11%	0.11%	0.71%	0.71%	0.00%	-4.09%	-0.15%	-4.20%	0.00%	-13.34%
2009	1.20%	1.20%	1.29%	1.29%	0.71%	3.25%	0.00%	-4.04%				

Year	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965	0.06%	-25.02%	0.00%	-25.97%	0.00%	-25.90%	0.00%	-25.22%	0.40%	-0.67%	0.07%	0.07%
1966	0.00%	-20.02%	0.01%	-4.66%	-0.38%	-12.05%	0.00%	-15.95%	0.00%	-15.04%	0.39%	-6.86%
1967	1.83%	-2.49%	2.27%	1.86%	0.00%	-12.94%	0.00%	-25.40%	0.00%	-21.84%	0.26%	0.26%
1968	0.00%	-6.30%	0.46%	0.44%	0.00%	-5.73%	0.00%	-6.08%	0.00%	-6.08%	0.00%	-4.43%
1969	0.00%	-9.00%	0.00%	-8.71%	0.00%	-13.84%	0.00%	-13.64%	0.00%	-4.79%	0.00%	-4.17%
1970	0.00%	-25.25%	0.85%	-15.61%	1.52%	1.52%	0.00%	-17.36%	0.00%	-6.47%	0.00%	-4.59%
1971	0.91%	-24.45%	0.03%	-7.14%	0.63%	-13.53%	0.81%	0.81%	2.12%	2.12%	2.45%	2.45%
1972	0.00%	-20.02%	0.13%	-17.87%	0.35%	-23.96%	1.13%	-10.58%	0.01%	0.01%	0.76%	0.76%
1973	0.80%	0.80%	-1.12%	-1.20%	-3.42%	-4.07%	-2.07%	-4.15%	-1.81%	-4.11%	0.28%	-3.20%
1974	0.00%	-9.39%	0.06%	-4.94%	-0.43%	-6.83%	1.32%	-1.49%	0.42%	-3.26%	0.00%	-4.17%
1975	0.06%	-4.50%	0.00%	-10.07%	-0.04%	-8.10%	0.00%	-11.45%	0.00%	-12.15%	0.69%	-7.29%
1976	1.77%	-2.51%	-0.39%	-9.53%	0.32%	-14.57%	-1.11%	-4.18%	0.00%	-7.24%	0.00%	-14.94%
1977	-0.45%	-22.02%	1.10%	-17.67%	-1.08%	-3.43%	0.00%	-21.66%	0.00%	-25.41%	0.00%	-25.80%
1978	0.00%	-18.18%	0.00%	-26.17%	0.00%	-29.98%	0.00%	-25.46%	2.10%	2.10%	0.15%	0.15%
1979	-1.64%	-4.33%	-0.54%	-4.16%	-0.37%	-4.20%	-2.94%	-2.94%	-3.82%	-3.82%	-1.52%	-3.80%
1980	-0.21%	-0.21%	-0.25%	-0.25%	0.13%	0.11%	-3.65%	-3.65%	-3.80%	-3.80%	-0.72%	-3.80%
1981	-1.44%	-1.63%	0.06%	-3.77%	-0.81%	-3.37%	-1.18%	-2.76%	-1.58%	-2.10%	1.11%	-1.25%
1982	-0.30%	-5.35%	0.49%	-2.26%	0.66%	-2.32%	0.00%	-10.07%	-0.42%	-0.42%	0.49%	0.49%
1983	-1.93%	-2.71%	0.12%	-0.25%	-0.41%	-1.22%	2.02%	2.02%	2.05%	2.05%	1.03%	1.03%
1984	0.00%	-18.48%	0.25%	-3.16%	1.82%	1.82%	2.51%	2.51%	2.32%	1.41%	-0.11%	-0.11%
1985	-1.19%	-3.83%	-1.04%	-2.02%	-1.30%	-1.66%	-0.02%	-0.02%	0.39%	0.39%	0.61%	0.61%
1986	-0.02%	-3.52%	1.22%	1.22%	0.45%	-0.57%	-2.10%	-2.58%	-2.23%	-2.23%	1.44%	-0.87%
1987	-0.03%	-14.18%	-0.41%	-2.70%	0.00%	-9.11%	-0.03%	-6.15%	-0.07%	-2.55%	0.00%	-4.13%
1988	-0.15%	-2.73%	1.11%	1.11%	1.64%	1.64%	0.00%	-5.08%	0.00%	-8.12%	0.68%	-4.06%
1989	0.00%	-25.10%	0.51%	-13.50%	0.00%	-13.44%	0.00%	-14.54%	0.00%	-14.94%	0.00%	-14.84%
1990	0.00%	-24.86%	0.55%	-14.62%	0.00%	-22.47%	0.00%	-22.72%	0.00%	-15.95%	2.21%	1.64%
1991	0.00%	-15.24%	0.54%	-15.60%	0.00%	-25.90%	0.00%	-25.31%	0.00%	-19.71%	1.70%	1.70%
1992	1.38%	-10.88%	1.71%	0.25%	1.00%	-1.86%	0.00%	-8.90%	0.14%	-4.20%	0.29%	0.29%
1993	-2.26%	-2.26%	0.17%	0.14%	0.97%	0.97%	-1.80%	-1.80%	0.04%	0.04%	3.43%	3.43%
1994	-0.59%	-4.21%	0.29%	-3.54%	-0.13%	-4.22%	0.13%	-3.81%	0.27%	-2.77%	1.82%	0.16%
1995	-0.46%	-4.21%	-0.02%	-4.21%	-1.44%	-3.97%	-0.74%	-4.20%	-0.40%	-4.17%	0.00%	-4.16%
1996	0.40%	-16.77%	0.00%	-19.09%	2.03%	-5.74%	0.00%	-17.46%	0.00%	-12.05%	0.00%	-7.14%
1997	0.00%	-24.54%	0.00%	-24.19%	0.00%	-24.95%	0.00%	-25.08%	0.00%	-17.46%	0.12%	-12.54%
1998	0.00%	-17.06%	0.00%	-20.22%	0.00%	-24.34%	0.00%	-24.75%	0.01%	-13.92%	0.00%	-4.23%
1999	0.62%	-15.28%	0.74%	-2.96%	0.64%	-1.13%	0.00%	-21.04%	0.00%	-21.35%	0.00%	-21.04%
2000	0.00%	-30.81%	0.00%	-29.58%	0.00%	-27.58%	1.18%	1.18%	0.77%	0.77%	0.00%	-6.08%
2001	0.00%	-29.41%	1.32%	-21.58%	0.00%	-26.91%	0.00%	-26.45%	0.00%	-25.54%	0.00%	-23.06%
2002	0.00%	-34.30%	0.00%	-32.10%	0.00%	-31.79%	0.00%	-31.29%	0.00%	-28.73%	0.00%	-25.77%
2003	0.00%	-33.83%	0.00%	-32.20%	0.00%	-30.91%	0.00%	-31.99%	0.00%	-29.93%	0.00%	-25.63%
2004	0.00%	-33.83%	0.00%	-32.20%	0.00%	-30.91%	0.00%	-31.99%	0.00%	-29.93%	0.00%	-25.63%
2005	0.00%	-24.52%	0.45%	-9.92%	0.00%	-22.70%	0.00%	-23.22%	0.00%	-22.28%	0.00%	-18.99%
2006	0.00%	-29.98%	0.00%	-27.39%	0.00%	-28.09%	0.00%	-25.50%	0.00%	-26.07%	0.00%	-24.57%
2007	0.00%	-33.83%	1.53%	-0.06%	0.00%	-29.71%	0.00%	-30.39%	0.00%	-28.81%	0.63%	0.63%
2008	-1.33%	-5.33%	-0.16%	-7.47%	0.00%	-17.36%	0.00%	-14.64%	0.00%	-13.64%	0.50%	0.50%
2009												

Figure 4-49. Habitat summary table for yellow bullhead (*Ameiurus natalis*), Gage site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Gage Site

No Wood

Yellow Bullhead

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-57.14%	0.00%	-51.00%	0.31%	-49.12%	0.00%	-52.17%	0.00%	-52.71%	0.00%	-53.96%	2.25%	-49.54%	0.34%	-1.56%
1966	0.42%	0.42%	7.49%	19.30%	10.28%	13.18%	0.00%	-59.68%	0.00%	-57.04%	0.00%	-56.67%	0.00%	-56.09%	1.59%	-54.81%	0.00%	-56.84%	0.00%	-56.48%	0.00%	-56.56%	2.05%	-51.62%
1967	0.00%	-57.44%	0.00%	-56.76%	0.00%	-56.90%	0.00%	-56.37%	0.00%	-56.48%	0.00%	-56.09%	8.67%	-44.53%	9.22%	-38.11%	0.00%	-56.76%	0.00%	-53.61%	0.00%	-55.83%	1.33%	-17.98%
1968	0.62%	0.62%	-0.96%	-0.96%	2.12%	2.12%	11.53%	-7.50%	-0.63%	-58.28%	-0.04%	-56.97%	-1.05%	-57.43%	3.38%	-55.25%	0.00%	-57.47%	0.00%	-57.41%	0.00%	-57.41%	0.00%	-57.77%
1969	2.09%	-19.40%	7.10%	7.10%	3.15%	3.15%	12.63%	-31.17%	6.34%	-56.11%	0.00%	-57.26%	0.00%	-57.13%	0.00%	-57.17%	0.00%	-56.68%	0.00%	-56.69%	0.00%	-57.65%	0.00%	-58.50%
1970	0.00%	-58.03%	0.00%	-57.27%	0.00%	-57.87%	0.00%	-57.89%	0.00%	-56.97%	0.00%	-55.81%	0.00%	-53.91%	3.81%	-50.17%	1.73%	-40.42%	0.00%	-56.34%	0.00%	-57.37%	0.00%	-57.83%
1971	0.00%	-57.80%	0.00%	-58.11%	0.00%	-57.86%	0.00%	-56.03%	0.00%	-55.78%	0.00%	-51.84%	2.48%	-50.84%	1.11%	-46.95%	1.55%	-45.46%	4.06%	-22.71%	7.37%	-52.99%	11.11%	-38.19%
1972	8.91%	-48.48%	0.00%	-57.53%	0.00%	-56.85%	0.00%	-56.27%	0.00%	-55.89%	0.85%	-55.76%	0.00%	-56.09%	0.65%	-53.50%	0.47%	-50.12%	4.01%	-33.52%	0.62%	-14.74%	4.62%	4.62%
1973	4.24%	4.24%	-0.04%	-0.04%	-1.26%	-1.26%	-0.04%	-0.04%	-0.91%	-0.91%	8.46%	-14.05%	0.58%	-26.58%	1.11%	-55.22%	-3.46%	-59.45%	-2.07%	-58.73%	-1.81%	-59.14%	0.90%	-59.20%
1974	10.24%	-35.20%	0.00%	-58.24%	0.74%	-54.03%	0.00%	-58.62%	-0.13%	-57.72%	0.00%	-57.00%	0.00%	-57.13%	1.80%	-57.10%	-0.43%	-57.59%	5.20%	-50.20%	0.96%	-58.04%	0.00%	-58.47%
1975	0.00%	-58.30%	5.58%	-47.35%	1.99%	1.99%	4.55%	4.55%	-1.41%	-59.32%	0.00%	-57.23%	0.65%	-55.56%	0.00%	-57.03%	-0.04%	-57.31%	0.00%	-56.90%	0.00%	-56.84%	1.36%	-56.68%
1976	-0.04%	-55.79%	1.47%	-18.41%	0.00%	-55.18%	11.25%	-49.17%	-0.15%	-58.09%	0.00%	-56.50%	5.43%	-51.18%	-1.11%	-55.49%	3.09%	-53.10%	-2.35%	-57.25%	0.00%	-57.30%	0.00%	-56.57%
1977	0.00%	-58.34%	0.00%	-57.66%	0.00%	-57.68%	5.12%	-53.67%	0.00%	-56.08%	0.00%	-52.71%	-0.52%	-54.81%	6.21%	-50.72%	0.49%	-55.49%	0.00%	-55.80%	0.00%	-53.61%	0.00%	-52.90%
1978	2.74%	-45.81%	2.65%	2.65%	1.16%	1.16%	-0.45%	-59.96%	-0.11%	-57.96%	0.00%	-56.98%	0.00%	-56.27%	0.00%	-52.22%	0.00%	-45.27%	0.00%	-51.84%	10.71%	-34.79%	0.40%	0.40%
1979	0.91%	0.91%	0.26%	0.26%	0.91%	0.91%	2.15%	2.15%	18.14%	18.14%	-1.06%	-51.55%	-1.81%	-58.64%	-1.04%	-58.57%	-0.52%	-58.21%	-4.55%	-58.28%	-4.72%	-60.35%	-1.60%	-60.38%
1980	4.01%	2.39%	0.77%	0.77%	0.68%	0.68%	7.67%	7.67%	19.41%	17.05%	-5.49%	-26.20%	-3.48%	-32.78%	0.80%	-39.80%	2.32%	-39.72%	-6.03%	-59.32%	-4.80%	-60.38%	-1.60%	-60.38%
1981	0.00%	-60.38%	1.16%	-54.80%	6.43%	-6.28%	1.93%	-53.72%	-0.97%	-58.79%	-0.06%	-57.80%	0.17%	-57.28%	0.91%	-56.92%	0.05%	-54.94%	-1.95%	-55.69%	-1.19%	-56.34%	4.62%	-52.97%
1982	13.84%	-3.91%	2.28%	2.28%	1.82%	1.82%	11.61%	11.61%	-2.05%	-59.57%	-1.26%	-58.30%	-0.30%	-57.77%	2.72%	-54.41%	3.25%	-55.03%	0.00%	-57.03%	-2.51%	-45.14%	2.59%	2.59%
1983	2.06%	2.22%	0.63%	0.63%	-0.63%	-0.63%	-0.05%	-0.05%	16.40%	16.40%	-4.42%	-59.64%	-1.26%	-58.05%	2.81%	-54.08%	3.21%	-42.09%	9.55%	-30.14%	0.10%	-48.91%	6.29%	6.29%
1984	7.26%	7.26%	0.50%	-52.71%	0.00%	-60.38%	0.00%	-59.50%	0.00%	-57.00%	0.00%	-56.33%	0.00%	-56.24%	1.09%	-42.92%	5.66%	-37.08%	9.55%	-33.85%	4.94%	-50.40%	-0.41%	-0.41%
1985	0.13%	0.13%	0.60%	0.60%	-0.24%	-0.24%	9.89%	9.89%	17.61%	-13.55%	-0.95%	-58.17%	-1.46%	-57.59%	-0.70%	-57.36%	-2.18%	-55.45%	-0.46%	-41.13%	2.66%	2.66%	4.34%	4.34%
1986	1.66%	-33.47%	8.44%	8.75%	0.57%	0.57%	16.92%	-4.00%	-2.43%	-59.70%	-1.28%	-58.31%	-0.02%	-57.83%	2.88%	-45.65%	2.29%	-47.93%	-1.88%	-58.53%	-2.50%	-53.24%	6.12%	-49.86%
1987	6.64%	-22.29%	7.36%	10.95%	1.74%	1.74%	5.27%	-50.72%	-0.19%	-58.26%	0.00%	-56.74%	2.20%	-55.50%	2.54%	-55.28%	0.00%	-57.13%	1.18%	-52.87%	0.31%	-54.21%	0.00%	-58.90%
1988	3.03%	-4.88%	2.33%	2.33%	0.00%	-59.03%	9.68%	-41.33%	2.58%	-57.30%	-0.57%	-57.98%	0.85%	-56.47%	5.86%	-29.71%	7.50%	-34.70%	0.00%	-57.56%	0.00%	-57.22%	1.53%	-56.81%
1989	9.13%	-38.85%	6.93%	6.93%	6.20%	-45.47%	6.94%	-51.89%	0.00%	-56.74%	0.00%	-54.78%	0.00%	-53.97%	0.51%	-56.48%	0.00%	-56.71%	0.00%	-56.61%	0.00%	-56.57%	0.00%	-56.58%
1990	0.00%	-57.55%	0.00%	-57.76%	0.00%	-57.68%	0.00%	-57.18%	0.00%	-56.16%	0.00%	-51.71%	0.00%	-53.82%	1.74%	-52.05%	0.00%	-55.57%	0.00%	-55.57%	0.00%	-56.48%	9.76%	-42.79%
1991	6.58%	-25.48%	0.07%	-42.63%	-0.63%	-0.63%	-0.01%	-0.01%	-0.67%	-58.16%	0.00%	-56.99%	0.00%	-56.54%	1.26%	-55.86%	0.00%	-52.71%	0.00%	-53.79%	0.00%	-56.12%	9.47%	-32.16%
1992	3.48%	3.48%	0.84%	0.84%	0.54%	0.54%	0.60%	0.60%	-4.11%	-52.94%	0.00%	-56.99%	4.00%	-49.80%	6.01%	-36.96%	2.17%	-56.69%	0.00%	-57.14%	0.58%	-53.41%	1.97%	-20.19%
1993	-0.49%	-0.49%	-0.05%	-0.05%	0.17%	0.17%	6.29%	6.29%	13.41%	8.95%	-6.95%	-34.88%	-6.38%	-49.76%	1.57%	-47.35%	-0.98%	-48.76%	-3.21%	-48.67%	0.83%	0.83%	17.39%	14.63%
1994	0.00%	-35.06%	6.28%	6.28%	8.89%	12.23%	16.08%	16.20%	9.52%	-53.55%	-1.73%	-58.50%	-0.59%	-58.12%	1.02%	-57.69%	-0.13%	-57.98%	0.23%	-57.75%	1.58%	-57.28%	7.26%	-41.02%
1995	0.67%	0.67%	1.13%	1.13%	0.22%	0.22%	12.99%	11.16%	-3.93%	-57.18%	-2.62%	-58.88%	-0.46%	-58.07%	-0.02%	-58.10%	-1.75%	-58.73%	-0.74%	-58.17%	-0.40%	-58.47%	0.00%	-58.64%
1996	0.00%	-58.73%	0.00%	-58.62%	0.00%	-58.46%	0.00%	-56.93%	0.00%	-56.23%	0.00%	-55.89%	0.84%	-55.98%	0.00%	-56.18%	7.76%	-47.41%	0.00%	-56.33%	0.00%	-56.84%	0.00%	-57.31%
1997	1.30%	-17.69%	2.51%	2.51%	1.39%	1.39%	0.00%	-58.14%	0.00%	-56.48%	0.00%	-55.78%	0.00%	-55.14%	0.00%	-55.22%	0.00%	-54.41%	0.00%	-54.19%	0.00%	-56.33%	0.12%	-56.74%
1998	3.62%	-57.23%	0.50%	0.50%	0.66%	0.66%	0.63%	0.63%	-0.69%	-58.64%	0.00%	-56.48%	0.00%	-56.37%	0.00%	-56.07%	0.00%	-55.45%	0.00%	-54.82%	0.26%	-56.54%	0.00%	-57.95%
1999	0.00%	-57.69%	0.00%	-57.41%	0.00%	-57.17%	17.35%	-41.56%	0.00%	-54.81%	0.00%	-51.26%	3.01%	-48.29%	2.60%	-55.92%	2.58%	-49.12%	0.00%	-56.00%	0.00%	-55.97%	0.00%	-56.00%
2000	0.00%	-56.61%	0.00%	-56.62%	0.00%	-57.00%	0.00%	-54.42%	0.00%	-47.70%	0.00%	-46.32%	0.00%	-43.75%	0.00%	-46.00%	0.00%	-49.65%	7.36%	-26.42%	5.43%	-11.99%	0.00%	-57.41%
2001	0.00%	-57.43%	5.88%	-50.36%	8.81%	6.16%	9.76%	-52.74%	0.00%	-55.97%	0.00%	-49.09%	0.00%	-46.32%	6.17%	-49.34%	0.00%	-50.87%	0.00%	-51.71%	0.00%	-53.38%	0.00%	-55.49%
2002	0.00%	-55.90%	0.00%	-55.60%	0.00%	-54.27%	0.00%	-49.72%	0.00%	-41.22%	0.00%	-37.17%	0.00%	-37.39%	0.00%	-41.40%	0.00%	-41.96%	0.00%	-42.87%	0.00%	-47.55%	0.00%	-52.96%
2003	0.00%	-52.71%	0.00%	-52.71%	1.79%	1.79%	0.00%	-56.37%	0.00%	-50.14%	0.00%	-39.76%	0.00%	-38.23%	0.00%	-41.22%	0.00%	-43.58%	0.00%	-41.59%	0.00%	-45.35%	0.00%	-53.19%
2004	0.00%	-52.71%	0.00%	-52.71%	1.79%	1.79%	0.00%	-56.37%	0.00%	-50.14%	0.00%	-39.76%	0.00%	-38.23%	0.00%	-41.22%	0.00%	-43.58%	0.00%	-41.59%	0.00%	-45.35%	0.00%	-53.19%
2005	6.60%	5.30%	1.24%	1.24%	1.16%	1.16%	13.42%	-27.41%	-0.25%	-58.12%	0.00%	-55.97%	0.00%	-55.05%	1.53%	-54.20%	0.00%	-55.84%	0.00%	-55.79%	0.00%	-55.88%	0.00%	-56.19%
2006	0.00%	-56.19%	0.00%	-56.21%	0.00%	-56.12%	0.00%	-55.59%	0.00%	-49.23%	0.00%	-45.51%	0.00%	-45.27%	0.00%	-49.99%	0.00%	-48.73%	0.00%	-49.73%	0.00%	-52.40%	0.00%	-54.94%
2007	0.00%	-55.71%	0.00%	-56.09%	0.00%	-56.32%	0.00%	-52.22%	0.00%	-43.84%	0.00%	-38.13%	0.00%	-38.23%	8.50%	-28.33%	0.00%	-45.76%	0.00%	-44.52%	0.00%	-47.40%	3.93%	-9.80%
2008	0.52%	0.52%	0.56%	0.56%	5.25%	5.25%	0.00%	-59.29%	-0.15%	-58.24%	0.00%	-56.72%	-1.47%	-53.16%	-0.11%	-56.49%	0.00%	-56.34%	0.00%	-56.60%	0.00%	-56.69%	2.85%	-23.07%
2009	6.76%	6.76%	6.48%	6.48%	4.24%	-18.08%	0.00%	-59.77%																

Figure 4-50. Habitat summary table for yellow bullhead (*Ameiurus natalis*), Gage site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes
Hypothetical Withdrawal 2 cfs

Gage Site
With LWD
Yellow Bullhead

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965									0.00%	-5.25%	0.00%	-14.11%	-0.20%	-12.77%	0.00%	-13.80%	0.00%	-13.84%	0.00%	-13.64%	-0.47%	-1.88%	-0.04%	-0.95%
1966	0.62%	0.62%	0.75%	1.04%	0.18%	0.18%	0.00%	-2.03%	0.00%	-5.35%	0.00%	-7.60%	0.00%	-11.00%	0.00%	-3.03%	0.00%	-6.53%	0.00%	-8.73%	0.00%	-8.22%	0.00%	-5.53%
1967	0.00%	-3.02%	0.00%	-7.03%	0.00%	-6.19%	0.00%	-9.35%	0.00%	-8.73%	0.00%	-11.00%	0.12%	-10.90%	0.02%	-4.42%	0.00%	-7.03%	0.00%	-13.70%	0.00%	-12.00%	0.00%	-7.03%
1968	-1.25%	-1.25%	-1.11%	-1.11%	-0.79%	-0.79%	0.64%	1.07%	-0.31%	-2.06%	-0.02%	-6.15%	0.00%	-3.25%	-0.22%	-1.33%	0.00%	-2.92%	0.00%	-3.12%	0.00%	-3.12%	0.00%	-2.20%
1969	0.64%	0.22%	0.49%	0.65%	0.08%	0.41%	0.61%	0.77%	0.33%	-1.05%	0.00%	-4.02%	0.00%	-4.79%	0.00%	-4.63%	0.00%	-7.54%	0.00%	-7.43%	0.00%	-2.39%	0.00%	-2.05%
1970	0.00%	-2.07%	0.00%	-2.43%	0.00%	-1.06%	0.00%	-2.07%	0.00%	-5.74%	0.00%	-12.39%	0.00%	-13.65%	0.30%	-10.23%	0.00%	-6.14%	0.00%	-9.52%	0.00%	-3.34%	0.00%	-2.28%
1971	0.00%	-2.07%	0.00%	-2.06%	0.00%	-2.39%	0.00%	-11.35%	0.00%	-12.57%	0.00%	-13.98%	0.00%	-13.95%	0.00%	-11.33%	0.11%	-10.73%	-0.93%	-3.21%	0.48%	-2.09%	0.11%	-2.78%
1972	0.25%	-1.63%	0.00%	-2.70%	0.00%	-6.47%	0.00%	-9.98%	0.00%	-11.66%	0.00%	-10.78%	0.00%	-11.00%	-0.09%	-9.62%	0.00%	-13.87%	-0.36%	-8.35%	0.65%	0.65%	0.13%	0.13%
1973	1.92%	1.92%	1.54%	1.54%	-0.13%	-0.13%	-2.03%	-2.03%	1.47%	1.47%	0.53%	0.53%	-0.14%	-0.14%	-0.54%	-0.58%	-1.71%	-2.03%	-1.02%	-2.05%	-0.90%	-2.04%	0.00%	-2.03%
1974	0.55%	0.06%	0.00%	-1.79%	0.10%	0.37%	0.00%	-2.05%	-0.06%	-2.12%	0.00%	-5.58%	0.00%	-5.02%	-0.07%	-2.73%	-0.21%	-3.57%	0.00%	-4.85%	0.00%	-2.06%	0.00%	-2.06%
1975	0.00%	-2.06%	0.16%	0.50%	0.64%	1.06%	1.34%	1.46%	-0.70%	-2.03%	0.00%	-4.18%	-0.37%	-3.77%	0.00%	-5.41%	-0.02%	-4.29%	0.00%	-6.19%	0.00%	-6.58%	0.00%	-4.55%
1976	0.00%	-2.26%	0.36%	0.64%	0.00%	-0.73%	0.44%	-0.02%	-0.07%	-2.11%	0.00%	-8.62%	0.76%	-3.81%	-0.16%	-5.72%	0.11%	-10.40%	0.00%	-2.41%	0.00%	-3.79%	0.00%	-8.16%
1977	0.00%	-2.06%	0.00%	-2.50%	0.00%	-2.07%	0.13%	-3.66%	0.00%	-11.06%	0.00%	-13.84%	-0.21%	-11.93%	-0.22%	-12.35%	-0.50%	-3.05%	0.00%	-11.90%	0.00%	-13.70%	0.00%	-13.81%
1978	0.00%	-6.47%	-0.10%	-0.10%	0.03%	0.24%	0.00%	-1.99%	-0.05%	-2.17%	0.00%	-5.69%	0.00%	-9.98%	0.00%	-13.92%	0.00%	-14.93%	0.00%	-13.48%	1.25%	-4.42%	0.33%	0.33%
1979	1.50%	1.50%	-1.57%	-1.57%	-1.15%	-1.15%	0.52%	0.52%	1.35%	1.35%	0.01%	0.01%	-0.81%	-2.16%	-0.26%	-2.05%	-0.18%	-2.06%	-1.69%	-1.69%	-1.94%	-1.94%	-0.77%	-1.93%
1980	-0.54%	-1.10%	-1.00%	-1.00%	-1.57%	-1.57%	-0.69%	-0.69%	1.07%	1.07%	0.08%	0.08%	-0.21%	-0.21%	-0.61%	-0.62%	-0.74%	-0.75%	-1.86%	-1.86%	-1.93%	-1.93%	-0.37%	-1.93%
1981	0.00%	-1.93%	0.10%	-0.56%	1.09%	1.34%	0.02%	-1.48%	-0.48%	-2.05%	-0.03%	-2.07%	-1.03%	-1.23%	0.27%	-1.58%	-0.68%	-1.88%	-0.88%	-1.62%	-1.07%	-1.32%	0.15%	-0.94%
1982	0.63%	0.65%	-0.29%	-0.29%	0.58%	0.70%	0.12%	0.12%	-1.02%	-2.03%	-0.62%	-2.06%	-0.15%	-2.71%	-0.07%	-1.34%	-0.02%	-1.41%	0.00%	-5.41%	-0.14%	-0.40%	0.47%	0.47%
1983	0.79%	0.79%	-0.93%	-0.93%	-0.83%	-0.83%	0.95%	0.95%	1.68%	1.68%	-1.83%	-2.03%	-1.19%	-1.57%	0.02%	-0.15%	-0.31%	-1.39%	0.86%	0.86%	-0.25%	-0.25%	0.62%	0.62%
1984	0.47%	0.47%	0.00%	-1.43%	0.00%	-1.95%	0.00%	-2.03%	0.00%	-5.58%	0.00%	-9.58%	0.00%	-10.15%	-0.53%	-2.07%	-0.54%	-1.69%	1.00%	1.00%	0.77%	-0.88%	0.47%	0.47%
1985	1.59%	1.59%	-1.38%	-1.38%	-0.66%	-0.66%	-0.78%	-0.78%	0.97%	0.97%	-0.46%	-2.06%	-0.18%	-2.12%	-0.70%	-1.18%	-1.23%	-1.43%	-0.12%	-0.12%	0.07%	0.07%	0.66%	0.66%
1986	0.65%	0.10%	0.66%	0.87%	1.39%	1.39%	1.70%	1.70%	-0.68%	-2.02%	-0.63%	-2.06%	-0.44%	-2.16%	-0.90%	-1.81%	-0.43%	-6.71%	-1.37%	-1.84%	-0.99%	-0.99%	0.76%	-0.37%
1987	-0.10%	-0.04%	-0.08%	0.00%	0.70%	0.70%	0.73%	0.99%	-0.09%	-2.06%	0.00%	-7.15%	0.03%	-8.37%	0.07%	-1.77%	0.00%	-4.86%	0.00%	-7.49%	-0.39%	-2.01%	0.00%	-2.04%
1988	0.68%	0.68%	1.07%	1.07%	0.00%	-1.60%	0.44%	0.38%	-0.56%	-2.05%	-0.28%	-2.12%	-0.09%	-2.76%	-0.26%	-0.86%	0.00%	-2.12%	0.00%	-2.56%	0.00%	-4.29%	0.00%	-2.79%
1989	0.31%	-1.14%	0.38%	0.38%	-0.20%	-0.97%	0.43%	0.42%	0.00%	-7.15%	0.00%	-13.26%	0.00%	-13.58%	0.00%	-7.60%	0.00%	-7.32%	0.00%	-7.94%	0.00%	-8.16%	0.00%	-8.11%
1990	0.00%	-2.48%	0.00%	-2.12%	0.00%	-2.27%	0.00%	-4.80%	0.00%	-10.61%	0.00%	-14.00%	0.00%	-13.43%	0.35%	-8.47%	0.00%	-12.32%	0.00%	-12.46%	0.00%	-8.73%	0.11%	-4.51%
1991	0.56%	0.56%	0.00%	-2.05%	0.54%	0.66%	0.43%	0.43%	-0.33%	-2.06%	0.00%	-5.63%	0.00%	-8.33%	0.00%	-9.13%	0.00%	-13.84%	0.00%	-13.67%	0.00%	-10.83%	0.65%	-2.86%
1992	-1.32%	-1.32%	0.59%	0.59%	0.02%	0.02%	0.97%	0.97%	-1.33%	-1.43%	0.00%	-5.63%	-0.25%	-6.94%	0.19%	-0.73%	0.00%	-2.07%	0.00%	-4.74%	-0.09%	-3.88%	1.01%	0.27%
1993	-0.94%	-0.94%	-1.23%	-1.23%	-1.67%	-1.67%	0.55%	0.55%	0.75%	0.75%	-0.61%	-0.61%	-1.22%	-1.22%	-0.59%	-0.60%	-0.15%	-0.15%	-0.97%	-0.97%	0.54%	0.54%	0.78%	0.78%
1994	0.00%	-0.61%	0.59%	0.59%	1.38%	1.38%	0.50%	0.50%	0.78%	0.78%	-0.85%	-2.05%	-0.29%	-2.06%	0.10%	-1.86%	-0.06%	-2.07%	-0.10%	-2.07%	0.02%	-1.56%	0.47%	0.47%
1995	0.14%	0.14%	-0.18%	-0.18%	0.73%	0.73%	0.77%	0.93%	-1.43%	-1.73%	-1.30%	-2.05%	-0.23%	-2.06%	-0.01%	-2.06%	-0.72%	-1.97%	-0.36%	-2.06%	-0.20%	-2.05%	0.00%	-2.05%
1996	0.00%	-2.05%	0.00%	-2.05%	0.00%	-2.06%	0.00%	-6.02%	0.00%	-10.21%	0.00%	-12.21%	0.00%	-9.58%	0.00%	-10.49%	0.26%	-4.67%	0.00%	-9.58%	0.00%	-6.53%	0.00%	-3.73%
1997	-0.18%	-2.21%	0.33%	0.35%	-0.11%	0.25%	0.00%	-2.06%	0.00%	-8.73%	0.00%	-12.84%	0.00%	-13.44%	0.00%	-13.25%	0.00%	-13.56%	0.00%	-13.60%	0.00%	-9.58%	0.00%	-6.87%
1998	0.21%	-1.73%	0.13%	-1.13%	0.02%	0.02%	0.45%	0.45%	-0.34%	-2.05%	0.00%	-8.73%	0.00%	-9.35%	0.00%	-11.12%	0.00%	-13.37%	0.00%	-13.51%	0.00%	-7.71%	0.00%	-2.07%
1999	0.00%	-2.07%	0.00%	-3.12%	0.00%	-4.57%	1.34%	1.34%	0.00%	-13.50%	0.00%	-14.07%	-0.21%	-12.29%	-0.04%	-3.30%	-0.04%	-2.10%	0.00%	-11.58%	0.00%	-11.75%	0.00%	-11.58%
2000	0.00%	-7.94%	0.00%	-7.88%	0.00%	-5.58%	0.00%	-13.57%	0.00%	-14.59%	0.00%	-14.78%	0.00%	-15.13%	0.00%	-14.83%	0.00%	-14.31%	0.00%	-14.22%	0.45%	0.45%	0.00%	-3.12%
2001	0.00%	-3.02%	0.79%	0.58%	1.36%	1.42%	0.78%	0.34%	0.00%	-11.75%	0.00%	-14.39%	0.00%	-14.78%	0.00%	-13.91%	0.00%	-14.13%	0.00%	-14.00%	0.00%	-13.74%	0.00%	-12.65%
2002	0.00%	-12.15%	0.00%	-12.78%	0.00%	-13.41%	0.00%	-14.30%	0.00%	-15.46%	0.00%	-15.95%	0.00%	-15.93%	0.00%	-15.43%	0.00%	-15.36%	0.00%	-15.25%	0.00%	-14.61%	0.00%	-13.80%
2003	0.00%	-13.84%	0.00%	-13.84%	0.29%	0.71%	0.00%	-9.35%	0.00%	-14.17%	0.00%	-15.64%	0.00%	-15.83%	0.00%	-15.46%	0.00%	-15.15%	0.00%	-15.41%	0.00%	-14.92%	0.00%	-13.76%
2004	0.00%	-13.84%	0.00%	-13.84%	0.29%	0.71%	0.00%	-9.35%	0.00%	-14.17%	0.00%	-15.64%	0.00%	-15.83%	0.00%	-15.46%	0.00%	-15.15%	0.00%	-15.41%	0.00%	-14.92%	0.00%	-13.76%
2005	0.76%	0.76%	-0.38%	-0.38%	0.89%	0.89%	0.54%	0.54%	-0.12%	-2.06%	0.00%	-11.75%	0.00%	-13.41%	-0.05%	-7.27%	0.00%	-12.49%	0.00%	-12.78%	0.00%	-12.26%	0.00%	-10.43%
2006	0.00%	-10.43%	0.00%	-10.32%	0.00%	-10.83%	0.00%	-12.49%	0.00%	-14.37%	0.00%	-14.89%	0.00%	-14.93%	0.00%	-14.26%	0.00%	-14.44%	0.00%	-13.21%	0.00%	-13.89%	0.00%	-13.42%
2007	0.00%	-13.24%	0.00%	-11.00%	0.00%	-9.64%	0.00%	-13.92%	0.00%	-15.12%	0.00%	-15.84%	0.00%	-15.83%	0.00%	-14.47%	0.00%	-14.86%	0.00%	-15.03%	0.00%	-14.63%	0.65%	0.65%
2008	1.25%	1.25%	-0.83%	-0.83%	0.51%	0.85%	0.00%	-2.03%	-0.07%	-2.06%	0.00%	-7.26%	-1.19%	-5.83%	-0.11%	-4.10%	0.00%	-9.52%	0.00%	-7.99%	0.00%	-7.43%	0.00%	-2.43%
2009	0.24%	0.24%	0.05%	0.05%	0.14%	0.60%	0.00%	-2.02%																

Figure 4-51. Habitat summary table for yellow bullhead (*Ameiurus natalis*), Gage site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Gage Site

With LWD

Yellow Bullhead

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-31.76%	0.00%	-26.80%	-0.98%	-27.49%	0.00%	-27.73%	0.00%	-28.17%	0.00%	-29.20%	-0.27%	-32.09%	0.57%	-26.44%
1966	1.58%	1.58%	1.91%	4.01%	2.66%	3.40%	0.00%	-33.78%	0.00%	-31.68%	0.00%	-31.40%	0.00%	-30.96%	0.00%	-32.05%	0.00%	-31.53%	0.00%	-31.25%	0.00%	-31.32%	0.00%	-31.76%
1967	0.00%	-32.00%	0.00%	-31.47%	0.00%	-31.58%	0.00%	-31.17%	0.00%	-31.25%	0.00%	-30.96%	0.12%	-30.88%	-0.04%	-31.01%	0.00%	-31.47%	0.00%	-28.90%	0.00%	-30.75%	0.00%	-31.47%
1968	-6.99%	-6.99%	-5.41%	-5.41%	-4.19%	-3.84%	2.60%	-9.89%	-0.31%	-32.65%	-0.02%	-31.63%	-0.49%	-31.99%	-0.67%	-32.15%	0.00%	-32.02%	0.00%	-31.97%	0.00%	-31.97%	0.00%	-32.25%
1969	2.38%	-31.64%	-0.23%	-0.23%	0.11%	2.56%	3.19%	-20.90%	0.33%	-32.79%	0.00%	-31.85%	0.00%	-31.75%	0.00%	-31.78%	0.00%	-31.40%	0.00%	-31.42%	0.00%	-32.16%	0.00%	-32.83%
1970	0.00%	-32.45%	0.00%	-32.21%	0.00%	-32.91%	0.00%	-32.34%	0.00%	-31.63%	0.00%	-30.74%	0.00%	-29.15%	1.17%	-28.17%	0.00%	-31.58%	0.00%	-31.15%	0.00%	-31.94%	0.00%	-32.30%
1971	0.00%	-32.28%	0.00%	-32.52%	0.00%	-32.32%	0.00%	-30.92%	0.00%	-30.72%	0.00%	-27.47%	0.00%	-27.62%	0.00%	-29.85%	0.31%	-30.75%	-1.28%	-32.52%	1.19%	-31.16%	0.19%	-31.91%
1972	1.21%	-31.23%	0.00%	-32.07%	0.00%	-31.54%	0.00%	-31.09%	0.00%	-30.80%	0.00%	-30.99%	0.00%	-30.96%	-0.45%	-29.48%	0.00%	-28.02%	-1.59%	-23.63%	3.25%	-21.72%	1.61%	1.61%
1973	4.48%	4.48%	3.91%	5.04%	-0.60%	-0.60%	-12.25%	-12.25%	6.09%	6.09%	-0.37%	-11.69%	-1.97%	-17.90%	-0.28%	-31.74%	-1.73%	-33.59%	-1.02%	-33.01%	-0.90%	-33.34%	0.00%	-33.69%
1974	1.84%	-23.05%	0.00%	-33.14%	0.26%	-31.66%	0.00%	-32.92%	-0.06%	-32.21%	0.00%	-31.65%	0.00%	-31.75%	-0.07%	-32.51%	-0.21%	-32.11%	0.00%	-31.75%	0.00%	-32.78%	0.00%	-32.80%
1975	0.00%	-32.67%	0.98%	-28.34%	1.46%	2.81%	5.95%	6.39%	-0.70%	-33.49%	0.00%	-31.83%	-1.01%	-31.87%	0.00%	-31.68%	-0.02%	-31.89%	0.00%	-31.58%	0.00%	-31.53%	0.00%	-31.85%
1976	0.00%	-32.11%	2.21%	-16.10%	0.00%	-32.29%	1.35%	-30.32%	-0.07%	-32.50%	0.00%	-31.27%	3.15%	-28.78%	0.78%	-30.84%	0.09%	-30.49%	-1.06%	-32.07%	0.00%	-31.88%	0.00%	-31.32%
1977	0.00%	-32.70%	0.00%	-32.17%	0.00%	-32.18%	0.58%	-31.37%	0.00%	-30.95%	0.00%	-28.17%	-0.25%	-29.85%	-0.25%	-29.04%	-0.71%	-31.69%	0.00%	-30.73%	0.00%	-28.91%	0.00%	-28.32%
1978	0.00%	-31.54%	-0.74%	-4.79%	0.35%	-4.36%	-0.21%	-34.02%	-0.05%	-32.40%	0.00%	-31.64%	0.00%	-31.09%	0.00%	-27.77%	0.00%	-22.54%	0.00%	-27.46%	4.88%	-26.74%	3.78%	3.78%
1979	8.00%	8.00%	-7.44%	-7.44%	-2.74%	-2.74%	1.28%	1.28%	6.85%	6.85%	-1.71%	-29.67%	-0.89%	-32.94%	-0.51%	-32.89%	-0.25%	-32.60%	-3.04%	-33.20%	-2.39%	-34.34%	-0.81%	-34.37%
1980	-0.29%	-25.98%	-2.84%	-2.84%	-6.70%	-6.70%	-2.74%	-2.74%	3.07%	2.06%	-3.38%	-14.99%	-1.46%	-18.82%	-0.69%	-22.62%	-1.44%	-24.80%	-3.06%	-33.76%	-2.43%	-34.37%	-0.81%	-34.37%
1981	0.00%	-34.37%	0.42%	-31.85%	3.30%	-9.66%	-0.11%	-31.00%	-0.48%	-33.06%	-0.03%	-32.27%	-1.00%	-33.01%	0.80%	-31.75%	-0.67%	-30.75%	-1.65%	-31.32%	-1.41%	-32.63%	0.24%	-32.33%
1982	1.47%	-8.44%	-1.97%	-1.97%	0.08%	0.08%	1.59%	-3.63%	-1.02%	-33.69%	-0.62%	-32.67%	-0.15%	-32.25%	0.53%	-30.92%	0.40%	-31.19%	0.00%	-31.68%	2.21%	-29.22%	2.74%	2.74%
1983	4.18%	4.18%	-3.06%	-3.06%	-4.97%	-4.97%	-0.88%	-0.88%	8.08%	7.18%	-2.21%	-33.75%	-1.06%	-33.05%	2.26%	-30.13%	-0.44%	-32.21%	1.27%	-28.16%	0.40%	-32.29%	3.36%	3.36%
1984	4.55%	4.55%	0.00%	-30.09%	0.00%	-34.36%	0.00%	-33.63%	0.00%	-31.65%	0.00%	-31.14%	0.00%	-31.07%	-2.00%	-26.07%	-0.54%	-32.90%	4.25%	-27.27%	0.40%	-32.47%	0.70%	0.09%
1985	4.72%	4.72%	-5.34%	-5.34%	-3.17%	-3.17%	-1.13%	-1.13%	5.15%	-12.55%	-0.46%	-32.56%	-0.34%	-32.28%	-0.39%	-32.45%	-3.21%	-32.69%	-2.91%	-28.43%	-1.73%	-18.61%	3.66%	3.66%
1986	0.45%	-19.21%	1.78%	-7.05%	4.71%	4.71%	6.53%	-8.42%	-1.21%	-33.80%	-0.63%	-32.68%	-0.44%	-32.59%	-1.08%	-32.27%	-1.14%	-31.33%	-1.44%	-33.30%	-1.03%	-30.16%	1.97%	-28.80%
1987	0.25%	-17.76%	0.47%	0.62%	2.67%	3.88%	1.77%	-29.91%	-0.09%	-32.64%	0.00%	-31.45%	0.45%	-30.93%	1.68%	-30.95%	0.00%	-31.75%	-0.56%	-31.41%	-1.88%	-32.98%	0.00%	-33.15%
1988	4.28%	-16.48%	4.43%	4.76%	0.00%	-33.84%	1.24%	-31.97%	-0.56%	-33.10%	-0.28%	-32.42%	-0.40%	-32.18%	-0.14%	-31.99%	-0.41%	-32.26%	0.00%	-32.09%	0.00%	-31.82%	0.00%	-32.01%
1989	1.28%	-25.43%	1.48%	1.48%	-0.32%	-27.79%	1.55%	-30.11%	0.00%	-31.45%	0.00%	-29.88%	0.00%	-29.20%	0.00%	-31.43%	0.00%	-31.43%	0.00%	-31.35%	0.00%	-31.32%	0.00%	-31.33%
1990	0.00%	-32.08%	0.00%	-32.24%	0.00%	-32.18%	0.00%	-31.79%	0.00%	-31.01%	0.00%	-27.37%	0.00%	-29.08%	2.55%	-28.19%	0.00%	-30.53%	0.00%	-30.54%	0.00%	-31.25%	0.29%	-31.55%
1991	2.91%	-28.89%	0.00%	-32.89%	2.56%	4.15%	2.99%	-0.70%	-0.33%	-32.56%	0.00%	-31.65%	0.00%	-31.30%	0.00%	-31.20%	0.00%	-28.17%	0.00%	-29.05%	0.00%	-30.98%	3.61%	-29.27%
1992	-2.42%	-2.42%	3.83%	4.01%	3.87%	3.87%	3.44%	-2.38%	-2.14%	-30.09%	0.00%	-31.65%	-0.89%	-29.78%	-0.02%	-29.73%	0.00%	-32.23%	0.00%	-31.76%	-0.11%	-31.05%	1.10%	-21.61%
1993	-5.06%	-5.06%	-6.47%	-6.47%	-7.15%	-7.15%	4.58%	4.58%	1.47%	-0.50%	-3.84%	-19.78%	-3.31%	-28.27%	-2.10%	-28.97%	-2.89%	-29.48%	-2.70%	-29.70%	3.62%	-21.55%	4.91%	0.96%
1994	0.00%	-19.78%	6.85%	-2.45%	6.20%	7.02%	3.36%	3.13%	1.17%	-31.65%	-0.85%	-32.83%	-0.29%	-32.53%	0.00%	-32.52%	-0.06%	-32.42%	-0.10%	-32.38%	0.45%	-32.34%	1.47%	-20.33%
1995	2.66%	2.66%	2.75%	2.75%	3.40%	3.75%	2.94%	-0.64%	-2.01%	-32.53%	-1.30%	-33.13%	-0.23%	-32.49%	-0.01%	-32.51%	-0.87%	-33.01%	-0.36%	-32.56%	-0.20%	-32.81%	0.00%	-32.94%
1996	0.00%	-33.01%	0.00%	-32.92%	0.00%	-32.79%	0.00%	-31.60%	0.00%	-31.06%	0.00%	-30.81%	0.00%	-31.16%	0.00%	-31.03%	1.27%	-29.62%	0.00%	-31.14%	0.00%	-31.53%	0.00%	-31.89%
1997	-0.59%	-31.61%	1.10%	2.49%	0.54%	-5.03%	0.00%	-32.54%	0.00%	-31.25%	0.00%	-30.73%	0.00%	-30.19%	0.00%	-30.25%	0.00%	-29.58%	0.00%	-29.39%	0.00%	-31.14%	0.00%	-31.49%
1998	0.21%	-33.13%	0.94%	-26.20%	-1.45%	-1.45%	1.17%	1.17%	-0.34%	-32.94%	0.00%	-31.25%	0.00%	-31.17%	0.00%	-30.95%	0.00%	-30.45%	0.00%	-29.92%	0.00%	-31.38%	0.00%	-32.39%
1999	0.00%	-32.19%	0.00%	-31.97%	0.00%	-31.78%	5.62%	-26.11%	0.00%	-29.91%	0.00%	-27.01%	-0.32%	-28.33%	0.23%	-31.97%	0.26%	-29.46%	0.00%	-30.89%	0.00%	-30.87%	0.00%	-30.89%
2000	0.00%	-31.35%	0.00%	-31.36%	0.00%	-31.65%	0.00%	-29.58%	0.00%	-24.29%	0.00%	-23.29%	0.00%	-21.49%	0.00%	-23.06%	0.00%	-25.76%	0.00%	-26.23%	3.35%	-23.00%	0.00%	-31.97%
2001	0.00%	-31.99%	2.80%	-29.37%	4.10%	-14.33%	2.84%	-30.53%	0.00%	-30.87%	0.00%	-25.33%	0.00%	-23.29%	0.00%	-27.82%	0.00%	-26.70%	0.00%	-27.37%	0.00%	-28.71%	0.00%	-30.47%
2002	0.00%	-30.82%	0.00%	-30.57%	0.00%	-29.45%	0.00%	-25.81%	0.00%	-19.79%	0.00%	-17.23%	0.00%	-17.36%	0.00%	-19.91%	0.00%	-20.28%	0.00%	-20.89%	0.00%	-24.18%	0.00%	-28.37%
2003	0.00%	-28.17%	0.00%	-28.17%	1.44%	-7.52%	0.00%	-31.17%	0.00%	-26.13%	0.00%	-18.85%	0.00%	-17.88%	0.00%	-19.79%	0.00%	-21.37%	0.00%	-20.03%	0.00%	-22.60%	0.00%	-28.56%
2004	0.00%	-28.17%	0.00%	-28.17%	1.44%	-7.52%	0.00%	-31.17%	0.00%	-26.13%	0.00%	-18.85%	0.00%	-17.88%	0.00%	-19.79%	0.00%	-21.37%	0.00%	-20.03%	0.00%	-22.60%	0.00%	-28.56%
2005	0.57%	0.57%	-1.49%	-1.40%	2.89%	3.48%	2.64%	-21.67%	-0.12%	-32.53%	0.00%	-30.87%	0.00%	-30.11%	0.21%	-30.80%	0.00%	-30.77%	0.00%	-30.74%	0.00%	-30.80%	0.00%	-31.04%
2006	0.00%	-31.04%	0.00%	-31.05%	0.00%	-30.98%	0.00%	-30.56%	0.00%	-25.44%	0.00%	-22.71%	0.00%	-22.54%	0.00%	-26.02%	0.00%	-25.06%	0.00%	-25.80%	0.00%	-27.92%	0.00%	-30.01%
2007	0.00%	-30.68%	0.00%	-30.96%	0.00%	-31.14%	0.00%	-27.77%	0.00%	-21.55%	0.00%	-17.82%	0.00%	-17.88%	0.00%	-24.90%	0.00%	-22.89%	0.00%	-22.02%	0.00%	-24.07%	3.35%	-17.23%
2008	4.15%	4.15%	-1.81%	-1.81%	1.92%	-5.98%	0.00%	-33.46%	-0.07%	-32.62%	0.00%	-31.44%	-3.07%	-31.42%	-0.16%	-31.58%	0.00%	-31.15%	0.00%	-31.35%	0.00%	-31.42%	0.00%	-32.07%
2009	1.38%	1.38%	1.77%	1.77%	0.56%	-15.78%	0.00%	-33.86%																

Figure 4-52. Habitat summary table for yellow bullhead (*Ameiurus natalis*), Gage site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Braided Site

No Wood

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Yellow Bullhead

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965									0.81%	-23.29%	-2.53%	-33.37%	4.75%	-21.43%	7.64%	-28.14%	0.00%	-33.34%	0.47%	-31.04%	-3.03%	-5.86%	0.43%	0.43%
1966	-0.94%	-0.94%	-0.31%	-1.34%	0.41%	2.09%	-1.08%	0.25%	0.00%	-18.23%	-0.92%	-19.64%	0.00%	-23.94%	5.78%	-9.68%	0.00%	-25.39%	0.00%	-18.48%	0.00%	-16.46%	-1.66%	-11.59%
1967	0.00%	-12.91%	0.00%	-21.52%	-0.75%	-19.87%	-0.84%	-20.66%	0.00%	-18.48%	0.00%	-23.94%	0.00%	-23.94%	0.97%	-5.64%	-5.10%	-18.25%	-6.66%	-31.59%	0.00%	-27.54%	-0.70%	-0.09%
1968	0.18%	0.18%	-0.23%	-0.23%	2.50%	2.50%	-6.60%	-8.34%	3.46%	-9.17%	0.65%	-36.02%	0.00%	-13.72%	0.05%	-12.84%	0.00%	-18.33%	0.00%	-19.69%	-0.05%	-13.93%	0.00%	-12.22%
1969	0.66%	-0.06%	8.33%	8.33%	4.26%	4.26%	-2.47%	-11.87%	2.90%	-5.25%	0.00%	-15.65%	0.00%	-17.15%	0.49%	-16.29%	0.86%	-18.54%	0.85%	-19.00%	-0.88%	-11.30%	0.00%	-8.58%
1970	0.00%	-12.61%	0.00%	-12.07%	0.00%	-4.04%	0.00%	-12.39%	0.00%	-24.33%	0.00%	-27.52%	-0.36%	-32.51%	0.84%	-17.66%	-0.70%	-0.96%	0.00%	-20.39%	0.00%	-12.67%	0.00%	-12.16%
1971	0.00%	-12.27%	0.00%	-12.72%	0.00%	-13.05%	0.00%	-24.77%	0.00%	-27.86%	-1.30%	-32.82%	0.00%	-32.66%	7.94%	-23.33%	-1.45%	-16.46%	-3.23%	-9.88%	0.00%	-13.00%	-3.03%	-3.98%
1972	0.00%	-12.76%	0.00%	-17.01%	-0.82%	-19.11%	0.00%	-21.48%	0.00%	-25.96%	0.00%	-27.93%	0.00%	-23.94%	0.00%	-23.94%	0.00%	-28.30%	-1.00%	-3.77%	-0.03%	-0.03%	0.42%	0.42%
1973	1.05%	1.05%	-0.04%	-0.04%	-0.10%	-0.10%	0.07%	0.07%	0.37%	0.11%	-0.69%	-10.60%	-8.69%	-9.66%	9.98%	9.89%	6.88%	-4.50%	-2.77%	-13.65%	-0.29%	-4.20%	1.87%	1.96%
1974	0.14%	-2.15%	0.00%	-0.56%	0.00%	7.77%	0.00%	-8.49%	-0.17%	-11.83%	0.00%	-33.64%	0.00%	-16.31%	1.02%	-11.01%	-0.57%	-11.69%	3.53%	-11.64%	-0.30%	-10.73%	-0.25%	-10.17%
1975	0.00%	-12.82%	0.00%	-5.57%	-0.20%	-1.03%	3.37%	3.37%	4.03%	-3.37%	0.00%	-15.70%	-0.03%	-14.47%	0.00%	-23.67%	-0.06%	-20.32%	0.00%	-19.87%	0.00%	-20.64%	0.00%	-14.99%
1976	-4.57%	-7.01%	-2.32%	0.79%	0.00%	-1.94%	0.11%	-5.55%	0.96%	-10.99%	0.00%	-18.24%	-0.59%	-23.87%	0.60%	-21.60%	0.01%	-23.94%	0.00%	-12.64%	0.00%	-15.21%	0.00%	-17.13%
1977	0.00%	-7.06%	0.00%	-11.96%	0.00%	-12.08%	0.00%	-16.23%	0.00%	-24.08%	0.00%	-32.08%	0.00%	-31.98%	-2.63%	-37.67%	1.60%	-15.39%	0.00%	-27.63%	-0.86%	-31.92%	0.00%	-31.93%
1978	-3.33%	-4.25%	0.08%	0.60%	0.40%	0.40%	0.00%	-1.80%	-0.14%	-12.28%	0.00%	-18.88%	0.00%	-21.48%	0.00%	-32.50%	0.00%	-38.58%	-0.25%	-32.30%	-1.38%	-20.31%	-5.68%	-5.89%
1979	-0.20%	-0.44%	0.67%	0.67%	0.20%	0.20%	0.03%	0.03%	0.63%	-0.01%	-1.95%	-3.42%	0.55%	-10.89%	-0.72%	-11.06%	2.93%	-9.89%	9.01%	3.66%	4.99%	9.83%	0.00%	2.93%
1980	-2.87%	0.91%	0.50%	0.50%	0.69%	0.08%	-3.23%	4.46%	-4.06%	-4.73%	-1.06%	-12.24%	-13.78%	-14.33%	-2.58%	-4.74%	-7.21%	-7.21%	9.75%	9.75%	6.51%	9.98%	0.00%	9.76%
1981	0.00%	8.14%	0.00%	8.44%	-0.08%	-9.06%	-1.55%	-3.43%	-1.30%	-10.29%	-0.38%	-12.24%	-1.63%	-9.01%	0.16%	-10.37%	-1.56%	-13.48%	3.01%	2.75%	-4.35%	-5.30%	-2.15%	-2.92%
1982	-1.89%	-4.14%	-1.56%	-7.53%	0.00%	-0.07%	1.09%	-0.28%	0.39%	-4.22%	-1.68%	-13.01%	-0.03%	-18.16%	0.22%	-10.86%	-2.14%	-13.07%	0.00%	-18.34%	-6.94%	-2.64%	-3.55%	0.94%
1983	0.11%	-4.99%	0.15%	0.15%	0.12%	0.12%	0.28%	0.28%	-2.95%	-3.58%	2.75%	-4.43%	0.12%	-10.20%	1.08%	-6.53%	-2.02%	-0.66%	-1.31%	4.38%	-4.89%	-2.75%	-7.58%	-2.35%
1984	-0.90%	1.01%	-2.56%	1.78%	0.00%	8.03%	-1.06%	0.22%	0.00%	-22.24%	0.00%	-29.47%	0.00%	-26.53%	0.50%	-3.95%	-5.00%	-0.40%	-4.06%	2.02%	-0.04%	-4.30%	0.17%	0.17%
1985	0.47%	0.47%	0.96%	0.73%	0.55%	0.55%	12.62%	14.53%	-12.63%	-13.77%	-5.94%	-12.82%	-0.88%	-12.19%	-1.42%	-6.77%	-1.93%	-5.81%	-1.51%	-2.85%	0.24%	-1.26%	2.01%	2.01%
1986	-0.23%	-10.29%	-5.25%	0.93%	0.20%	0.20%	-2.87%	-7.45%	5.75%	0.50%	-1.71%	-13.03%	-1.23%	-10.22%	1.73%	-5.18%	0.82%	-18.78%	-4.14%	-14.42%	-0.73%	-2.50%	-10.20%	-4.99%
1987	-0.54%	-4.31%	3.27%	3.42%	0.51%	0.34%	1.32%	0.55%	0.02%	-9.52%	-0.85%	-17.11%	0.00%	-18.62%	-0.62%	-12.69%	0.00%	-15.62%	0.85%	-25.89%	-0.43%	-3.85%	-7.56%	-4.91%
1988	1.95%	1.09%	1.26%	0.39%	-1.06%	-0.63%	-0.08%	-2.14%	-1.46%	-10.39%	-0.77%	-12.53%	-0.26%	-12.61%	0.79%	0.37%	0.72%	0.27%	-0.37%	-17.51%	0.00%	-26.84%	0.00%	-11.70%
1989	0.12%	-8.06%	0.20%	0.20%	3.20%	-0.38%	-0.82%	-4.24%	-0.83%	-19.80%	-0.83%	-30.35%	0.69%	-32.30%	-0.13%	-25.64%	0.82%	-28.06%	-0.88%	-23.20%	0.00%	-17.13%	0.00%	-16.99%
1990	0.00%	-11.21%	0.00%	-11.77%	0.00%	-11.51%	0.00%	-17.05%	0.08%	-22.08%	0.00%	-32.93%	0.00%	-32.69%	-0.29%	-31.04%	0.95%	-30.78%	0.00%	-28.08%	0.01%	-22.00%	-6.40%	-15.64%
1991	-6.55%	-5.13%	-3.77%	-2.62%	-0.15%	-0.15%	0.30%	0.30%	-0.90%	-12.77%	0.00%	-18.77%	-1.75%	-24.20%	0.91%	-20.90%	-2.39%	-32.08%	-6.38%	-31.18%	0.00%	-23.53%	-1.72%	-7.49%
1992	1.12%	1.12%	1.14%	0.25%	0.39%	3.42%	0.66%	0.66%	-2.76%	-6.46%	0.00%	-18.77%	1.01%	-18.83%	-7.12%	-4.94%	0.00%	-12.18%	0.00%	-30.68%	0.00%	-21.74%	-4.64%	-0.04%
1993	0.48%	0.25%	0.15%	0.15%	0.05%	0.05%	4.48%	3.72%	-1.53%	-2.37%	-11.46%	-12.62%	-14.30%	-14.30%	8.85%	8.12%	1.03%	0.00%	4.90%	-1.31%	2.37%	-0.55%	1.43%	1.25%
1994	-2.69%	-12.96%	-5.12%	-3.40%	0.66%	2.21%	0.87%	0.41%	0.34%	-4.39%	-2.32%	-13.31%	-0.79%	-12.75%	0.00%	-11.08%	-0.17%	-12.54%	-1.02%	-12.49%	-2.62%	-8.56%	-3.63%	-1.79%
1995	0.36%	0.36%	0.57%	0.57%	-0.16%	-0.16%	-0.99%	-4.28%	0.72%	-0.30%	4.18%	-7.01%	-0.62%	-12.67%	-0.03%	-12.71%	-0.72%	-12.44%	-0.99%	-12.82%	-0.53%	-13.27%	0.00%	-5.55%
1996	0.00%	-5.19%	0.00%	-4.78%	0.00%	-10.04%	0.00%	-19.54%	0.00%	-22.03%	0.00%	-26.83%	0.84%	-28.39%	0.00%	-22.71%	-0.90%	-23.50%	0.00%	-20.80%	0.00%	-20.53%	0.00%	-15.10%
1997	0.48%	0.48%	1.04%	1.04%	0.61%	0.61%	-0.23%	-11.97%	0.00%	-19.22%	0.00%	-28.35%	1.01%	-29.73%	1.65%	-25.79%	-6.83%	-21.46%	2.99%	-23.68%	0.03%	-25.27%	0.82%	-17.27%
1998	-0.67%	-2.36%	0.32%	0.32%	0.34%	0.34%	0.50%	0.50%	-3.28%	-9.18%	0.81%	-18.50%	0.00%	-28.17%	0.76%	-24.24%	0.00%	-30.20%	0.00%	-30.33%	-0.04%	-19.36%	0.00%	-12.49%
1999	0.00%	-12.10%	0.00%	-13.93%	0.00%	-19.08%	0.00%	-9.93%	0.00%	-30.31%	0.00%	-33.31%	0.05%	-31.03%	-0.11%	-17.03%	3.96%	-10.64%	0.00%	-25.32%	0.00%	-25.73%	0.00%	-25.32%
2000	0.00%	-16.59%	0.00%	-19.35%	-0.22%	-18.40%	-0.84%	-31.24%	0.00%	-36.40%	0.00%	-37.63%	0.00%	-39.97%	5.81%	-37.92%	0.00%	-34.70%	-10.57%	-34.16%	-6.05%	-2.86%	0.00%	-13.93%
2001	0.00%	-12.90%	0.00%	-9.10%	0.91%	0.91%	-0.51%	-3.68%	0.00%	-25.73%	0.00%	-35.19%	0.00%	-35.81%	1.73%	-37.44%	-4.55%	-34.25%	0.00%	-29.44%	0.00%	-27.42%	0.00%	-28.76%
2002	0.00%	-26.70%	0.00%	-28.75%	1.12%	-31.12%	-6.12%	-34.64%	0.00%	-42.34%	0.00%	-46.25%	0.00%	-46.04%	0.00%	-41.00%	0.00%	-41.63%	0.00%	-40.78%	0.00%	-33.90%	-10.89%	-31.88%
2003	0.00%	-28.76%	0.00%	-32.08%	3.35%	3.35%	0.00%	-19.98%	0.00%	-28.60%	0.00%	-43.72%	0.00%	-45.21%	0.00%	-42.34%	-0.38%	-40.13%	0.00%	-41.98%	0.00%	-38.50%	1.41%	-26.32%
2004	0.00%	-28.76%	0.00%	-32.08%	3.35%	3.35%	0.00%	-19.98%	0.00%	-28.60%	0.00%	-43.72%	0.00%	-45.21%	0.00%	-42.34%	-0.38%	-40.13%	0.00%	-41.98%	0.00%	-38.50%	1.41%	-26.32%
2005	2.46%	2.18%	0.10%	0.10%	-0.44%	-0.44%	0.03%	-3.19%	-0.34%	-12.75%	0.00%	-25.73%	0.30%	-30.85%	0.00%	-17.50%	0.00%	-27.52%	0.00%	-28.22%	0.00%	-26.97%	0.00%	-22.57%
2006	0.00%	-22.57%	0.00%	-22.30%	0.01%	-23.41%	0.00%	-27.62%	0.00%	-35.06%	0.00%	-38.36%	0.00%	-38.58%	0.00%	-30.21%	0.00%	-35.50%	0.00%	-31.56%	0.00%	-29.84%	0.00%	-28.92%
2007	0.00%	-31.72%	-0.90%	-32.83%	0.04%	-20.15%	0.00%	-32.50%	0.00%	-39.89%	0.00%	-45.31%	0.00%	-45.21%	0.00%	-35.69%	0.00%	-38.14%	0.00%	-39.26%	0.00%	-36.67%	-6.68%	0.54%
2008	0.42%	0.42%	0.23%	-2.31%	0.70%	1.71%	-1.10%	0.44%	-0.20%	-10.45%	0.82%	-25.00%	0.45%	-25.24%	0.83%	-11.44%	0.03%	-21.44%	0.00%	-19.59%	0.85%	-19.00%	-1.46%	0.82%
2009	2.41%	2.41%	3.02%	3.91%	0.00%	-13.35%	0.00%	-3.59%																

Figure 4-53. Habitat summary table for yellow bullhead (*Ameiurus natalis*), Braided site, with no LWD and with a hypothetical withdrawal rate of 2 ft³/sec.

Summary of normalized habitat changes

Braided Site
No Wood

Hypothetical Withdrawal 10 cfs

Yellow Bullhead

Year	Jan		Feb		Mar		Apr		May		Jun	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.81%	-71.15%	-2.53%	-63.90%
1966	0.48%	-0.47%	-1.09%	-15.70%	7.23%	-16.85%	-1.08%	-71.40%	0.00%	-71.29%	-0.92%	-69.83%
1967	0.00%	-71.66%	0.00%	-71.04%	-0.75%	-71.16%	-0.84%	-68.52%	0.00%	-68.29%	0.00%	-68.13%
1968	2.34%	6.03%	1.43%	1.79%	2.76%	5.06%	-1.82%	-49.38%	3.51%	-71.19%	0.65%	-70.80%
1969	1.51%	-61.93%	9.25%	15.17%	5.73%	7.61%	-3.16%	-71.81%	2.90%	-72.00%	0.00%	-71.49%
1970	0.00%	-72.18%	0.00%	-71.91%	0.00%	-73.02%	0.00%	-72.05%	0.00%	-71.23%	0.00%	-68.08%
1971	0.00%	-71.98%	0.00%	-72.25%	0.00%	-72.03%	0.00%	-68.10%	0.00%	-68.03%	-1.30%	-64.49%
1972	0.00%	-71.72%	0.00%	-71.74%	-0.82%	-70.65%	0.00%	-68.20%	0.00%	-68.17%	0.00%	-68.14%
1973	4.70%	10.16%	-0.28%	-0.28%	-0.16%	-0.16%	0.29%	1.04%	1.94%	3.30%	-9.74%	-55.25%
1974	1.45%	-58.65%	0.00%	-68.11%	0.00%	-68.11%	0.00%	-72.70%	-0.17%	-71.91%	0.00%	-71.26%
1975	0.00%	-72.36%	0.00%	-72.64%	-0.90%	3.94%	8.94%	-27.81%	4.87%	-71.48%	0.00%	-71.47%
1976	-4.76%	-68.19%	-2.33%	-36.89%	0.00%	-71.45%	0.11%	-72.76%	0.96%	-71.91%	0.00%	-68.31%
1977	0.00%	-70.55%	0.00%	-71.85%	0.00%	-71.87%	0.00%	-71.47%	0.00%	-68.12%	0.00%	-65.28%
1978	-2.57%	-65.43%	2.01%	5.28%	1.97%	1.53%	-1.43%	-72.34%	-0.14%	-72.11%	0.00%	-71.24%
1979	0.90%	1.52%	3.17%	8.03%	1.20%	1.20%	1.20%	5.77%	-9.81%	-52.07%	-3.71%	-65.71%
1980	1.40%	-43.23%	2.20%	1.72%	2.72%	2.72%	18.27%	20.84%	-10.10%	-51.33%	-9.91%	-63.48%
1981	0.00%	-70.17%	0.00%	-69.49%	-0.08%	-44.36%	-0.91%	-66.78%	-1.30%	-72.85%	-0.09%	-71.97%
1982	-2.59%	-11.15%	-2.12%	-5.87%	0.73%	-2.03%	6.81%	-51.59%	3.43%	-71.86%	-1.68%	-72.42%
1983	-7.21%	-3.44%	0.65%	0.55%	0.61%	0.77%	0.83%	3.92%	-4.96%	-50.69%	5.82%	-70.31%
1984	10.21%	12.40%	-2.56%	-62.39%	0.00%	-70.14%	-1.06%	-71.89%	0.00%	-71.26%	0.00%	-68.24%
1985	1.49%	2.19%	4.39%	4.34%	2.04%	3.51%	12.76%	20.09%	-7.93%	-54.30%	-1.27%	-72.30%
1986	-0.96%	-46.54%	-6.89%	-18.32%	1.03%	0.98%	-0.28%	-49.36%	5.76%	-71.20%	-1.71%	-72.43%
1987	-0.69%	-53.16%	4.36%	2.57%	3.19%	8.38%	1.32%	-66.23%	0.88%	-72.07%	-0.85%	-69.82%
1988	5.37%	-24.22%	3.13%	6.21%	-1.06%	-72.00%	0.92%	-69.86%	-1.46%	-72.88%	-0.77%	-72.14%
1989	-0.86%	-62.05%	6.24%	2.62%	3.20%	-72.05%	-0.82%	-72.49%	-0.83%	-70.30%	-0.83%	-67.40%
1990	0.00%	-71.64%	0.00%	-71.81%	0.00%	-71.87%	0.00%	-71.36%	0.08%	-68.21%	0.00%	-64.37%
1991	-7.17%	-65.21%	-3.57%	-62.96%	-0.77%	-0.73%	1.52%	-6.07%	-0.90%	-72.30%	0.00%	-71.25%
1992	5.76%	16.09%	0.99%	2.77%	2.67%	5.80%	3.23%	-15.47%	0.90%	-63.78%	0.00%	-71.25%
1993	1.86%	-0.80%	0.75%	3.21%	0.19%	7.45%	3.66%	5.23%	-9.01%	-69.46%	-8.27%	-69.00%
1994	-2.69%	-46.65%	-0.37%	-28.34%	6.19%	5.97%	1.17%	-57.24%	0.75%	-71.41%	-2.32%	-72.60%
1995	0.99%	3.29%	1.23%	6.61%	1.97%	5.19%	-2.28%	-56.55%	7.56%	-66.78%	4.18%	-70.77%
1996	0.00%	-72.70%	0.00%	-72.48%	0.00%	-72.56%	0.00%	-71.19%	0.00%	-68.19%	0.00%	-68.04%
1997	4.79%	-61.89%	5.05%	10.69%	2.15%	1.87%	-0.23%	-72.28%	0.00%	-68.58%	0.00%	-67.99%
1998	-0.67%	-71.41%	1.27%	-43.25%	1.39%	4.30%	1.82%	-1.76%	0.05%	-72.45%	0.81%	-68.30%
1999	0.00%	-71.87%	0.00%	-71.62%	0.00%	-71.41%	0.00%	-72.57%	0.00%	-67.17%	0.00%	-63.96%
2000	0.00%	-68.35%	0.00%	-68.36%	-0.22%	-71.26%	-0.84%	-67.11%	0.00%	-60.61%	0.00%	-59.28%
2001	0.00%	-71.65%	0.00%	-70.42%	3.49%	-31.66%	-0.51%	-72.44%	0.00%	-68.07%	0.00%	-61.93%
2002	0.00%	-68.04%	0.00%	-68.04%	1.12%	-67.05%	-6.12%	-62.52%	0.00%	-54.19%	0.00%	-49.95%
2003	0.00%	-63.59%	0.00%	-65.28%	4.97%	4.47%	0.00%	-68.25%	0.00%	-59.80%	0.00%	-52.69%
2004	0.00%	-63.59%	0.00%	-65.28%	4.97%	4.47%	0.00%	-68.25%	0.00%	-59.80%	0.00%	-52.69%
2005	2.25%	-2.89%	1.05%	-2.03%	-0.22%	4.01%	0.03%	-63.43%	-0.34%	-72.26%	0.00%	-68.07%
2006	0.00%	-68.17%	0.00%	-68.18%	0.01%	-68.15%	0.00%	-67.80%	0.00%	-62.06%	0.00%	-58.49%
2007	0.00%	-67.96%	-0.90%	-68.66%	0.04%	-68.26%	0.00%	-64.83%	0.00%	-56.84%	0.00%	-50.97%
2008	1.79%	6.19%	1.88%	1.88%	4.83%	-19.64%	-1.10%	-71.61%	-0.20%	-72.37%	0.82%	-70.77%
2009	10.10%	6.07%	6.16%	1.44%	0.00%	-50.05%	0.00%	-72.06%				

Year	Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965	5.24%	-67.24%	7.64%	-62.65%	0.00%	-65.93%	0.47%	-66.42%	-2.87%	-69.98%	1.06%	-11.78%
1966	0.00%	-68.13%	2.50%	-70.03%	0.00%	-71.11%	0.00%	-68.29%	0.00%	-69.17%	0.17%	-69.34%
1967	0.00%	-68.13%	3.21%	-66.87%	-5.59%	-69.83%	-6.66%	-66.23%	0.00%	-68.06%	2.83%	-62.25%
1968	0.00%	-71.65%	0.05%	-72.36%	0.00%	-71.68%	0.00%	-71.62%	0.00%	-71.62%	0.00%	-71.95%
1969	0.00%	-71.37%	0.49%	-71.27%	0.86%	-69.47%	0.85%	-69.75%	0.00%	-71.84%	0.00%	-72.60%
1970	-0.36%	-67.06%	-0.99%	-67.44%	-1.07%	-62.62%	0.00%	-68.24%	0.00%	-71.59%	0.00%	-72.00%
1971	0.00%	-64.66%	7.94%	-66.17%	-1.14%	-64.99%	-3.42%	-56.57%	0.00%	-71.63%	-1.94%	-69.13%
1972	0.00%	-68.13%	0.00%	-68.13%	0.00%	-63.26%	-1.92%	-59.97%	0.09%	-56.38%	4.29%	-5.35%
1973	-6.38%	-51.71%	8.32%	-67.59%	6.82%	-70.25%	-2.77%	-72.80%	-0.94%	-71.81%	0.59%	-71.47%
1974	0.00%	-71.37%	1.02%	-71.98%	-0.57%	-71.79%	5.70%	-69.62%	-0.30%	-72.50%	-0.25%	-72.57%
1975	-0.03%	-71.57%	0.00%	-71.28%	-0.06%	-71.53%	0.00%	-71.16%	0.00%	-71.11%	0.00%	-71.49%
1976	-0.59%	-70.08%	0.80%	-70.87%	0.01%	-68.13%	0.00%	-71.75%	0.00%	-71.52%	0.00%	-68.34%
1977	0.00%	-67.71%	-2.67%	-69.61%	1.13%	-71.33%	0.00%	-68.15%	-0.86%	-66.39%	0.00%	-65.45%
1978	0.00%	-68.20%	0.00%	-64.83%	0.00%	-58.25%	-0.25%	-64.81%	-0.58%	-68.14%	-0.28%	-11.13%
1979	0.33%	-71.95%	-1.39%	-72.66%	2.71%	-71.39%	6.64%	-70.17%	4.84%	-70.17%	0.00%	-70.17%
1980	-9.24%	-51.90%	1.22%	-42.64%	-4.71%	-57.36%	6.29%	-68.89%	4.84%	-70.17%	0.00%	-70.17%
1981	-2.10%	-72.63%	0.86%	-72.33%	-1.56%	-72.70%	0.43%	-71.91%	-5.30%	-73.96%	-4.68%	-72.56%
1982	-0.03%	-71.84%	0.91%	-72.15%	-0.80%	-72.03%	0.00%	-71.28%	-7.12%	-64.04%	-1.83%	0.57%
1983	0.03%	-72.03%	1.08%	-72.32%	0.85%	-68.65%	1.97%	-62.02%	-8.10%	-69.08%	-6.63%	-29.17%
1984	0.00%	-68.19%	2.74%	-68.27%	-3.49%	-65.80%	-1.80%	-64.77%	1.10%	-71.11%	2.07%	3.08%
1985	-0.17%	-71.98%	-0.82%	-72.83%	-2.14%	-72.67%	2.21%	-59.70%	-5.27%	-30.20%	6.50%	-30.46%
1986	-1.01%	-72.28%	-2.15%	-69.49%	0.82%	-70.58%	-4.41%	-73.26%	-1.38%	-66.31%	-11.07%	-62.05%
1987	0.00%	-68.29%	0.30%	-71.73%	0.00%	-70.67%	0.85%	-69.74%	0.38%	-72.31%	-8.75%	-72.78%
1988	-1.30%	-71.87%	-4.65%	-60.20%	-1.08%	-67.54%	0.00%	-71.76%	0.00%	-71.45%	0.00%	-71.67%
1989	0.69%	-67.10%	-0.13%	-69.83%	0.82%	-70.03%	-0.88%	-69.18%	0.00%	-68.34%	0.00%	-68.34%
1990	0.00%	-67.30%	-0.29%	-68.77%	0.95%	-68.09%	0.00%	-68.00%	0.01%	-68.29%	-7.08%	-70.85%
1991	-1.75%	-68.90%	0.91%	-68.84%	-2.39%	-65.28%	-6.38%	-66.26%	0.00%	-68.14%	-5.49%	-67.71%
1992	0.42%	-69.43%	-5.08%	-55.77%	0.00%	-71.92%	0.00%	-71.38%	0.00%	-71.37%	-6.48%	-14.91%
1993	-8.56%	-62.62%	7.20%	-63.87%	-0.49%	-64.50%	2.25%	-58.18%	3.65%	-38.85%	-13.74%	-69.00%
1994	-0.79%	-72.26%	-0.22%	-72.32%	-0.17%	-72.14%	-0.34%	-72.11%	-0.74%	-72.56%	-5.13%	-45.01%
1995	-0.62%	-72.22%	-0.03%	-72.24%	-1.14%	-72.46%	-0.99%	-72.30%	-0.53%	-72.57%	0.00%	-72.72%
1996	0.84%	-68.83%	0.00%	-68.16%	-0.90%	-70.01%	0.00%	-68.23%	0.00%	-71.11%	0.00%	-71.53%
1997	1.01%	-65.94%	1.65%	-65.78%	-6.83%	-62.43%	1.18%	-65.20%	0.03%	-68.24%	-0.49%	-70.73%
1998	0.00%	-68.25%	0.76%	-68.13%	0.00%	-67.96%	0.00%	-67.18%	-0.37%	-69.98%	0.00%	-72.11%
1999	-1.22%	-67.24%	-0.11%	-71.95%	3.23%	-64.23%	0.00%	-68.08%	0.00%	-68.07%	0.00%	-68.08%
2000	0.00%	-56.75%	5.81%	-58.97%	0.00%	-62.45%	-10.57%	-63.03%	3.74%	-56.23%	0.00%	-71.62%
2001	0.00%	-58.08%	1.73%	-65.80%	-4.55%	-63.59%	0.00%	-62.52%	0.00%	-63.84%	0.00%	-68.04%
2002	0.00%	-50.18%	0.00%	-53.47%	0.00%	-54.95%	0.00%	-55.87%	0.00%	-58.82%	-10.89%	-65.51%
2003	0.00%	-51.08%	0.00%	-54.19%	-0.38%	-56.58%	0.00%	-54.57%	0.00%	-58.33%	1.41%	-63.04%
2004	0.00%	-51.08%	0.00%	-54.19%	-0.38%	-56.58%	0.00%	-54.57%	0.00%	-58.33%	1.41%	-63.04%
2005	0.30%	-67.78%	0.00%	-68.64%	0.00%	-68.02%	0.00%	-68.00%	0.00%	-68.03%	0.00%	-68.17%
2006	0.00%	-58.25%	0.00%	-60.40%	0.00%	-61.59%	0.00%	-62.26%	0.00%	-63.71%	0.00%	-66.73%
2007	0.00%	-51.08%	0.00%	-61.38%	0.00%	-58.73%	0.00%	-57.52%	0.00%	-60.32%	-3.91%	-23.75%
2008	0.45%	-71.07%	0.56%	-71.04%	0.03%	-68.24%	0.00%	-68.35%	0.85%	-69.75%	-1.63%	-61.56%
2009												

Figure 4-54. Habitat summary table for yellow bullhead (*Ameiurus natalis*), Braided site, with no LWD and with a hypothetical withdrawal rate of 10 ft³/sec.

Summary of normalized habitat changes

Braided Site

With LWD

Hypothetical Withdrawal 2 cfs

Yellow Bullhead

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.53%	-16.12%	-1.64%	-21.60%	3.23%	-14.60%	4.88%	-17.99%	0.00%	-21.93%	0.31%	-20.60%	-2.48%	-1.18%	-2.49%	-2.49%
1966	-0.44%	-0.44%	-0.55%	-2.03%	-1.00%	-1.30%	-1.04%	0.24%	0.00%	-12.48%	-0.64%	-13.31%	0.00%	-16.08%	5.98%	-5.94%	0.00%	-17.32%	0.00%	-12.31%	0.00%	-10.96%	-0.77%	-7.07%
1967	0.00%	-9.24%	0.00%	-14.54%	0.00%	-13.51%	-0.52%	-13.79%	0.00%	-12.31%	0.00%	-16.08%	-1.17%	-15.19%	-0.41%	-1.94%	-3.04%	-12.40%	-4.40%	-20.91%	0.00%	-18.53%	1.52%	1.52%
1968	-0.27%	-0.27%	-0.65%	-0.65%	3.16%	3.16%	-6.28%	-7.24%	3.34%	-6.25%	0.34%	-24.87%	0.00%	-9.73%	0.05%	-9.92%	0.00%	-13.07%	0.00%	-13.82%	-0.05%	-9.78%	0.00%	-8.95%
1969	0.97%	1.76%	10.48%	10.40%	6.69%	6.69%	-2.03%	-10.18%	2.80%	-4.00%	0.00%	-10.87%	0.00%	-11.80%	0.48%	-11.11%	0.55%	-12.35%	0.55%	-12.69%	-0.85%	-8.33%	0.00%	-7.10%
1970	0.00%	-9.51%	0.00%	-8.86%	0.00%	-3.91%	0.00%	-9.20%	0.00%	-16.70%	0.00%	-18.51%	-0.10%	-21.57%	-3.56%	-11.36%	-4.58%	-1.58%	0.00%	-13.63%	0.00%	-9.13%	0.00%	-9.01%
1971	0.00%	-9.02%	0.00%	-9.68%	0.00%	-9.64%	0.00%	-16.64%	0.00%	-18.76%	-0.84%	-21.37%	0.00%	-21.31%	3.44%	-15.11%	-1.86%	-8.71%	-1.42%	-4.96%	0.00%	-9.19%	-2.87%	-2.76%
1972	0.00%	-9.11%	0.00%	-12.46%	-0.54%	-12.92%	0.00%	-14.38%	0.00%	-17.42%	0.00%	-18.77%	0.00%	-16.08%	0.00%	-16.08%	0.00%	-18.21%	1.93%	-6.40%	0.45%	0.45%	0.75%	0.75%
1973	-0.07%	-0.07%	0.30%	0.30%	0.73%	0.73%	0.50%	0.50%	0.45%	0.45%	0.07%	-8.52%	-9.22%	-9.96%	9.62%	9.53%	6.63%	-2.47%	-2.68%	-11.03%	0.21%	-2.72%	1.80%	1.90%
1974	0.41%	-2.52%	0.00%	-0.54%	0.00%	7.49%	0.00%	-7.22%	-0.17%	-8.69%	0.00%	-23.23%	0.00%	-11.35%	0.98%	-8.22%	-0.55%	-8.96%	4.12%	-7.72%	-0.29%	-8.68%	-0.24%	-8.40%
1975	0.00%	-9.91%	0.00%	-5.38%	1.23%	1.98%	4.20%	4.20%	3.89%	-2.18%	0.00%	-10.87%	-0.03%	-10.26%	0.00%	-16.28%	-0.06%	-14.46%	0.00%	-13.51%	0.00%	-13.99%	0.00%	-10.56%
1976	-3.68%	-5.84%	-1.34%	0.16%	0.00%	-1.88%	0.11%	-5.36%	0.92%	-8.17%	0.00%	-12.14%	-0.34%	-16.19%	0.32%	-14.65%	0.01%	-16.08%	0.00%	-9.01%	0.00%	-10.59%	0.00%	-11.37%
1977	0.00%	-4.20%	0.00%	-8.67%	0.00%	-8.75%	0.00%	-11.25%	0.00%	-16.17%	0.00%	-21.06%	0.00%	-21.22%	-2.55%	-26.20%	1.54%	-11.23%	0.00%	-18.56%	-0.42%	-21.07%	0.00%	-20.99%
1978	-4.02%	0.77%	0.12%	0.91%	0.32%	0.32%	0.00%	-1.74%	-0.14%	-9.25%	0.00%	-12.89%	0.00%	-14.38%	0.00%	-21.24%	0.00%	-23.68%	-0.17%	-20.96%	-2.69%	-9.55%	-4.66%	-1.52%
1979	-2.44%	-2.44%	0.84%	1.74%	0.33%	0.33%	0.65%	0.65%	-1.53%	-2.81%	-1.58%	-3.00%	0.54%	-8.31%	-0.69%	-9.09%	2.82%	-6.92%	8.68%	4.58%	4.81%	9.47%	0.00%	2.82%
1980	0.53%	0.51%	0.52%	0.52%	0.74%	1.66%	-4.99%	4.86%	-1.62%	-1.73%	0.01%	-9.84%	-11.80%	-12.34%	-3.19%	-5.36%	-6.45%	-6.45%	9.40%	9.40%	6.27%	9.62%	0.00%	9.41%
1981	0.00%	7.84%	0.00%	8.14%	0.00%	-7.16%	-0.92%	-3.11%	-1.26%	-8.61%	-0.36%	-8.99%	-1.57%	-7.37%	0.16%	-8.26%	-1.50%	-10.77%	2.91%	2.66%	-4.21%	-5.13%	-2.21%	-3.63%
1982	-4.48%	-5.79%	-2.30%	-8.91%	0.15%	2.58%	1.06%	-4.67%	0.38%	-3.15%	-1.63%	-10.10%	-0.03%	-13.16%	0.21%	-8.42%	-2.07%	-9.93%	0.00%	-12.55%	-6.79%	-0.41%	-5.14%	2.52%
1983	0.23%	-6.09%	0.15%	0.15%	0.25%	0.25%	0.89%	0.89%	-1.40%	-4.68%	2.65%	-2.55%	0.11%	-8.11%	1.04%	-5.15%	-3.31%	-1.74%	-3.05%	2.45%	-4.51%	-0.77%	-5.31%	-0.03%
1984	-1.56%	0.86%	-2.27%	1.93%	0.00%	7.74%	-1.03%	0.21%	0.00%	-15.25%	0.00%	-19.78%	0.00%	-17.80%	0.92%	-3.05%	-5.16%	-0.64%	-3.37%	3.09%	-0.54%	-4.68%	0.07%	0.07%
1985	0.72%	0.72%	0.67%	0.37%	0.50%	0.50%	12.63%	15.03%	-10.51%	-11.55%	-5.74%	-9.81%	-0.85%	-8.98%	-1.38%	-5.94%	-1.96%	-5.10%	1.58%	0.26%	-0.39%	-1.19%	1.87%	1.87%
1986	0.00%	-8.39%	-5.12%	0.10%	0.28%	0.28%	-4.16%	-7.56%	5.54%	0.89%	-1.65%	-10.12%	-1.19%	-7.92%	1.75%	-3.50%	0.54%	-12.63%	-4.00%	-12.15%	-0.19%	-2.13%	-9.92%	-4.88%
1987	-3.92%	-6.66%	1.87%	1.28%	0.96%	0.72%	1.38%	0.63%	0.12%	-7.26%	-0.55%	-11.60%	0.00%	-12.40%	-0.60%	-9.22%	0.00%	-11.03%	0.55%	-17.44%	0.58%	-3.62%	-6.61%	-4.02%
1988	0.76%	1.48%	0.53%	1.27%	-1.02%	-0.60%	0.99%	-1.36%	-1.42%	-8.77%	-0.74%	-9.41%	-0.25%	-9.22%	-2.97%	-1.27%	-1.33%	-1.88%	-0.36%	-12.72%	0.00%	-18.65%	0.00%	-8.54%
1989	-0.13%	-6.51%	0.77%	0.77%	0.90%	-2.49%	-0.79%	-3.86%	-0.54%	-13.31%	-0.41%	-20.22%	0.47%	-21.47%	-0.16%	-17.41%	0.52%	-19.00%	-0.58%	-15.55%	0.00%	-11.37%	0.00%	-11.28%
1990	0.00%	-7.96%	0.00%	-8.51%	0.00%	-8.48%	0.00%	-11.73%	0.04%	-14.78%	0.00%	-21.42%	0.00%	-21.55%	-0.03%	-20.78%	0.50%	-20.67%	0.00%	-18.91%	0.01%	-14.69%	-6.11%	-9.80%
1991	-6.32%	-5.40%	-3.07%	-4.81%	-0.04%	-0.04%	0.55%	0.55%	-0.87%	-9.78%	0.00%	-12.82%	-1.13%	-16.21%	0.52%	-14.00%	-1.57%	-21.06%	-4.23%	-20.67%	0.00%	-15.79%	-2.29%	-1.64%
1992	1.77%	1.77%	0.82%	1.62%	0.50%	5.36%	0.98%	0.98%	-2.49%	-5.78%	0.00%	-12.82%	0.67%	-12.88%	-3.76%	-5.90%	0.00%	-8.89%	0.00%	-21.35%	0.00%	-15.01%	-5.75%	1.41%
1993	0.76%	0.44%	0.63%	0.63%	0.45%	0.45%	3.74%	4.37%	-0.95%	-0.95%	-10.71%	-11.75%	-12.96%	-12.96%	8.53%	8.42%	2.31%	1.60%	4.51%	-0.90%	-0.95%	1.64%	-0.13%	-0.11%
1994	-1.74%	-10.73%	-6.42%	-3.95%	0.55%	1.20%	-0.87%	-0.84%	0.72%	-3.27%	-2.24%	-10.53%	-0.76%	-9.72%	0.00%	-8.72%	-0.16%	-9.41%	-0.99%	-9.33%	-2.75%	-7.27%	-4.10%	-1.95%
1995	0.52%	0.52%	1.04%	1.04%	-0.18%	-0.18%	-0.47%	-3.19%	0.80%	-0.18%	4.03%	-4.54%	-0.60%	-9.60%	-0.03%	-9.66%	-0.70%	-9.89%	-0.95%	-9.81%	-0.51%	-10.47%	0.00%	-5.37%
1996	0.00%	-5.02%	0.00%	-4.62%	0.00%	-8.23%	0.00%	-13.30%	0.00%	-14.76%	0.00%	-18.06%	0.51%	-19.16%	0.00%	-15.23%	-0.60%	-16.08%	0.00%	-13.91%	0.00%	-13.92%	0.00%	-10.52%
1997	0.69%	0.15%	0.92%	0.92%	0.64%	0.64%	-0.22%	-9.20%	0.00%	-12.82%	0.00%	-19.10%	0.52%	-19.39%	0.81%	-16.83%	-4.53%	-13.56%	2.23%	-15.83%	0.01%	-16.93%	0.54%	-11.64%
1998	-0.65%	-2.28%	0.33%	0.33%	-2.24%	-2.24%	-2.09%	-2.09%	-3.17%	-7.43%	0.47%	-12.32%	0.00%	-18.89%	0.40%	-16.28%	0.00%	-20.32%	0.00%	-20.29%	-0.05%	-12.95%	0.00%	-9.33%
1999	0.00%	-8.77%	0.00%	-9.78%	0.00%	-13.19%	0.00%	-8.10%	0.00%	-20.27%	0.00%	-21.58%	-0.70%	-20.98%	-0.11%	-12.31%	1.16%	-9.21%	0.00%	-17.02%	0.00%	-17.31%	0.00%	-17.02%
2000	0.00%	-10.99%	0.00%	-12.87%	0.00%	-12.57%	-0.42%	-20.77%	0.00%	-22.84%	0.00%	-23.32%	0.00%	-24.19%	3.61%	-23.43%	0.00%	-22.16%	-6.74%	-21.90%	-5.67%	-1.94%	0.00%	-9.78%
2001	0.00%	-9.22%	0.00%	-7.01%	2.38%	2.30%	-0.49%	-3.08%	0.00%	-17.31%	0.00%	-22.35%	0.00%	-21.94%	1.01%	-24.69%	-2.94%	-22.11%	0.00%	-18.81%	0.00%	-17.74%	0.00%	-19.36%
2002	0.00%	-17.97%	0.00%	-19.36%	0.61%	-20.67%	-3.91%	-22.13%	0.00%	-25.04%	0.00%	-26.36%	0.00%	-26.29%	0.00%	-24.10%	0.00%	-24.79%	0.00%	-24.49%	0.00%	-20.91%	-7.17%	-20.97%
2003	0.00%	-18.57%	0.00%	-21.06%	3.87%	3.87%	0.00%	-13.34%	0.00%	-17.81%	0.00%	-25.52%	0.00%	-26.02%	0.00%	-25.04%	-0.23%	-24.25%	0.00%	-24.92%	0.00%	-23.65%	0.75%	-16.90%
2004	0.00%	-18.57%	0.00%	-21.06%	3.87%	3.87%	0.00%	-13.34%	0.00%	-17.81%	0.00%	-25.52%	0.00%	-26.02%	0.00%	-25.04%	-0.23%	-24.25%	0.00%	-24.92%	0.00%	-23.65%	0.75%	-16.90%
2005	-0.10%	-0.10%	0.34%	0.34%	1.89%	1.89%	-0.21%	-2.73%	-0.33%	-9.72%	0.00%	-17.31%	0.20%	-20.65%	0.00%	-11.65%	0.00%	-18.54%	0.00%	-19.01%	0.00%	-18.16%	0.00%	-15.13%
2006	0.00%	-15.13%	0.00%	-14.94%	0.01%	-15.70%	0.00%	-18.56%	0.00%	-22.30%	0.00%	-23.59%	0.00%	-23.68%	0.00%	-18.92%	0.00%	-22.48%	0.00%	-20.11%	0.00%	-19.29%	0.00%	-18.54%
2007	0.00%	-21.38%	-0.59%	-22.11%	0.02%	-13.45%	0.00%	-21.24%	0.00%	-24.16%	0.00%	-26.05%	0.00%	-26.02%	0.48%	-22.18%	0.00%	-23.51%	0.00%	-23.93%	0.00%	-22.94%	-5.94%	0.76%
2008	-0.13%	0.53%	0.55%	-2.88%	0.80%	2.31%	-1.06%	0.42%	-0.19%	-8.24%	0.54%	-16.92%	0.00%	-17.53%	0.79%	-8.04%	0.01%	-14.34%	0.00%	-13.04%	0.55%	-12.69%	-1.53%	-0.22%
2009	3.43%	3.43%	5.06%	5.53%	0.00%	-11.24%	0.00%	-3.47%																

Figure 4-55. Habitat summary table for yellow bullhead (*Ameiurus natalis*), Braided site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Braided Site

With LWD

Yellow Bullhead

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2
1965									0.53%	-49.50%	-1.64%	-41.37%
1966	3.18%	6.70%	-1.56%	-12.83%	0.26%	-17.42%	-1.04%	-49.80%	0.00%	-49.62%	-0.64%	-47.88%
1967	0.00%	-50.23%	0.00%	-49.19%	0.00%	-49.40%	-0.52%	-46.33%	0.00%	-46.08%	0.00%	-45.95%
1968	-0.92%	2.37%	2.67%	5.46%	4.13%	7.60%	-1.31%	-36.41%	3.38%	-49.45%	0.34%	-49.07%
1969	2.69%	-28.94%	11.22%	16.32%	5.86%	13.44%	-2.34%	-52.52%	2.80%	-50.82%	0.00%	-49.95%
1970	0.00%	-51.12%	0.00%	-50.66%	0.00%	-52.55%	0.00%	-50.90%	0.00%	-49.52%	0.00%	-45.92%
1971	0.00%	-50.78%	0.00%	-51.24%	0.00%	-50.86%	0.00%	-45.93%	0.00%	-45.88%	-0.84%	-42.00%
1972	0.00%	-50.34%	0.00%	-50.37%	-0.54%	-48.78%	0.00%	-46.01%	0.00%	-45.99%	0.00%	-45.97%
1973	4.21%	8.22%	-1.48%	-1.48%	-1.86%	-1.86%	2.49%	0.90%	4.00%	6.67%	-7.67%	-40.56%
1974	0.83%	-43.17%	0.00%	-46.91%	0.00%	-46.91%	0.00%	-52.01%	-0.17%	-50.66%	0.00%	-49.56%
1975	0.00%	-51.43%	0.00%	-51.91%	4.34%	14.65%	7.93%	-10.14%	4.70%	-49.94%	0.00%	-49.91%
1976	-3.85%	-42.99%	-1.17%	-17.29%	0.00%	-51.14%	0.11%	-52.11%	0.92%	-50.67%	0.00%	-46.10%
1977	0.00%	-48.37%	0.00%	-50.56%	0.00%	-50.59%	0.00%	-49.91%	0.00%	-45.95%	0.00%	-42.85%
1978	-2.83%	-37.60%	2.55%	2.73%	1.34%	1.03%	-1.38%	-51.39%	-0.14%	-51.01%	0.00%	-49.53%
1979	-0.44%	5.06%	2.92%	7.64%	1.60%	1.60%	4.29%	8.73%	-9.93%	-40.12%	-3.29%	-47.23%
1980	2.20%	-16.66%	2.09%	3.06%	2.32%	4.32%	14.04%	9.98%	-6.40%	-37.60%	-7.52%	-46.35%
1981	0.00%	-47.72%	0.00%	-47.53%	-0.01%	-32.67%	-0.29%	-47.87%	-1.26%	-52.27%	-0.08%	-50.77%
1982	-4.79%	-6.89%	-1.78%	-1.83%	1.30%	-1.80%	2.60%	-38.85%	3.31%	-50.58%	-1.63%	-51.53%
1983	-6.38%	-3.99%	0.76%	0.66%	1.25%	1.25%	4.04%	8.94%	-4.96%	-38.17%	5.61%	-47.96%
1984	6.33%	6.68%	-2.27%	-43.56%	0.00%	-47.67%	-1.03%	-50.64%	0.00%	-49.56%	0.00%	-46.05%
1985	1.79%	4.45%	2.03%	3.06%	1.57%	3.66%	14.15%	10.52%	-5.78%	-39.85%	-1.23%	-51.33%
1986	-0.77%	-34.30%	-7.74%	-9.45%	1.53%	1.23%	-1.48%	-37.08%	5.56%	-49.46%	-1.65%	-51.54%
1987	-3.90%	-40.00%	2.58%	0.42%	5.25%	10.92%	1.38%	-46.22%	0.95%	-50.89%	-0.55%	-47.82%
1988	6.15%	-7.63%	4.12%	10.73%	-1.02%	-50.81%	1.94%	-46.30%	-1.42%	-52.32%	-0.74%	-51.05%
1989	-1.31%	-45.32%	6.58%	-1.30%	0.90%	-51.94%	-0.79%	-51.65%	-0.54%	-48.34%	-0.41%	-45.10%
1990	0.00%	-50.21%	0.00%	-50.50%	0.00%	-50.59%	0.00%	-49.73%	0.04%	-46.02%	0.00%	-41.88%
1991	-8.29%	-37.92%	-2.64%	-46.68%	-0.36%	5.78%	2.76%	5.55%	-0.87%	-51.32%	0.00%	-49.54%
1992	8.82%	16.70%	0.73%	5.02%	3.67%	5.65%	4.44%	7.46%	1.37%	-45.42%	0.00%	-49.54%
1993	2.02%	3.71%	3.13%	3.86%	2.23%	5.82%	6.00%	6.86%	-6.72%	-50.90%	-7.52%	-50.71%
1994	-2.53%	-34.29%	-2.20%	-18.29%	3.83%	1.68%	-0.94%	-42.57%	1.12%	-50.88%	-2.24%	-51.83%
1995	3.08%	4.04%	1.89%	8.31%	3.16%	5.02%	-1.27%	-41.38%	7.40%	-45.95%	4.03%	-48.74%
1996	0.00%	-52.01%	0.00%	-51.63%	0.00%	-51.76%	0.00%	-49.44%	0.00%	-46.00%	0.00%	-45.88%
1997	3.47%	-29.74%	6.32%	13.30%	2.88%	9.32%	-0.22%	-51.29%	0.00%	-46.40%	0.00%	-45.85%
1998	-0.65%	-51.07%	0.46%	-12.12%	-0.46%	0.48%	0.22%	0.08%	0.05%	-51.58%	0.47%	-46.09%
1999	0.00%	-50.60%	0.00%	-50.18%	0.00%	-49.81%	0.00%	-51.78%	0.00%	-44.93%	0.00%	-41.44%
2000	0.00%	-46.13%	0.00%	-46.13%	0.00%	-49.56%	-0.42%	-44.78%	0.00%	-38.03%	0.00%	-36.73%
2001	0.00%	-50.22%	0.00%	-50.36%	3.88%	-18.90%	-0.49%	-51.57%	0.00%	-45.91%	0.00%	-39.34%
2002	0.00%	-45.89%	0.00%	-45.88%	0.61%	-44.71%	-3.91%	-39.95%	0.00%	-32.05%	0.00%	-28.47%
2003	0.00%	-41.05%	0.00%	-42.85%	4.67%	9.95%	0.00%	-46.05%	0.00%	-37.23%	0.00%	-30.75%
2004	0.00%	-41.05%	0.00%	-42.85%	4.67%	9.95%	0.00%	-46.05%	0.00%	-37.23%	0.00%	-30.75%
2005	2.06%	-2.14%	2.72%	3.24%	3.40%	10.35%	-0.21%	-46.07%	-0.33%	-51.26%	0.00%	-45.91%
2006	0.00%	-45.99%	0.00%	-45.99%	0.01%	-45.97%	0.00%	-45.61%	0.00%	-39.48%	0.00%	-35.98%
2007	0.00%	-45.82%	-0.59%	-46.50%	0.02%	-46.06%	0.00%	-42.37%	0.00%	-34.43%	0.00%	-29.31%
2008	2.48%	1.43%	2.61%	4.44%	4.36%	-7.21%	-1.06%	-50.15%	-0.19%	-51.44%	0.54%	-48.85%
2009	9.17%	2.86%	9.28%	2.41%	0.00%	-36.83%	0.00%	-50.92%				

Year	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965	3.79%	-45.35%	4.88%	-40.08%	0.00%	-43.49%	0.31%	-44.09%	-1.23%	-46.57%	-0.93%	-1.25%
1966	0.00%	-45.95%	4.27%	-47.66%	0.00%	-49.32%	0.00%	-46.08%	0.00%	-47.05%	1.38%	-46.70%
1967	1.05%	-45.38%	2.23%	-41.80%	-3.51%	-47.91%	-4.40%	-43.87%	0.00%	-45.90%	5.42%	-29.22%
1968	0.00%	-50.22%	0.05%	-51.43%	0.00%	-50.27%	0.00%	-50.18%	0.00%	-50.18%	0.00%	-50.73%
1969	0.00%	-49.76%	0.48%	-49.57%	0.55%	-47.36%	0.55%	-47.68%	0.00%	-50.55%	0.00%	-51.83%
1970	-0.10%	-44.70%	-3.62%	-44.93%	-4.53%	-36.84%	0.00%	-46.04%	0.00%	-50.12%	0.00%	-50.82%
1971	0.00%	-42.18%	4.55%	-43.59%	-1.15%	-39.25%	-1.07%	-24.44%	0.00%	-50.19%	-1.74%	-44.87%
1972	0.00%	-45.95%	0.00%	-45.95%	0.00%	-40.71%	-4.50%	-41.56%	1.60%	-19.45%	4.35%	-9.72%
1973	-6.81%	-38.72%	8.02%	-46.08%	6.57%	-47.85%	-2.68%	-52.18%	-0.43%	-50.26%	0.57%	-49.92%
1974	0.00%	-49.76%	0.98%	-50.78%	-0.55%	-50.45%	4.33%	-47.60%	-0.29%	-51.67%	-0.24%	-51.78%
1975	-0.03%	-50.09%	0.00%	-49.60%	-0.06%	-50.02%	0.00%	-49.40%	0.00%	-49.30%	0.00%	-49.95%
1976	-0.34%	-48.13%	0.51%	-49.03%	0.01%	-45.95%	0.00%	-50.38%	0.00%	-50.01%	0.00%	-46.12%
1977	0.00%	-45.34%	-2.57%	-48.00%	1.09%	-49.79%	0.00%	-45.97%	-0.42%	-43.98%	0.00%	-43.03%
1978	0.00%	-46.01%	0.00%	-42.37%	0.00%	-35.75%	-0.17%	-42.25%	-2.08%	-43.43%	1.61%	0.15%
1979	0.31%	-50.73%	-1.35%	-51.94%	2.62%	-49.78%	6.40%	-47.72%	4.66%	-47.72%	0.00%	-47.72%
1980	-7.31%	-38.21%	-0.56%	-30.95%	-4.01%	-41.57%	6.07%	-46.92%	4.66%	-47.72%	0.00%	-47.72%
1981	-2.03%	-51.88%	0.83%	-51.38%	-1.50%	-52.00%	0.42%	-50.65%	-5.13%	-54.14%	-5.42%	-52.33%
1982	-0.03%	-50.55%	0.87%	-51.07%	-0.77%	-50.88%	0.00%	-49.60%	-8.56%	-33.13%	-4.91%	1.98%
1983	0.03%	-50.88%	1.04%	-51.35%	-2.13%	-44.11%	-1.19%	-40.17%	-5.87%	-44.18%	-9.33%	-16.43%
1984	0.00%	-46.00%	1.00%	-49.23%	-3.02%	-38.60%	-1.20%	-40.20%	1.65%	-49.33%	1.83%	2.91%
1985	-0.17%	-50.78%	-0.79%	-52.22%	-1.82%	-52.00%	2.85%	-40.90%	-5.18%	-7.09%	7.03%	-14.05%
1986	-0.98%	-51.29%	-1.64%	-48.77%	-0.42%	-48.67%	-4.27%	-52.96%	-0.82%	-47.18%	-10.76%	-45.38%
1987	0.00%	-46.08%	0.29%	-50.37%	0.00%	-48.96%	0.55%	-47.68%	1.23%	-51.29%	-7.77%	-51.78%
1988	-1.25%	-50.59%	-8.14%	-26.22%	-3.38%	-40.26%	0.00%	-50.41%	0.00%	-49.88%	0.00%	-50.26%
1989	0.47%	-44.78%	-0.16%	-47.87%	0.52%	-48.02%	-0.58%	-47.05%	0.00%	-46.12%	0.00%	-46.12%
1990	0.00%	-44.83%	-0.03%	-46.54%	0.50%	-45.89%	0.00%	-45.85%	0.01%	-46.08%	-7.20%	-48.62%
1991	-1.13%	-46.74%	0.52%	-46.70%	-1.57%	-42.85%	-4.23%	-43.92%	0.00%	-45.96%	-7.20%	-42.56%
1992	0.11%	-47.50%	-4.83%	-35.19%	0.00%	-50.69%	0.00%	-49.77%	0.00%	-49.74%	-6.38%	-5.02%
1993	-7.34%	-46.11%	6.95%	-43.78%	-0.08%	-45.55%	2.23%	-40.33%	5.85%	-8.25%	-12.98%	-50.79%
1994	-0.76%	-51.26%	-0.21%	-51.36%	-0.16%	-51.05%	-0.33%	-51.00%	-0.56%	-51.76%	-5.88%	-30.91%
1995	-0.60%	-51.18%	-0.03%	-51.22%	-1.11%	-51.61%	-0.95%	-51.33%	-0.51%	-51.79%	0.00%	-52.04%
1996	0.51%	-46.72%	0.00%	-45.98%	-0.60%	-48.14%	0.00%	-46.04%	0.00%	-49.32%	0.00%	-50.02%
1997	0.52%	-43.39%	0.81%	-43.27%	-4.53%	-39.76%	0.63%	-42.91%	0.01%	-46.04%	-0.62%	-49.00%
1998	0.00%	-46.05%	0.40%	-45.95%	0.00%	-45.79%	0.00%	-44.94%	-0.36%	-47.95%	0.00%	-51.00%
1999	-1.55%	-45.24%	-0.11%	-50.73%	-0.07%	-45.81%	0.00%	-45.92%	0.00%	-45.91%	0.00%	-45.92%
2000	0.00%	-34.35%	3.61%	-36.43%	0.00%	-39.88%	-6.74%	-40.45%	2.51%	-31.51%	0.00%	-50.18%
2001	0.00%	-35.59%	1.01%	-43.40%	-2.94%	-41.05%	0.00%	-39.94%	0.00%	-41.32%	0.00%	-45.89%
2002	0.00%	-28.66%	0.00%	-31.42%	0.00%	-32.72%	0.00%	-33.55%	0.00%	-36.29%	-7.17%	-43.09%
2003	0.00%	-29.40%	0.00%	-32.05%	-0.23%	-34.19%	0.00%	-32.39%	0.00%	-35.83%	0.75%	-40.48%
2004	0.00%	-29.40%	0.00%	-32.05%	-0.23%	-34.19%	0.00%	-32.39%	0.00%	-35.83%	0.75%	-40.48%
2005	0.20%	-45.54%	0.00%	-46.47%	0.00%	-45.87%	0.00%	-45.85%	0.00%	-45.88%	0.00%	-45.99%
2006	0.00%	-35.75%	0.00%	-37.82%	0.00%	-39.00%	0.00%	-39.68%	0.00%	-41.18%	0.00%	-43.94%
2007	0.00%	-29.40%	0.48%	-38.50%	0.00%	-36.20%	0.00%	-35.06%	0.00%	-37.74%	-5.04%	-10.27%
2008	0.00%	-49.46%	0.14%	-49.59%	0.01%	-46.04%	0.00%	-46.13%	0.55%	-47.68%	-1.41%	-38.59%
2009												

Figure 4-56. Habitat summary table for yellow bullhead (*Ameiurus natalis*), Braided site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Gage Site

No Wood

Green sunfish

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-3.76%	0.00%	-25.91%	0.58%	-22.95%	0.80%	-20.89%	0.00%	-25.03%	1.07%	-22.73%	5.32%	5.51%	0.13%	0.13%
1966	0.23%	0.23%	1.82%	2.78%	1.69%	1.69%	0.00%	7.69%	0.00%	-3.23%	0.00%	-10.52%	0.51%	-16.50%	2.19%	2.29%	1.35%	0.28%	0.67%	-11.69%	1.14%	-7.94%	1.84%	1.20%
1967	0.00%	0.35%	0.00%	-9.01%	0.00%	-6.54%	0.00%	-13.99%	0.00%	-13.13%	0.00%	-18.09%	3.31%	3.31%	2.84%	2.84%	1.88%	-1.40%	0.00%	-24.56%	0.67%	-18.96%	0.28%	0.28%
1968	0.07%	0.07%	-0.01%	-0.01%	0.10%	0.10%	1.56%	2.59%	4.73%	7.45%	0.34%	-6.43%	4.10%	4.41%	5.70%	5.70%	0.04%	0.09%	0.55%	0.35%	0.90%	1.28%	2.16%	3.37%
1969	0.17%	0.17%	1.13%	1.13%	0.46%	0.46%	4.28%	5.11%	5.80%	5.80%	0.65%	-0.84%	1.14%	-2.38%	1.42%	0.96%	1.19%	-6.16%	1.08%	-6.81%	2.69%	3.46%	0.00%	1.81%
1970	0.00%	1.80%	0.00%	2.94%	0.00%	6.67%	0.00%	1.84%	0.00%	-5.81%	0.00%	-20.65%	3.32%	-15.43%	2.63%	-9.26%	2.33%	2.33%	0.00%	-14.36%	0.29%	0.27%	0.69%	1.97%
1971	0.00%	1.80%	0.00%	1.79%	0.00%	1.32%	0.00%	-17.79%	0.00%	-21.59%	0.00%	-25.48%	1.91%	-15.75%	4.33%	4.35%	2.30%	-8.48%	0.55%	0.55%	5.70%	5.70%	2.04%	2.04%
1972	2.32%	4.48%	0.00%	0.66%	0.00%	-7.76%	0.00%	-15.70%	0.07%	-19.53%	0.86%	-11.22%	1.92%	-7.49%	1.08%	-15.53%	0.19%	-22.19%	2.91%	2.91%	0.01%	0.01%	1.98%	1.98%
1973	0.68%	0.68%	-0.25%	-0.25%	-0.01%	-0.01%	0.02%	0.02%	-0.18%	-0.18%	5.51%	5.51%	5.76%	5.76%	6.38%	6.38%	2.54%	2.56%	1.19%	1.81%	3.87%	3.91%	0.16%	2.42%
1974	4.33%	4.75%	1.26%	7.56%	0.21%	5.96%	0.64%	5.93%	0.00%	1.80%	0.28%	-5.30%	1.81%	-1.97%	2.80%	0.50%	0.59%	-0.39%	4.69%	4.69%	4.80%	4.84%	0.34%	2.09%
1975	0.00%	1.83%	0.93%	3.79%	0.40%	0.40%	0.84%	0.84%	7.48%	7.48%	0.71%	-1.09%	2.15%	2.76%	0.63%	-2.73%	0.30%	-2.71%	0.00%	-7.14%	1.43%	-5.53%	2.30%	0.25%
1976	-0.02%	1.19%	1.86%	1.86%	0.00%	5.68%	4.23%	4.23%	2.75%	5.65%	0.06%	-11.87%	5.02%	5.02%	5.46%	5.48%	3.03%	-3.89%	1.99%	2.81%	0.00%	-1.87%	0.00%	-10.48%
1977	0.00%	2.11%	0.00%	1.98%	0.00%	1.81%	1.26%	3.52%	0.00%	-17.68%	0.00%	-25.03%	0.18%	-20.54%	4.34%	3.97%	3.70%	3.70%	0.51%	-18.86%	0.00%	-24.57%	0.00%	-24.94%
1978	1.70%	4.95%	0.52%	0.52%	0.54%	0.54%	1.82%	6.82%	6.89%	7.70%	0.09%	-5.64%	1.32%	-10.38%	0.00%	-25.29%	0.00%	-28.82%	0.00%	-24.38%	1.50%	1.50%	0.08%	0.08%
1979	0.43%	0.43%	0.12%	0.12%	0.15%	0.15%	0.46%	0.46%	2.46%	2.46%	7.03%	7.03%	3.67%	3.67%	6.64%	6.64%	1.20%	1.97%	3.09%	3.09%	3.20%	3.20%	5.23%	6.98%
1980	0.53%	0.53%	0.33%	0.33%	0.38%	0.38%	0.37%	0.37%	2.58%	2.58%	6.89%	6.89%	7.11%	7.11%	6.30%	6.30%	6.17%	6.17%	5.10%	5.10%	4.24%	4.87%	4.78%	5.68%
1981	1.17%	7.25%	0.18%	3.93%	1.85%	2.69%	2.71%	7.16%	1.30%	2.68%	1.89%	2.63%	3.97%	3.97%	3.33%	4.01%	2.21%	3.13%	2.98%	2.98%	5.21%	5.41%	1.14%	2.33%
1982	2.17%	2.17%	0.35%	0.35%	0.38%	0.38%	1.41%	1.41%	4.67%	7.79%	1.03%	1.82%	1.85%	2.88%	2.47%	3.32%	1.91%	2.78%	1.33%	-2.02%	5.16%	5.16%	1.01%	1.01%
1983	0.61%	0.61%	0.28%	0.28%	0.32%	0.32%	0.07%	0.07%	2.21%	2.21%	7.65%	7.65%	4.44%	4.44%	4.82%	4.90%	0.70%	1.09%	1.74%	1.74%	5.15%	5.15%	1.05%	1.05%
1984	0.97%	0.97%	1.95%	7.23%	0.00%	4.53%	0.00%	4.56%	0.00%	-3.94%	0.13%	-14.59%	2.55%	-6.29%	3.82%	4.12%	2.28%	2.28%	1.76%	1.76%	4.95%	4.95%	-0.11%	-0.11%
1985	0.36%	0.36%	0.09%	0.09%	0.12%	0.12%	1.53%	1.53%	3.42%	3.42%	7.61%	7.61%	4.36%	4.37%	5.05%	5.06%	2.90%	3.07%	5.57%	5.57%	0.06%	0.06%	0.30%	0.30%
1986	4.01%	6.98%	1.87%	1.87%	0.22%	0.22%	2.31%	2.31%	3.71%	6.76%	1.89%	2.44%	6.06%	6.06%	4.85%	4.85%	3.14%	3.41%	4.17%	4.17%	6.70%	6.70%	6.43%	6.43%
1987	2.28%	4.36%	1.28%	2.34%	0.31%	0.31%	4.58%	5.58%	3.15%	4.41%	1.30%	-7.41%	0.96%	-3.90%	2.55%	3.18%	0.05%	-3.95%	1.96%	0.00%	2.97%	2.41%	7.06%	7.21%
1988	0.89%	0.89%	0.14%	0.14%	0.00%	7.02%	3.26%	3.26%	6.58%	6.58%	0.53%	1.80%	5.06%	5.13%	0.64%	0.64%	1.31%	1.31%	1.44%	2.27%	0.18%	-2.65%	0.53%	2.09%
1989	3.73%	4.59%	0.77%	0.77%	3.64%	3.78%	4.01%	5.23%	0.00%	-7.81%	0.00%	-23.43%	0.00%	-24.13%	0.88%	-7.20%	0.01%	-9.84%	0.15%	-10.93%	0.00%	-11.94%	0.00%	-10.66%
1990	0.00%	0.24%	0.00%	1.57%	0.00%	1.68%	0.00%	-3.40%	5.49%	-5.73%	4.15%	-22.45%	0.51%	-23.23%	1.72%	-9.33%	0.16%	-20.49%	0.02%	-21.52%	0.19%	-12.21%	2.38%	2.71%
1991	0.84%	0.84%	-0.02%	1.00%	0.39%	0.39%	0.09%	0.09%	5.86%	7.45%	0.34%	-5.28%	0.00%	-12.13%	1.95%	-8.92%	0.70%	-23.76%	0.00%	-24.48%	0.68%	-16.57%	1.27%	1.27%
1992	0.23%	0.23%	0.61%	0.61%	0.05%	0.05%	0.17%	0.17%	5.04%	7.77%	3.68%	-0.55%	4.68%	4.06%	2.23%	2.23%	5.91%	5.91%	0.00%	-3.84%	0.10%	0.87%	1.53%	1.53%
1993	0.09%	0.09%	-0.25%	-0.25%	-0.07%	-0.07%	0.83%	0.83%	4.30%	4.30%	7.57%	7.57%	7.58%	7.58%	5.73%	5.73%	6.14%	6.14%	6.86%	6.86%	0.02%	0.02%	3.35%	3.35%
1994	3.22%	8.15%	0.86%	0.86%	1.48%	1.64%	3.16%	3.16%	5.46%	5.46%	1.38%	1.89%	0.99%	2.09%	1.88%	2.99%	1.84%	2.65%	2.43%	3.00%	3.85%	3.98%	4.26%	4.26%
1995	0.29%	0.29%	0.08%	0.08%	0.54%	0.54%	3.05%	3.44%	7.84%	7.84%	2.33%	2.59%	0.89%	1.81%	2.74%	3.54%	1.02%	2.05%	0.88%	2.09%	0.14%	1.80%	0.00%	1.81%
1996	0.00%	2.10%	0.00%	2.37%	0.00%	2.37%	0.00%	-5.89%	0.00%	-16.12%	0.00%	-20.79%	2.38%	-5.30%	1.04%	-8.11%	3.95%	3.95%	0.00%	-14.68%	0.18%	-7.41%	0.18%	-1.42%
1997	-0.01%	-0.01%	0.21%	0.21%	0.48%	0.48%	0.00%	7.80%	0.00%	-12.04%	0.00%	-21.87%	0.68%	-23.08%	0.16%	-23.11%	0.00%	-24.13%	0.52%	-22.11%	0.00%	-14.80%	4.32%	5.09%
1998	4.49%	6.61%	0.47%	0.47%	0.06%	0.06%	0.15%	0.15%	6.80%	6.80%	0.33%	-11.61%	0.33%	-13.92%	0.83%	-14.99%	0.14%	-23.06%	0.12%	-23.86%	2.13%	-3.97%	2.12%	2.76%
1999	0.00%	1.79%	0.00%	0.18%	0.00%	0.29%	2.40%	2.40%	0.00%	-23.49%	0.00%	-25.77%	2.51%	2.97%	3.21%	3.88%	3.96%	3.96%	2.28%	-14.23%	0.00%	-19.86%	0.00%	-19.05%
2000	0.00%	-11.38%	0.00%	-11.09%	0.00%	-4.49%	0.00%	-24.16%	0.00%	-27.59%	0.00%	-28.29%	0.00%	-29.59%	0.79%	-25.71%	0.00%	-26.60%	1.02%	1.02%	0.77%	0.77%	1.37%	2.47%
2001	0.00%	1.16%	0.93%	5.82%	1.37%	1.37%	5.37%	5.37%	0.00%	-17.42%	0.00%	-26.88%	1.50%	-18.38%	1.78%	-10.69%	0.00%	-25.98%	0.00%	-25.54%	0.00%	-24.69%	0.00%	-22.01%
2002	0.00%	-20.84%	0.00%	-22.27%	0.00%	-23.84%	0.00%	-26.56%	0.00%	-30.87%	0.00%	-32.90%	0.00%	-32.79%	0.00%	-30.77%	0.00%	-30.49%	0.00%	-30.03%	0.00%	-27.66%	0.00%	-24.91%
2003	0.00%	-25.03%	0.42%	-1.63%	0.27%	0.27%	0.00%	0.93%	0.00%	-26.20%	0.00%	-31.60%	0.00%	-32.36%	0.00%	-30.87%	0.00%	-29.68%	0.00%	-30.68%	0.79%	-26.95%	0.00%	-24.77%
2004	0.00%	-25.03%	0.42%	-1.63%	0.27%	0.27%	0.00%	0.93%	0.00%	-26.20%	0.00%	-31.60%	0.00%	-32.36%	0.00%	-30.87%	0.00%	-29.68%	0.00%	-30.68%	0.79%	-26.95%	0.00%	-24.77%
2005	1.11%	1.11%	-0.01%	-0.01%	0.48%	0.48%	3.52%	3.52%	0.21%	3.55%	0.11%	-18.37%	2.21%	-9.39%	3.67%	4.38%	0.00%	-21.07%	0.00%	-21.99%	0.00%	-20.92%	0.00%	-17.06%
2006	0.00%	-17.02%	0.00%	-16.80%	0.00%	-16.28%	0.00%	-21.05%	0.00%	-26.81%	0.00%	-28.70%	0.70%	-24.79%	1.07%	-21.36%	0.00%	-27.06%	0.00%	-24.12%	0.00%	-25.19%	0.00%	-23.76%
2007	0.00%	-22.67%	0.00%	-14.85%	0.00%	-14.12%	0.00%	-25.29%	0.00%	-29.54%	0.00%	-32.42%	2.96%	-6.50%	0.83%	0.83%	0.00%	-28.57%	0.00%	-29.20%	0.42%	-27.43%	1.10%	1.10%
2008	1.44%	1.44%	0.47%	0.47%	0.61%	0.61%	0.00%	7.43%	1.78%	3.09%	0.06%	-8.84%	2.62%	2.96%	2.28%	0.20%	0.46%	-13.83%	0.18%	-11.29%	0.17%	-9.25%	0.70%	0.70%
2009	0.74%	0.74%	0.78%	0.78%	0.55%	3.75%	0.00%	6.98%																

Figure 4-57. Habitat summary table for green sunfish (*Lepomis cyanellus*), Gage site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 **cfs**

Gage Site

No Wood

Green sunfish

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-52.43%	0.00%	-49.23%	2.33%	-46.07%	1.86%	-49.00%	0.00%	-50.94%	2.20%	-51.14%	16.03%	-26.23%	0.65%	0.65%
1966	1.57%	1.57%	7.10%	24.39%	8.43%	10.73%	0.00%	-42.42%	0.00%	-52.11%	0.00%	-53.36%	0.60%	-52.70%	8.21%	-42.99%	3.45%	-49.02%	0.77%	-52.71%	6.08%	-49.80%	6.19%	-41.82%
1967	0.00%	-52.82%	0.00%	-53.19%	0.00%	-52.85%	0.00%	-53.24%	0.00%	-53.48%	0.00%	-53.60%	19.45%	-14.80%	18.37%	-2.66%	6.62%	-47.04%	0.00%	-51.84%	0.77%	-52.80%	1.07%	1.07%
1968	0.99%	0.99%	-0.92%	-0.92%	0.50%	0.50%	13.67%	23.71%	5.69%	-46.26%	0.34%	-52.78%	10.45%	-44.66%	18.20%	-32.90%	0.04%	-52.79%	0.74%	-52.72%	1.12%	-52.26%	6.04%	-47.11%
1969	1.25%	1.25%	5.73%	5.73%	2.31%	2.31%	22.48%	14.42%	28.31%	-29.40%	0.65%	-52.36%	1.42%	-52.29%	6.13%	-49.76%	3.42%	-51.15%	2.92%	-51.62%	4.41%	-50.51%	0.00%	-52.39%
1970	0.00%	-52.56%	0.00%	-45.95%	0.00%	-33.25%	0.00%	-52.24%	0.00%	-52.97%	0.00%	-53.37%	9.40%	-46.45%	9.36%	-36.56%	13.35%	-22.11%	0.00%	-53.25%	0.29%	-52.53%	0.69%	-52.27%
1971	0.00%	-52.49%	0.00%	-52.78%	0.00%	-52.85%	0.00%	-53.02%	0.00%	-53.71%	0.00%	-50.07%	9.09%	-39.38%	13.31%	-24.84%	9.23%	-36.25%	3.56%	3.56%	28.34%	-23.85%	13.09%	-4.36%
1972	10.95%	-17.56%	0.00%	-52.98%	0.00%	-53.16%	0.00%	-53.46%	0.07%	-53.55%	3.66%	-50.00%	5.35%	-47.60%	4.10%	-47.49%	1.31%	-46.28%	17.83%	-12.89%	0.74%	0.74%	6.21%	6.21%
1973	4.28%	4.28%	-1.02%	-1.02%	-0.06%	-0.06%	0.10%	0.10%	-0.81%	-0.81%	35.92%	35.92%	19.39%	0.01%	15.62%	-36.28%	3.11%	-51.24%	1.19%	-52.21%	4.95%	-49.66%	1.32%	-49.35%
1974	14.80%	-4.48%	1.57%	-37.72%	0.53%	-26.78%	0.64%	-46.98%	0.00%	-52.67%	0.28%	-52.89%	5.63%	-48.77%	8.15%	-45.15%	0.59%	-52.46%	25.59%	-19.91%	17.76%	-39.41%	0.34%	-52.29%
1975	0.00%	-52.52%	4.68%	-13.86%	2.50%	2.50%	4.76%	4.76%	21.74%	-37.88%	0.71%	-52.31%	5.60%	-46.72%	2.55%	-51.80%	0.30%	-52.92%	0.00%	-53.15%	2.22%	-51.91%	8.67%	-45.83%
1976	-0.09%	-50.43%	3.31%	-2.42%	0.00%	-25.34%	17.21%	-17.21%	3.23%	-48.83%	0.06%	-52.94%	23.14%	-22.31%	12.73%	-37.19%	8.61%	-41.05%	4.71%	-47.70%	0.00%	-53.09%	0.00%	-52.71%
1977	0.00%	-51.54%	0.00%	-51.82%	0.00%	-52.28%	6.32%	-36.51%	0.00%	-53.30%	0.00%	-50.94%	0.21%	-52.22%	17.41%	-27.85%	11.22%	-39.00%	0.66%	-52.81%	0.00%	-51.85%	0.00%	-51.12%
1978	4.15%	-27.61%	2.58%	2.58%	2.25%	2.25%	4.51%	-42.86%	15.90%	-43.86%	0.09%	-52.94%	4.00%	-50.52%	0.00%	-50.44%	0.00%	-43.52%	0.00%	-49.93%	8.04%	-1.07%	0.62%	0.62%
1979	1.34%	1.34%	0.55%	0.55%	1.04%	1.04%	2.31%	2.31%	15.42%	15.42%	41.59%	-20.64%	4.98%	-50.53%	18.52%	-42.57%	1.38%	-52.12%	8.10%	-46.32%	3.28%	-50.46%	5.23%	-48.06%
1980	2.99%	2.99%	1.37%	1.37%	1.60%	1.60%	4.39%	4.39%	25.56%	25.56%	31.41%	11.57%	17.11%	-4.96%	14.45%	-24.05%	23.48%	-18.92%	6.79%	-48.28%	4.77%	-49.75%	5.52%	-48.83%
1981	1.17%	-44.70%	0.73%	-37.78%	5.13%	17.68%	7.70%	-30.25%	2.11%	-50.87%	2.32%	-51.66%	11.66%	-41.75%	9.15%	-45.95%	4.20%	-45.24%	5.63%	-44.21%	12.80%	-39.19%	4.91%	-37.48%
1982	15.45%	17.58%	1.82%	1.82%	1.72%	1.72%	8.41%	8.41%	8.87%	-45.84%	1.03%	-52.18%	3.16%	-51.32%	5.82%	-42.67%	7.26%	-43.42%	3.53%	-51.33%	13.66%	-23.59%	3.28%	3.28%
1983	2.58%	4.53%	1.09%	1.09%	1.22%	1.22%	0.63%	0.63%	13.11%	13.11%	21.15%	-42.60%	13.16%	-43.87%	17.04%	-32.90%	2.49%	-25.18%	13.13%	-0.10%	25.30%	-20.13%	5.94%	5.94%
1984	5.86%	5.86%	1.95%	-27.53%	0.00%	-49.93%	0.00%	-49.93%	0.00%	-52.21%	0.13%	-53.30%	5.92%	-48.04%	14.80%	-31.66%	14.63%	-5.93%	10.52%	3.91%	27.88%	-19.61%	-0.43%	-0.43%
1985	2.05%	2.05%	1.40%	1.40%	1.50%	1.50%	8.28%	8.28%	23.80%	23.80%	11.71%	-47.07%	10.82%	-42.52%	12.17%	-41.51%	9.72%	-40.85%	23.27%	-13.70%	1.10%	1.10%	2.60%	2.60%
1986	5.35%	1.79%	6.48%	6.85%	0.79%	0.79%	14.44%	14.44%	4.04%	-47.87%	2.81%	-51.33%	19.06%	-41.84%	21.16%	-15.29%	13.69%	-24.63%	10.42%	-46.05%	13.97%	-36.02%	22.73%	-24.30%
1987	6.76%	15.56%	6.25%	17.36%	1.31%	1.31%	14.80%	-18.45%	3.15%	-49.58%	1.30%	-52.25%	3.12%	-47.48%	5.92%	-42.74%	0.05%	-52.98%	7.39%	-42.58%	8.51%	-40.12%	15.05%	-43.41%
1988	4.85%	4.85%	0.82%	0.82%	0.00%	-33.77%	15.54%	-5.48%	24.43%	-33.22%	0.53%	-52.55%	14.68%	-38.45%	4.48%	-3.73%	9.21%	-7.85%	1.77%	-52.15%	0.18%	-52.95%	2.85%	-48.51%
1989	13.84%	-6.01%	4.67%	4.67%	14.32%	-14.13%	12.84%	-23.13%	0.00%	-52.45%	0.00%	-52.96%	0.00%	-52.11%	5.06%	-48.95%	0.01%	-53.32%	0.15%	-53.20%	0.00%	-53.48%	0.00%	-52.87%
1990	0.00%	-52.84%	0.00%	-52.81%	0.00%	-52.57%	0.00%	-52.61%	11.32%	-47.14%	4.15%	-47.86%	0.94%	-51.54%	7.42%	-40.44%	0.16%	-53.06%	0.02%	-53.53%	0.19%	-52.99%	12.62%	-13.21%
1991	4.86%	4.86%	-0.08%	-34.58%	2.84%	2.84%	0.26%	0.26%	7.23%	-45.28%	0.34%	-52.82%	0.00%	-53.39%	8.38%	-46.77%	1.70%	-50.11%	0.00%	-52.02%	0.87%	-52.95%	10.16%	2.42%
1992	1.48%	1.48%	3.75%	3.75%	0.27%	0.27%	0.38%	0.38%	6.51%	-36.18%	4.55%	-50.46%	18.04%	-26.71%	16.39%	-7.74%	21.21%	-35.05%	0.00%	-53.06%	0.37%	-47.94%	2.21%	-11.11%
1993	-0.06%	-0.06%	-1.25%	-1.25%	-0.34%	-0.34%	4.63%	4.63%	32.99%	32.99%	26.88%	-3.07%	11.49%	-33.82%	20.91%	-20.30%	19.05%	-25.05%	17.40%	-29.79%	-0.11%	-0.11%	23.46%	23.46%
1994	3.22%	-7.71%	5.12%	5.12%	7.43%	10.36%	21.59%	22.37%	29.21%	-23.81%	1.59%	-51.87%	1.17%	-52.33%	4.98%	-48.55%	2.99%	-51.34%	7.19%	-48.93%	9.93%	-43.90%	24.50%	-17.03%
1995	1.20%	1.20%	1.14%	1.14%	3.21%	3.21%	20.31%	25.84%	14.46%	-37.12%	2.94%	-51.23%	0.89%	-52.46%	5.93%	-48.69%	1.02%	-52.22%	0.88%	-52.40%	0.14%	-52.54%	0.00%	-52.37%
1996	0.00%	-52.19%	0.00%	-51.76%	0.00%	-51.75%	0.00%	-52.70%	0.00%	-53.43%	0.00%	-53.73%	8.68%	-45.75%	4.58%	-48.62%	20.93%	-15.17%	0.00%	-53.35%	0.18%	-52.92%	0.18%	-52.93%
1997	0.54%	0.54%	1.75%	1.75%	1.79%	1.79%	0.00%	-45.63%	0.00%	-52.90%	0.00%	-53.60%	0.88%	-52.96%	0.16%	-53.27%	0.00%	-52.65%	2.74%	-51.07%	0.00%	-53.42%	13.75%	-41.97%
1998	11.66%	-30.94%	1.73%	1.73%	0.29%	0.29%	1.08%	1.08%	29.43%	-33.95%	0.33%	-52.67%	0.42%	-53.20%	3.01%	-51.70%	0.14%	-53.39%	0.12%	-53.00%	3.58%	-48.68%	3.58%	-48.41%
1999	0.00%	-52.91%	0.00%	-52.80%	0.00%	-50.70%	14.92%	-4.22%	0.00%	-52.77%	0.00%	-49.49%	11.06%	-28.12%	12.23%	-39.89%	13.98%	-25.44%	4.87%	-50.70%	0.00%	-53.73%	0.00%	-53.47%
2000	0.00%	-53.44%	0.00%	-53.35%	0.00%	-50.58%	0.00%	-52.66%	0.00%	-45.93%	0.00%	-44.56%	0.00%	-42.01%	1.38%	-42.35%	0.00%	-47.87%	6.84%	6.84%	5.24%	5.24%	1.52%	-51.53%
2001	0.00%	-52.41%	4.08%	-26.19%	6.67%	7.52%	21.91%	-21.79%	0.00%	-52.33%	0.00%	-47.31%	6.81%	-37.67%	9.17%	-33.43%	0.00%	-49.09%	0.00%	-49.94%	0.00%	-51.61%	0.00%	-53.54%
2002	0.00%	-53.82%	0.00%	-53.70%	0.00%	-52.46%	0.00%	-47.94%	0.00%	-39.51%	0.00%	-35.53%	0.00%	-35.74%	0.00%	-39.69%	0.00%	-40.25%	0.00%	-41.14%	0.00%	-45.78%	0.00%	-51.19%
2003	0.00%	-50.94%	1.68%	-31.14%	0.80%	0.80%	0.00%	-45.13%	0.00%	-48.34%	0.00%	-38.07%	0.00%	-36.57%	0.00%	-39.51%	0.00%	-41.84%	0.00%	-39.88%	2.57%	-42.15%	0.00%	-51.42%
2004	0.00%	-50.94%	1.68%	-31.14%	0.80%	0.80%	0.00%	-45.13%	0.00%	-48.34%	0.00%	-38.07%	0.00%	-36.57%	0.00%	-39.51%	0.00%	-41.84%	0.00%	-39.88%	2.57%	-42.15%	0.00%	-51.42%
2005	5.83%	5.83%	0.19%	0.19%	1.94%	1.94%	20.26%	17.09%	0.21%	-50.33%	0.11%	-52.87%	8.20%	-44.50%	12.31%	-37.32%	0.00%	-53.55%	0.00%	-53.74%	0.00%	-53.73%	0.00%	-53.69%
2006	0.00%	-53.67%	0.00%	-53.67%	0.00%	-52.78%	0.00%	-53.25%	0.00%	-47.46%	0.00%	-43.76%	4.75%	-40.32%	4.41%	-44.66%	0.00%	-46.96%	0.00%	-47.63%	0.00%	-50.63%	0.00%	-53.16%
2007	0.00%	-53.58%	0.00%	-51.77%	0.00%	-52.98%	0.00%	-50.44%	0.00%	-42.10%	0.00%	-36.47%	11.12%	-12.32%	5.14%	5.14%	0.00%	-44.00%	0.00%	-42.78%	0.42%	-46.33%	5.45%	4.10%
2008	7.80%	7.80%	2.44%	2.44%	4.43%	4.43%	0.00%	-46.47%	3.31%	-50.73%	0.06%	-52.86%	5.74%	-39.95%	8.12%	-47.59%	0.54%	-52.96%	0.22%	-53.31%	0.17%	-52.89%	4.17%	4.17%
2009	4.95%	4.95%	4.22%	4.22%	3.17%	25.98%	0.00%	-48.06%																

Figure 4-58. Habitat summary table for green sunfish (*Lepomis cyanellus*), Gage site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

										Gage Site														
Summary of normalized habitat changes										With LWD														
Hypothetical Withdrawal	2 cfs									Green sunfish														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-5.08%	0.00%	-29.05%	0.13%	-25.96%	0.00%	-28.00%	0.00%	-27.95%	0.63%	-26.18%	3.47%	3.59%	2.75%	3.53%
1966	0.30%	0.30%	0.15%	0.60%	-0.01%	-0.01%	0.00%	5.45%	0.00%	-4.71%	0.00%	-12.00%	0.41%	-18.99%	1.37%	1.07%	0.92%	-3.34%	0.55%	-13.67%	0.96%	-9.37%	0.96%	-0.06%
1967	0.00%	-0.31%	0.00%	-10.43%	0.00%	-7.91%	0.00%	-15.91%	0.00%	-14.82%	0.00%	-20.24%	2.29%	0.73%	1.29%	1.29%	1.57%	-2.41%	0.00%	-27.36%	0.51%	-21.67%	0.27%	0.27%
1968	-2.36%	-2.36%	-0.10%	-0.10%	0.39%	0.39%	0.13%	0.20%	3.42%	5.38%	0.28%	-7.80%	2.95%	3.19%	3.80%	3.80%	0.03%	-0.46%	0.42%	-0.41%	0.69%	0.35%	1.58%	2.54%
1969	1.19%	1.19%	0.46%	0.46%	0.43%	2.13%	4.44%	5.22%	4.17%	4.17%	0.53%	-1.92%	0.88%	-3.71%	1.07%	-0.94%	0.90%	-8.70%	0.84%	-9.07%	2.02%	2.64%	0.00%	1.46%
1970	0.00%	1.46%	0.00%	2.01%	0.00%	4.43%	0.00%	1.49%	0.00%	-7.03%	0.00%	-23.20%	2.06%	-21.42%	1.67%	-11.96%	2.42%	2.49%	0.00%	-16.31%	0.23%	-0.60%	0.51%	1.41%
1971	0.00%	1.46%	0.00%	1.45%	0.00%	0.86%	0.00%	-20.23%	0.00%	-24.05%	0.00%	-28.51%	1.76%	-17.60%	4.64%	-3.29%	2.65%	-7.21%	2.61%	2.61%	3.60%	3.60%	1.07%	1.71%
1972	0.97%	2.97%	0.00%	0.14%	0.00%	-9.06%	0.00%	-17.67%	0.06%	-21.87%	0.54%	-14.80%	1.60%	-11.94%	0.78%	-17.59%	1.08%	-25.82%	4.19%	-3.31%	1.11%	1.11%	-0.38%	-0.38%
1973	1.18%	1.18%	0.78%	0.78%	-0.24%	-0.24%	-0.16%	-0.16%	0.85%	0.85%	7.29%	7.29%	3.25%	3.25%	4.96%	4.96%	1.98%	2.00%	0.96%	1.47%	2.91%	2.95%	0.01%	1.78%
1974	3.32%	3.58%	0.89%	5.32%	0.01%	4.30%	0.47%	4.33%	0.00%	1.46%	0.22%	-6.52%	1.24%	-3.11%	1.86%	-1.13%	0.45%	-1.30%	3.64%	3.64%	3.66%	3.69%	0.26%	1.67%
1975	0.00%	1.48%	-0.07%	1.98%	0.91%	2.19%	1.28%	1.30%	5.33%	5.33%	0.57%	-2.23%	1.36%	2.06%	0.48%	-4.49%	0.25%	-3.61%	0.00%	-8.39%	1.06%	-7.48%	1.83%	-1.06%
1976	0.06%	0.87%	0.85%	2.80%	0.00%	4.90%	2.21%	2.21%	2.03%	4.17%	0.05%	-13.74%	3.83%	3.83%	4.15%	4.16%	1.73%	-6.84%	1.19%	1.84%	0.00%	-2.60%	0.00%	-12.34%
1977	0.00%	1.68%	0.00%	1.58%	0.00%	1.47%	0.21%	1.80%	0.00%	-19.95%	0.00%	-27.95%	0.15%	-22.91%	2.73%	-4.73%	2.59%	2.59%	0.41%	-21.53%	0.00%	-27.38%	0.00%	-27.83%
1978	1.27%	3.58%	0.63%	0.63%	-0.03%	1.46%	1.30%	4.86%	4.91%	5.49%	0.07%	-6.86%	1.23%	-13.53%	0.00%	-28.27%	0.00%	-32.76%	0.00%	-27.30%	0.18%	0.18%	0.90%	0.90%
1979	1.65%	1.65%	-3.10%	-3.10%	-1.53%	-1.53%	1.22%	1.22%	0.98%	0.98%	5.14%	5.14%	2.79%	2.79%	5.02%	5.02%	0.96%	1.58%	2.29%	2.29%	2.44%	2.45%	3.81%	5.09%
1980	-1.02%	-0.39%	-1.67%	-1.67%	-2.89%	-2.89%	-1.54%	-1.54%	0.22%	0.22%	4.79%	4.79%	5.00%	5.00%	5.02%	5.02%	4.41%	4.41%	3.79%	3.79%	3.14%	3.63%	3.50%	4.19%
1981	0.84%	5.20%	0.01%	3.02%	0.61%	0.69%	2.06%	5.16%	0.98%	2.08%	1.45%	2.05%	2.94%	2.94%	2.32%	2.85%	1.27%	1.99%	2.16%	2.16%	3.56%	3.70%	0.29%	1.15%
1982	0.16%	0.56%	-0.46%	-0.46%	0.83%	0.86%	-0.12%	-0.12%	3.36%	5.60%	0.83%	1.47%	1.40%	2.23%	1.88%	2.54%	1.53%	2.21%	0.99%	-3.81%	3.59%	3.59%	-0.17%	-0.17%
1983	0.56%	0.56%	-1.48%	-1.48%	-1.00%	-1.00%	0.10%	0.10%	1.40%	1.40%	5.42%	5.42%	3.38%	3.38%	3.79%	3.85%	-0.03%	0.19%	3.61%	3.61%	4.47%	4.47%	2.90%	2.90%
1984	0.61%	0.61%	1.36%	5.03%	0.00%	3.39%	0.00%	3.41%	0.00%	-5.43%	0.11%	-16.53%	1.76%	-11.00%	2.15%	2.37%	1.16%	1.16%	1.93%	1.93%	4.09%	4.09%	3.83%	3.83%
1985	0.98%	0.98%	-2.36%	-2.36%	-0.36%	-0.36%	0.27%	0.27%	2.35%	2.35%	5.51%	5.51%	3.10%	3.11%	3.57%	3.58%	1.73%	1.86%	3.51%	3.51%	5.05%	5.05%	0.03%	0.03%
1986	2.78%	4.83%	0.68%	2.39%	0.53%	0.53%	0.98%	0.98%	2.71%	4.94%	1.50%	1.90%	4.21%	4.21%	4.46%	4.46%	1.26%	1.43%	2.97%	2.97%	4.86%	4.86%	4.78%	4.78%
1987	0.74%	2.02%	-0.01%	1.16%	0.51%	0.52%	3.42%	4.17%	2.32%	3.30%	0.96%	-9.32%	0.73%	-6.20%	1.95%	2.35%	0.04%	-4.97%	0.86%	-1.58%	1.56%	0.72%	5.30%	5.40%
1988	1.03%	1.03%	0.72%	0.72%	0.00%	4.79%	3.54%	3.54%	4.72%	4.72%	0.43%	1.46%	3.72%	3.77%	3.04%	3.09%	4.33%	4.33%	1.12%	1.61%	0.14%	-3.56%	0.54%	1.79%
1989	3.10%	4.13%	0.19%	0.19%	2.31%	2.32%	3.10%	3.84%	0.00%	-9.55%	0.00%	-26.05%	0.00%	-26.91%	1.17%	-8.11%	0.01%	-11.28%	0.12%	-12.55%	0.00%	-13.50%	0.00%	-12.45%
1990	0.00%	-0.25%	0.00%	1.18%	0.00%	1.23%	0.00%	-4.39%	3.99%	-10.99%	0.36%	-28.33%	0.00%	-26.67%	1.54%	-10.27%	0.13%	-22.98%	0.00%	-23.94%	0.15%	-14.09%	1.73%	2.30%
1991	1.83%	1.83%	0.00%	1.46%	0.12%	0.14%	0.35%	0.35%	4.21%	5.36%	0.28%	-6.53%	0.00%	-13.76%	1.59%	-11.46%	0.53%	-27.17%	0.00%	-27.26%	0.50%	-18.97%	2.31%	2.31%
1992	-1.07%	-1.07%	0.18%	0.18%	0.72%	0.72%	0.35%	0.35%	3.63%	5.59%	2.79%	-2.94%	2.18%	0.43%	2.48%	2.48%	4.28%	4.28%	0.00%	-4.80%	0.02%	-0.59%	4.27%	4.27%
1993	-1.12%	-1.12%	-1.74%	-1.74%	-2.80%	-2.80%	1.22%	1.22%	4.38%	4.38%	5.30%	5.30%	5.50%	5.50%	2.84%	2.84%	3.33%	3.33%	5.18%	5.18%	1.20%	1.20%	2.41%	2.41%
1994	2.28%	5.78%	1.43%	1.43%	1.06%	1.07%	2.00%	2.00%	4.21%	4.21%	1.11%	1.52%	0.77%	1.67%	1.29%	2.17%	1.41%	2.06%	2.09%	2.55%	2.59%	2.69%	2.48%	2.48%
1995	0.31%	0.31%	0.30%	0.30%	0.67%	0.67%	2.07%	2.10%	5.53%	5.53%	1.81%	2.02%	0.72%	1.46%	2.30%	2.94%	0.80%	1.63%	0.69%	1.67%	0.11%	1.46%	0.00%	1.46%
1996	0.00%	1.67%	0.00%	1.87%	0.00%	1.87%	0.00%	-7.28%	0.00%	-18.16%	0.00%	-23.16%	1.72%	-6.92%	0.92%	-11.95%	1.46%	1.46%	0.00%	-16.60%	0.14%	-8.82%	0.14%	-2.20%
1997	4.76%	4.76%	1.20%	2.27%	-0.20%	1.06%	0.00%	5.61%	0.00%	-13.95%	0.00%	-24.43%	0.51%	-25.94%	0.06%	-25.86%	0.00%	-26.84%	0.39%	-25.48%	0.00%	-16.70%	3.23%	3.82%
1998	4.28%	5.73%	0.00%	1.17%	0.33%	0.33%	-0.43%	-0.43%	5.40%	5.40%	0.27%	-13.61%	0.27%	-15.86%	0.63%	-18.01%	0.12%	-25.86%	0.00%	-26.61%	1.46%	-6.72%	1.45%	1.73%
1999	0.00%	1.45%	0.00%	-0.52%	0.00%	-0.86%	0.55%	0.55%	0.00%	-26.59%	0.00%	-28.88%	3.09%	-9.11%	2.42%	2.93%	2.54%	1.98%	1.72%	-17.80%	0.00%	-22.13%	0.00%	-21.37%
2000	0.00%	-12.91%	0.00%	-12.64%	0.00%	-5.76%	0.00%	-26.86%	0.00%	-31.17%	0.00%	-32.07%	0.00%	-33.75%	0.04%	-31.67%	0.00%	-29.91%	0.05%	-13.16%	1.77%	1.77%	1.05%	1.58%
2001	0.00%	0.35%	0.37%	3.62%	0.54%	0.54%	4.28%	4.28%	0.00%	-20.21%	0.00%	-30.28%	0.37%	-29.31%	0.40%	-12.37%	0.00%	-29.13%	0.00%	-28.59%	0.00%	-27.53%	0.00%	-24.45%
2002	0.00%	-23.16%	0.00%	-24.73%	0.00%	-26.53%	0.00%	-29.87%	0.00%	-35.43%	0.00%	-38.13%	0.00%	-37.98%	0.00%	-35.30%	0.00%	-34.93%	0.00%	-34.33%	0.00%	-31.27%	0.00%	-27.79%
2003	0.00%	-27.95%	0.04%	-8.19%	-0.08%	2.46%	0.00%	-5.00%	0.00%	-29.44%	0.00%	-36.39%	0.00%	-37.41%	0.00%	-35.43%	0.00%	-33.87%	0.00%	-35.18%	0.12%	-32.62%	0.00%	-27.63%
2004	0.00%	-27.95%	0.04%	-8.19%	-0.08%	2.46%	0.00%	-5.00%	0.00%	-29.44%	0.00%	-36.39%	0.00%	-37.41%	0.00%	-35.43%	0.00%	-33.87%	0.00%	-35.18%	0.12%	-32.62%	0.00%	-27.63%
2005	1.54%	1.54%	-1.14%	-1.14%	0.24%	0.24%	2.36%	2.36%	0.17%	2.70%	0.09%	-20.95%	1.86%	-15.70%	2.38%	2.92%	0.00%	-23.57%	0.00%	-24.49%	0.00%	-23.30%	0.00%	-19.05%
2006	0.00%	-19.02%	0.00%	-18.77%	0.00%	-18.70%	0.00%	-23.71%	0.00%	-30.19%	0.00%	-32.60%	0.66%	-32.12%	0.84%	-27.69%	0.00%	-30.51%	0.00%	-27.18%	0.00%	-28.15%	0.00%	-26.39%
2007	0.00%	-25.32%	0.00%	-17.76%	0.00%	-16.20%	0.00%	-28.27%	0.00%	-33.69%	0.00%	-37.48%	0.00%	-37.41%	0.34%	-25.46%	0.00%	-32.44%	0.00%	-33.25%	0.00%	-31.37%	3.95%	3.95%
2008	0.53%	0.53%	-0.80%	-0.80%	0.60%	1.09%	0.00%	5.37%	1.32%	2.37%	0.05%	-10.45%	1.21%	1.46%	1.70%	-0.80%	0.35%	-15.92%	0.14%	-12.85%	0.14%	-10.88%	-0.53%	-0.53%
2009	-0.26%	-0.26%	-0.14%	-0.14%	-0.12%	2.89%	0.00%	5.09%																

Figure 4-59. Habitat summary table for green sunfish (*Lepomis cyanellus*), Gage site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Gage Site

With LWD

Green sunfish

Summary of normalized habitat changes
Hypothetical Withdrawal 10 cfs

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965									0.00%	-58.73%	0.00%	-55.19%	-0.12%	-53.71%	0.00%	-56.31%	0.00%	-56.88%	1.34%	-57.55%	10.46%	-50.44%	6.42%	-38.71%
1966	1.37%	1.37%	4.32%	20.44%	4.05%	4.64%	0.00%	-52.54%	0.00%	-58.51%	0.00%	-59.39%	0.49%	-58.92%	5.84%	-55.27%	2.06%	-56.62%	0.63%	-58.93%	4.60%	-57.03%	3.25%	-54.99%
1967	0.00%	-59.01%	0.00%	-59.27%	0.00%	-59.03%	0.00%	-59.30%	0.00%	-59.47%	0.00%	-59.56%	9.42%	-46.67%	7.40%	-48.65%	5.94%	-54.87%	0.00%	-57.76%	0.60%	-59.00%	3.06%	-50.48%
1968	-13.09%	-13.09%	-0.37%	-0.37%	2.03%	2.11%	11.22%	20.41%	4.13%	-54.83%	0.28%	-58.98%	7.53%	-53.74%	13.42%	-46.26%	0.03%	-58.98%	0.57%	-58.95%	0.86%	-58.63%	4.36%	-55.21%
1969	5.43%	-42.22%	2.90%	5.98%	2.01%	11.23%	18.69%	-3.72%	20.04%	-44.34%	0.53%	-58.68%	1.10%	-58.65%	4.55%	-57.03%	2.54%	-57.92%	2.22%	-58.22%	3.32%	-57.49%	0.00%	-58.71%
1970	0.00%	-58.82%	0.00%	-54.53%	0.00%	-47.20%	0.00%	-58.60%	0.00%	-59.11%	0.00%	-59.39%	6.49%	-54.73%	5.32%	-49.27%	8.91%	-52.23%	0.00%	-59.31%	0.23%	-58.81%	0.51%	-58.64%
1971	0.00%	-58.77%	0.00%	-58.98%	0.00%	-59.03%	0.00%	-59.15%	0.00%	-59.64%	0.00%	-56.02%	7.05%	-49.40%	13.18%	-48.78%	8.76%	-51.82%	4.59%	-44.47%	18.27%	-42.01%	5.28%	-46.60%
1972	5.78%	-42.78%	0.00%	-59.12%	0.00%	-59.25%	0.00%	-59.46%	0.06%	-59.52%	2.93%	-57.08%	4.34%	-55.35%	2.88%	-55.01%	0.04%	-55.35%	17.86%	-31.56%	9.97%	-17.56%	1.71%	1.71%
1973	1.10%	1.10%	6.50%	15.85%	-1.87%	-1.87%	-10.94%	-10.94%	4.19%	4.19%	33.24%	29.25%	10.39%	-9.97%	11.57%	-46.94%	2.44%	-57.92%	0.96%	-58.58%	3.69%	-56.93%	1.35%	-56.58%
1974	8.79%	-24.45%	1.11%	-48.43%	0.04%	-41.19%	0.47%	-55.26%	0.00%	-58.90%	0.22%	-59.06%	4.54%	-56.26%	6.76%	-53.80%	0.45%	-58.76%	17.47%	-42.73%	14.69%	-49.84%	0.26%	-58.64%
1975	0.00%	-58.80%	1.95%	-36.40%	1.96%	16.04%	6.20%	8.59%	15.24%	-49.88%	0.57%	-58.65%	4.74%	-54.35%	1.91%	-58.35%	0.25%	-59.07%	0.00%	-59.24%	1.67%	-58.42%	7.20%	-54.17%
1976	0.07%	-58.99%	3.14%	-18.36%	0.00%	-40.58%	9.06%	-39.12%	2.39%	-56.40%	0.05%	-59.09%	17.33%	-40.52%	9.71%	-49.15%	5.16%	-51.89%	2.59%	-56.00%	0.00%	-59.20%	0.00%	-58.93%
1977	0.00%	-58.12%	0.00%	-58.31%	0.00%	-58.63%	2.89%	-49.17%	0.00%	-59.35%	0.00%	-56.88%	0.17%	-58.19%	9.74%	-46.22%	7.57%	-50.29%	0.53%	-59.00%	0.00%	-57.76%	0.00%	-57.06%
1978	3.50%	-50.47%	-1.41%	-2.34%	0.64%	8.68%	3.21%	-52.79%	11.37%	-53.39%	0.07%	-59.09%	3.23%	-57.42%	0.00%	-56.39%	0.00%	-49.46%	0.00%	-55.89%	2.36%	-33.39%	5.03%	5.03%
1979	8.02%	8.02%	-13.80%	-13.80%	-3.33%	-3.33%	-3.15%	-3.15%	6.65%	6.65%	28.41%	-35.74%	3.83%	-57.48%	14.02%	-52.30%	1.10%	-58.52%	5.87%	-54.54%	2.48%	-57.43%	3.81%	-55.93%
1980	-1.72%	-29.79%	-6.50%	-6.50%	-8.93%	-8.93%	-2.14%	-2.14%	22.98%	22.98%	21.88%	0.55%	12.34%	-14.92%	10.04%	-34.84%	15.86%	-28.36%	5.13%	-55.47%	3.56%	-56.98%	4.03%	-56.40%
1981	0.84%	-53.88%	0.05%	-47.56%	1.77%	2.74%	6.10%	-41.59%	1.58%	-57.70%	1.78%	-58.24%	8.42%	-51.63%	6.26%	-54.59%	3.04%	-53.89%	4.44%	-53.29%	7.31%	-51.21%	2.53%	-50.97%
1982	2.14%	-3.42%	-3.19%	-3.19%	2.17%	2.17%	1.27%	1.27%	6.41%	-54.57%	0.83%	-58.56%	2.40%	-58.01%	4.39%	-52.42%	5.93%	-52.61%	2.63%	-58.05%	18.42%	-41.00%	2.06%	2.06%
1983	6.92%	6.92%	-6.56%	-6.56%	-6.27%	-6.27%	-4.52%	-4.52%	5.09%	5.09%	15.13%	-52.64%	9.28%	-53.23%	13.44%	-46.36%	-1.12%	-54.69%	21.97%	-30.53%	21.92%	-45.24%	15.34%	15.34%
1984	6.60%	6.60%	1.36%	-39.02%	0.00%	-57.10%	0.00%	-57.10%	0.00%	-58.58%	0.11%	-59.35%	3.84%	-55.96%	7.97%	-40.85%	7.75%	-50.30%	12.88%	-30.63%	21.07%	-42.86%	20.30%	20.98%
1985	2.87%	2.87%	-8.81%	-8.81%	2.22%	2.22%	4.39%	4.39%	16.65%	16.65%	8.61%	-55.32%	8.41%	-52.25%	9.30%	-51.65%	4.91%	-52.26%	13.86%	-34.02%	3.89%	-7.51%	6.17%	6.17%
1986	3.71%	-10.00%	2.29%	13.81%	2.96%	2.96%	7.02%	7.02%	2.96%	-55.81%	2.17%	-58.00%	13.90%	-52.02%	9.46%	-45.13%	3.36%	-51.45%	7.73%	-54.57%	9.78%	-45.43%	16.31%	-37.73%
1987	1.46%	-11.14%	1.52%	10.50%	0.79%	1.03%	10.23%	-34.74%	2.32%	-56.88%	0.96%	-58.64%	3.00%	-55.31%	4.75%	-52.39%	0.04%	-59.12%	3.83%	-53.32%	4.58%	-52.70%	11.00%	-53.00%
1988	2.24%	-15.42%	4.03%	7.45%	0.00%	-47.68%	15.42%	-43.79%	17.52%	-46.70%	0.43%	-58.82%	10.45%	-49.74%	11.69%	-48.83%	16.47%	-46.21%	1.38%	-58.56%	0.14%	-59.10%	2.45%	-55.95%
1989	12.02%	-25.17%	0.55%	0.55%	8.31%	-36.32%	9.49%	-40.87%	0.00%	-58.75%	0.00%	-58.85%	0.00%	-58.04%	4.75%	-56.10%	0.01%	-59.36%	0.12%	-59.27%	0.00%	-59.47%	0.00%	-59.04%
1990	0.00%	-59.02%	0.00%	-59.00%	0.00%	-58.83%	0.00%	-58.86%	8.27%	-55.38%	0.36%	-55.73%	0.00%	-57.91%	6.64%	-50.91%	0.13%	-59.07%	0.00%	-59.43%	0.15%	-59.13%	5.35%	-46.95%
1991	9.75%	-36.35%	0.00%	-58.66%	2.42%	5.89%	3.82%	3.82%	5.22%	-54.24%	0.28%	-59.01%	0.00%	-59.41%	7.31%	-54.69%	1.08%	-56.41%	0.00%	-57.94%	0.66%	-59.11%	15.51%	-35.04%
1992	-0.85%	-0.85%	4.20%	6.14%	5.34%	5.34%	4.40%	4.40%	4.71%	-44.27%	3.48%	-57.43%	7.98%	-45.49%	13.13%	-39.53%	15.37%	-47.74%	0.00%	-59.17%	-0.17%	-57.25%	16.21%	-27.19%
1993	-6.88%	-6.88%	-9.99%	-9.99%	-9.67%	-9.67%	5.88%	5.88%	30.41%	30.41%	18.93%	-13.03%	8.48%	-41.01%	11.56%	-37.18%	10.44%	-39.93%	11.33%	-40.76%	11.90%	-12.86%	17.41%	17.41%
1994	2.28%	-15.98%	7.90%	7.90%	4.06%	5.48%	15.14%	15.55%	21.35%	-40.00%	1.27%	-58.34%	0.92%	-58.67%	4.06%	-56.09%	2.29%	-58.02%	5.74%	-56.34%	7.30%	-53.13%	14.47%	-24.96%
1995	2.88%	2.88%	3.23%	3.23%	2.44%	2.50%	17.45%	20.87%	10.22%	-47.40%	2.30%	-57.92%	0.72%	-58.75%	5.05%	-56.06%	0.80%	-58.60%	0.69%	-58.72%	0.11%	-58.81%	0.00%	-58.69%
1996	0.00%	-58.57%	0.00%	-58.30%	0.00%	-58.29%	0.00%	-58.92%	0.00%	-59.44%	0.00%	-59.65%	7.00%	-54.15%	4.14%	-56.01%	15.13%	-39.69%	0.00%	-59.38%	0.14%	-59.08%	0.14%	-59.09%
1997	9.63%	-41.83%	3.80%	13.48%	-0.39%	8.97%	0.00%	-54.45%	0.00%	-59.06%	0.00%	-59.55%	0.57%	-59.02%	0.06%	-59.26%	0.00%	-58.54%	2.05%	-57.46%	0.00%	-59.43%	10.54%	-51.92%
1998	9.67%	-44.49%	-2.54%	-34.89%	-0.39%	-0.39%	-2.00%	-2.00%	21.09%	-47.33%	0.27%	-58.90%	0.34%	-59.28%	2.26%	-58.29%	0.12%	-59.41%	0.00%	-58.94%	2.50%	-56.24%	2.49%	-56.06%
1999	0.00%	-59.07%	0.00%	-58.99%	0.00%	-57.64%	5.43%	-32.75%	0.00%	-58.93%	0.00%	-55.45%	7.88%	-47.44%	8.83%	-50.67%	7.06%	-46.91%	3.68%	-57.62%	0.00%	-59.65%	0.00%	-59.47%
2000	0.00%	-59.44%	0.00%	-59.38%	0.00%	-57.57%	0.00%	-58.56%	0.00%	-51.90%	0.00%	-50.52%	0.00%	-47.93%	0.34%	-49.75%	0.00%	-53.85%	5.31%	-43.89%	10.49%	-22.56%	1.17%	-58.13%
2001	0.00%	-58.74%	0.74%	-42.14%	1.15%	3.42%	15.11%	-40.45%	0.00%	-58.66%	0.00%	-53.29%	3.38%	-48.51%	5.41%	-46.43%	0.00%	-55.06%	0.00%	-55.89%	0.00%	-57.53%	0.00%	-59.43%
2002	0.00%	-59.72%	0.00%	-59.58%	0.00%	-58.37%	0.00%	-53.92%	0.00%	-45.34%	0.00%	-41.18%	0.00%	-41.40%	0.00%	-45.54%	0.00%	-46.11%	0.00%	-47.03%	0.00%	-51.75%	0.00%	-57.12%
2003	0.00%	-56.88%	0.13%	-45.05%	-0.48%	12.21%	0.00%	-54.02%	0.00%	-54.31%	0.00%	-43.85%	0.00%	-42.28%	0.00%	-45.34%	0.00%	-47.75%	0.00%	-45.73%	0.12%	-49.48%	0.00%	-57.35%
2004	0.00%	-56.88%	0.13%	-45.05%	-0.48%	12.21%	0.00%	-54.02%	0.00%	-54.31%	0.00%	-43.85%	0.00%	-42.28%	0.00%	-45.34%	0.00%	-47.75%	0.00%	-45.73%	0.12%	-49.48%	0.00%	-57.35%
2005	2.67%	2.67%	-3.85%	-2.68%	1.44%	1.53%	12.21%	-13.25%	0.17%	-57.36%	0.09%	-59.04%	6.71%	-53.26%	8.00%	-49.48%	0.00%	-59.52%	0.00%	-59.66%	0.00%	-59.65%	0.00%	-59.62%
2006	0.00%	-59.60%	0.00%	-59.61%	0.00%	-58.98%	0.00%	-59.31%	0.00%	-53.43%	0.00%	-49.71%	0.95%	-48.98%	2.85%	-52.88%	0.00%	-52.93%	0.00%	-53.63%	0.00%	-56.57%	0.00%	-59.04%
2007	0.00%	-59.54%	0.00%	-58.30%	0.00%	-59.12%	0.00%	-56.39%	0.00%	-48.01%	0.00%	-42.17%	0.00%	-42.28%	2.06%	-49.18%	0.00%	-49.95%	0.00%	-48.71%	0.00%	-51.60%	19.12%	-15.69%
2008	3.03%	3.03%	-2.26%	-2.26%	1.18%	9.25%	0.00%	-54.96%	2.45%	-57.64%	0.05%	-59.04%	1.65%	-51.88%	6.00%	-55.07%	0.41%	-59.11%	0.18%	-59.35%	0.14%	-59.05%	-0.64%	-44.12%
2009	1.38%	1.38%	-0.20%	-0.20%	-0.86%	6.62%	0.00%	-55.93%																

Figure 4-60. Habitat summary table for green sunfish (*Lepomis cyanellus*), Gage site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Braided Site

No Wood

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Green sunfish

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.82%	-24.26%	-2.79%	-36.74%	7.62%	-21.27%	-1.96%	-28.33%	0.00%	-36.58%	0.51%	-33.94%	-8.27%	1.02%	2.50%	2.50%
1966	-1.43%	-1.43%	3.78%	10.84%	4.03%	8.90%	-0.63%	0.14%	0.00%	-18.82%	-0.86%	-20.89%	0.00%	-26.12%	-0.23%	-10.66%	-0.40%	-26.35%	0.00%	-20.25%	-4.39%	-18.05%	-5.53%	-11.17%
1967	0.00%	-12.35%	0.00%	-22.77%	-0.81%	-20.26%	-0.88%	-22.54%	0.00%	-20.25%	0.00%	-26.12%	-7.47%	-17.15%	-4.71%	-12.94%	-6.32%	-19.31%	-7.30%	-34.57%	0.00%	-30.01%	-2.06%	-2.06%
1968	-1.92%	-1.92%	5.62%	5.62%	3.56%	3.56%	0.64%	7.78%	2.01%	-8.94%	0.78%	-38.32%	-3.51%	-12.30%	1.18%	-1.85%	0.00%	-18.25%	0.00%	-19.93%	-0.03%	-13.62%	0.85%	-10.44%
1969	2.42%	0.30%	10.69%	10.69%	5.42%	5.42%	23.20%	30.08%	3.27%	0.13%	0.00%	-15.71%	0.00%	-17.51%	0.29%	-16.74%	0.86%	-20.04%	0.85%	-20.44%	-0.52%	-10.25%	0.00%	-6.77%
1970	0.00%	-11.20%	0.00%	-11.05%	0.51%	-1.91%	0.00%	-11.20%	0.00%	-25.55%	0.00%	-30.00%	-0.50%	-35.58%	-4.47%	-18.88%	5.24%	8.85%	0.00%	-22.30%	0.00%	-12.09%	0.00%	-11.00%
1971	0.00%	-11.19%	0.00%	-11.20%	0.00%	-11.95%	0.00%	-27.01%	0.00%	-30.35%	-1.43%	-36.08%	0.00%	-35.88%	-4.19%	-3.25%	-4.90%	-12.31%	0.00%	-1.18%	6.48%	1.78%	-8.41%	3.33%
1972	-1.89%	2.79%	0.00%	-16.51%	-0.83%	-20.15%	0.00%	-23.47%	0.00%	-28.32%	0.00%	-30.46%	0.00%	-26.12%	3.91%	-23.24%	-0.25%	-30.11%	-3.45%	3.12%	-0.48%	-0.48%	0.99%	0.99%
1973	1.14%	1.14%	1.75%	1.75%	-0.73%	-0.73%	-0.32%	-0.32%	0.40%	0.04%	25.30%	20.91%	-4.55%	-1.56%	6.69%	6.11%	3.93%	-5.14%	-1.64%	-11.21%	-0.28%	-3.78%	1.09%	1.14%
1974	3.22%	6.37%	0.00%	-0.32%	0.00%	1.57%	0.00%	-6.43%	-0.10%	-10.78%	0.00%	-35.66%	0.00%	-16.51%	1.68%	-8.89%	-0.34%	-10.63%	3.21%	-1.25%	-0.15%	-8.72%	-0.15%	-8.04%
1975	0.00%	-11.09%	0.43%	4.18%	-1.58%	-4.08%	4.38%	4.38%	2.35%	-3.47%	0.00%	-15.79%	6.26%	-5.41%	0.00%	-24.76%	-0.03%	-20.54%	0.00%	-20.79%	0.00%	-21.71%	0.00%	-14.87%
1976	-8.79%	-6.79%	-1.26%	0.55%	-0.67%	0.91%	8.56%	14.70%	0.56%	-9.91%	0.00%	-19.99%	-2.13%	-8.14%	0.05%	-13.40%	-0.66%	-22.95%	-0.07%	-7.23%	0.00%	-15.17%	0.00%	-18.79%
1977	0.00%	-7.67%	0.00%	-11.07%	0.00%	-11.19%	-2.82%	-4.54%	0.00%	-26.27%	0.00%	-35.19%	0.00%	-35.03%	6.42%	-26.11%	7.14%	-3.11%	0.00%	-30.14%	-1.06%	-34.98%	0.00%	-35.01%
1978	-10.96%	-0.13%	-2.33%	0.68%	0.40%	0.40%	0.00%	-1.06%	-0.08%	-10.92%	0.00%	-19.61%	0.00%	-23.47%	0.00%	-35.69%	0.00%	-43.16%	-0.27%	-35.57%	0.90%	13.07%	-4.17%	-3.87%
1979	3.12%	0.40%	0.48%	0.48%	-0.05%	-0.05%	-1.10%	-1.10%	9.18%	11.83%	-1.23%	-2.10%	0.32%	-9.50%	-0.42%	-8.83%	1.70%	-9.43%	8.20%	8.25%	2.85%	5.62%	0.00%	1.67%
1980	-7.22%	-1.35%	0.36%	0.36%	0.62%	0.62%	-4.51%	6.79%	-0.76%	9.20%	-0.92%	-7.96%	0.72%	0.35%	-9.49%	-6.72%	2.75%	5.25%	5.58%	5.58%	3.72%	5.70%	0.00%	5.58%
1981	0.00%	4.65%	0.36%	0.51%	6.51%	8.08%	-1.05%	-2.08%	-0.77%	-8.02%	-0.22%	-11.16%	4.84%	-0.13%	-0.52%	-8.10%	-0.20%	-5.29%	2.79%	1.61%	-4.45%	-2.14%	-8.42%	2.67%
1982	-5.71%	-13.04%	2.97%	-1.42%	-2.27%	-4.42%	1.65%	6.84%	0.23%	-3.76%	-0.99%	-11.20%	-0.02%	-17.77%	3.79%	-2.70%	0.93%	-6.97%	0.00%	-18.95%	-14.72%	-3.19%	-2.48%	0.29%
1983	-0.01%	-12.79%	0.52%	0.52%	0.44%	0.44%	-0.05%	-0.05%	-1.53%	4.25%	1.58%	-4.91%	-0.62%	-7.80%	5.11%	5.04%	-3.33%	6.96%	-2.10%	11.29%	-9.60%	-4.31%	-11.15%	-1.14%
1984	-1.35%	1.28%	-1.54%	0.99%	0.00%	4.59%	-0.62%	0.13%	0.00%	-23.24%	0.00%	-32.17%	0.00%	-28.95%	-3.12%	-3.51%	-13.07%	-6.68%	-7.72%	0.56%	-3.94%	-0.43%	0.42%	0.42%
1985	0.50%	3.39%	0.88%	0.22%	0.34%	0.34%	19.38%	22.17%	3.87%	9.45%	-3.50%	-11.20%	1.40%	-7.11%	1.33%	0.52%	-0.31%	-2.66%	-6.49%	-1.60%	1.93%	-1.41%	3.03%	3.03%
1986	-0.20%	-6.65%	-4.05%	2.88%	-0.01%	-0.01%	6.31%	10.75%	3.33%	-0.29%	-1.01%	-11.20%	-0.72%	-8.80%	1.97%	8.19%	7.52%	7.16%	-1.40%	-10.24%	0.74%	1.39%	3.59%	3.60%
1987	-3.74%	2.28%	2.72%	13.30%	0.09%	-0.09%	1.33%	0.87%	-0.01%	-8.22%	-0.85%	-18.15%	0.00%	-20.39%	-0.53%	-7.20%	0.00%	-15.79%	-3.94%	-17.26%	-4.49%	0.08%	0.00%	1.83%
1988	3.73%	1.10%	2.52%	-0.16%	-0.62%	-0.37%	0.51%	10.39%	3.45%	-3.80%	-0.45%	-11.18%	7.15%	1.04%	3.55%	1.92%	3.87%	4.19%	-0.22%	-17.11%	0.00%	-27.99%	0.84%	-10.15%
1989	5.74%	12.23%	-0.01%	-0.01%	2.10%	8.22%	3.81%	3.61%	-0.84%	-21.10%	-1.03%	-33.18%	0.79%	-35.28%	0.64%	-26.97%	0.84%	-30.16%	-0.87%	-25.16%	0.00%	-18.79%	0.00%	-18.64%
1990	0.00%	-10.57%	0.00%	-10.91%	0.00%	-10.47%	0.00%	-17.42%	0.10%	-24.12%	0.00%	-36.21%	0.00%	-35.89%	-1.76%	-26.83%	1.14%	-33.58%	0.00%	-30.58%	0.02%	-24.06%	-0.58%	6.27%
1991	-6.21%	-5.05%	-10.97%	-3.18%	-0.22%	-0.22%	-0.01%	-0.01%	-0.53%	-11.16%	0.00%	-19.48%	-1.72%	-26.30%	1.01%	-22.82%	-2.62%	-35.19%	-6.98%	-34.11%	0.00%	-25.68%	-7.23%	4.60%
1992	1.06%	1.13%	2.63%	0.03%	0.04%	2.85%	0.55%	0.55%	-1.68%	-3.94%	0.00%	-19.48%	1.51%	-4.03%	-13.68%	1.29%	-3.09%	-7.64%	0.00%	-32.23%	-3.16%	-10.77%	-1.40%	-0.68%
1993	0.86%	0.81%	-0.36%	-0.36%	-0.35%	-0.35%	7.51%	5.09%	7.84%	16.06%	-6.98%	-7.71%	-8.91%	-8.91%	-2.13%	2.94%	-0.46%	-1.19%	2.66%	6.33%	5.83%	-2.76%	10.13%	13.84%
1994	-6.45%	-8.35%	-5.66%	-0.12%	1.34%	4.42%	10.69%	12.65%	2.67%	5.37%	-1.37%	-11.20%	-0.47%	-11.20%	0.17%	-9.19%	-0.10%	-11.20%	-0.60%	-11.20%	-8.05%	-1.82%	-8.74%	1.79%
1995	0.19%	0.19%	0.68%	0.68%	-0.90%	-0.90%	8.50%	14.41%	0.39%	-0.19%	2.41%	-7.14%	-0.37%	-11.20%	1.30%	-10.03%	-0.43%	-10.37%	-0.58%	-11.20%	-0.31%	-11.20%	0.00%	-3.29%
1996	0.00%	-3.08%	0.00%	-2.82%	0.00%	-8.03%	0.00%	-20.39%	0.00%	-24.06%	0.00%	-29.24%	0.87%	-30.76%	0.00%	-24.80%	-0.02%	-6.38%	0.00%	-22.75%	0.00%	-21.58%	0.00%	-15.04%
1997	0.22%	0.22%	1.20%	1.20%	0.59%	0.59%	-0.13%	-10.40%	0.00%	-20.95%	0.00%	-30.88%	1.23%	-32.73%	2.03%	-28.37%	-7.41%	-23.84%	2.52%	-25.36%	0.03%	-27.60%	0.83%	-18.32%
1998	1.30%	0.28%	0.45%	0.45%	2.38%	2.38%	2.49%	2.49%	-1.94%	-7.48%	0.88%	-20.27%	0.00%	-30.75%	0.88%	-26.44%	0.00%	-32.89%	0.00%	-33.09%	0.00%	-20.75%	0.72%	-10.16%
1999	0.00%	-11.19%	0.00%	-13.62%	0.00%	-19.58%	2.45%	11.43%	0.00%	-33.07%	0.00%	-36.67%	8.92%	-12.99%	0.55%	-12.93%	-1.59%	4.60%	0.00%	-27.61%	0.00%	-28.05%	0.00%	-27.61%
2000	0.00%	-18.21%	0.00%	-21.21%	-0.47%	-19.06%	-1.04%	-34.17%	0.00%	-40.46%	0.00%	-41.99%	0.00%	-44.91%	5.37%	-42.34%	0.00%	-38.36%	-8.08%	-5.73%	-8.91%	-3.15%	0.00%	-13.62%
2001	0.00%	-12.35%	0.00%	2.91%	0.98%	0.98%	2.29%	0.66%	0.00%	-28.05%	0.00%	-38.96%	0.00%	-40.08%	7.18%	-36.80%	-5.01%	-37.74%	0.00%	-32.54%	0.00%	-30.20%	0.00%	-31.34%
2002	0.00%	-29.09%	0.00%	-31.33%	1.33%	-34.05%	-6.77%	-38.29%	0.00%	-47.92%	0.00%	-53.00%	0.00%	-52.72%	0.00%	-46.51%	0.00%	-47.02%	0.00%	-45.94%	0.00%	-37.87%	-11.94%	-34.94%
2003	0.00%	-31.70%	0.00%	-35.19%	3.81%	3.81%	0.00%	-21.86%	0.00%	-31.86%	0.00%	-49.71%	0.00%	-51.63%	0.00%	-47.92%	-0.43%	-45.11%	0.00%	-47.47%	0.00%	-43.07%	1.68%	-29.05%
2004	0.00%	-31.70%	0.00%	-35.19%	3.81%	3.81%	0.00%	-21.86%	0.00%	-31.86%	0.00%	-49.71%	0.00%	-51.63%	0.00%	-47.92%	-0.43%	-45.11%	0.00%	-47.47%	0.00%	-43.07%	1.68%	-29.05%
2005	0.01%	7.04%	0.74%	0.74%	-2.21%	-3.09%	-0.87%	3.19%	-0.20%	-11.20%	0.00%	-28.05%	0.32%	-33.69%	1.33%	-12.88%	0.00%	-29.99%	0.00%	-30.73%	0.00%	-29.39%	0.00%	-24.65%
2006	0.00%	-24.65%	0.00%	-24.35%	0.02%	-25.55%	0.00%	-30.11%	0.00%	-38.81%	0.00%	-42.89%	0.00%	-43.16%	0.00%	-33.59%	0.00%	-39.34%	0.00%	-34.91%	0.00%	-32.88%	0.00%	-32.08%
2007	0.00%	-34.54%	-0.88%	-35.70%	0.05%	-22.04%	0.00%	-35.69%	0.00%	-44.81%	0.00%	-51.77%	0.00%	-51.63%	3.91%	-3.11%	0.00%	-42.61%	0.00%	-44.02%	-1.76%	-40.19%	-6.72%	0.43%
2008	0.20%	0.20%	0.19%	0.19%	0.77%	1.71%	-0.64%	0.26%	-0.12%	-8.80%	0.82%	-26.65%	3.95%	-10.23%	0.48%	-11.57%	0.03%	-23.44%	0.00%	-21.47%	0.85%	-20.44%	-0.04%	1.82%
2009	3.09%	3.09%	3.05%	4.50%	-0.27%	10.18%	0.00%	-2.11%																

Figure 4-61. Habitat summary table for green sunfish (*Lepomis cyanellus*), Braided site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Braided Site

No Wood

Hypothetical Withdrawal 10 cfs

Green sunfish

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2
1965									0.82%	-76.52%	-2.79%	-70.36%
1966	-0.71%	-3.43%	10.97%	16.67%	15.71%	41.79%	-0.63%	-76.72%	0.00%	-76.67%	-0.86%	-75.52%
1967	0.00%	-76.84%	0.00%	-76.55%	-0.81%	-76.45%	-0.88%	-74.51%	0.00%	-74.33%	0.00%	-74.16%
1968	3.04%	5.20%	6.11%	3.39%	1.81%	4.80%	15.38%	-37.45%	2.03%	-76.62%	0.78%	-76.26%
1969	2.27%	-43.31%	10.84%	29.03%	7.62%	6.54%	31.03%	-64.44%	6.73%	-75.87%	0.00%	-76.76%
1970	0.00%	-77.09%	0.00%	-76.96%	0.51%	-77.39%	0.00%	-77.03%	0.00%	-76.64%	0.00%	-74.12%
1971	0.00%	-77.00%	0.00%	-77.13%	0.00%	-77.02%	0.00%	-74.14%	0.00%	-74.07%	-1.43%	-70.89%
1972	8.77%	-70.79%	0.00%	-76.88%	-0.83%	-76.20%	0.00%	-74.24%	0.00%	-74.21%	0.00%	-74.18%
1973	5.20%	14.15%	-0.42%	0.61%	1.09%	1.09%	-1.63%	-0.37%	2.50%	2.46%	21.59%	-43.24%
1974	9.77%	-49.65%	0.00%	-73.52%	0.00%	-73.52%	0.00%	-77.35%	-0.10%	-76.96%	0.00%	-76.65%
1975	0.00%	-77.18%	8.13%	-68.88%	-5.94%	-1.78%	11.84%	24.95%	2.84%	-76.76%	0.00%	-76.75%
1976	-8.93%	-71.53%	-1.51%	-27.05%	-0.67%	-75.43%	19.79%	-68.57%	0.56%	-76.96%	0.00%	-74.35%
1977	0.00%	-76.32%	0.00%	-76.93%	0.00%	-76.94%	8.10%	-73.46%	0.00%	-74.16%	0.00%	-71.61%
1978	-6.34%	-59.16%	1.14%	3.39%	1.42%	-1.57%	-0.84%	-77.17%	-0.08%	-77.06%	0.00%	-76.64%
1979	2.54%	0.04%	3.02%	6.92%	0.04%	0.04%	-0.81%	3.83%	32.20%	-23.05%	-2.28%	-69.38%
1980	7.04%	-1.52%	1.30%	-0.19%	2.61%	1.13%	29.88%	42.94%	13.98%	-39.95%	-6.54%	-65.65%
1981	0.00%	-76.15%	0.62%	-75.08%	15.40%	-15.07%	-0.67%	-70.57%	-0.77%	-77.42%	-0.05%	-76.99%
1982	-12.06%	2.14%	-0.17%	-2.09%	-2.96%	-0.61%	20.03%	-13.89%	2.01%	-76.94%	-0.99%	-77.21%
1983	-16.81%	-12.27%	3.12%	5.87%	0.59%	1.78%	-1.51%	1.83%	25.21%	-14.52%	3.33%	-76.21%
1984	15.18%	34.72%	-1.54%	-66.76%	0.00%	-76.13%	-0.62%	-76.95%	0.00%	-76.65%	0.00%	-74.28%
1985	2.42%	4.00%	3.72%	2.33%	0.75%	2.49%	19.17%	39.91%	15.53%	-41.08%	-0.75%	-77.15%
1986	-0.79%	-46.34%	-1.30%	14.27%	0.02%	-0.10%	28.35%	-16.93%	3.34%	-76.63%	-1.01%	-77.21%
1987	6.91%	-33.67%	16.37%	24.06%	1.64%	8.45%	1.33%	-70.84%	0.49%	-77.05%	-0.85%	-75.54%
1988	6.85%	12.90%	3.03%	5.50%	-0.62%	-77.00%	11.77%	-57.65%	3.66%	-76.41%	-0.45%	-77.07%
1989	15.93%	-56.00%	8.64%	23.02%	2.54%	-66.72%	4.94%	-73.09%	-0.84%	-75.95%	-1.03%	-73.53%
1990	0.00%	-76.83%	0.00%	-76.91%	0.00%	-76.94%	0.00%	-76.70%	0.10%	-74.25%	0.00%	-70.79%
1991	-7.03%	-48.42%	-11.19%	-55.30%	-1.08%	-3.29%	-0.05%	-2.26%	-0.53%	-77.15%	0.00%	-76.65%
1992	6.18%	22.36%	1.37%	2.88%	2.15%	5.12%	2.34%	7.76%	0.42%	-67.51%	0.00%	-76.65%
1993	0.82%	0.67%	-1.82%	1.06%	-1.76%	3.38%	3.33%	17.28%	15.15%	-66.02%	-5.07%	-72.15%
1994	-6.45%	-46.44%	7.33%	-0.63%	12.86%	36.44%	23.70%	-38.94%	10.06%	-73.62%	-1.37%	-77.30%
1995	1.51%	3.83%	2.08%	9.86%	1.03%	4.04%	16.23%	-45.91%	4.33%	-72.08%	2.41%	-76.43%
1996	0.00%	-77.35%	0.00%	-77.24%	0.00%	-77.28%	0.00%	-76.62%	0.00%	-74.22%	0.00%	-74.07%
1997	5.70%	-40.87%	6.27%	13.33%	1.36%	11.05%	-0.13%	-77.14%	0.00%	-74.56%	0.00%	-74.03%
1998	1.30%	-75.52%	-0.75%	-7.03%	2.13%	4.15%	2.78%	2.83%	0.03%	-77.22%	0.88%	-74.34%
1999	0.00%	-76.95%	0.00%	-76.82%	0.00%	-76.72%	31.94%	-62.16%	0.00%	-73.29%	0.00%	-70.41%
2000	0.00%	-74.39%	0.00%	-74.40%	-0.47%	-76.65%	-1.04%	-73.27%	0.00%	-67.36%	0.00%	-66.13%
2001	0.00%	-76.84%	12.58%	-68.66%	16.85%	25.21%	7.77%	-73.31%	0.00%	-74.11%	0.00%	-68.57%
2002	0.00%	-74.08%	0.00%	-74.07%	1.33%	-73.22%	-6.77%	-69.11%	0.00%	-61.34%	0.00%	-57.24%
2003	0.00%	-70.08%	0.00%	-71.61%	3.46%	9.05%	0.00%	-74.29%	0.00%	-66.62%	0.00%	-59.90%
2004	0.00%	-70.08%	0.00%	-71.61%	3.46%	9.05%	0.00%	-74.29%	0.00%	-66.62%	0.00%	-59.90%
2005	13.89%	5.28%	1.60%	1.49%	-4.11%	1.01%	11.23%	-54.51%	-0.20%	-77.13%	0.00%	-74.11%
2006	0.00%	-74.21%	0.00%	-74.22%	0.02%	-74.19%	0.00%	-73.86%	0.00%	-68.69%	0.00%	-65.40%
2007	0.00%	-74.00%	-0.88%	-74.62%	0.05%	-74.30%	0.00%	-71.21%	0.00%	-63.85%	0.00%	-58.24%
2008	0.77%	3.47%	1.51%	1.51%	5.88%	23.96%	-0.64%	-76.82%	-0.12%	-77.18%	0.82%	-76.34%
2009	14.30%	43.42%	7.03%	21.62%	2.19%	-29.56%	0.00%	-77.03%				

Year	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965	10.70%	-69.37%	-0.43%	-68.00%	0.00%	-72.22%	0.51%	-72.62%	-7.82%	-68.35%	4.00%	5.06%
1966	0.00%	-74.16%	-5.17%	-71.10%	0.70%	-76.42%	0.00%	-74.33%	-2.73%	-75.04%	-2.46%	-68.52%
1967	1.52%	-59.09%	1.57%	-55.44%	-6.61%	-75.50%	-7.30%	-72.46%	0.00%	-74.10%	1.33%	-39.77%
1968	-0.90%	-76.57%	6.81%	-74.80%	0.00%	-76.85%	0.00%	-76.82%	0.00%	-76.82%	0.85%	-76.78%
1969	0.00%	-76.71%	0.29%	-76.66%	0.86%	-75.30%	0.85%	-75.52%	0.00%	-76.93%	0.00%	-77.30%
1970	-0.50%	-73.24%	-4.41%	-72.60%	2.56%	-46.92%	0.00%	-74.27%	0.00%	-76.81%	0.00%	-77.01%
1971	0.00%	-71.05%	-0.98%	-64.14%	-5.23%	-61.37%	2.08%	-42.26%	8.36%	-73.03%	1.36%	-59.31%
1972	0.00%	-74.16%	3.91%	-73.15%	-6.80%	-69.31%	-4.00%	-45.20%	-0.76%	-36.81%	9.00%	-3.48%
1973	7.08%	-40.77%	9.29%	-72.04%	3.90%	-76.18%	-1.64%	-77.40%	-0.66%	-76.94%	0.34%	-76.75%
1974	0.00%	-76.71%	1.68%	-76.75%	-0.34%	-76.90%	9.25%	-66.58%	-0.15%	-77.24%	-0.15%	-77.28%
1975	8.12%	-74.43%	0.00%	-76.66%	-0.03%	-76.78%	0.00%	-76.61%	0.00%	-76.58%	0.00%	-76.76%
1976	10.98%	-70.09%	4.65%	-73.50%	4.31%	-73.05%	2.09%	-75.63%	0.00%	-76.78%	0.00%	-74.38%
1977	0.00%	-73.85%	11.76%	-69.34%	10.18%	-73.33%	0.00%	-74.19%	-1.06%	-72.64%	0.00%	-71.76%
1978	0.00%	-74.24%	0.00%	-71.21%	0.00%	-65.18%	-0.27%	-71.23%	15.60%	-55.68%	10.78%	12.78%
1979	0.19%	-76.98%	-0.83%	-77.33%	1.58%	-76.71%	7.40%	-74.13%	2.76%	-76.15%	0.00%	-76.15%
1980	2.46%	-47.54%	-6.52%	-42.28%	8.63%	-52.53%	3.60%	-74.72%	2.76%	-76.15%	0.00%	-76.15%
1981	3.46%	-75.54%	0.48%	-76.66%	3.30%	-74.31%	4.31%	-73.78%	1.49%	-74.20%	4.06%	-70.73%
1982	-0.02%	-76.93%	7.15%	-73.83%	1.54%	-75.71%	0.00%	-76.66%	-13.07%	-56.68%	2.10%	3.52%
1983	0.72%	-76.86%	11.29%	-71.88%	10.20%	-60.48%	14.96%	-46.17%	-10.22%	-67.31%	-9.63%	5.18%
1984	0.00%	-74.23%	1.86%	-66.24%	-15.65%	-54.65%	-8.80%	-49.49%	-1.11%	-68.49%	2.45%	4.86%
1985	2.48%	-75.96%	3.88%	-75.51%	1.34%	-73.24%	-1.75%	-52.26%	-4.58%	1.40%	9.54%	18.05%
1986	-0.60%	-77.14%	-4.09%	-63.27%	0.04%	-66.95%	-1.57%	-77.38%	2.95%	-68.65%	3.01%	-61.31%
1987	0.00%	-74.33%	3.52%	-75.47%	0.00%	-76.13%	5.37%	-71.81%	5.51%	-72.37%	-0.57%	-76.28%
1988	8.61%	-73.62%	-4.01%	-43.02%	10.15%	-58.71%	0.00%	-76.89%	0.00%	-76.74%	0.84%	-76.65%
1989	0.79%	-73.25%	0.64%	-75.37%	0.84%	-75.74%	-0.87%	-75.06%	0.00%	-74.38%	0.00%	-74.38%
1990	0.00%	-73.50%	2.18%	-72.08%	1.14%	-74.14%	0.00%	-74.04%	0.02%	-74.33%	-10.09%	-61.11%
1991	-1.72%	-74.83%	1.01%	-74.77%	-2.62%	-71.61%	-6.98%	-72.48%	0.00%	-74.18%	-6.54%	-53.90%
1992	20.71%	-67.30%	-4.18%	-46.72%	2.28%	-76.05%	0.00%	-76.71%	-2.50%	-73.16%	-4.14%	5.06%
1993	-5.42%	-64.80%	5.33%	-64.38%	1.72%	-64.57%	9.97%	-54.29%	2.42%	1.30%	24.71%	-61.54%
1994	-0.47%	-77.13%	0.04%	-77.12%	-0.10%	-77.07%	-0.20%	-77.06%	-5.58%	-75.19%	-1.18%	-40.55%
1995	-0.37%	-77.11%	1.30%	-76.82%	-0.68%	-77.23%	-0.58%	-77.15%	-0.31%	-77.28%	0.00%	-77.36%
1996	0.87%	-74.73%	0.00%	-74.20%	4.13%	-69.62%	0.00%	-74.27%	0.00%	-76.58%	0.00%	-76.78%
1997	1.23%	-72.27%	2.03%	-72.11%	-7.41%	-69.07%	1.42%	-71.32%	0.03%	-74.28%	0.04%	-76.16%
1998	0.00%	-74.29%	0.88%	-74.16%	0.00%	-73.99%	0.00%	-73.30%	-0.20%	-75.71%	1.17%	-76.79%
1999	16.29%	-64.70%	0.96%	-75.86%	0.37%	-52.66%	0.00%	-74.12%	0.00%	-74.11%	0.00%	-74.12%
2000	0.00%	-63.77%	5.37%	-65.84%	0.00%	-69.05%	5.05%	-51.36%	6.46%	-28.37%	0.00%	-76.82%
2001	0.00%	-65.02%	9.29%	-70.08%	-5.01%	-70.09%	0.00%	-69.11%	0.00%	-70.31%	0.00%	-74.08%
2002	0.00%	-57.47%	0.00%	-60.65%	0.00%	-62.07%	0.00%	-62.94%	0.00%	-65.71%	-11.94%	-71.81%
2003	0.00%	-58.35%	0.00%	-61.34%	-0.43%	-63.61%	0.00%	-61.71%	0.00%	-65.25%	1.68%	-69.58%
2004	0.00%	-58.35%	0.00%	-61.34%	-0.43%	-63.61%	0.00%	-61.71%	0.00%	-65.25%	1.68%	-69.58%
2005	0.32%	-73.86%	7.66%	-72.67%	0.00%	-74.05%	0.00%	-74.03%	0.00%	-74.07%	0.00%	-74.21%
2006	0.00%	-65.18%	0.00%	-67.17%	0.00%	-68.26%	0.00%	-68.87%	0.00%	-70.19%	0.00%	-73.10%
2007	0.00%	-58.35%	13.57%	-48.80%	0.00%	-65.62%	0.00%	-64.49%	1.01%	-66.76%	-1.84%	12.03%
2008	4.26%	-71.27%	0.33%	-76.30%	0.03%	-74.27%	0.00%	-74.39%	0.85%	-75.52%	-2.08%	-40.34%
2009												

Figure 4-62. Habitat summary table for green sunfish (*Lepomis cyanellus*), Braided site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Braided Site

With LWD

Green sunfish

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965									0.29%	-13.20%	-1.61%	-21.24%	5.64%	-12.05%	-1.91%	-11.48%	0.00%	-21.46%	0.30%	-20.27%	-6.93%	-0.34%	-5.60%	-5.60%
1966	-3.83%	-3.83%	3.26%	8.23%	3.68%	7.17%	-0.62%	0.14%	0.00%	-9.38%	-0.35%	-11.55%	0.00%	-15.71%	0.53%	-6.18%	0.00%	-14.51%	0.00%	-11.89%	-4.73%	-9.46%	-3.53%	-4.45%
1967	0.00%	-5.78%	0.00%	-11.77%	0.00%	-10.57%	-0.27%	-13.17%	0.00%	-11.89%	0.00%	-15.71%	-5.42%	-12.60%	-5.58%	-11.92%	-3.46%	-10.63%	-4.32%	-20.55%	0.00%	-18.17%	-0.24%	1.39%
1968	0.07%	0.07%	-0.07%	-0.07%	-0.90%	-0.90%	0.66%	2.93%	1.96%	-3.41%	0.17%	-22.37%	-0.61%	-6.23%	-0.16%	-3.73%	0.00%	-9.68%	0.00%	-10.34%	-0.03%	-6.22%	0.00%	-5.01%
1969	1.67%	0.57%	7.31%	7.31%	3.28%	3.28%	16.02%	12.44%	1.67%	-2.27%	0.00%	-7.49%	0.00%	-8.58%	0.28%	-8.02%	0.29%	-10.96%	0.29%	-11.05%	-0.50%	-4.73%	0.00%	-4.13%
1970	0.00%	-5.38%	0.00%	-5.05%	0.00%	-2.36%	0.00%	-5.18%	0.00%	-13.74%	0.00%	-18.14%	-0.34%	-21.04%	-9.38%	-3.88%	-1.29%	8.77%	0.00%	-13.23%	0.00%	-5.90%	0.00%	-5.07%
1971	0.00%	-5.06%	0.00%	-5.50%	0.00%	-5.67%	0.00%	-16.29%	0.00%	-18.41%	-0.83%	-21.01%	0.00%	-20.95%	-2.88%	-3.44%	-3.64%	-7.27%	0.63%	0.67%	4.00%	-0.39%	-7.27%	2.23%
1972	-2.15%	0.95%	0.00%	-9.31%	-0.29%	-10.46%	0.00%	-13.99%	0.00%	-17.01%	0.00%	-18.36%	0.00%	-15.71%	2.28%	-13.79%	-0.01%	-16.17%	-4.78%	1.17%	-0.06%	-0.06%	0.83%	0.83%
1973	1.02%	1.02%	0.46%	0.46%	0.87%	0.87%	0.67%	0.67%	0.38%	0.17%	12.13%	4.77%	-3.55%	-2.66%	4.67%	4.01%	3.85%	-1.24%	-1.61%	-6.40%	-0.44%	-2.08%	1.06%	1.12%
1974	1.42%	2.73%	0.00%	-0.31%	0.00%	4.38%	0.00%	-4.23%	-0.10%	-4.87%	0.00%	-20.36%	0.00%	-8.28%	0.58%	-4.63%	-0.33%	-5.86%	0.61%	-1.36%	-0.17%	-5.02%	-0.14%	-4.88%
1975	0.00%	-5.65%	0.57%	2.75%	-0.70%	-1.88%	2.82%	2.82%	2.30%	-1.18%	0.00%	-7.53%	4.19%	-2.75%	0.00%	-13.26%	-0.03%	-11.44%	0.00%	-10.57%	0.00%	-11.13%	0.00%	-7.35%
1976	-6.85%	-3.25%	-1.08%	1.01%	0.00%	-1.13%	6.73%	10.34%	0.55%	-4.63%	0.00%	-11.71%	-4.00%	-6.38%	-1.03%	-7.22%	-0.29%	-13.23%	-0.34%	-3.42%	0.00%	-7.16%	0.00%	-10.94%
1977	0.00%	-2.18%	0.00%	-4.84%	0.00%	-4.89%	-1.84%	-2.04%	0.00%	-15.81%	0.00%	-20.71%	0.00%	-20.56%	2.98%	-15.05%	3.85%	-3.81%	0.00%	-18.15%	-0.25%	-20.59%	0.00%	-20.65%
1978	-7.08%	1.22%	0.13%	0.57%	0.36%	0.36%	0.00%	-1.04%	-0.08%	-5.23%	0.00%	-9.86%	0.00%	-13.99%	0.00%	-20.88%	0.00%	-23.24%	-0.18%	-20.45%	0.45%	10.12%	-9.63%	-9.63%
1979	-3.11%	-3.11%	0.36%	0.36%	0.52%	0.52%	-0.04%	-0.04%	7.63%	9.91%	-1.31%	-2.17%	0.32%	-4.71%	-0.42%	-5.29%	1.66%	-3.80%	5.07%	5.07%	2.79%	5.49%	0.00%	1.64%
1980	-0.22%	3.41%	0.29%	0.29%	0.75%	-0.45%	-2.16%	4.26%	-0.60%	4.07%	-1.32%	-8.52%	-4.66%	-5.00%	-7.20%	-6.38%	1.52%	2.42%	5.45%	5.45%	3.63%	5.57%	0.00%	5.45%
1981	0.00%	4.54%	0.00%	4.27%	5.28%	6.81%	-1.23%	-2.10%	-0.76%	-5.04%	-0.22%	-5.05%	1.15%	-2.25%	-1.13%	-4.77%	0.78%	-2.31%	3.09%	2.55%	-3.28%	-2.43%	-5.37%	1.46%
1982	-4.06%	-10.03%	1.24%	-8.16%	0.02%	2.98%	1.34%	5.68%	0.23%	-1.77%	-0.97%	-5.78%	-0.02%	-9.66%	3.84%	-0.64%	0.77%	-4.21%	0.00%	-9.46%	-12.52%	-1.94%	-2.00%	2.84%
1983	0.73%	-11.78%	0.32%	0.32%	0.40%	0.40%	0.58%	0.58%	-1.24%	3.93%	1.54%	-1.30%	0.07%	-4.64%	3.03%	2.58%	-1.55%	6.89%	-1.51%	8.91%	-8.43%	-5.62%	-8.04%	0.21%
1984	-0.55%	1.09%	-1.58%	0.90%	0.00%	4.48%	-0.61%	0.13%	0.00%	-12.24%	0.00%	-19.29%	0.00%	-17.37%	-1.60%	-1.29%	-10.68%	-5.22%	-7.41%	0.00%	-2.51%	-1.48%	0.40%	0.40%
1985	0.66%	0.66%	0.57%	0.45%	0.59%	0.59%	12.68%	14.31%	2.73%	4.61%	-3.43%	-5.59%	-0.51%	-5.05%	-0.77%	-1.54%	-0.34%	-2.71%	-5.33%	-2.55%	1.51%	-0.81%	2.34%	2.34%
1986	-0.28%	-7.07%	-3.47%	2.87%	0.46%	0.46%	5.32%	9.51%	3.26%	0.57%	-0.99%	-5.79%	-0.71%	-4.52%	2.59%	6.51%	6.15%	6.18%	-2.42%	-7.16%	-0.77%	-0.09%	-1.21%	2.01%
1987	-2.50%	1.68%	3.52%	9.82%	0.43%	0.36%	0.69%	0.25%	-0.05%	-4.24%	-0.29%	-10.01%	0.00%	-11.99%	-1.64%	-6.82%	0.00%	-8.78%	-1.65%	-7.96%	-4.21%	0.09%	-2.37%	-0.79%
1988	2.38%	1.08%	1.46%	0.14%	-0.61%	-0.36%	-0.26%	6.33%	-0.85%	-5.14%	-0.44%	-5.32%	4.66%	-0.74%	-1.39%	-2.15%	-0.05%	-0.55%	-0.21%	-9.40%	0.00%	-15.49%	0.00%	-5.21%
1989	4.33%	6.06%	0.05%	0.05%	2.56%	5.32%	2.33%	1.76%	-0.29%	-11.18%	-0.24%	-19.75%	0.48%	-20.99%	-0.10%	-15.67%	0.28%	-17.13%	-0.31%	-14.38%	0.00%	-10.94%	0.00%	-10.84%
1990	0.00%	-4.47%	0.00%	-4.74%	0.00%	-4.75%	0.00%	-8.55%	0.02%	-14.39%	0.00%	-21.06%	0.00%	-20.81%	-1.68%	-14.31%	0.33%	-20.21%	0.00%	-18.59%	0.00%	-14.24%	-1.83%	3.98%
1991	-5.84%	-4.07%	-9.95%	-0.47%	0.02%	0.02%	0.65%	0.65%	-0.52%	-5.57%	0.00%	-9.78%	-0.60%	-15.26%	0.26%	-13.63%	-1.54%	-20.71%	-4.16%	-20.33%	0.00%	-15.43%	-5.18%	4.13%
1992	0.72%	0.72%	1.42%	0.08%	0.40%	2.33%	0.53%	0.53%	-1.71%	-4.02%	0.00%	-9.78%	2.45%	-2.81%	-7.75%	-2.57%	-2.11%	-4.97%	0.00%	-18.38%	-1.53%	-2.84%	-4.81%	1.49%
1993	0.02%	0.02%	0.82%	0.82%	0.59%	0.59%	4.78%	3.64%	5.22%	5.93%	-6.88%	-7.62%	-9.03%	-9.03%	-2.09%	0.31%	-1.93%	-2.68%	4.11%	6.68%	3.26%	-1.05%	7.69%	9.76%
1994	-5.19%	-8.84%	-4.95%	-0.08%	1.08%	3.76%	8.01%	8.50%	0.85%	-1.49%	-1.34%	-6.06%	-0.46%	-5.52%	0.00%	-5.00%	-0.10%	-5.32%	-0.59%	-5.27%	-6.87%	-2.17%	-7.19%	-0.25%
1995	0.43%	0.43%	-0.50%	1.17%	-0.26%	-0.26%	6.40%	8.52%	0.34%	-0.23%	2.36%	-2.42%	-0.36%	-5.45%	-0.02%	-5.48%	-0.42%	-5.69%	-0.57%	-5.59%	-0.31%	-6.03%	0.00%	-3.22%
1996	0.00%	-3.01%	0.00%	-2.76%	0.00%	-4.78%	0.00%	-10.33%	0.00%	-14.38%	0.00%	-17.73%	0.27%	-18.22%	0.00%	-14.85%	-0.46%	-4.88%	0.00%	-13.51%	0.00%	-11.05%	0.00%	-7.08%
1997	0.28%	0.28%	0.96%	0.96%	0.37%	0.37%	-0.13%	-5.24%	0.00%	-12.16%	0.00%	-18.78%	0.35%	-18.78%	0.48%	-16.34%	-4.63%	-13.17%	1.37%	-14.96%	0.01%	-16.48%	0.29%	-9.85%
1998	-0.39%	-1.37%	0.27%	0.27%	-2.50%	-2.50%	-2.35%	-2.35%	-1.89%	-4.29%	0.24%	-11.90%	0.00%	-18.41%	0.20%	-15.91%	0.00%	-19.87%	0.00%	-19.97%	-0.03%	-11.11%	0.00%	-5.27%
1999	0.00%	-4.90%	0.00%	-6.22%	0.00%	-9.96%	2.36%	9.54%	0.00%	-19.95%	0.00%	-21.22%	7.91%	-1.41%	0.32%	-8.89%	-1.01%	2.90%	0.00%	-16.67%	0.00%	-16.96%	0.00%	-16.67%
2000	0.00%	-10.55%	0.00%	-12.40%	0.00%	-9.51%	-0.24%	-20.30%	0.00%	-22.43%	0.00%	-22.89%	0.00%	-23.73%	3.07%	-23.00%	0.00%	-21.77%	-6.01%	-4.61%	-6.47%	-4.92%	0.00%	-6.22%
2001	0.00%	-5.77%	0.55%	1.60%	0.37%	0.37%	0.96%	-2.10%	0.00%	-16.96%	0.00%	-21.96%	0.00%	-21.53%	2.70%	-22.87%	-2.89%	-21.73%	0.00%	-18.48%	0.00%	-17.44%	0.00%	-19.01%
2002	0.00%	-17.63%	0.00%	-19.00%	0.44%	-20.20%	-3.84%	-21.75%	0.00%	-24.55%	0.00%	-25.82%	0.00%	-25.75%	0.00%	-23.62%	0.00%	-24.31%	0.00%	-24.02%	0.00%	-20.53%	-7.05%	-20.62%
2003	0.00%	-18.25%	0.00%	-20.71%	2.53%	2.53%	0.00%	-12.94%	0.00%	-17.48%	0.00%	-25.01%	0.00%	-25.49%	0.00%	-24.55%	-0.23%	-23.79%	0.00%	-24.43%	0.00%	-23.21%	0.57%	-16.61%
2004	0.00%	-18.25%	0.00%	-20.71%	2.53%	2.53%	0.00%	-12.94%	0.00%	-17.48%	0.00%	-25.01%	0.00%	-25.49%	0.00%	-24.55%	-0.23%	-23.79%	0.00%	-24.43%	0.00%	-23.21%	0.57%	-16.61%
2005	5.98%	5.68%	0.29%	0.29%	-0.82%	-0.82%	-1.23%	1.43%	-0.20%	-5.52%	0.00%	-16.96%	0.19%	-20.19%	1.09%	-6.02%	0.00%	-18.21%	0.00%	-18.68%	0.00%	-17.82%	0.00%	-14.76%
2006	0.00%	-14.76%	0.00%	-14.57%	0.00%	-15.33%	0.00%	-18.22%	0.00%	-21.91%	0.00%	-23.16%	0.00%	-23.24%	0.00%	-18.57%	0.00%	-22.08%	-0.20%	-19.76%	0.00%	-18.96%	0.00%	-17.39%
2007	0.00%	-21.04%	-0.31%	-21.29%	0.01%	-13.04%	0.00%	-20.88%	0.00%	-23.70%	0.00%	-25.52%	3.32%	-18.08%	3.40%	6.25%	0.00%	-23.08%	0.00%	-23.48%	-2.88%	-18.27%	-6.53%	-1.38%
2008	0.32%	0.32%	0.74%	-2.39%	0.54%	2.07%	-0.63%	0.25%	-0.11%	-4.72%	0.29%	-14.43%	3.17%	-4.84%	0.47%	-6.14%	0.01%	-13.93%	0.00%	-12.57%	0.29%	-11.05%	-0.33%	1.06%
2009	1.75%	1.75%	2.42%	3.55%	-0.24%	7.47%	0.00%	-2.06%																

Figure 4-63. Habitat summary table for green sunfish (*Lepomis cyanellus*), Braided site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Braided Site

With LWD

Green sunfish

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.29%	-47.13%	-1.61%	-40.67%	6.97%	-39.59%	-0.51%	-34.82%	0.00%	-42.69%	0.30%	-43.38%	-6.89%	-35.07%	-4.27%	-4.27%
1966	-1.94%	-3.22%	7.98%	1.82%	13.31%	33.91%	-0.62%	-47.30%	0.00%	-47.19%	-0.35%	-46.21%	0.00%	-45.16%	-4.02%	-38.70%	0.00%	-47.00%	0.00%	-45.22%	-3.27%	-45.31%	-2.12%	-34.46%
1967	0.00%	-47.57%	0.00%	-46.92%	0.00%	-47.06%	-0.27%	-45.35%	0.00%	-45.22%	0.00%	-45.16%	2.03%	-22.88%	-0.85%	-17.41%	-3.73%	-46.23%	-4.32%	-43.14%	0.00%	-45.14%	3.84%	4.94%
1968	-0.61%	1.17%	2.86%	3.02%	-0.64%	1.06%	7.45%	-26.65%	1.99%	-47.09%	0.17%	-46.88%	0.00%	-47.56%	2.07%	-47.26%	0.00%	-47.60%	0.00%	-47.54%	0.00%	-47.54%	0.00%	-47.88%
1969	2.44%	7.07%	8.49%	21.10%	4.38%	4.35%	17.12%	-37.93%	1.67%	-47.94%	0.00%	-47.40%	0.00%	-47.28%	0.28%	-47.16%	0.29%	-45.91%	0.29%	-46.08%	0.00%	-47.77%	0.00%	-48.58%
1970	0.00%	-48.13%	0.00%	-47.84%	0.00%	-49.04%	0.00%	-47.99%	0.00%	-47.13%	0.00%	-45.14%	-0.97%	-43.85%	-9.40%	-42.73%	-3.69%	-2.84%	0.00%	-45.20%	0.00%	-47.50%	0.00%	-47.94%
1971	0.00%	-47.91%	0.00%	-48.20%	0.00%	-47.97%	0.00%	-45.15%	0.00%	-45.13%	-0.83%	-41.29%	0.00%	-41.48%	-3.04%	-30.27%	-3.25%	-24.13%	3.28%	-3.48%	2.75%	-44.61%	-0.80%	-22.59%
1972	4.57%	-40.82%	0.00%	-47.66%	-0.29%	-46.71%	0.00%	-45.19%	0.00%	-45.18%	0.00%	-45.17%	0.00%	-45.16%	2.28%	-43.91%	-5.91%	-38.75%	-5.76%	-14.66%	0.50%	0.83%	6.66%	-12.65%
1973	4.47%	11.92%	-1.44%	-1.44%	-2.16%	-2.16%	2.05%	1.73%	2.28%	2.55%	5.34%	-28.77%	5.39%	-23.13%	4.66%	-44.28%	3.81%	-46.11%	-1.61%	-48.80%	-0.82%	-47.89%	0.34%	-47.37%
1974	5.19%	-30.89%	0.00%	-44.78%	0.00%	-44.78%	0.00%	-48.70%	-0.10%	-47.84%	0.00%	-47.15%	0.00%	-47.28%	0.58%	-47.92%	-0.33%	-47.71%	4.99%	-33.41%	-0.17%	-48.48%	-0.14%	-48.55%
1975	0.00%	-48.32%	6.59%	-39.18%	-2.56%	0.27%	9.29%	18.37%	2.78%	-47.39%	0.00%	-47.37%	4.06%	-45.12%	0.00%	-47.18%	-0.03%	-47.44%	0.00%	-47.06%	0.00%	-46.99%	0.00%	-47.40%
1976	-6.97%	-39.02%	-0.86%	3.75%	0.00%	-47.78%	14.41%	-38.11%	0.55%	-47.84%	0.00%	-45.23%	5.37%	-41.42%	2.83%	-43.94%	2.96%	-43.54%	1.00%	-46.29%	0.00%	-47.43%	0.00%	-45.24%
1977	0.00%	-46.43%	0.00%	-47.78%	0.00%	-47.79%	6.38%	-44.01%	0.00%	-45.16%	0.00%	-42.14%	0.00%	-44.40%	7.36%	-39.63%	3.80%	-44.55%	0.00%	-45.17%	-0.25%	-43.17%	0.00%	-42.32%
1978	-3.36%	-15.83%	1.74%	5.96%	1.75%	1.62%	-0.83%	-48.30%	-0.08%	-48.06%	0.00%	-47.14%	0.00%	-45.19%	0.00%	-41.66%	0.00%	-35.09%	-0.18%	-41.42%	13.32%	-15.46%	3.60%	7.81%
1979	-1.80%	-2.62%	1.91%	4.73%	2.58%	2.58%	0.54%	3.71%	25.14%	-11.15%	-2.34%	-43.79%	0.19%	-47.89%	-0.81%	-48.65%	1.54%	-47.29%	3.41%	-44.39%	2.70%	-46.04%	0.00%	-46.04%
1980	10.24%	-5.77%	1.05%	1.05%	2.14%	3.07%	20.95%	30.75%	0.17%	-29.04%	-7.14%	-43.26%	-1.84%	-31.23%	-4.36%	-25.56%	2.30%	-32.31%	3.52%	-45.17%	2.70%	-46.04%	0.00%	-46.04%
1981	0.00%	-46.04%	0.00%	-45.64%	13.19%	-8.41%	-0.85%	-44.66%	-0.76%	-48.86%	-0.05%	-47.91%	-0.55%	-47.53%	-0.11%	-48.23%	2.89%	-44.58%	1.49%	-43.77%	1.30%	-44.86%	5.31%	-39.42%
1982	-9.23%	-0.95%	-0.08%	-7.54%	0.81%	-3.82%	15.76%	2.51%	1.97%	-47.79%	-0.97%	-48.39%	-0.02%	-47.77%	5.00%	-43.71%	0.84%	-46.50%	0.00%	-47.18%	-14.29%	-8.74%	-2.33%	4.26%
1983	-12.92%	-10.21%	1.61%	1.82%	1.98%	1.98%	2.08%	4.52%	21.01%	-2.44%	3.26%	-46.18%	0.02%	-47.97%	6.76%	-42.17%	10.08%	-17.93%	11.89%	-10.06%	-10.55%	-32.36%	-5.42%	4.70%
1984	12.49%	29.01%	-1.58%	-40.98%	0.00%	-46.01%	-0.61%	-47.82%	0.00%	-47.15%	0.00%	-45.20%	0.00%	-45.18%	2.38%	-36.44%	-12.82%	-14.27%	-8.06%	-12.61%	-1.67%	-35.79%	2.74%	3.61%
1985	1.84%	2.38%	1.58%	2.05%	2.28%	3.58%	12.01%	28.67%	8.34%	-26.60%	-0.73%	-48.26%	-0.10%	-47.91%	1.15%	-47.10%	1.02%	-43.26%	-1.72%	-25.42%	-4.25%	0.65%	7.43%	14.81%
1986	-0.38%	-30.55%	-0.08%	10.63%	2.18%	2.37%	22.59%	-5.57%	3.27%	-47.10%	-0.99%	-48.40%	-0.58%	-48.23%	-3.62%	-32.10%	-0.23%	-33.50%	-2.58%	-49.31%	1.17%	-42.79%	-1.74%	-38.49%
1987	6.46%	-15.18%	13.42%	15.24%	2.61%	7.59%	0.69%	-43.67%	0.45%	-48.05%	-0.29%	-46.17%	0.00%	-45.22%	0.41%	-47.49%	0.00%	-46.83%	5.26%	-40.39%	3.68%	-42.15%	-3.07%	-47.69%
1988	5.25%	11.04%	3.08%	4.92%	-0.61%	-47.93%	6.30%	-22.78%	-0.85%	-48.89%	-0.44%	-48.08%	4.09%	-45.17%	-5.99%	2.01%	3.54%	-14.67%	0.00%	-47.68%	0.00%	-47.35%	0.00%	-47.59%
1989	9.35%	-35.02%	7.41%	18.65%	2.18%	-34.27%	1.95%	-44.39%	-0.29%	-46.45%	-0.24%	-44.29%	0.48%	-43.96%	-0.10%	-46.20%	0.28%	-46.27%	-0.31%	-45.74%	0.00%	-45.24%	0.00%	-45.24%
1990	0.00%	-47.55%	0.00%	-47.73%	0.00%	-47.79%	0.00%	-47.26%	0.02%	-45.19%	0.00%	-41.17%	0.00%	-43.83%	1.91%	-41.63%	0.33%	-45.08%	0.00%	-45.11%	0.00%	-45.22%	-8.72%	-25.86%
1991	-5.65%	-1.35%	-9.22%	-12.03%	0.12%	8.04%	3.27%	6.89%	-0.52%	-48.25%	0.00%	-47.14%	-0.60%	-45.57%	0.26%	-45.56%	-1.54%	-42.14%	-4.16%	-43.20%	0.00%	-45.17%	-4.49%	-14.78%
1992	4.04%	15.28%	0.89%	1.97%	3.05%	5.08%	2.42%	6.64%	0.23%	-42.35%	0.00%	-47.14%	13.45%	-36.29%	-3.23%	-17.89%	0.00%	-47.85%	0.00%	-47.28%	-1.04%	-41.87%	-6.56%	5.76%
1993	0.10%	-2.76%	1.60%	1.92%	2.93%	8.32%	3.21%	13.64%	1.22%	-43.49%	-5.04%	-46.58%	-5.63%	-42.12%	2.10%	-38.70%	-0.88%	-39.17%	10.01%	-29.06%	3.21%	5.37%	9.14%	-36.44%
1994	-5.19%	-30.74%	4.56%	2.85%	10.85%	28.84%	14.35%	-21.95%	1.09%	-47.41%	-1.34%	-48.58%	-0.46%	-48.22%	-0.13%	-48.28%	-0.10%	-48.08%	-0.20%	-48.05%	-4.40%	-45.61%	-3.93%	-20.88%
1995	-5.21%	0.93%	0.77%	6.08%	1.88%	3.94%	8.66%	-30.92%	4.20%	-43.88%	2.36%	-46.65%	-0.36%	-48.17%	-0.02%	-48.19%	-0.66%	-48.44%	-0.57%	-48.26%	-0.31%	-48.55%	0.00%	-48.71%
1996	0.00%	-48.69%	0.00%	-48.45%	0.00%	-48.54%	0.00%	-47.08%	0.00%	-45.18%	0.00%	-45.13%	0.27%	-45.57%	0.00%	-45.17%	0.53%	-40.46%	0.00%	-45.20%	0.00%	-47.00%	0.00%	-47.44%
1997	4.92%	6.18%	4.85%	10.58%	1.02%	7.47%	-0.13%	-48.24%	0.00%	-45.39%	0.00%	-45.11%	0.35%	-42.47%	0.48%	-42.42%	-4.63%	-38.95%	0.45%	-41.73%	0.01%	-45.20%	-0.51%	-46.91%
1998	-0.39%	-47.74%	0.72%	2.99%	0.13%	2.04%	0.59%	1.02%	0.03%	-48.42%	0.24%	-45.23%	0.00%	-45.21%	0.20%	-45.16%	0.00%	-44.98%	0.00%	-44.22%	-0.21%	-46.23%	0.00%	-48.05%
1999	0.00%	-47.80%	0.00%	-47.54%	0.00%	-47.31%	26.20%	-29.07%	0.00%	-44.21%	0.00%	-40.73%	10.27%	-30.55%	-0.45%	-47.48%	0.41%	-23.39%	0.00%	-45.14%	0.00%	-45.14%	0.00%	-45.14%
2000	0.00%	-45.25%	0.00%	-45.25%	0.00%	-47.15%	-0.24%	-43.97%	0.00%	-37.34%	0.00%	-36.05%	0.00%	-33.70%	3.07%	-35.76%	0.00%	-39.19%	4.56%	-10.31%	3.30%	6.57%	0.00%	-47.54%
2001	0.00%	-47.56%	11.99%	-40.79%	12.38%	24.73%	4.65%	-44.76%	0.00%	-45.14%	0.00%	-38.65%	0.00%	-34.93%	2.70%	-41.62%	-2.89%	-40.35%	0.00%	-39.25%	0.00%	-40.61%	0.00%	-45.13%
2002	0.00%	-45.13%	0.00%	-45.13%	0.44%	-43.90%	-3.84%	-39.25%	0.00%	-31.42%	0.00%	-27.88%	0.00%	-28.07%	0.00%	-30.80%	0.00%	-32.09%	0.00%	-32.90%	0.00%	-35.62%	-7.05%	-42.38%
2003	0.00%	-40.35%	0.00%	-42.14%	3.27%	6.54%	0.00%	-45.21%	0.00%	-36.56%	0.00%	-30.14%	0.00%	-28.80%	0.00%	-31.42%	-0.23%	-33.54%	0.00%	-31.76%	0.00%	-35.16%	0.57%	-39.78%
2004	0.00%	-40.35%	0.00%	-42.14%	3.27%	6.54%	0.00%	-45.21%	0.00%	-36.56%	0.00%	-30.14%	0.00%	-28.80%	0.00%	-31.42%	-0.23%	-33.54%	0.00%	-31.76%	0.00%	-35.16%	0.57%	-39.78%
2005	6.36%	-4.60%	1.78%	-0.81%	-0.31%	2.91%	5.49%	-31.95%	-0.20%	-48.22%	0.00%	-45.14%	0.19%	-44.72%	5.53%	-42.41%	0.00%	-45.12%	0.00%	-45.11%	0.00%	-45.13%	0.00%	-45.18%
2006	0.00%	-45.18%	0.00%	-45.18%	0.00%	-45.17%	0.00%	-44.87%	0.00%	-38.79%	0.00%	-35.31%	0.00%	-35.09%	0.00%	-37.14%	0.00%	-38.31%	-0.20%	-38.98%	0.00%	-40.48%	0.00%	-42.64%
2007	0.00%	-45.10%	-0.31%	-45.45%	0.01%	-45.21%	0.00%	-41.66%	0.00%	-33.78%	0.00%	-28.71%	9.94%	-21.72%	9.92%	-3.61%	0.00%	-35.54%	0.00%	-34.40%	0.06%	-33.60%	-6.89%	7.06%
2008	1.31%	5.61%	3.59%	6.37%	5.03%	18.70%	-0.63%	-47.52%	-0.11%	-48.33%	0.29%	-46.73%	2.74%	-41.03%	0.03%	-47.16%	0.01%	-45.20%	0.00%	-45.24%	0.29%	-46.08%	-0.77%	5.85%
2009	10.22%	32.75%	5.13%	17.52%	1.98%	-17.83%	0.00%	-48.00%																

Figure 4-64. Habitat summary table for green sunfish (*Lepomis cyanellus*), Braided site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Gage Site

No Wood

Red Shiner

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-11.86%	0.00%	-29.82%	0.13%	-27.57%	0.00%	-28.79%	0.00%	-28.66%	0.00%	-27.82%	-0.93%	-2.92%	0.02%	0.02%
1966	0.33%	0.33%	2.63%	3.68%	2.74%	2.74%	0.00%	-5.90%	0.00%	-12.07%	0.00%	-16.07%	0.00%	-22.28%	-0.05%	-6.20%	0.00%	-14.15%	0.00%	-18.11%	0.00%	-17.19%	0.18%	-10.19%
1967	0.00%	-7.98%	0.00%	-15.06%	0.00%	-13.55%	0.00%	-19.25%	0.00%	-18.11%	0.00%	-22.28%	0.99%	-16.79%	1.54%	0.70%	0.00%	-15.06%	0.00%	-28.05%	0.00%	-24.16%	0.48%	0.48%
1968	0.02%	0.02%	0.05%	0.05%	0.71%	0.71%	2.26%	3.77%	-0.93%	-6.20%	-0.06%	-13.46%	0.00%	-8.37%	-0.12%	-6.20%	0.00%	-7.81%	0.00%	-8.16%	0.00%	-8.16%	0.00%	-6.36%
1969	0.62%	0.62%	1.92%	1.92%	0.89%	0.89%	1.83%	2.41%	-1.97%	-5.98%	0.00%	-9.72%	0.00%	-11.08%	0.00%	-10.79%	0.00%	-15.97%	0.00%	-15.77%	0.00%	-6.86%	0.00%	-6.15%
1970	0.00%	-6.25%	0.00%	-6.93%	0.00%	-5.93%	0.00%	-6.29%	0.00%	-12.76%	0.00%	-24.87%	0.00%	-27.86%	-0.29%	-21.78%	-0.57%	-0.78%	0.00%	-19.56%	0.00%	-8.55%	0.00%	-6.65%
1971	0.00%	-6.30%	0.00%	-6.24%	0.00%	-6.83%	0.00%	-22.91%	0.00%	-25.20%	0.00%	-29.25%	0.00%	-29.12%	-0.50%	-15.00%	0.18%	-15.55%	1.13%	1.13%	0.00%	-8.36%	1.73%	-1.21%
1972	1.74%	-1.03%	0.00%	-7.41%	0.00%	-14.05%	0.00%	-20.39%	0.00%	-23.52%	0.00%	-21.86%	0.00%	-22.28%	0.16%	-19.83%	0.02%	-27.03%	0.26%	-8.32%	0.22%	0.22%	1.27%	1.27%
1973	0.87%	0.87%	0.09%	0.09%	0.19%	0.19%	0.02%	0.02%	0.36%	0.36%	0.39%	0.39%	-0.91%	-0.91%	-2.38%	-2.47%	-4.99%	-5.95%	-3.05%	-6.10%	-2.64%	-6.01%	0.00%	-5.92%
1974	1.69%	-0.74%	0.00%	-5.26%	0.35%	-4.52%	0.00%	-6.12%	-0.19%	-6.40%	0.00%	-12.46%	0.00%	-11.47%	0.00%	-6.23%	-0.64%	-8.88%	-0.60%	-7.30%	0.00%	-6.16%	0.00%	-6.16%
1975	0.00%	-6.19%	1.44%	1.99%	0.60%	0.60%	1.00%	1.00%	-2.06%	-5.97%	0.00%	-10.00%	-0.49%	-7.24%	0.00%	-12.16%	-0.06%	-10.15%	0.00%	-13.55%	0.00%	-14.26%	0.00%	-10.58%
1976	0.01%	-6.31%	0.50%	0.50%	0.00%	-5.72%	1.73%	-0.28%	-0.22%	-6.32%	0.00%	-17.91%	0.00%	-15.66%	0.00%	-14.36%	0.33%	-21.20%	0.00%	-6.89%	0.00%	-9.32%	0.00%	-17.09%
1977	0.00%	-6.18%	0.00%	-7.06%	0.00%	-6.33%	0.90%	-8.97%	0.00%	-22.38%	0.00%	-28.66%	-0.57%	-24.57%	-0.71%	-25.37%	-1.50%	-7.48%	0.00%	-23.99%	0.00%	-28.06%	0.00%	-28.54%
1978	0.82%	-1.97%	0.30%	0.30%	0.10%	0.10%	0.00%	-5.78%	-0.16%	-6.44%	0.00%	-12.66%	0.00%	-20.39%	0.00%	-28.99%	0.00%	-33.74%	0.00%	-28.29%	2.80%	-0.73%	0.38%	0.38%
1979	0.23%	0.23%	0.05%	0.05%	0.10%	0.10%	0.37%	0.37%	3.70%	3.70%	-4.70%	-4.70%	-2.42%	-6.29%	-0.79%	-6.13%	-0.54%	-6.21%	-5.08%	-5.08%	-5.59%	-5.59%	-2.22%	-5.56%
1980	0.92%	0.92%	0.09%	0.09%	0.08%	0.08%	1.72%	1.72%	3.71%	3.71%	-2.54%	-2.54%	-1.55%	-1.55%	-1.56%	-1.56%	-2.69%	-2.72%	-5.40%	-5.40%	-5.56%	-5.56%	-1.08%	-5.56%
1981	0.00%	-5.56%	0.36%	-3.09%	2.72%	3.68%	-0.95%	-5.23%	-1.43%	-6.09%	-0.09%	-6.30%	-4.24%	-5.80%	0.09%	-5.51%	-1.25%	-4.97%	-2.00%	-4.27%	-3.37%	-4.11%	0.59%	-3.35%
1982	2.79%	2.79%	0.67%	0.67%	0.18%	0.18%	2.54%	2.54%	-2.99%	-5.92%	-1.86%	-6.19%	-0.44%	-7.39%	0.25%	-3.66%	0.41%	-4.47%	0.00%	-12.16%	-1.46%	-1.46%	0.87%	0.87%
1983	0.55%	0.55%	0.11%	0.11%	0.18%	0.18%	0.13%	0.13%	3.23%	3.23%	-5.34%	-5.90%	-3.93%	-5.05%	-0.89%	-1.65%	-0.51%	-1.72%	0.36%	-0.33%	0.05%	0.05%	1.55%	1.55%
1984	1.78%	1.78%	0.00%	-4.44%	0.00%	-5.61%	0.00%	-5.93%	0.00%	-12.46%	0.00%	-19.66%	0.00%	-20.70%	0.06%	-4.63%	1.37%	1.37%	1.54%	1.54%	0.11%	-2.69%	0.46%	0.46%
1985	0.14%	0.14%	0.30%	0.30%	0.01%	0.01%	2.09%	2.09%	3.35%	3.35%	-1.40%	-6.22%	-0.19%	-6.39%	-2.23%	-4.63%	-3.22%	-3.86%	-2.22%	-2.22%	0.97%	0.97%	1.26%	1.26%
1986	0.00%	-2.56%	2.11%	2.11%	0.07%	0.07%	3.32%	3.32%	-1.92%	-5.89%	-1.89%	-6.19%	-1.34%	-6.38%	0.05%	0.05%	-0.28%	-3.93%	-4.61%	-5.99%	-4.16%	-4.16%	0.41%	-2.90%
1987	1.35%	1.04%	1.94%	1.95%	0.45%	0.45%	-0.53%	-5.01%	-0.28%	-6.20%	0.00%	-15.26%	0.00%	-18.22%	-0.71%	-8.69%	0.00%	-11.20%	-0.50%	-11.29%	-0.82%	-3.80%	0.00%	-6.06%
1988	0.95%	0.95%	0.80%	0.80%	0.00%	-5.79%	1.53%	0.81%	-1.67%	-6.08%	-0.85%	-6.35%	-0.28%	-7.49%	1.66%	1.66%	1.86%	1.86%	0.00%	-7.11%	0.00%	-10.20%	0.00%	-7.59%
1989	0.99%	-3.36%	1.68%	1.68%	1.08%	-2.16%	1.11%	-1.31%	0.00%	-15.26%	0.00%	-26.82%	0.00%	-27.70%	0.00%	-16.06%	0.00%	-15.56%	0.00%	-16.68%	0.00%	-17.09%	0.00%	-16.99%
1990	0.00%	-7.01%	0.00%	-6.40%	0.00%	-6.66%	0.00%	-11.07%	0.00%	-21.54%	0.00%	-29.33%	0.00%	-27.47%	0.51%	-21.11%	0.00%	-24.84%	0.00%	-25.11%	0.00%	-18.11%	1.74%	0.97%
1991	1.56%	1.56%	0.01%	-3.85%	0.32%	0.32%	0.01%	0.01%	-1.00%	-6.22%	0.00%	-12.56%	0.00%	-17.39%	0.00%	-18.83%	0.00%	-28.66%	0.00%	-27.94%	0.00%	-21.96%	1.66%	0.73%
1992	1.12%	1.12%	0.40%	0.40%	0.07%	0.07%	0.36%	0.36%	-4.15%	-4.44%	0.00%	-12.56%	0.66%	-14.05%	0.63%	-3.31%	0.00%	-6.32%	0.00%	-10.98%	0.18%	-5.96%	0.24%	0.24%
1993	0.09%	0.09%	0.09%	0.09%	0.04%	0.04%	1.47%	1.47%	2.75%	2.75%	-2.56%	-2.56%	-3.96%	-3.96%	-1.37%	-1.40%	-0.53%	-0.53%	-3.73%	-3.73%	0.22%	0.22%	3.17%	3.17%
1994	0.00%	-2.56%	1.58%	1.58%	2.36%	2.62%	2.98%	2.98%	-3.77%	-5.43%	-2.55%	-6.15%	-0.87%	-6.23%	0.00%	-6.20%	-0.19%	-6.26%	-0.31%	-6.28%	-0.65%	-5.37%	0.72%	-2.84%
1995	0.12%	0.12%	0.45%	0.45%	0.15%	0.15%	2.81%	3.37%	-4.25%	-5.11%	-3.85%	-6.07%	-0.69%	-6.24%	-0.03%	-6.24%	-2.19%	-5.91%	-1.09%	-6.22%	-0.58%	-6.16%	0.00%	-6.12%
1996	0.00%	-6.10%	0.00%	-6.12%	0.00%	-6.16%	0.00%	-13.26%	0.00%	-20.81%	0.00%	-24.51%	0.00%	-19.66%	0.00%	-21.33%	1.28%	-8.79%	0.00%	-19.66%	0.00%	-14.15%	0.00%	-9.23%
1997	0.63%	0.63%	0.87%	0.87%	0.50%	0.50%	0.00%	-6.23%	0.00%	-18.11%	0.00%	-25.69%	0.00%	-27.01%	0.00%	-26.64%	0.00%	-27.50%	0.00%	-27.66%	0.00%	-19.66%	0.00%	-14.76%
1998	0.00%	-5.66%	0.20%	0.20%	0.08%	0.08%	0.06%	0.06%	-1.01%	-6.12%	0.00%	-18.11%	0.00%	-19.25%	0.00%	-22.49%	0.00%	-26.77%	0.00%	-27.26%	0.00%	-16.27%	0.00%	-6.27%
1999	0.00%	-6.33%	0.00%	-8.16%	0.00%	-10.69%	3.64%	3.64%	0.00%	-27.24%	0.00%	-29.64%	-0.44%	-25.33%	-0.13%	-9.05%	0.93%	-4.74%	0.00%	-23.34%	0.00%	-23.66%	0.00%	-23.34%
2000	0.00%	-16.68%	0.00%	-16.58%	0.00%	-12.46%	0.00%	-27.52%	0.00%	-32.06%	0.00%	-33.01%	0.00%	-34.79%	0.00%	-33.23%	0.00%	-30.73%	1.62%	-6.36%	1.03%	1.03%	0.00%	-8.16%
2001	0.00%	-7.98%	1.62%	-1.89%	2.52%	2.52%	1.02%	-2.01%	0.00%	-23.66%	0.00%	-31.11%	0.00%	-33.01%	0.00%	-28.95%	0.00%	-29.90%	0.00%	-29.33%	0.00%	-28.22%	0.00%	-25.45%
2002	0.00%	-24.40%	0.00%	-25.65%	0.00%	-27.28%	0.00%	-30.68%	0.00%	-36.58%	0.00%	-39.46%	0.00%	-39.31%	0.00%	-36.44%	0.00%	-36.05%	0.00%	-35.41%	0.00%	-32.16%	0.00%	-28.50%
2003	0.00%	-28.66%	0.00%	-28.66%	0.59%	0.59%	0.00%	-19.25%	0.00%	-30.27%	0.00%	-37.61%	0.00%	-38.70%	0.00%	-36.58%	0.00%	-34.92%	0.00%	-36.31%	0.00%	-33.68%	0.00%	-28.33%
2004	0.00%	-28.66%	0.00%	-28.66%	0.59%	0.59%	0.00%	-19.25%	0.00%	-30.27%	0.00%	-37.61%	0.00%	-38.70%	0.00%	-36.58%	0.00%	-34.92%	0.00%	-36.31%	0.00%	-33.68%	0.00%	-28.33%
2005	1.16%	1.16%	0.09%	0.09%	0.57%	0.57%	2.51%	2.51%	-0.37%	-6.23%	0.00%	-23.66%	0.00%	-27.01%	0.00%	-16.78%	0.00%	-25.05%	0.00%	-25.59%	0.00%	-24.62%	0.00%	-21.23%
2006	0.00%	-21.23%	0.00%	-21.02%	0.00%	-21.96%	0.00%	-25.13%	0.00%	-31.02%	0.00%	-33.57%	0.00%	-33.74%	0.00%	-30.50%	0.00%	-31.36%	0.00%	-28.55%	0.00%	-28.87%	0.00%	-27.06%
2007	0.00%	-26.45%	0.00%	-22.28%	0.00%	-19.77%	0.00%	-28.99%	0.00%	-34.73%	0.00%	-38.77%	0.00%	-38.70%	2.09%	-15.47%	0.00%	-33.40%	0.00%	-34.26%	0.00%	-32.27%	1.05%	1.05%
2008	0.35%	0.35%	0.35%	0.35%	1.20%	1.20%	0.00%	-5.98%	-0.22%	-6.21%	0.00%	-15.46%	-1.90%	-9.93%	-0.57%	-9.82%	0.00%	-19.56%	0.00%	-16.78%	0.00%	-15.77%	0.87%	0.87%
2009	1.75%	1.75%	1.71%	1.71%	0.85%	2.49%	0.00%	-5.88%																

Figure 4-65. Habitat summary table for red shiner (*Cyprinella lutrensis*), Gage site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes										Gage Site														
Hypothetical Withdrawal	10 cfs									No Wood														
										Red Shiner														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-63.11%	0.00%	-56.65%	0.63%	-55.26%	0.00%	-57.81%	0.00%	-58.33%	0.00%	-59.54%	-0.11%	-59.38%	0.13%	-2.26%
1966	1.92%	1.92%	6.95%	7.31%	12.66%	15.87%	0.00%	-66.29%	0.00%	-62.98%	0.00%	-62.50%	0.00%	-61.74%	0.97%	-62.11%	0.00%	-62.73%	0.00%	-62.25%	0.00%	-62.36%	0.45%	-59.18%
1967	0.00%	-63.50%	0.00%	-62.62%	0.00%	-62.80%	0.00%	-62.11%	0.00%	-62.25%	0.00%	-61.74%	4.90%	-57.74%	7.33%	-51.96%	0.00%	-62.62%	0.00%	-59.20%	0.00%	-61.43%	2.59%	-28.72%
1968	0.10%	0.10%	0.33%	0.33%	3.54%	3.54%	8.53%	-26.40%	-0.93%	-64.57%	-0.06%	-62.90%	0.00%	-63.49%	-0.71%	-64.57%	0.00%	-63.54%	0.00%	-63.46%	0.00%	-63.46%	0.00%	-63.92%
1969	3.83%	-29.02%	9.55%	9.55%	4.45%	4.45%	4.06%	-47.11%	-1.97%	-65.81%	0.00%	-63.27%	0.00%	-63.10%	0.00%	-63.15%	0.00%	-62.51%	0.00%	-62.53%	0.00%	-63.77%	0.00%	-64.84%
1970	0.00%	-64.24%	0.00%	-63.86%	0.00%	-65.97%	0.00%	-64.06%	0.00%	-62.90%	0.00%	-61.39%	0.00%	-59.49%	1.09%	-59.61%	-3.43%	-44.63%	0.00%	-62.07%	0.00%	-63.41%	0.00%	-64.00%
1971	0.00%	-63.96%	0.00%	-64.34%	0.00%	-64.03%	0.00%	-61.67%	0.00%	-61.35%	0.00%	-57.47%	0.00%	-57.66%	0.39%	-56.24%	1.12%	-53.64%	5.77%	-33.49%	0.00%	-63.47%	7.17%	-52.21%
1972	7.11%	-61.01%	0.00%	-63.62%	0.00%	-62.74%	0.00%	-61.97%	0.00%	-61.51%	0.00%	-61.80%	0.00%	-61.74%	0.79%	-59.84%	0.14%	-56.29%	1.52%	-46.90%	1.49%	-17.01%	6.34%	6.34%
1973	5.12%	5.12%	0.47%	0.47%	0.94%	0.94%	0.08%	0.08%	2.23%	2.23%	-10.08%	-31.85%	-3.10%	-37.43%	-4.01%	-63.95%	-5.05%	-66.01%	-3.05%	-65.13%	-2.64%	-65.63%	0.00%	-66.15%
1974	6.41%	-46.87%	0.00%	-64.99%	0.78%	-64.71%	0.00%	-64.99%	-0.19%	-63.86%	0.00%	-62.93%	0.00%	-63.10%	0.00%	-64.37%	-0.64%	-63.69%	0.05%	-60.04%	0.00%	-64.76%	0.00%	-64.79%
1975	0.00%	-64.59%	6.34%	-61.08%	3.45%	3.45%	5.17%	5.17%	-2.06%	-65.86%	0.00%	-63.23%	-0.02%	-62.50%	0.00%	-62.97%	-0.06%	-63.33%	0.00%	-62.80%	0.00%	-62.72%	0.00%	-63.27%
1976	0.06%	-62.05%	3.28%	-17.54%	0.00%	-65.12%	7.82%	-61.69%	-0.22%	-64.32%	0.00%	-62.27%	0.00%	-62.55%	0.00%	-62.71%	1.39%	-61.21%	-1.83%	-63.63%	0.00%	-63.32%	0.00%	-62.37%
1977	0.00%	-64.64%	0.00%	-63.78%	0.00%	-63.80%	1.39%	-62.72%	0.00%	-61.73%	0.00%	-58.33%	-0.67%	-60.53%	-0.81%	-59.63%	-2.24%	-64.26%	0.00%	-61.41%	0.00%	-59.20%	0.00%	-58.50%
1978	4.23%	-53.85%	2.00%	2.00%	0.51%	0.51%	-0.53%	-66.64%	-0.16%	-64.15%	0.00%	-62.91%	0.00%	-61.97%	0.00%	-57.84%	0.00%	-50.94%	0.00%	-57.51%	13.73%	-47.28%	1.94%	1.94%
1979	1.22%	1.22%	0.72%	0.72%	0.58%	0.58%	2.77%	2.77%	19.30%	19.30%	-9.53%	-60.81%	-2.67%	-65.01%	-1.54%	-64.93%	-0.77%	-64.47%	-7.51%	-65.78%	-6.88%	-67.13%	-2.34%	-67.17%
1980	5.14%	-9.57%	0.48%	0.48%	0.51%	0.51%	9.85%	9.85%	0.49%	-2.44%	-12.58%	-34.83%	-7.33%	-41.45%	-3.30%	-46.00%	-3.00%	-49.75%	-8.84%	-66.08%	-7.00%	-67.17%	-2.34%	-67.17%
1981	0.00%	-67.17%	1.43%	-64.21%	7.53%	-25.23%	-1.42%	-61.60%	-1.43%	-65.20%	-0.09%	-63.95%	-5.14%	-65.90%	1.20%	-63.82%	-0.05%	-62.40%	-3.31%	-63.45%	-3.08%	-64.56%	2.45%	-62.46%
1982	9.67%	-11.75%	3.87%	3.87%	0.65%	0.65%	14.82%	4.04%	-2.99%	-66.16%	-1.86%	-64.59%	-0.44%	-63.92%	1.53%	-62.72%	1.20%	-63.29%	0.00%	-62.97%	-5.34%	-50.44%	5.12%	5.12%
1983	1.49%	1.01%	0.56%	0.56%	0.90%	0.90%	0.79%	0.79%	19.39%	9.71%	-6.44%	-66.24%	-4.23%	-65.57%	0.11%	-64.00%	4.80%	-50.60%	7.26%	-41.92%	-6.41%	-60.02%	9.35%	9.35%
1984	10.38%	10.38%	0.00%	-59.64%	0.00%	-67.15%	0.00%	-66.07%	0.00%	-62.93%	0.00%	-62.06%	0.00%	-61.94%	1.16%	-48.55%	2.98%	-49.99%	4.92%	-48.73%	-1.18%	-61.16%	2.80%	2.80%
1985	0.89%	0.89%	0.42%	0.42%	0.20%	0.20%	11.39%	11.39%	5.95%	-31.50%	-1.40%	-64.42%	-0.19%	-63.96%	-2.39%	-65.49%	-5.13%	-63.78%	-6.20%	-50.99%	5.76%	5.76%	7.73%	7.73%
1986	0.00%	-41.91%	11.54%	11.72%	0.33%	0.33%	18.49%	-22.91%	-3.53%	-66.32%	-1.89%	-64.60%	-1.34%	-64.47%	-1.40%	-57.11%	0.74%	-57.85%	-4.82%	-65.76%	-4.82%	-60.80%	1.46%	-59.38%
1987	6.88%	-35.12%	7.71%	7.75%	2.41%	2.41%	-0.53%	-62.65%	-0.28%	-64.54%	0.00%	-62.60%	0.00%	-62.24%	0.00%	-63.73%	0.00%	-63.10%	-0.02%	-60.48%	-2.32%	-62.84%	0.00%	-65.34%
1988	5.56%	-9.25%	4.71%	4.71%	0.00%	-66.79%	5.71%	-55.33%	-1.67%	-65.27%	-0.85%	-64.19%	-0.28%	-63.80%	4.76%	-36.88%	6.91%	-43.31%	0.00%	-63.65%	0.00%	-63.21%	0.00%	-63.53%
1989	3.34%	-52.29%	10.15%	10.15%	5.15%	-57.42%	3.61%	-63.76%	0.00%	-62.60%	0.00%	-60.35%	0.00%	-59.55%	0.00%	-62.55%	0.00%	-62.56%	0.00%	-62.42%	0.00%	-62.37%	0.00%	-62.39%
1990	0.00%	-63.64%	0.00%	-63.91%	0.00%	-63.80%	0.00%	-63.16%	0.00%	-61.83%	0.00%	-57.35%	0.00%	-59.42%	2.09%	-60.16%	0.00%	-61.16%	0.00%	-61.16%	0.00%	-62.25%	6.70%	-56.04%
1991	9.16%	-38.74%	0.05%	-45.56%	1.63%	-10.88%	0.07%	0.07%	-1.00%	-64.41%	0.00%	-62.92%	0.00%	-62.34%	0.00%	-62.16%	0.00%	-58.33%	0.00%	-59.37%	0.00%	-61.78%	6.31%	-46.76%
1992	5.76%	5.76%	2.78%	2.78%	1.01%	1.01%	1.80%	1.80%	-6.43%	-59.64%	0.00%	-62.92%	3.55%	-58.72%	2.79%	-46.80%	0.00%	-63.88%	0.00%	-63.11%	1.00%	-60.34%	3.57%	-14.72%
1993	0.49%	0.49%	0.44%	0.44%	0.17%	0.17%	8.72%	8.72%	-4.78%	-10.28%	-11.80%	-41.91%	-9.85%	-56.45%	-1.32%	-57.40%	-5.63%	-58.69%	-6.58%	-56.26%	2.30%	-0.13%	12.62%	-5.88%
1994	0.00%	-41.91%	9.40%	-3.31%	11.23%	14.60%	11.41%	2.32%	-4.35%	-65.60%	-2.55%	-64.84%	-0.87%	-64.37%	-0.62%	-64.58%	-0.19%	-64.19%	-0.31%	-64.12%	-0.56%	-64.75%	4.89%	-49.38%
1995	0.36%	0.36%	2.66%	2.66%	1.20%	1.20%	6.72%	-8.93%	-5.91%	-63.91%	-3.85%	-65.31%	-0.69%	-64.30%	-0.03%	-64.33%	-2.65%	-65.15%	-1.09%	-64.42%	-0.58%	-64.81%	0.00%	-65.01%
1996	0.00%	-65.13%	0.00%	-64.99%	0.00%	-64.78%	0.00%	-62.84%	0.00%	-61.92%	0.00%	-61.47%	0.00%	-62.09%	0.00%	-61.86%	5.96%	-58.48%	0.00%	-62.06%	0.00%	-62.73%	0.00%	-63.33%
1997	3.58%	-29.72%	5.13%	5.13%	2.26%	2.26%	0.00%	-64.39%	0.00%	-62.25%	0.00%	-61.33%	0.00%	-60.68%	0.00%	-60.77%	0.00%	-59.98%	0.00%	-59.76%	0.00%	-62.06%	0.00%	-62.66%
1998	0.00%	-65.35%	0.93%	0.93%	0.40%	0.40%	0.44%	0.44%	-1.01%	-65.01%	0.00%	-62.25%	0.00%	-62.11%	0.00%	-61.72%	0.00%	-60.98%	0.00%	-60.37%	0.00%	-62.47%	0.00%	-64.14%
1999	0.00%	-63.81%	0.00%	-63.46%	0.00%	-63.15%	18.48%	-57.39%	0.00%	-60.36%	0.00%	-56.91%	-0.80%	-58.74%	-0.13%	-63.92%	2.29%	-59.28%	0.00%	-61.62%	0.00%	-61.58%	0.00%	-61.62%
2000	0.00%	-62.42%	0.00%	-62.44%	0.00%	-62.93%	0.00%	-59.99%	0.00%	-53.38%	0.00%	-52.00%	0.00%	-49.41%	0.00%	-51.68%	0.00%	-55.32%	8.89%	-40.78%	6.39%	-25.58%	0.00%	-63.46%
2001	0.00%	-63.49%	4.11%	-61.19%	11.57%	-9.44%	4.45%	-64.20%	0.00%	-61.58%	0.00%	-54.76%	0.00%	-52.00%	0.00%	-57.90%	0.00%	-56.52%	0.00%	-57.35%	0.00%	-58.97%	0.00%	-61.06%
2002	0.00%	-61.49%	0.00%	-61.17%	0.00%	-59.86%	0.00%	-55.39%	0.00%	-46.82%	0.00%	-42.62%	0.00%	-42.85%	0.00%	-47.01%	0.00%	-47.58%	0.00%	-48.51%	0.00%	-53.23%	0.00%	-58.56%
2003	0.00%	-58.33%	0.00%	-58.33%	3.23%	3.23%	0.00%	-62.11%	0.00%	-55.80%	0.00%	-45.32%	0.00%	-43.73%	0.00%	-46.82%	0.00%	-49.23%	0.00%	-47.20%	0.00%	-51.03%	0.00%	-58.79%
2004	0.00%	-58.33%	0.00%	-58.33%	3.23%	3.23%	0.00%	-62.11%	0.00%	-55.80%	0.00%	-45.32%	0.00%	-43.73%	0.00%	-46.82%	0.00%	-49.23%	0.00%	-47.20%	0.00%	-51.03%	0.00%	-58.79%
2005	6.23%	2.84%	0.28%	0.28%	3.18%	3.18%	8.96%	-43.07%	-0.37%	-64.37%	0.00%	-61.58%	0.00%	-60.60%	0.00%	-62.41%	0.00%	-61.41%	0.00%	-61.34%	0.00%	-61.46%	0.00%	-61.87%
2006	0.00%	-61.87%	0.00%	-61.90%	0.00%	-61.78%	0.00%	-61.18%	0.00%	-54.90%	0.00%	-51.19%	0.00%	-50.94%	0.00%	-55.66%	0.00%	-54.41%	0.00%	-55.49%	0.00%	-58.03%	0.00%	-60.49%
2007	0.00%	-61.24%	0.00%	-61.74%	0.00%	-62.05%	0.00%	-57.84%	0.00%	-49.50%	0.00%	-43.62%	0.00%	-43.73%	10.13%	-43.47%	0.00%	-51.44%	0.00%	-50.19%	0.00%	-53.08%	6.37%	-16.41%
2008	1.84%	1.84%	1.80%	1.80%	7.81%	7.81%	0.00%	-65.82%	-0.22%	-64.51%	0.00%	-62.57%	-2.22%	-61.38%	-0.85%	-62.78%	0.00%	-62.07%	0.00%	-62.41%	0.00%	-62.53%	4.65%	-28.19%
2009	9.58%	9.58%	9.45%	9.45%	5.08%	-35.03%	0.00%	-66.41%																

Figure 4-66. Habitat summary table for red shiner (*Cyprinella lutrensis*), Gage site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes Hypothetical Withdrawal 2 cfs										Gage Site With LWD Red Shiner														
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.00%	-11.01%	0.00%	-19.76%	-0.19%	-17.25%	0.00%	-19.30%	0.00%	-19.25%	0.00%	-18.87%	0.00%	-8.26%	-0.09%	-4.95%
1966	0.43%	0.47%	-0.64%	-0.40%	-0.10%	-0.55%	0.00%	-7.60%	0.00%	-11.14%	0.00%	-13.09%	0.00%	-16.14%	0.00%	-9.13%	0.00%	-12.15%	0.00%	-14.09%	0.00%	-13.63%	0.00%	-11.23%
1967	0.00%	-9.16%	0.00%	-12.59%	0.00%	-11.86%	0.00%	-14.64%	0.00%	-14.09%	0.00%	-16.14%	0.00%	-16.14%	0.00%	-11.14%	0.00%	-12.59%	0.00%	-18.97%	0.00%	-17.08%	0.00%	-12.59%
1968	-1.19%	-1.19%	2.98%	2.98%	3.31%	3.31%	0.11%	0.11%	-1.22%	-8.11%	-0.09%	-11.79%	0.00%	-9.34%	-0.16%	-8.11%	0.00%	-9.07%	0.00%	-9.25%	0.00%	-9.25%	0.00%	-8.31%
1969	0.00%	-7.77%	0.09%	0.46%	0.86%	0.63%	0.64%	0.70%	-2.56%	-7.75%	0.00%	-10.00%	0.00%	-10.66%	0.00%	-10.52%	0.00%	-13.04%	0.00%	-12.94%	0.00%	-8.59%	0.00%	-8.03%
1970	0.00%	-8.21%	0.00%	-8.60%	0.00%	-6.80%	0.00%	-8.26%	0.00%	-11.47%	0.00%	-17.43%	0.00%	-18.89%	-0.73%	-16.80%	0.00%	-11.81%	0.00%	-14.80%	0.00%	-9.44%	0.00%	-8.44%
1971	0.00%	-8.30%	0.00%	-8.18%	0.00%	-8.52%	0.00%	-16.46%	0.00%	-17.59%	0.00%	-19.51%	0.00%	-19.45%	0.00%	-16.63%	0.00%	-16.14%	-1.47%	-8.32%	0.00%	-9.34%	0.00%	-9.05%
1972	0.00%	-8.96%	0.00%	-8.87%	0.00%	-12.10%	0.00%	-15.21%	0.00%	-16.76%	0.00%	-15.93%	0.00%	-16.14%	0.00%	-16.14%	0.00%	-19.30%	-0.36%	-12.24%	-5.59%	-5.59%	-0.55%	-0.55%
1973	-1.75%	-1.75%	-0.45%	-0.45%	0.13%	0.13%	0.13%	0.13%	0.30%	0.30%	0.56%	0.56%	-0.79%	-0.79%	-6.08%	-6.19%	-6.46%	-7.69%	-3.97%	-7.95%	-3.43%	-7.80%	0.00%	-7.65%
1974	-0.11%	-5.35%	0.00%	-6.28%	0.03%	-6.10%	0.00%	-7.99%	-0.25%	-8.36%	0.00%	-11.33%	0.00%	-10.83%	0.00%	-8.17%	-0.84%	-9.52%	0.00%	-10.71%	0.00%	-8.05%	0.00%	-8.04%
1975	0.00%	-8.11%	0.00%	-8.01%	-0.29%	-1.17%	0.34%	0.34%	-2.67%	-7.73%	0.00%	-10.14%	-0.04%	-9.84%	0.00%	-11.18%	-0.08%	-10.16%	0.00%	-11.86%	0.00%	-12.20%	0.00%	-10.31%
1976	0.06%	-7.76%	0.13%	-7.09%	0.00%	-7.21%	0.00%	-7.96%	-0.29%	-8.22%	0.00%	-13.99%	0.00%	-12.89%	0.00%	-12.25%	0.00%	-16.14%	0.00%	-8.58%	0.00%	-9.81%	0.00%	-13.58%
1977	0.00%	-8.09%	0.00%	-8.68%	0.00%	-8.34%	0.00%	-10.23%	0.00%	-16.19%	0.00%	-19.25%	-0.14%	-17.27%	-0.93%	-17.55%	-0.86%	-8.28%	0.00%	-16.99%	0.00%	-18.98%	0.00%	-19.19%
1978	0.00%	-12.10%	-0.35%	-1.80%	0.22%	0.02%	0.00%	-7.37%	-0.21%	-8.32%	0.00%	-11.42%	0.00%	-15.21%	0.00%	-19.40%	0.00%	-21.41%	0.00%	-19.04%	0.00%	-15.12%	0.15%	0.15%
1979	0.85%	0.85%	-1.39%	-1.39%	0.62%	0.62%	-0.96%	-0.96%	0.19%	0.19%	-3.89%	-3.89%	-3.16%	-8.06%	-1.24%	-8.00%	-0.71%	-8.14%	-4.75%	-7.38%	-7.00%	-7.00%	-2.78%	-6.95%
1980	-0.06%	-3.07%	-0.79%	-0.79%	-0.67%	-0.67%	-0.28%	-0.28%	0.10%	0.10%	0.32%	0.32%	-0.24%	-0.24%	-3.56%	-3.59%	-2.73%	-2.77%	-6.59%	-6.59%	-6.95%	-6.95%	-1.31%	-6.95%
1981	0.00%	-6.95%	0.00%	-6.01%	0.00%	-0.26%	-0.73%	-6.24%	-1.86%	-7.92%	-0.12%	-8.30%	-4.86%	-6.88%	-0.12%	-8.10%	-2.12%	-8.01%	-4.15%	-4.50%	-6.13%	-7.47%	0.00%	-7.71%
1982	-0.99%	-2.54%	-0.32%	0.22%	-0.58%	-1.25%	0.22%	0.22%	-3.85%	-7.64%	-2.43%	-8.11%	-0.58%	-8.80%	0.00%	-8.16%	-0.17%	-8.27%	0.00%	-11.18%	0.00%	-8.28%	-0.71%	-0.71%
1983	-0.58%	-0.58%	0.04%	0.04%	-0.29%	-0.29%	-0.96%	-0.96%	0.21%	0.21%	-6.90%	-7.62%	-6.47%	-7.70%	-2.73%	-7.81%	-2.20%	-7.99%	-4.09%	-4.09%	-6.74%	-6.74%	0.75%	0.75%
1984	0.35%	0.35%	0.13%	-4.33%	0.00%	-7.06%	0.00%	-7.67%	0.00%	-11.33%	0.00%	-14.85%	0.00%	-15.36%	-0.24%	-6.82%	-2.75%	-7.20%	-5.54%	-6.54%	-1.41%	-7.83%	0.63%	0.63%
1985	-0.45%	-0.45%	-0.35%	-0.35%	2.38%	2.38%	3.54%	3.54%	0.39%	0.39%	-1.84%	-8.16%	-0.25%	-8.33%	-3.96%	-7.66%	-6.18%	-7.55%	-4.05%	-4.05%	-0.37%	-0.37%	-0.10%	-0.10%
1986	0.44%	0.39%	-0.37%	0.10%	-0.20%	0.31%	0.28%	0.28%	-2.65%	-7.60%	-2.47%	-8.10%	-1.75%	-8.22%	-3.49%	-6.95%	0.00%	-12.49%	-5.97%	-7.76%	-3.34%	-5.48%	-1.11%	-5.21%
1987	0.08%	-2.96%	-0.14%	0.44%	-0.03%	-0.31%	0.08%	-5.02%	-0.37%	-8.12%	0.00%	-12.69%	0.00%	-14.14%	0.00%	-9.42%	0.00%	-10.71%	0.00%	-12.99%	0.00%	-7.95%	0.00%	-7.88%
1988	-0.18%	-3.94%	-0.17%	0.31%	0.00%	-7.41%	0.00%	-7.68%	-2.17%	-7.90%	-1.11%	-8.26%	-0.38%	-8.86%	-2.12%	-7.72%	0.00%	-8.34%	0.00%	-8.66%	0.00%	-10.23%	0.00%	-8.97%
1989	-0.31%	-5.88%	-0.17%	0.26%	0.00%	-7.81%	0.00%	-7.84%	0.00%	-12.69%	0.00%	-18.38%	0.00%	-18.81%	0.00%	-13.07%	0.00%	-12.84%	0.00%	-13.38%	0.00%	-13.58%	0.00%	-13.53%
1990	0.00%	-8.66%	0.00%	-8.35%	0.00%	-8.49%	0.00%	-10.64%	0.00%	-15.78%	0.00%	-19.55%	0.00%	-18.69%	0.00%	-16.87%	0.00%	-17.41%	0.00%	-17.59%	0.00%	-14.09%	0.00%	-10.66%
1991	0.00%	-7.67%	0.00%	-8.00%	0.79%	0.79%	0.18%	0.18%	-1.31%	-8.16%	0.00%	-11.38%	0.00%	-13.73%	0.00%	-14.44%	0.00%	-19.25%	0.00%	-18.92%	0.00%	-15.99%	-0.09%	-11.32%
1992	1.08%	1.08%	-0.59%	-0.36%	0.77%	0.77%	0.12%	0.12%	-4.08%	-4.45%	0.00%	-11.38%	0.00%	-14.09%	-0.52%	-7.24%	0.00%	-8.32%	0.00%	-10.61%	0.00%	-10.71%	0.48%	-5.06%
1993	0.21%	0.21%	-0.78%	-0.78%	0.07%	0.07%	-0.67%	-0.67%	0.10%	0.10%	-0.16%	-0.16%	-3.38%	-3.38%	-4.98%	-5.17%	-5.09%	-5.09%	-4.85%	-4.85%	-3.11%	-3.11%	0.43%	0.43%
1994	0.00%	-0.24%	0.00%	-0.24%	-0.25%	-0.63%	0.39%	0.39%	-4.85%	-6.98%	-3.33%	-8.03%	-1.14%	-8.17%	0.00%	-8.11%	-0.25%	-8.23%	-0.41%	-8.25%	-1.27%	-6.80%	-0.20%	-4.64%
1995	-0.52%	-0.52%	0.46%	0.46%	-1.12%	-1.38%	0.26%	0.26%	-4.85%	-5.95%	-5.01%	-7.89%	-0.90%	-8.19%	-0.04%	-8.18%	-2.67%	-7.52%	-1.43%	-8.16%	-0.76%	-8.04%	0.00%	-7.98%
1996	0.00%	-7.95%	0.00%	-7.99%	0.00%	-8.05%	0.00%	-11.71%	0.00%	-15.41%	0.00%	-17.25%	0.00%	-14.84%	0.00%	-15.67%	-0.26%	-12.73%	0.00%	-14.85%	0.00%	-12.15%	0.00%	-9.76%
1997	0.00%	-8.95%	-0.47%	-0.16%	0.00%	0.22%	0.00%	-8.17%	0.00%	-14.09%	0.00%	-17.84%	0.00%	-18.49%	0.00%	-18.30%	0.00%	-18.72%	0.00%	-18.79%	0.00%	-14.85%	0.00%	-12.44%
1998	0.00%	-7.10%	0.00%	-5.35%	0.49%	0.49%	0.31%	0.31%	-1.32%	-7.98%	0.00%	-14.09%	0.00%	-14.64%	0.00%	-16.25%	0.00%	-18.37%	0.00%	-18.60%	0.00%	-13.18%	0.00%	-8.24%
1999	0.00%	-8.34%	0.00%	-9.25%	0.00%	-10.47%	0.00%	-8.04%	0.00%	-18.60%	0.00%	-19.68%	-0.89%	-17.54%	-0.17%	-9.54%	-0.87%	-8.85%	0.00%	-16.67%	0.00%	-16.83%	0.00%	-16.67%
2000	0.00%	-13.38%	0.00%	-13.33%	0.00%	-11.33%	0.00%	-18.73%	0.00%	-20.73%	0.00%	-21.12%	0.00%	-21.83%	0.00%	-21.21%	0.00%	-20.16%	0.00%	-19.98%	-2.12%	-5.86%	0.00%	-9.25%
2001	0.00%	-9.16%	0.00%	-7.20%	0.00%	-1.82%	0.00%	-7.63%	0.00%	-16.83%	0.00%	-20.32%	0.00%	-21.12%	0.00%	-19.38%	0.00%	-19.80%	0.00%	-19.55%	0.00%	-19.05%	0.00%	-17.71%
2002	0.00%	-17.20%	0.00%	-17.81%	0.00%	-18.60%	0.00%	-20.14%	0.00%	-22.52%	0.00%	-23.58%	0.00%	-23.53%	0.00%	-22.47%	0.00%	-22.32%	0.00%	-22.07%	0.00%	-20.77%	0.00%	-19.18%
2003	0.00%	-19.25%	0.00%	-19.25%	0.00%	-1.32%	0.00%	-14.64%	0.00%	-19.96%	0.00%	-22.91%	0.00%	-23.31%	0.00%	-22.52%	0.00%	-21.88%	0.00%	-22.42%	0.00%	-21.39%	0.00%	-19.10%
2004	0.00%	-19.25%	0.00%	-19.25%	0.00%	-1.32%	0.00%	-14.64%	0.00%	-19.96%	0.00%	-22.91%	0.00%	-23.31%	0.00%	-22.52%	0.00%	-21.88%	0.00%	-22.42%	0.00%	-21.39%	0.00%	-19.10%
2005	-0.81%	-0.78%	-0.53%	-0.53%	-0.65%	-0.65%	-0.23%	-3.98%	-0.49%	-8.17%	0.00%	-16.83%	0.00%	-18.51%	0.00%	-13.43%	0.00%	-17.52%	0.00%	-17.79%	0.00%	-17.30%	0.00%	-15.62%
2006	0.00%	-15.62%	0.00%	-15.52%	0.00%	-15.99%	0.00%	-17.56%	0.00%	-20.28%	0.00%	-21.34%	0.00%	-21.41%	0.00%	-20.06%	0.00%	-20.43%	0.00%	-19.11%	0.00%	-19.34%	0.00%	-18.51%
2007	0.00%	-18.22%	0.00%	-16.14%	0.00%	-14.90%	0.00%	-19.40%	0.00%	-21.81%	0.00%	-23.34%	0.00%	-23.31%	0.00%	-20.49%	0.00%	-21.28%	0.00%	-21.62%	0.00%	-20.81%	-0.81%	-8.78%
2008	0.72%	0.72%	-0.41%	-0.41%	0.00%	0.23%	0.00%	-7.74%	-0.28%	-8.13%	0.00%	-12.79%	0.00%	-11.76%	-0.62%	-9.52%	0.00%	-14.80%	0.00%	-13.43%	0.00%	-12.94%	0.00%	-8.67%
2009	0.59%	0.59%	0.28%	0.30%	0.00%	0.42%	0.00%	-7.57%																

Figure 4-67. Habitat summary table for red shiner (*Cyprinella lutrensis*), Gage site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Summary of normalized habitat changes

Gage Site
With LWD
Red Shiner

Hypothetical Withdrawal 10 cfs

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2
1965									0.00%	-45.83%	0.00%	-37.55%
1966	0.33%	0.33%	-0.98%	-0.59%	-0.08%	-18.38%	0.00%	-51.85%	0.00%	-45.58%	0.00%	-44.63%
1967	0.00%	-46.59%	0.00%	-44.87%	0.00%	-45.23%	0.00%	-43.87%	0.00%	-44.14%	0.00%	-43.13%
1968	-5.87%	-5.87%	5.76%	5.76%	3.98%	2.70%	0.64%	-28.87%	-1.22%	-48.62%	-0.09%	-45.41%
1969	0.00%	-50.76%	-0.71%	0.58%	0.55%	0.02%	1.18%	-40.18%	-2.56%	-50.95%	0.00%	-46.13%
1970	0.00%	-48.01%	0.00%	-47.28%	0.00%	-50.80%	0.00%	-47.67%	0.00%	-45.41%	0.00%	-42.47%
1971	0.00%	-47.47%	0.00%	-48.20%	0.00%	-47.60%	0.00%	-42.98%	0.00%	-42.39%	0.00%	-38.34%
1972	0.00%	-46.77%	0.00%	-46.81%	0.00%	-45.11%	0.00%	-43.59%	0.00%	-42.75%	0.00%	-43.24%
1973	-2.35%	-2.11%	0.38%	0.38%	-2.04%	-2.04%	0.67%	0.67%	1.39%	1.39%	-8.86%	-27.77%
1974	-0.20%	-41.35%	0.00%	-51.89%	0.03%	-51.80%	0.00%	-49.43%	-0.25%	-47.28%	0.00%	-45.48%
1975	0.00%	-48.67%	0.00%	-49.26%	-0.91%	-0.77%	0.40%	-8.16%	-2.67%	-51.05%	0.00%	-46.07%
1976	0.31%	-46.03%	0.64%	-40.02%	0.00%	-50.98%	0.00%	-49.59%	-0.29%	-48.16%	0.00%	-44.19%
1977	0.00%	-48.77%	0.00%	-47.12%	0.00%	-47.17%	0.00%	-46.07%	0.00%	-43.11%	0.00%	-39.17%
1978	0.00%	-45.11%	-2.54%	-16.44%	0.39%	-19.08%	-0.98%	-52.47%	-0.21%	-47.84%	0.00%	-45.44%
1979	-7.14%	-7.14%	-4.81%	-4.81%	-0.33%	-0.33%	-0.93%	-0.93%	-0.03%	-0.63%	-10.20%	-48.40%
1980	-0.06%	-45.32%	-4.11%	-4.11%	3.72%	3.72%	-1.07%	-1.07%	-4.36%	-7.98%	-11.20%	-30.36%
1981	0.00%	-53.37%	-0.11%	-51.79%	0.00%	-33.59%	-1.01%	-49.48%	-1.86%	-49.83%	-0.12%	-47.45%
1982	-0.72%	-19.64%	-0.63%	-2.29%	-3.26%	-5.30%	0.05%	-30.42%	-3.85%	-51.61%	-2.43%	-48.67%
1983	-1.70%	-1.70%	-1.34%	-1.34%	-1.48%	-1.48%	-0.50%	-0.50%	-4.81%	-17.98%	-8.30%	-51.76%
1984	1.99%	-9.26%	0.13%	-48.18%	0.00%	-53.37%	0.00%	-51.44%	0.00%	-45.48%	0.00%	-43.77%
1985	-4.06%	-4.06%	-0.32%	-0.32%	7.51%	7.51%	-0.03%	-0.03%	-5.25%	-33.73%	-1.84%	-48.35%
1986	0.42%	-35.44%	-0.83%	-27.64%	-0.18%	-11.16%	0.51%	-35.37%	-4.56%	-51.90%	-2.47%	-48.69%
1987	0.15%	-40.79%	-0.34%	-14.94%	-0.13%	-1.09%	0.08%	-49.77%	-0.37%	-48.58%	0.00%	-44.82%
1988	-0.78%	-43.57%	-0.71%	-3.42%	0.00%	-52.76%	0.00%	-51.35%	-2.17%	-49.94%	-1.11%	-47.91%
1989	-0.41%	-41.64%	-0.47%	-9.28%	0.00%	-50.55%	0.00%	-50.38%	0.00%	-44.82%	0.00%	-41.25%
1990	0.00%	-46.86%	0.00%	-47.37%	0.00%	-47.17%	0.00%	-45.93%	0.00%	-43.31%	0.00%	-38.22%
1991	0.00%	-51.14%	0.00%	-49.32%	3.95%	3.95%	-0.14%	-25.65%	-1.31%	-48.33%	0.00%	-45.46%
1992	2.43%	2.46%	-2.82%	-2.39%	-0.23%	1.02%	0.30%	-27.99%	-7.03%	-48.25%	0.00%	-45.46%
1993	0.47%	0.47%	-3.82%	-3.82%	1.86%	1.86%	-0.49%	-0.49%	-4.67%	-11.83%	-11.56%	-35.80%
1994	0.00%	-35.84%	0.00%	-36.57%	-2.04%	-2.07%	1.30%	-15.63%	-5.60%	-51.94%	-3.33%	-49.14%
1995	-0.49%	-0.50%	0.34%	0.34%	-0.84%	-2.99%	1.09%	-15.78%	-6.98%	-51.17%	-5.01%	-50.02%
1996	0.00%	-49.69%	0.00%	-49.43%	0.00%	-49.04%	0.00%	-45.30%	0.00%	-43.49%	0.00%	-42.59%
1997	0.00%	-47.39%	-0.50%	-2.43%	0.00%	-27.54%	0.00%	-48.29%	0.00%	-44.14%	0.00%	-42.31%
1998	0.00%	-51.38%	0.00%	-44.03%	1.23%	1.23%	0.82%	-2.68%	-1.32%	-49.47%	0.00%	-44.14%
1999	0.00%	-47.19%	0.00%	-46.50%	0.00%	-45.90%	0.00%	-49.06%	0.00%	-41.20%	0.00%	-37.79%
2000	0.00%	-44.48%	0.00%	-44.51%	0.00%	-45.48%	0.00%	-40.82%	0.00%	-34.51%	0.00%	-33.26%
2001	0.00%	-46.57%	0.00%	-47.90%	0.00%	-39.78%	0.00%	-51.14%	0.00%	-42.80%	0.00%	-35.77%
2002	0.00%	-42.62%	0.00%	-42.16%	0.00%	-40.73%	0.00%	-36.35%	0.00%	-28.83%	0.00%	-25.47%
2003	0.00%	-39.17%	0.00%	-39.17%	-1.35%	-25.75%	0.00%	-43.87%	0.00%	-36.76%	0.00%	-27.61%
2004	0.00%	-39.17%	0.00%	-39.17%	-1.35%	-25.75%	0.00%	-43.87%	0.00%	-36.76%	0.00%	-27.61%
2005	-1.79%	-3.16%	-3.07%	-2.98%	-1.75%	-4.25%	-0.23%	-43.42%	-0.49%	-48.25%	0.00%	-42.80%
2006	0.00%	-43.39%	0.00%	-43.44%	0.00%	-43.21%	0.00%	-42.23%	0.00%	-35.90%	0.00%	-32.55%
2007	0.00%	-42.12%	0.00%	-43.13%	0.00%	-43.74%	0.00%	-38.70%	0.00%	-31.08%	0.00%	-26.25%
2008	-2.51%	-2.51%	-1.77%	-1.77%	0.00%	-29.49%	0.00%	-50.97%	-0.28%	-48.52%	0.00%	-44.77%
2009	1.41%	-9.42%	0.49%	-18.50%	0.00%	-36.84%	0.00%	-52.07%				

Year	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965	-0.96%	-40.12%	0.00%	-38.70%	0.00%	-39.17%	0.00%	-40.38%	0.00%	-47.71%	-1.63%	-44.20%
1966	0.00%	-43.13%	0.00%	-46.77%	0.00%	-45.08%	0.00%	-44.14%	0.00%	-44.36%	0.00%	-45.83%
1967	0.00%	-43.13%	0.00%	-45.58%	0.00%	-44.87%	0.00%	-40.03%	0.00%	-42.60%	0.00%	-44.87%
1968	0.00%	-46.57%	-0.16%	-48.62%	0.00%	-46.66%	0.00%	-46.50%	0.00%	-46.50%	0.00%	-47.39%
1969	0.00%	-45.81%	0.00%	-45.90%	0.00%	-44.65%	0.00%	-44.70%	0.00%	-47.10%	0.00%	-49.14%
1970	0.00%	-40.32%	-1.23%	-42.37%	0.00%	-45.25%	0.00%	-43.79%	0.00%	-46.41%	0.00%	-47.54%
1971	0.00%	-38.52%	0.00%	-41.84%	0.00%	-43.13%	-0.94%	-42.11%	0.00%	-46.52%	0.00%	-46.72%
1972	0.00%	-43.13%	0.00%	-43.13%	0.00%	-39.00%	-0.49%	-28.69%	-8.52%	-46.35%	0.76%	0.76%
1973	-10.23%	-38.33%	-8.11%	-51.83%	-6.53%	-51.33%	-3.97%	-49.69%	-3.43%	-50.63%	0.00%	-51.59%
1974	0.00%	-45.81%	0.00%	-48.25%	-0.84%	-46.95%	0.00%	-45.79%	0.00%	-49.00%	0.00%	-49.06%
1975	-0.04%	-46.36%	0.00%	-45.55%	-0.08%	-46.25%	0.00%	-45.23%	0.00%	-45.06%	0.00%	-46.13%
1976	0.00%	-44.72%	0.00%	-45.04%	0.00%	-43.13%	0.00%	-46.83%	0.00%	-46.23%	0.00%	-44.38%
1977	-0.28%	-41.71%	-1.07%	-41.15%	-1.52%	-48.03%	0.00%	-42.60%	0.00%	-40.04%	0.00%	-39.35%
1978	0.00%	-43.59%	0.00%	-38.70%	0.00%	-32.33%	0.00%	-38.50%	0.00%	-43.59%	1.04%	-17.52%
1979	-3.48%	-49.47%	-2.00%	-49.31%	-1.01%	-48.45%	-7.72%	-51.65%	-8.66%	-53.30%	-2.93%	-53.37%
1980	-11.23%	-37.30%	-7.58%	-39.11%	-10.00%	-43.50%	-11.01%	-52.64%	-8.79%	-53.37%	-2.93%	-53.37%
1981	-6.02%	-50.80%	-0.12%	-48.73%	-2.12%	-49.28%	-7.59%	-51.58%	-7.47%	-52.69%	0.00%	-51.16%
1982	-0.58%	-47.39%	0.00%	-48.35%	-1.16%	-47.63%	0.00%	-45.55%	0.00%	-47.54%	-4.08%	-4.08%
1983	-6.85%	-51.24%	-2.73%	-50.57%	-2.20%	-49.38%	-10.04%	-49.14%	-8.58%	-53.26%	1.36%	-2.70%
1984	0.00%	-43.52%	-2.89%	-42.21%	-2.75%	-49.67%	-10.15%	-51.43%	-2.98%	-50.40%	2.44%	0.26%
1985	-0.25%	-47.47%	-4.08%	-51.23%	-7.13%	-51.94%	-10.64%	-47.25%	-6.83%	-32.10%	1.21%	-5.79%
1986	-1.75%	-48.44%	-4.18%	-49.72%	0.00%	-44.92%	-6.24%	-50.88%	-6.34%	-48.74%	-2.77%	-48.60%
1987	0.00%	-44.11%	0.00%	-47.03%	0.00%	-45.81%	0.00%	-44.67%	-0.16%	-49.67%	0.00%	-50.08%
1988	-0.38%	-47.17%	-2.12%	-51.14%	0.00%	-47.41%	0.00%	-46.88%	0.00%	-46.02%	0.00%	-46.63%
1989	0.00%	-40.40%	0.00%	-44.72%	0.00%	-44.75%	0.00%	-44.48%	0.00%	-44.38%	0.00%	-44.41%
1990	0.00%	-40.31%	0.00%	-42.70%	0.00%	-42.26%	0.00%	-42.26%	0.00%	-44.14%	0.00%	-45.81%
1991	0.00%	-44.31%	0.00%	-43.97%	0.00%	-39.17%	0.00%	-40.21%	0.00%	-43.21%	-0.09%	-45.79%
1992	0.00%	-44.14%	-1.60%	-46.53%	0.00%	-47.32%	0.00%	-45.83%	0.00%	-45.79%	0.65%	-29.72%
1993	-11.03%	-46.05%	-8.26%	-49.71%	-10.43%	-49.67%	-11.07%	-48.25%	-8.65%	-45.90%	1.29%	-19.50%
1994	-1.14%	-48.25%	-0.81%	-48.65%	-0.25%	-47.91%	-0.41%	-47.78%	-2.85%	-50.07%	-0.28%	-37.80%
1995	-0.90%	-48.12%	-0.04%	-48.18%	-3.27%	-49.63%	-1.43%	-48.35%	-0.76%	-49.08%	0.00%	-49.47%
1996	0.00%	-43.82%	0.00%	-43.36%	-0.26%	-45.06%	0.00%	-43.77%	0.00%	-45.08%	0.00%	-46.25%
1997	0.00%	-41.53%	0.00%	-41.66%	0.00%	-40.82%	0.00%	-40.60%	0.00%	-43.77%	0.00%	-44.94%
1998	0.00%	-43.87%	0.00%	-43.08%	0.00%	-41.84%	0.00%	-41.21%	0.00%	-44.58%	0.00%	-47.82%
1999	-1.36%	-40.50%	-0.17%	-47.39%	-0.87%	-47.47%	0.00%	-42.88%	0.00%	-42.80%	0.00%	-42.88%
2000	0.00%	-31.00%	0.00%	-32.98%	0.00%	-36.29%	0.00%	-36.86%	-5.93%	-49.67%	0.00%	-46.50%
2001	0.00%	-33.26%	0.00%	-38.76%	0.00%	-37.43%	0.00%	-38.22%	0.00%	-39.81%	0.00%	-42.09%
2002	0.00%	-25.65%	0.00%	-28.99%	0.00%	-29.46%	0.00%	-30.24%	0.00%	-34.37%	0.00%	-39.40%
2003	0.00%	-26.34%	0.00%	-28.83%	0.00%	-30.85%	0.00%	-29.15%	0.00%	-32.41%	0.00%	-39.63%
2004	0.00%	-26.34%	0.00%	-28.83%	0.00%	-30.85%	0.00%	-29.15%	0.00%	-32.41%	0.00%	-39.63%
2005	0.00%	-41.47%	0.00%	-44.46%	0.00%	-42.46%	0.00%	-42.33%	0.00%	-42.57%	0.00%	-43.39%
2006	0.00%	-32.33%	0.00%	-36.61%	0.00%	-35.44%	0.00%	-36.73%	0.00%	-38.88%	0.00%	-41.34%
2007	0.00%	-26.34%	0.00%	-35.25%	0.00%	-32.77%	0.00%	-31.68%	0.00%	-34.23%	-1.75%	-33.76%
2008	0.00%	-45.32%	-0.93%	-46.65%	0.00%	-43.79%	0.00%	-44.46%	0.00%	-44.70%	0.00%	-46.83%
2009												

Figure 4-68. Habitat summary table for red shiner (*Cyprinella lutrensis*), Gage site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Braided Site

No Wood

Summary of normalized habitat changes

Hypothetical Withdrawal 2 cfs

Red Shiner

Year	Jan Scenario 1	Jan Scenario 2	Feb Scenario 1	Feb Scenario 2	Mar Scenario 1	Mar Scenario 2	Apr Scenario 1	Apr Scenario 2	May Scenario 1	May Scenario 2	Jun Scenario 1	Jun Scenario 2
1965									0.69%	-21.12%	-2.36%	-31.11%
1966	-0.70%	-0.70%	0.15%	-0.29%	-0.55%	-2.65%	-0.70%	0.16%	0.00%	-16.31%	-0.75%	-18.05%
1967	0.00%	-10.88%	0.00%	-19.66%	-0.68%	-17.71%	-0.73%	-19.40%	0.00%	-17.40%	0.00%	-22.52%
1968	-0.03%	-0.03%	-0.46%	-0.46%	2.39%	2.39%	-4.48%	-5.92%	2.22%	-7.71%	0.62%	-33.37%
1969	0.32%	-0.01%	2.17%	2.33%	3.50%	3.50%	-1.76%	-8.42%	1.88%	-4.16%	0.00%	-13.67%
1970	0.00%	-10.10%	0.00%	-9.84%	0.00%	-2.66%	0.00%	-10.01%	0.00%	-22.19%	0.00%	-25.87%
1971	0.00%	-9.97%	0.00%	-10.14%	0.00%	-10.66%	0.00%	-23.29%	0.00%	-26.19%	-1.21%	-30.64%
1972	0.00%	-10.68%	0.00%	-14.71%	-0.70%	-17.39%	0.00%	-20.21%	0.00%	-24.41%	0.00%	-26.27%
1973	0.54%	0.54%	-0.02%	-0.02%	-0.14%	-0.14%	0.07%	0.07%	0.55%	0.27%	-0.74%	-7.75%
1974	0.28%	-2.70%	0.00%	-0.36%	0.00%	4.97%	0.00%	-6.26%	-0.11%	-9.60%	0.00%	-31.06%
1975	0.00%	-10.12%	0.00%	-3.65%	0.34%	-0.10%	2.66%	2.66%	2.60%	-2.93%	0.00%	-13.73%
1976	-3.23%	-5.28%	-2.70%	0.91%	0.00%	-1.27%	0.07%	-3.64%	0.62%	-8.87%	0.00%	-17.18%
1977	0.00%	-6.32%	0.00%	-9.79%	0.00%	-9.89%	0.00%	-14.24%	0.00%	-22.65%	0.00%	-29.99%
1978	-2.43%	-5.82%	0.28%	0.82%	0.54%	0.54%	0.00%	-1.18%	-0.09%	-9.84%	0.00%	-16.98%
1979	-0.34%	-0.34%	1.20%	1.64%	0.32%	0.32%	0.28%	0.28%	0.28%	-1.57%	-1.39%	-2.36%
1980	0.71%	0.82%	0.17%	0.17%	0.81%	0.57%	-3.43%	2.79%	-3.94%	-4.64%	-1.13%	-8.96%
1981	0.00%	5.16%	0.00%	5.38%	-0.08%	-6.70%	-1.22%	-2.32%	-0.85%	-7.70%	-0.24%	-9.94%
1982	-2.63%	-3.31%	-4.03%	-7.21%	0.07%	-0.15%	0.43%	-6.93%	0.25%	-3.38%	-1.10%	-10.25%
1983	0.28%	-2.17%	0.19%	0.19%	0.09%	0.09%	0.47%	0.47%	-2.28%	-5.11%	1.75%	-4.01%
1984	-1.11%	0.43%	-1.73%	1.08%	0.00%	5.09%	-0.69%	0.14%	0.00%	-20.17%	0.00%	-27.73%
1985	0.68%	0.68%	0.94%	0.80%	0.62%	0.62%	6.99%	8.49%	-9.12%	-9.92%	-3.87%	-10.18%
1986	-0.24%	-7.47%	-3.87%	0.37%	0.32%	0.32%	-3.59%	-6.95%	3.69%	0.03%	-1.12%	-10.26%
1987	-4.46%	-7.11%	0.60%	0.80%	0.68%	0.59%	0.82%	0.32%	-0.03%	-7.53%	-0.72%	-15.69%
1988	1.12%	0.67%	1.03%	0.57%	-0.69%	-0.41%	1.22%	-1.50%	-0.96%	-7.73%	-0.50%	-10.06%
1989	0.10%	-6.35%	0.44%	0.44%	0.00%	-2.28%	-0.53%	-2.94%	-0.71%	-18.19%	-0.80%	-28.50%
1990	0.00%	-9.26%	0.00%	-9.64%	0.00%	-9.33%	0.00%	-15.12%	0.08%	-20.77%	0.00%	-30.73%
1991	-6.20%	-4.23%	-3.24%	-2.87%	-0.10%	-0.10%	0.39%	0.39%	-0.59%	-10.14%	0.00%	-16.86%
1992	1.08%	1.08%	0.80%	0.32%	0.45%	3.71%	0.79%	0.79%	-1.88%	-4.40%	0.00%	-16.86%
1993	0.17%	0.01%	0.18%	0.18%	0.06%	0.06%	2.34%	1.93%	-1.42%	-2.32%	-7.70%	-8.50%
1994	-0.94%	-9.37%	-3.30%	-3.69%	0.28%	0.56%	-0.96%	-1.45%	0.08%	-3.43%	-1.51%	-10.37%
1995	0.48%	0.48%	0.80%	0.80%	-0.39%	-0.39%	-0.95%	-3.34%	0.42%	-0.23%	2.67%	-6.04%
1996	0.00%	-3.40%	0.00%	-3.12%	0.00%	-7.61%	0.00%	-17.64%	0.00%	-20.72%	0.00%	-25.22%
1997	0.40%	0.40%	0.43%	0.43%	0.67%	0.67%	-0.15%	-9.47%	0.00%	-18.02%	0.00%	-26.65%
1998	-0.44%	-1.55%	0.46%	0.46%	0.62%	0.62%	0.79%	0.79%	-2.14%	-7.02%	0.72%	-17.42%
1999	0.00%	-9.90%	0.00%	-11.90%	0.00%	-17.02%	0.00%	-7.56%	0.00%	-28.44%	0.00%	-31.07%
2000	0.00%	-15.62%	0.00%	-18.22%	-0.31%	-16.50%	-0.81%	-29.32%	0.00%	-33.74%	0.00%	-34.79%
2001	0.00%	-10.87%	0.00%	-7.08%	2.07%	2.07%	-0.33%	-2.74%	0.00%	-24.19%	0.00%	-32.69%
2002	0.00%	-25.09%	0.00%	-27.03%	1.06%	-29.21%	-5.69%	-32.22%	0.00%	-38.77%	0.00%	-42.03%
2003	0.00%	-26.81%	0.00%	-29.99%	2.22%	2.22%	0.00%	-18.80%	0.00%	-26.46%	0.00%	-39.94%
2004	0.00%	-26.81%	0.00%	-29.99%	2.22%	2.22%	0.00%	-18.80%	0.00%	-26.46%	0.00%	-39.94%
2005	2.34%	2.17%	0.15%	0.15%	0.19%	0.19%	0.11%	-2.24%	-0.22%	-10.15%	0.00%	-24.19%
2006	0.00%	-21.23%	0.00%	-20.98%	0.01%	-22.01%	0.00%	-25.95%	0.00%	-32.58%	0.00%	-35.41%
2007	0.00%	-29.80%	-0.75%	-30.81%	0.04%	-18.96%	0.00%	-30.36%	0.00%	-36.71%	0.00%	-41.25%
2008	0.46%	0.46%	0.18%	-2.75%	0.71%	0.66%	-0.71%	0.28%	-0.13%	-8.13%	0.70%	-23.04%
2009	2.26%	2.26%	2.05%	2.14%	0.00%	-9.58%	0.00%	-2.33%				

Year	Jul Scenario 1	Jul Scenario 2	Aug Scenario 1	Aug Scenario 2	Sep Scenario 1	Sep Scenario 2	Oct Scenario 1	Oct Scenario 2	Nov Scenario 1	Nov Scenario 2	Dec Scenario 1	Dec Scenario 2
1965	3.93%	-19.79%	7.10%	-26.18%	0.00%	-31.22%	0.44%	-29.08%	-2.22%	-5.82%	0.34%	0.34%
1966	0.00%	-22.52%	3.05%	-10.62%	0.00%	-23.29%	0.00%	-17.40%	0.00%	-15.41%	0.03%	-11.93%
1967	0.00%	-22.52%	-0.80%	-9.78%	-5.27%	-16.70%	-6.24%	-29.59%	0.00%	-25.89%	-1.10%	-7.77%
1968	0.00%	-11.66%	0.03%	-10.15%	0.00%	-16.06%	0.00%	-17.42%	-0.03%	-11.90%	0.00%	-9.95%
1969	0.00%	-15.20%	0.32%	-14.48%	0.73%	-17.22%	0.72%	-17.58%	-0.57%	-9.14%	0.00%	-6.46%
1970	-0.36%	-30.51%	0.51%	-16.78%	-3.39%	-5.12%	0.00%	-19.19%	0.00%	-10.68%	0.00%	-9.83%
1971	0.00%	-30.50%	7.45%	-21.89%	-0.37%	-16.54%	-0.29%	-7.13%	0.00%	-10.99%	-0.11%	-4.37%
1972	0.00%	-22.52%	0.00%	-22.52%	0.00%	-26.36%	-2.56%	-5.33%	0.22%	0.22%	0.48%	0.48%
1973	-8.45%	-9.14%	6.35%	6.29%	4.37%	-4.15%	-1.82%	-10.50%	-0.36%	-3.50%	1.20%	1.27%
1974	0.00%	-14.39%	0.66%	-8.85%	-0.37%	-9.52%	2.06%	-13.08%	-0.20%	-8.21%	-0.16%	-7.66%
1975	-0.02%	-12.44%	0.00%	-21.52%	-0.04%	-18.08%	0.00%	-17.98%	0.00%	-18.76%	0.00%	-13.02%
1976	-0.54%	-22.05%	0.56%	-19.73%	0.01%	-22.52%	0.00%	-10.54%	0.00%	-13.21%	0.00%	-16.13%
1977	0.00%	-30.06%	-1.52%	-34.65%	1.03%	-13.37%	0.00%	-25.99%	-0.82%	-29.92%	0.00%	-29.86%
1978	0.00%	-20.21%	0.00%	-30.36%	0.00%	-35.60%	-0.24%	-30.19%	-0.42%	-19.43%	1.64%	0.38%
1979	0.36%	-8.62%	-0.47%	-8.38%	1.89%	-8.21%	5.72%	1.60%	3.17%	6.24%	0.00%	1.86%
1980	-9.81%	-10.18%	-2.60%	-3.95%	-6.27%	-6.27%	6.20%	6.20%	4.13%	6.33%	0.00%	6.20%
1981	-1.07%	-6.85%	0.11%	-8.01%	-1.02%	-10.43%	1.95%	1.78%	-2.89%	-3.53%	-0.95%	-2.47%
1982	-0.02%	-15.75%	0.14%	-8.53%	-1.39%	-10.87%	0.00%	-16.42%	-5.50%	-1.30%	-4.56%	0.66%
1983	0.07%	-7.85%	0.70%	-5.09%	-3.34%	-4.03%	-3.22%	0.61%	-3.02%	-2.34%	-2.42%	-0.76%
1984	0.00%	-24.95%	-0.36%	-4.69%	-0.91%	1.34%	0.24%	2.98%	-0.78%	-3.59%	0.25%	0.25%
1985	-0.57%	-9.89%	-0.93%	-4.88%	-2.23%	-5.18%	0.04%	-1.54%	0.40%	-0.46%	0.99%	0.99%
1986	-0.80%	-8.05%	-1.92%	-6.93%	0.70%	-17.14%	-2.73%	-10.81%	-0.66%	-1.87%	-7.68%	-4.26%
1987	0.00%	-17.53%	-0.40%	-11.11%	0.00%	-13.86%	0.72%	-24.10%	0.18%	-3.21%	-5.22%	-3.48%
1988	-0.17%	-10.39%	-0.20%	0.17%	0.45%	0.13%	-0.24%	-15.18%	0.00%	-24.42%	0.00%	-9.68%
1989	0.65%	-30.30%	-0.05%	-23.76%	0.71%	-26.09%	-0.74%	-21.67%	0.00%	-16.13%	0.00%	-16.00%
1990	0.00%	-30.72%	-0.36%	-29.19%	0.91%	-28.95%	0.00%	-26.39%	0.01%	-20.70%	-5.63%	-15.20%
1991	-1.47%	-22.66%	0.82%	-19.58%	-2.24%	-29.99%	-5.97%	-29.21%	0.00%	-22.13%	-1.04%	-11.14%
1992	0.85%	-17.29%	-4.97%	-5.43%	0.00%	-9.93%	0.00%	-28.14%	0.00%	-19.60%	-5.91%	-0.69%
1993	-9.89%	-9.89%	5.65%	5.57%	1.13%	0.72%	1.28%	-2.67%	1.66%	0.08%	1.53%	1.34%
1994	-0.51%	-10.15%	0.00%	-8.63%	-0.11%	-10.07%	-0.66%	-10.05%	-1.35%	-6.31%	-1.39%	-1.53%
1995	-0.41%	-10.12%	-0.02%	-10.14%	-0.47%	-9.63%	-0.64%	-10.18%	-0.35%	-10.35%	0.00%	-3.64%
1996	0.72%	-26.56%	0.00%	-21.36%	-0.76%	-21.62%	0.00%	-19.58%	0.00%	-18.65%	0.00%	-13.10%
1997	0.97%	-27.86%	1.58%	-24.15%	-6.33%	-19.98%	2.28%	-21.73%	0.03%	-23.77%	0.70%	-15.85%
1998	0.00%	-26.50%	0.70%	-22.79%	0.00%	-28.38%	0.00%	-28.46%	-0.01%	-17.86%	0.00%	-10.05%
1999	0.56%	-28.73%	-0.07%	-15.02%	-0.14%	-13.04%	0.00%	-23.80%	0.00%	-24.19%	0.00%	-23.80%
2000	0.00%	-36.78%	4.76%	-35.04%	0.00%	-32.27%	-9.84%	-31.81%	-2.38%	-0.29%	0.00%	-11.90%
2001	0.00%	-33.03%	1.63%	-35.04%	-4.24%	-31.92%	0.00%	-27.38%	0.00%	-25.56%	0.00%	-27.04%
2002	0.00%	-41.86%	0.00%	-37.50%	0.00%	-38.18%	0.00%	-37.47%	0.00%	-31.31%	-10.19%	-29.81%
2003	0.00%	-41.17%	0.00%	-38.77%	-0.35%	-36.91%	0.00%	-38.48%	0.00%	-35.54%	1.33%	-24.50%
2004	0.00%	-41.17%	0.00%	-38.77%	-0.35%	-36.91%	0.00%	-38.48%	0.00%	-35.54%	1.33%	-24.50%
2005	0.28%	-29.00%	0.00%	-16.40%	0.00%	-25.87%	0.00%	-26.52%	0.00%	-25.35%	0.00%	-21.23%
2006	0.00%	-35.60%	0.00%	-27.99%	0.00%	-32.96%	0.00%	-29.34%	0.00%	-27.82%	0.00%	-27.19%
2007	0.00%	-41.17%	0.00%	-33.12%	0.00%	-35.22%	0.00%	-36.18%	0.00%	-33.97%	-6.74%	0.46%
2008	0.00%	-23.40%	0.53%	-10.13%	0.03%	-20.18%	0.00%	-18.45%	0.72%	-17.58%	-2.15%	0.59%
2009												

Figure 4-69. Habitat summary table for red shiner (*Cyprinella lutrensis*), Braided site, with no LWD and with a hypothetical withdrawal rate of 2 ft^3/sec.

Braided Site

No Wood

Summary of normalized habitat changes

Hypothetical Withdrawal 10 cfs

Red Shiner

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.69%	-66.89%	-2.36%	-59.58%	4.73%	-63.15%	7.10%	-58.29%	0.00%	-61.72%	0.44%	-62.23%	-2.49%	-66.11%	-0.11%	-13.31%
1966	1.26%	0.74%	-0.31%	-11.83%	0.00%	-20.19%	-0.70%	-67.13%	0.00%	-67.05%	-0.75%	-65.65%	0.00%	-64.04%	2.72%	-66.47%	0.00%	-66.91%	0.00%	-64.22%	0.00%	-65.06%	0.82%	-66.42%
1967	0.00%	-67.32%	0.00%	-66.86%	-0.68%	-66.84%	-0.73%	-64.43%	0.00%	-64.22%	0.00%	-64.04%	0.00%	-64.04%	1.89%	-64.47%	-5.58%	-65.64%	-6.24%	-62.03%	0.00%	-63.97%	1.99%	-61.96%
1968	2.57%	7.47%	2.01%	3.79%	3.53%	5.61%	-1.39%	-44.80%	2.25%	-66.97%	0.62%	-66.56%	0.00%	-67.31%	0.03%	-67.84%	0.00%	-67.33%	0.00%	-67.29%	0.00%	-67.29%	0.00%	-67.53%
1969	1.62%	-60.64%	2.41%	6.69%	5.22%	7.62%	-2.35%	-66.99%	1.88%	-67.58%	0.00%	-67.19%	0.00%	-67.11%	0.32%	-67.03%	0.73%	-65.36%	0.72%	-65.62%	0.00%	-67.46%	0.00%	-68.03%
1970	0.00%	-67.71%	0.00%	-67.50%	0.00%	-68.35%	0.00%	-67.61%	0.00%	-67.00%	0.00%	-63.99%	-0.36%	-62.92%	-1.01%	-63.22%	-3.31%	-60.03%	0.00%	-64.16%	0.00%	-67.27%	0.00%	-67.58%
1971	0.00%	-67.56%	0.00%	-67.76%	0.00%	-67.59%	0.00%	-64.01%	0.00%	-63.94%	-1.21%	-60.20%	0.00%	-60.38%	7.45%	-61.98%	-0.08%	-61.27%	-0.73%	-53.04%	0.00%	-67.30%	-0.18%	-65.43%
1972	0.00%	-67.36%	0.00%	-67.38%	-0.70%	-66.46%	0.00%	-64.12%	0.00%	-64.09%	0.00%	-64.06%	0.00%	-64.04%	0.00%	-64.04%	0.00%	-58.92%	-2.74%	-57.31%	0.51%	-55.14%	2.68%	-7.14%
1973	2.64%	4.02%	0.05%	0.05%	-0.02%	-0.02%	0.32%	0.47%	2.98%	0.61%	-7.18%	-50.61%	-7.02%	-48.72%	5.29%	-63.76%	4.33%	-66.28%	-1.82%	-68.18%	-0.78%	-67.49%	0.38%	-67.18%
1974	0.41%	-54.97%	0.00%	-64.13%	0.00%	-64.13%	0.00%	-68.11%	-0.11%	-67.50%	0.00%	-67.02%	0.00%	-67.11%	0.66%	-67.56%	-0.37%	-67.41%	2.06%	-66.43%	-0.20%	-67.95%	-0.16%	-68.00%
1975	0.00%	-67.84%	0.00%	-68.06%	0.65%	5.80%	4.52%	-32.81%	3.14%	-67.19%	0.00%	-67.18%	-0.02%	-67.26%	0.00%	-67.04%	-0.04%	-67.22%	0.00%	-66.95%	0.00%	-66.91%	0.00%	-67.19%
1976	-3.38%	-64.04%	-2.25%	-34.33%	0.00%	-66.89%	0.07%	-68.15%	0.62%	-67.51%	0.00%	-64.25%	-0.54%	-65.90%	0.69%	-66.67%	0.01%	-64.04%	0.00%	-67.38%	0.00%	-67.22%	0.00%	-64.27%
1977	0.00%	-66.51%	0.00%	-67.46%	0.00%	-67.47%	0.00%	-67.18%	0.00%	-64.04%	0.00%	-61.04%	0.00%	-63.61%	-1.55%	-65.16%	0.73%	-67.02%	0.00%	-64.07%	-0.82%	-62.21%	0.00%	-61.21%
1978	-1.33%	-61.94%	2.76%	2.92%	2.66%	2.40%	-0.93%	-67.83%	-0.09%	-67.66%	0.00%	-67.01%	0.00%	-64.12%	0.00%	-60.56%	0.00%	-53.76%	-0.24%	-60.55%	0.00%	-64.20%	-2.78%	-11.68%
1979	1.07%	1.69%	4.05%	9.77%	1.82%	1.82%	2.09%	6.59%	-9.12%	-48.30%	-2.55%	-61.26%	0.21%	-67.54%	-0.91%	-68.08%	1.75%	-67.12%	4.21%	-66.23%	3.07%	-66.23%	0.00%	-66.23%
1980	1.90%	-42.13%	0.84%	0.84%	2.96%	3.58%	6.30%	-0.08%	-8.47%	-46.83%	-7.40%	-58.80%	-6.78%	-47.28%	0.03%	-40.37%	-4.65%	-53.66%	4.00%	-65.00%	3.07%	-66.23%	0.00%	-66.23%
1981	0.00%	-66.23%	0.00%	-65.52%	-0.08%	-39.85%	-0.80%	-62.33%	-0.85%	-68.22%	-0.06%	-67.55%	-1.37%	-68.05%	0.56%	-67.82%	-1.02%	-68.10%	0.28%	-67.50%	-3.53%	-69.08%	-2.88%	-68.25%
1982	-2.90%	-15.02%	-4.27%	-5.28%	1.01%	-2.42%	-1.56%	-51.61%	2.22%	-67.47%	-1.10%	-67.89%	-0.02%	-67.46%	0.59%	-67.68%	-0.52%	-67.60%	0.00%	-67.04%	-5.21%	-61.28%	-2.78%	-0.62%
1983	-4.87%	-0.33%	0.97%	1.14%	-0.42%	-0.42%	1.62%	4.93%	-6.38%	-47.66%	3.70%	-66.33%	0.02%	-67.60%	0.70%	-67.81%	-1.97%	-65.81%	-1.27%	-60.11%	-5.02%	-65.27%	-7.21%	-31.24%
1984	2.56%	0.11%	-1.73%	-58.47%	0.00%	-66.21%	-0.69%	-67.49%	0.00%	-67.02%	0.00%	-64.17%	0.00%	-64.11%	-1.59%	-65.31%	0.84%	-63.24%	1.84%	-62.12%	0.74%	-67.71%	2.14%	3.51%
1985	1.86%	3.80%	4.61%	5.57%	2.09%	4.30%	8.32%	2.40%	-6.03%	-49.69%	-0.83%	-67.80%	-0.11%	-67.56%	-0.54%	-68.20%	-2.13%	-68.39%	0.06%	-57.56%	-2.83%	-32.27%	4.01%	-34.09%
1986	-0.58%	-41.98%	-5.52%	-21.45%	1.46%	1.67%	-1.97%	-45.88%	3.70%	-66.98%	-1.12%	-67.90%	-0.66%	-67.78%	-1.91%	-66.22%	0.70%	-66.40%	-2.91%	-68.54%	-1.08%	-61.97%	-8.24%	-57.98%
1987	-4.61%	-51.30%	2.03%	0.41%	3.81%	6.77%	0.82%	-62.16%	0.54%	-67.64%	-0.72%	-65.67%	0.00%	-64.22%	0.19%	-67.37%	0.00%	-66.42%	0.72%	-65.62%	0.37%	-68.04%	-5.99%	-68.25%
1988	4.07%	-30.02%	2.35%	5.21%	-0.69%	-67.57%	2.62%	-67.02%	-0.96%	-68.25%	-0.50%	-67.68%	-0.84%	-67.47%	-4.09%	-58.17%	-1.15%	-63.71%	0.00%	-67.40%	0.00%	-67.16%	0.00%	-67.33%
1989	-0.54%	-57.54%	2.89%	-3.27%	0.00%	-68.27%	-0.53%	-67.94%	-0.71%	-66.14%	-0.80%	-63.28%	0.65%	-62.96%	-0.05%	-65.66%	0.71%	-65.88%	-0.74%	-65.07%	0.00%	-64.27%	0.00%	-64.27%
1990	0.00%	-67.30%	0.00%	-67.43%	0.00%	-67.47%	0.00%	-67.09%	0.08%	-64.13%	0.00%	-60.08%	0.00%	-63.18%	-0.36%	-64.71%	0.91%	-64.00%	0.00%	-63.90%	0.01%	-64.22%	-4.41%	-67.11%
1991	-4.96%	-62.96%	-2.96%	-59.44%	-0.50%	-0.77%	1.95%	-8.80%	-0.59%	-67.80%	0.00%	-67.01%	-1.47%	-64.80%	0.82%	-64.74%	-2.24%	-61.04%	-5.97%	-62.06%	0.00%	-64.05%	-4.22%	-65.21%
1992	5.07%	7.88%	1.09%	3.06%	2.93%	6.43%	3.67%	-22.46%	0.41%	-59.52%	0.00%	-67.01%	0.47%	-65.23%	-5.13%	-53.24%	0.00%	-67.52%	0.00%	-67.11%	0.00%	-67.10%	-7.85%	-19.73%
1993	0.35%	-2.23%	0.91%	3.62%	0.27%	8.31%	1.69%	-8.91%	-7.01%	-64.74%	-5.60%	-64.13%	-6.06%	-57.85%	4.60%	-60.14%	-0.47%	-60.33%	-0.42%	-55.31%	3.93%	-40.73%	-9.25%	-64.13%
1994	-1.79%	-42.11%	-1.07%	-29.21%	1.14%	-2.31%	-0.65%	-53.46%	0.34%	-66.90%	-1.51%	-68.03%	-0.51%	-67.77%	-0.14%	-67.81%	-0.11%	-67.68%	-0.22%	-67.65%	-0.38%	-68.00%	-7.19%	-41.82%
1995	0.15%	4.26%	2.11%	5.38%	2.21%	5.78%	-1.98%	-51.96%	4.80%	-62.87%	2.67%	-66.67%	-0.41%	-67.74%	-0.02%	-67.76%	-0.75%	-67.93%	-0.64%	-67.80%	-0.35%	-68.01%	0.00%	-68.12%
1996	0.00%	-68.11%	0.00%	-67.93%	0.00%	-68.00%	0.00%	-66.97%	0.00%	-64.10%	0.00%	-63.94%	0.72%	-64.71%	0.00%	-64.08%	-0.76%	-65.81%	0.00%	-64.15%	0.00%	-66.91%	0.00%	-67.22%
1997	2.31%	-61.72%	4.02%	7.46%	2.39%	-8.43%	-0.15%	-67.78%	0.00%	-64.49%	0.00%	-63.89%	0.97%	-61.74%	1.58%	-61.57%	-6.33%	-58.07%	1.13%	-60.75%	0.03%	-64.16%	-0.18%	-66.47%
1998	-0.44%	-66.86%	1.40%	-45.66%	2.15%	5.45%	2.79%	-4.82%	0.03%	-67.92%	0.72%	-64.23%	0.00%	-64.17%	0.70%	-64.04%	0.00%	-63.86%	0.00%	-63.03%	-0.23%	-65.84%	0.00%	-67.65%
1999	0.00%	-67.48%	0.00%	-67.29%	0.00%	-67.13%	0.00%	-68.00%	0.00%	-63.02%	0.00%	-59.65%	-0.37%	-62.71%	-0.07%	-67.53%	-1.41%	-61.68%	0.00%	-63.99%	0.00%	-63.98%	0.00%	-63.99%
2000	0.00%	-64.29%	0.00%	-64.29%	-0.31%	-67.02%	-0.81%	-62.96%	0.00%	-56.17%	0.00%	-54.80%	0.00%	-52.22%	4.76%	-54.48%	0.00%	-58.08%	-9.84%	-58.68%	0.69%	-56.12%	0.00%	-67.29%
2001	0.00%	-67.31%	0.00%	-65.90%	3.96%	-33.07%	-0.33%	-67.91%	0.00%	-63.98%	0.00%	-57.53%	0.00%	-53.58%	1.63%	-61.58%	-4.24%	-59.27%	0.00%	-58.15%	0.00%	-59.53%	0.00%	-63.95%
2002	0.00%	-63.95%	0.00%	-63.94%	1.06%	-62.90%	-5.69%	-58.15%	0.00%	-49.63%	0.00%	-45.40%	0.00%	-45.63%	0.00%	-48.91%	0.00%	-50.40%	0.00%	-51.33%	0.00%	-54.34%	-10.19%	-61.27%
2003	0.00%	-59.26%	0.00%	-61.04%	4.85%	-7.10%	0.00%	-64.17%	0.00%	-55.34%	0.00%	-48.12%	0.00%	-46.52%	0.00%	-49.63%	-0.35%	-52.05%	0.00%	-50.02%	0.00%	-53.84%	1.33%	-58.69%
2004	0.00%	-59.26%	0.00%	-61.04%	4.85%	-7.10%	0.00%	-64.17%	0.00%	-55.34%	0.00%	-48.12%	0.00%	-46.52%	0.00%	-49.63%	-0.35%	-52.05%	0.00%	-50.02%	0.00%	-53.84%	1.33%	-58.69%
2005	2.72%	-2.28%	1.29%	-1.10%	1.03%	4.94%	0.11%	-58.88%	-0.22%	-67.77%	0.00%	-63.98%	0.28%	-63.67%	0.00%	-64.56%	0.00%	-63.92%	0.00%	-63.90%	0.00%	-63.94%	0.00%	-64.09%
2006	0.00%	-64.09%	0.00%	-64.10%	0.01%	-64.06%	0.00%	-63.69%	0.00%	-57.67%	0.00%	-54.00%	0.00%	-53.76%	0.00%	-55.96%	0.00%	-57.18%	0.00%	-57.88%	0.00%	-59.39%	0.00%	-62.60%
2007	0.00%	-63.86%	-0.75%	-64.56%	0.04%	-64.18%	0.00%	-60.56%	0.00%	-52.31%	0.00%	-46.41%	0.00%	-46.52%	0.00%	-56.97%	0.00%	-54.24%	0.00%	-53.00%	0.00%	-55.88%	-4.02%	-27.70%
2008	1.97%	-0.73%	0.96%	2.52%	2.32%	-25.45%	-0.71%	-67.28%	-0.13%	-67.85%	0.70%	-66.60%	0.00%	-66.98%	0.36%	-66.72%	0.03%	-64.16%	0.00%	-64.28%	0.72%	-65.62%	-1.87%	-60.76%
2009	4.82%	-6.50%	4.10%	-10.35%	0.00%	-45.46%	0.00%	-67.62%																

Figure 4-70. Habitat summary table for red shiner (*Cyprinella lutrensis*), Braided site, with no LWD and with a hypothetical withdrawal rate of 10 ft^3/sec.

Summary of normalized habitat changes										Braided Site With LWD Red Shiner														
Hypothetical Withdrawal	2 cfs																							
Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.34%	-7.30%	-0.47%	-6.17%	1.55%	-3.85%	1.09%	-5.07%	0.00%	-6.49%	0.09%	-6.09%	-1.98%	-0.62%	-0.27%	-0.27%
1966	-0.85%	-0.85%	0.46%	1.04%	-0.02%	0.55%	-0.77%	0.17%	0.00%	-6.23%	-0.42%	-5.32%	0.00%	-4.92%	0.84%	-4.00%	0.00%	-7.48%	0.00%	-3.83%	0.00%	-4.03%	0.30%	-4.16%
1967	0.00%	-5.67%	0.00%	-6.51%	0.00%	-6.37%	-0.32%	-4.44%	0.00%	-3.83%	0.00%	-4.92%	0.03%	-2.81%	-0.79%	-1.25%	-0.45%	-5.08%	-1.30%	-6.17%	0.00%	-5.64%	1.16%	1.61%
1968	-0.89%	-0.89%	-1.12%	-1.12%	1.86%	1.86%	-4.28%	-5.47%	2.45%	-4.06%	0.19%	-9.70%	0.00%	-5.84%	0.04%	-6.84%	0.00%	-6.88%	0.00%	-7.11%	-0.04%	-5.85%	0.00%	-6.02%
1969	0.91%	2.06%	0.79%	1.29%	2.61%	2.61%	-0.11%	-6.98%	2.07%	-2.74%	0.00%	-6.01%	0.00%	-6.13%	0.35%	-5.76%	0.35%	-4.64%	0.35%	-4.95%	-0.63%	-5.62%	0.00%	-5.04%
1970	0.00%	-6.49%	0.00%	-5.91%	0.00%	-2.92%	0.00%	-6.23%	0.00%	-7.45%	0.00%	-5.64%	-0.10%	-6.51%	-4.18%	-3.61%	0.23%	-0.17%	0.00%	-4.21%	0.00%	-5.48%	0.00%	-6.10%
1971	0.00%	-6.09%	0.00%	-6.63%	0.00%	-6.33%	0.00%	-5.08%	0.00%	-5.70%	-0.24%	-6.16%	0.00%	-6.15%	1.57%	-4.61%	-0.82%	-3.25%	0.25%	0.49%	0.00%	-5.66%	-0.67%	-0.08%
1972	0.00%	-5.76%	0.00%	-6.65%	-0.34%	-5.77%	0.00%	-4.43%	0.00%	-5.34%	0.00%	-5.74%	0.00%	-4.92%	0.00%	-4.92%	0.00%	-5.16%	0.69%	-2.70%	0.86%	0.86%	0.40%	0.40%
1973	0.45%	0.45%	0.04%	0.04%	0.22%	0.22%	0.28%	0.28%	0.86%	0.86%	0.55%	-6.66%	-7.29%	-7.96%	7.01%	6.95%	4.83%	-1.42%	-1.99%	-7.76%	-0.14%	-2.11%	1.33%	1.40%
1974	0.40%	-2.14%	0.00%	-0.39%	0.00%	5.48%	0.00%	-5.17%	-0.12%	-5.86%	0.00%	-9.51%	0.00%	-5.93%	0.73%	-5.58%	-0.41%	-5.59%	0.93%	-3.56%	-0.22%	-6.10%	-0.18%	-5.95%
1975	0.00%	-6.84%	0.00%	-4.00%	1.97%	2.93%	0.78%	0.78%	2.86%	-1.39%	0.00%	-5.97%	-0.02%	-5.86%	0.00%	-7.39%	-0.04%	-7.04%	0.00%	-6.37%	0.00%	-6.43%	0.00%	-5.84%
1976	-2.87%	-4.68%	-2.59%	-0.80%	0.00%	-1.40%	0.08%	-3.99%	0.68%	-5.50%	0.00%	-3.79%	-0.20%	-6.35%	0.18%	-6.46%	0.00%	-4.92%	0.00%	-5.78%	0.00%	-5.97%	0.00%	-3.56%
1977	0.00%	-2.54%	0.00%	-5.81%	0.00%	-5.86%	0.00%	-6.09%	0.00%	-4.94%	0.00%	-6.13%	0.00%	-6.53%	-2.08%	-10.08%	1.13%	-5.78%	0.00%	-5.68%	-0.19%	-6.28%	0.00%	-6.12%
1978	-3.53%	0.56%	0.68%	0.98%	0.24%	0.24%	0.00%	-1.29%	-0.10%	-6.31%	0.00%	-6.28%	0.00%	-4.43%	0.00%	-6.14%	0.00%	-6.33%	-0.05%	-6.13%	-2.06%	-2.83%	2.87%	3.33%
1979	-1.72%	-1.72%	1.88%	3.97%	0.19%	0.19%	0.94%	0.94%	0.88%	0.85%	-1.37%	-2.43%	0.40%	-5.69%	-0.51%	-6.43%	2.08%	-4.55%	6.32%	3.54%	3.50%	6.89%	0.00%	2.05%
1980	1.52%	1.82%	0.64%	0.64%	1.25%	1.25%	-0.74%	0.59%	-0.11%	-0.47%	-0.62%	-8.72%	-9.91%	-10.31%	-4.67%	-5.31%	-4.82%	-4.82%	6.85%	6.85%	4.56%	7.00%	0.00%	6.85%
1981	0.00%	5.70%	0.00%	5.94%	0.22%	-3.87%	-1.04%	-2.45%	-0.94%	-6.14%	-0.27%	-6.07%	-1.17%	-5.20%	0.12%	-5.76%	-1.12%	-7.55%	2.15%	1.96%	-3.06%	-3.75%	-1.05%	-2.71%
1982	-1.66%	-2.64%	-3.73%	-5.97%	0.41%	1.29%	0.22%	-3.65%	0.28%	-2.14%	-1.21%	-6.98%	-0.02%	-7.12%	0.15%	-5.81%	-1.53%	-6.12%	0.00%	-6.24%	-5.07%	0.52%	-3.67%	0.78%
1983	0.35%	-2.39%	0.03%	0.03%	0.21%	0.21%	1.25%	1.25%	0.40%	-0.25%	1.93%	-1.51%	0.08%	-5.64%	0.77%	-3.58%	-4.36%	-2.32%	-4.40%	0.44%	-3.20%	-0.57%	-1.92%	1.23%
1984	-0.08%	0.25%	-1.79%	1.29%	0.00%	5.63%	-0.76%	0.16%	0.00%	-7.04%	0.00%	-6.08%	0.00%	-5.46%	0.30%	-2.58%	-2.61%	-0.09%	-2.24%	0.97%	-0.79%	-3.01%	0.64%	0.64%
1985	1.26%	1.26%	0.65%	0.82%	0.71%	0.71%	1.32%	1.56%	-7.84%	-8.68%	-4.26%	-6.75%	-0.63%	-6.07%	-1.02%	-4.30%	-2.44%	-4.63%	0.23%	0.08%	-1.09%	-0.62%	1.01%	1.01%
1986	-0.13%	-7.35%	-4.22%	0.43%	0.17%	0.17%	-0.67%	-3.92%	4.07%	0.74%	-1.23%	-7.00%	-0.88%	-5.47%	-0.33%	-2.98%	0.34%	-5.58%	-2.99%	-8.71%	-0.39%	-1.36%	-7.48%	-3.70%
1987	-2.97%	-5.51%	0.25%	0.94%	0.80%	0.98%	0.95%	0.40%	0.03%	-5.05%	-0.35%	-4.67%	0.00%	-3.86%	-0.44%	-5.56%	0.00%	-5.24%	0.35%	-6.40%	0.20%	-3.53%	-5.09%	-3.17%
1988	-0.04%	0.89%	0.07%	1.01%	-0.76%	-0.45%	0.54%	-0.62%	-1.06%	-6.27%	-0.55%	-6.41%	-0.18%	-5.96%	-2.91%	0.20%	-0.17%	-0.18%	-0.26%	-6.82%	0.00%	-8.37%	0.00%	-5.41%
1989	0.53%	-1.91%	0.24%	0.24%	0.00%	-2.50%	-0.59%	-2.82%	-0.35%	-5.58%	-0.19%	-6.12%	0.15%	-6.45%	-0.13%	-6.56%	0.33%	-7.12%	-0.37%	-5.42%	0.00%	-3.56%	0.00%	-3.54%
1990	0.00%	-5.28%	0.00%	-5.69%	0.00%	-5.72%	0.00%	-6.08%	0.02%	-4.55%	0.00%	-6.16%	0.00%	-6.62%	0.03%	-6.66%	0.22%	-6.32%	0.00%	-5.73%	0.00%	-4.56%	-4.60%	-3.03%
1991	-5.36%	-4.44%	-1.22%	-5.27%	-0.05%	-0.05%	0.58%	0.58%	-0.65%	-6.72%	0.00%	-6.27%	-0.71%	-5.42%	0.31%	-4.74%	-0.46%	-6.13%	-1.25%	-6.10%	0.00%	-4.84%	-0.78%	-1.71%
1992	0.56%	0.56%	1.07%	2.14%	0.58%	3.47%	1.18%	1.18%	-1.96%	-4.58%	0.00%	-6.27%	0.43%	-4.97%	-4.50%	-3.63%	0.00%	-5.98%	0.00%	-9.08%	0.00%	-7.12%	-6.53%	-1.37%
1993	0.56%	0.73%	0.30%	0.30%	0.24%	0.24%	0.11%	0.95%	0.32%	-0.17%	-8.36%	-9.20%	-10.36%	-10.36%	6.24%	6.15%	1.65%	1.18%	3.20%	-0.52%	-1.16%	2.23%	0.75%	1.04%
1994	-0.58%	-9.27%	-0.99%	-2.49%	0.30%	0.60%	0.75%	0.83%	0.30%	-2.54%	-1.66%	-7.34%	-0.57%	-6.67%	0.00%	-6.06%	-0.12%	-6.41%	-0.73%	-6.35%	-1.48%	-5.20%	-1.73%	-1.85%
1995	0.97%	0.97%	1.53%	1.53%	-0.81%	-0.81%	0.79%	-1.42%	0.52%	-0.19%	2.95%	-2.86%	-0.45%	-6.57%	-0.02%	-6.62%	-0.52%	-6.91%	-0.71%	-6.75%	-0.38%	-7.30%	0.00%	-4.00%
1996	0.00%	-3.74%	0.00%	-3.43%	0.00%	-5.81%	0.00%	-6.34%	0.00%	-4.54%	0.00%	-5.49%	0.32%	-6.34%	0.00%	-4.67%	-0.39%	-6.35%	0.00%	-4.30%	0.00%	-6.42%	0.00%	-5.96%
1997	-0.14%	-1.59%	-0.15%	-0.15%	0.58%	0.58%	-0.16%	-6.33%	0.00%	-4.19%	0.00%	-5.79%	0.22%	-5.82%	0.36%	-5.02%	-1.20%	-3.87%	0.99%	-5.23%	0.01%	-5.21%	0.34%	-5.06%
1998	-0.48%	-1.70%	0.95%	0.95%	-0.80%	-0.80%	-0.56%	-0.56%	-2.35%	-5.22%	0.28%	-3.84%	0.00%	-5.81%	0.23%	-4.98%	0.00%	-6.15%	0.00%	-6.06%	-0.04%	-5.21%	0.00%	-6.35%
1999	0.00%	-5.88%	0.00%	-5.85%	0.00%	-6.61%	0.00%	-5.71%	0.00%	-6.06%	0.00%	-6.17%	-0.56%	-7.22%	-0.08%	-6.25%	-0.31%	-4.15%	0.00%	-5.19%	0.00%	-5.27%	0.00%	-5.19%
2000	0.00%	-3.46%	0.00%	-4.03%	0.00%	-6.21%	-0.19%	-6.26%	0.00%	-6.27%	0.00%	-6.31%	0.00%	-6.37%	1.95%	-6.31%	0.00%	-6.22%	-0.02%	0.41%	-0.04%	0.42%	0.00%	-5.85%
2001	0.00%	-5.65%	0.00%	-5.26%	1.13%	1.13%	-0.37%	-2.19%	0.00%	-5.27%	0.00%	-6.23%	0.00%	-5.86%	0.36%	-7.24%	-0.84%	-6.29%	0.00%	-5.28%	0.00%	-5.07%	0.00%	-5.88%
2002	0.00%	-5.46%	0.00%	-5.88%	0.25%	-6.22%	-1.10%	-6.22%	0.00%	-6.43%	0.00%	-6.51%	0.00%	-6.51%	0.00%	-6.14%	0.00%	-6.41%	0.00%	-6.39%	0.00%	-5.63%	-2.09%	-6.12%
2003	0.00%	-5.29%	0.00%	-6.13%	-0.59%	-0.59%	0.00%	-4.13%	0.00%	-4.84%	0.00%	-6.46%	0.00%	-6.49%	0.00%	-6.43%	-0.06%	-6.37%	0.00%	-6.42%	0.00%	-6.33%	0.28%	-4.78%
2004	0.00%	-5.29%	0.00%	-6.13%	-0.59%	-0.59%	0.00%	-4.13%	0.00%	-4.84%	0.00%	-6.46%	0.00%	-6.49%	0.00%	-6.43%	-0.06%	-6.37%	0.00%	-6.42%	0.00%	-6.33%	0.28%	-4.78%
2005	0.42%	0.42%	1.25%	1.25%	2.38%	2.38%	-0.01%	-2.26%	-0.24%	-6.67%	0.00%	-5.27%	0.06%	-6.28%	0.00%	-3.88%	0.00%	-5.62%	0.00%	-5.76%	0.00%	-5.51%	0.00%	-4.65%
2006	0.00%	-4.65%	0.00%	-4.59%	0.00%	-4.81%	0.00%	-5.61%	0.00%	-6.23%	0.00%	-6.33%	0.00%	-6.33%	0.00%	-5.18%	0.00%	-6.24%	0.00%	-5.63%	0.00%	-5.50%	0.00%	-5.86%
2007	0.00%	-6.46%	-0.37%	-7.08%	0.01%	-4.17%	0.00%	-6.14%	0.00%	-6.37%	0.00%	-6.49%	0.00%	-6.49%	0.81%	-1.13%	0.00%	-6.32%	0.00%	-6.35%	0.00%	-6.28%	-3.21%	1.79%
2008	-8.95%	-3.53%	0.30%	-2.52%	1.00%	2.10%	-0.78%	0.31%	-0.14%	-5.73%	0.34%	-7.02%	0.00%	-7.66%	0.58%	-4.04%	0.01%	-4.43%	0.00%	-4.07%	0.35%	-4.95%	-4.99%	-1.64%
2009	0.67%	0.67%	1.58%	1.58%	0.07%	-7.92%	0.00%	-2.56%																

Figure 4-71. Habitat summary table for red shiner (*Cyprinella lutrensis*), Braided site, with LWD and a hypothetical withdrawal rate of 2 ft^3/sec.

Braided Site
With LWD
Red Shiner

Summary of normalized habitat changes
Hypothetical Withdrawal 10 cfs

Year	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
1965									0.34%	-17.65%	-0.47%	-11.82%	1.55%	-15.40%	1.11%	-11.28%	0.00%	-12.81%	0.09%	-13.03%	-0.20%	-12.66%	1.59%	2.01%
1966	2.08%	3.44%	1.01%	-6.88%	0.58%	-8.58%	-0.77%	-17.97%	0.00%	-17.75%	-0.42%	-15.92%	0.00%	-13.96%	-0.28%	-16.74%	0.00%	-17.39%	0.00%	-14.06%	0.00%	-15.04%	0.75%	-14.98%
1967	0.00%	-18.49%	0.00%	-17.23%	0.00%	-17.49%	-0.32%	-14.31%	0.00%	-14.06%	0.00%	-13.96%	1.60%	-12.05%	0.89%	-7.67%	-0.79%	-15.97%	-1.30%	-12.94%	0.00%	-13.91%	2.90%	-1.98%
1968	0.54%	7.09%	3.85%	6.35%	4.51%	4.98%	-0.71%	-18.46%	2.48%	-17.55%	0.19%	-17.18%	0.00%	-18.47%	0.04%	-19.94%	0.00%	-18.54%	0.00%	-18.42%	0.00%	-18.42%	0.00%	-19.09%
1969	2.15%	1.94%	2.24%	6.90%	2.90%	5.91%	-0.57%	-22.52%	2.07%	-19.21%	0.00%	-18.15%	0.00%	-17.92%	0.35%	-17.70%	0.35%	-15.34%	0.35%	-15.67%	0.00%	-18.87%	0.00%	-20.43%
1970	0.00%	-19.56%	0.00%	-19.00%	0.00%	-21.32%	0.00%	-19.30%	0.00%	-17.63%	0.00%	-13.93%	-0.10%	-13.39%	-4.25%	-18.33%	0.26%	-10.71%	0.00%	-14.03%	0.00%	-18.35%	0.00%	-19.20%
1971	0.00%	-19.15%	0.00%	-19.71%	0.00%	-19.25%	0.00%	-13.94%	0.00%	-13.90%	-0.24%	-12.10%	0.00%	-12.18%	1.57%	-12.96%	-0.71%	-5.54%	0.96%	-4.47%	0.00%	-18.44%	-0.64%	-14.55%
1972	0.00%	-18.62%	0.00%	-18.66%	-0.34%	-16.84%	0.00%	-14.00%	0.00%	-13.98%	0.00%	-13.97%	0.00%	-13.96%	0.00%	-13.96%	0.00%	-11.54%	-3.35%	-11.37%	2.93%	5.04%	1.57%	-6.59%
1973	1.66%	3.72%	-0.90%	-0.90%	-0.77%	-0.77%	1.37%	0.38%	7.78%	12.22%	-6.03%	-19.49%	-5.60%	-18.76%	5.84%	-15.23%	4.78%	-15.65%	-1.99%	-20.86%	-0.61%	-18.76%	0.42%	-18.11%
1974	0.68%	-19.30%	0.00%	-16.19%	0.00%	-16.19%	0.00%	-20.66%	-0.12%	-19.00%	0.00%	-17.68%	0.00%	-17.92%	0.73%	-19.16%	-0.41%	-18.76%	0.81%	-15.47%	-0.22%	-20.24%	-0.18%	-20.37%
1975	0.00%	-19.94%	0.00%	-20.53%	6.41%	11.07%	1.77%	4.58%	3.46%	-18.14%	0.00%	-18.10%	-0.02%	-18.32%	0.00%	-17.73%	-0.04%	-18.24%	0.00%	-17.49%	0.00%	-17.37%	0.00%	-18.15%
1976	-3.04%	-12.08%	-2.28%	-5.53%	0.00%	-20.39%	0.08%	-20.78%	0.68%	-19.01%	0.00%	-14.08%	-0.20%	-16.16%	0.32%	-17.08%	0.00%	-13.96%	0.00%	-18.67%	0.00%	-18.22%	0.00%	-14.09%
1977	0.00%	-16.26%	0.00%	-18.89%	0.00%	-18.92%	0.00%	-18.10%	0.00%	-13.95%	0.00%	-12.47%	0.00%	-13.76%	-2.09%	-16.72%	0.80%	-17.99%	0.00%	-13.97%	-0.19%	-13.04%	0.00%	-12.55%
1978	-3.18%	-7.81%	3.73%	0.85%	1.20%	1.60%	-1.03%	-19.90%	-0.10%	-19.43%	0.00%	-17.64%	0.00%	-14.00%	0.00%	-12.26%	0.00%	-9.56%	-0.05%	-12.27%	-0.84%	-11.59%	-0.03%	3.99%
1979	1.98%	6.56%	6.49%	16.07%	0.94%	0.94%	3.22%	5.51%	-2.83%	-16.94%	-2.64%	-19.61%	0.23%	-19.10%	-1.00%	-20.57%	1.93%	-17.95%	4.66%	-15.49%	3.39%	-15.49%	0.00%	-15.49%
1980	5.25%	-1.60%	2.08%	3.80%	2.91%	4.74%	0.94%	-0.22%	-4.49%	-18.82%	-7.00%	-22.22%	-6.56%	-19.44%	-2.11%	-13.62%	-3.00%	-18.15%	4.42%	-15.39%	3.39%	-15.49%	0.00%	-15.49%
1981	0.00%	-15.49%	0.00%	-15.86%	0.84%	-15.66%	-0.58%	-19.88%	-0.94%	-20.97%	-0.06%	-19.14%	-1.51%	-20.50%	0.62%	-19.88%	-1.12%	-20.64%	0.31%	-19.00%	-3.75%	-23.22%	-3.25%	-21.05%
1982	-2.31%	-1.25%	-3.21%	-2.17%	1.11%	-1.22%	1.52%	-16.91%	2.45%	-18.91%	-1.21%	-20.07%	-0.02%	-18.87%	0.65%	-19.50%	-0.57%	-19.27%	0.00%	-17.73%	-6.03%	-5.94%	-3.85%	1.50%
1983	-5.39%	-0.37%	0.17%	0.70%	1.07%	1.16%	5.18%	8.10%	-1.14%	-16.52%	4.09%	-15.78%	0.02%	-19.27%	0.77%	-19.85%	-3.37%	-12.30%	-2.86%	-11.32%	-5.06%	-11.11%	-7.44%	-7.03%
1984	0.89%	3.54%	-1.79%	-16.31%	0.00%	-15.43%	-0.76%	-18.98%	0.00%	-17.68%	0.00%	-14.03%	0.00%	-14.00%	0.28%	-19.90%	-1.50%	-3.91%	-1.20%	-7.66%	0.29%	-17.95%	2.62%	5.02%
1985	2.25%	8.15%	4.51%	6.96%	1.50%	6.01%	1.61%	1.37%	-4.33%	-19.04%	-0.91%	-19.82%	-0.12%	-19.15%	-0.59%	-20.92%	-2.34%	-21.44%	-0.11%	-15.04%	-4.30%	-1.16%	3.98%	0.70%
1986	-0.96%	-18.29%	-3.44%	-3.56%	0.58%	1.12%	1.28%	-16.78%	4.08%	-17.56%	-1.23%	-20.08%	-0.72%	-19.77%	-0.18%	-18.82%	0.34%	-16.70%	-3.19%	-21.83%	-0.86%	-19.01%	-8.10%	-19.63%
1987	-3.06%	-18.57%	2.16%	2.44%	3.92%	6.71%	0.95%	-17.01%	0.64%	-19.34%	-0.35%	-15.83%	0.00%	-14.06%	0.21%	-18.65%	0.00%	-17.09%	0.35%	-15.67%	0.40%	-20.46%	-5.95%	-20.52%
1988	2.74%	1.14%	2.92%	4.66%	-0.76%	-19.19%	2.32%	-15.38%	-1.06%	-21.04%	-0.55%	-19.48%	-0.92%	-18.92%	-5.54%	0.12%	-1.35%	-5.92%	0.00%	-18.71%	0.00%	-18.07%	0.00%	-18.52%
1989	1.30%	-17.60%	1.18%	-2.69%	0.00%	-21.10%	-0.59%	-20.21%	-0.35%	-16.35%	-0.19%	-13.57%	0.15%	-13.40%	-0.13%	-15.90%	0.33%	-16.03%	-0.37%	-15.02%	0.00%	-14.09%	0.00%	-14.09%
1990	0.00%	-18.46%	0.00%	-18.81%	0.00%	-18.92%	0.00%	-17.88%	0.02%	-14.01%	0.00%	-12.04%	0.00%	-13.55%	0.03%	-14.49%	0.22%	-13.94%	0.00%	-13.87%	0.00%	-14.06%	-5.72%	-14.68%
1991	-5.11%	-2.24%	-1.20%	-15.56%	-0.23%	2.26%	2.92%	4.28%	-0.65%	-19.81%	0.00%	-17.66%	-0.71%	-14.71%	0.31%	-14.69%	-0.46%	-12.47%	-1.25%	-12.95%	0.00%	-13.96%	-3.99%	-9.52%
1992	2.73%	3.34%	2.86%	4.70%	3.04%	7.12%	4.83%	8.79%	0.72%	-18.50%	0.00%	-17.66%	0.02%	-15.56%	-4.71%	-10.11%	0.00%	-19.04%	0.00%	-17.93%	0.00%	-17.90%	-9.32%	-3.91%
1993	2.84%	6.78%	1.48%	3.70%	1.20%	6.53%	2.13%	-1.65%	-5.06%	-23.10%	-6.02%	-22.78%	-6.15%	-21.60%	5.08%	-14.98%	-0.12%	-17.74%	2.02%	-14.73%	3.51%	4.53%	-9.18%	-22.06%
1994	-1.97%	-18.39%	0.70%	-7.85%	1.00%	0.07%	1.11%	-19.20%	0.59%	-20.28%	-1.66%	-20.43%	-0.57%	-19.74%	-0.16%	-19.85%	-0.12%	-19.48%	-0.24%	-19.42%	-0.42%	-20.35%	-5.85%	-12.54%
1995	5.66%	7.86%	3.67%	6.10%	3.10%	6.64%	0.07%	-19.78%	5.35%	-15.92%	2.95%	-16.70%	-0.45%	-19.64%	-0.02%	-19.69%	-0.82%	-20.16%	-0.71%	-19.82%	-0.38%	-20.39%	0.00%	-20.69%
1996	0.00%	-20.65%	0.00%	-20.18%	0.00%	-20.35%	0.00%	-17.54%	0.00%	-13.99%	0.00%	-13.90%	0.32%	-14.73%	0.00%	-13.98%	-0.39%	-16.21%	0.00%	-14.02%	0.00%	-17.39%	0.00%	-18.24%
1997	2.68%	0.40%	5.89%	8.52%	2.84%	7.00%	-0.16%	-19.77%	0.00%	-14.38%	0.00%	-13.87%	0.22%	-12.84%	0.36%	-12.75%	-1.20%	-11.21%	0.25%	-13.10%	0.01%	-14.03%	-0.57%	-17.18%
1998	-0.48%	-20.32%	1.70%	10.51%	0.10%	2.77%	1.49%	2.10%	0.04%	-20.13%	0.28%	-14.07%	0.00%	-14.03%	0.23%	-13.96%	0.00%	-13.85%	0.00%	-13.43%	-0.27%	-15.95%	0.00%	-19.42%
1999	0.00%	-18.94%	0.00%	-18.42%	0.00%	-17.98%	0.00%	-20.37%	0.00%	-13.42%	0.00%	-11.85%	-1.34%	-14.88%	-0.08%	-19.09%	-1.25%	-16.93%	0.00%	-13.93%	0.00%	-13.92%	0.00%	-13.93%
2000	0.00%	-14.10%	0.00%	-14.11%	0.00%	-17.68%	-0.19%	-13.41%	0.00%	-10.44%	0.00%	-9.93%	0.00%	-9.04%	1.95%	-9.82%	0.00%	-11.19%	1.69%	-4.46%	1.70%	2.41%	0.00%	-18.42%
2001	0.00%	-18.47%	0.00%	-20.50%	3.30%	-5.07%	-0.37%	-20.12%	0.00%	-13.92%	0.00%	-10.97%	0.00%	-9.50%	0.36%	-12.72%	-0.84%	-11.69%	0.00%	-11.22%	0.00%	-11.80%	0.00%	-13.90%
2002	0.00%	-13.90%	0.00%	-13.90%	0.25%	-13.38%	-1.10%	-11.22%	0.00%	-8.23%	0.00%	-7.03%	0.00%	-7.09%	0.00%	-8.01%	0.00%	-8.46%	0.00%	-8.75%	0.00%	-9.77%	-2.09%	-12.58%
2003	0.00%	-11.69%	0.00%	-12.47%	3.00%	7.29%	0.00%	-14.03%	0.00%	-10.13%	0.00%	-7.78%	0.00%	-7.33%	0.00%	-8.23%	-0.06%	-8.99%	0.00%	-8.34%	0.00%	-9.59%	0.28%	-11.44%
2004	0.00%	-11.69%	0.00%	-12.47%	3.00%	7.29%	0.00%	-14.03%	0.00%	-10.13%	0.00%	-7.78%	0.00%	-7.33%	0.00%	-8.23%	-0.06%	-8.99%	0.00%	-8.34%	0.00%	-9.59%	0.28%	-11.44%
2005	1.26%	3.26%	5.00%	3.14%	5.84%	6.87%	-0.01%	-20.24%	-0.24%	-19.74%	0.00%	-13.92%	0.06%	-13.77%	0.00%	-14.45%	0.00%	-13.88%	0.00%	-13.87%	0.00%	-13.90%	0.00%	-13.98%
2006	0.00%	-13.98%	0.00%	-13.99%	0.00%	-13.97%	0.00%	-13.76%	0.00%	-11.03%	0.00%	-9.65%	0.00%	-9.56%	0.00%	-10.36%	0.00%	-10.83%	0.00%	-11.11%	0.00%	-11.74%	0.00%	-13.32%
2007	0.00%	-13.85%	-0.37%	-14.48%	0.01%	-14.04%	0.00%	-12.26%	0.00%	-9.07%	0.00%	-7.30%	0.00%	-7.33%	-0.12%	-4.45%	0.00%	-9.73%	0.00%	-9.30%	0.00%	-10.33%	-3.49%	2.46%
2008	-6.93%	-6.03%	1.80%	1.85%	2.53%	1.71%	-0.78%	-18.39%	-0.14%	-19.95%	0.34%	-16.88%	0.00%	-17.56%	0.00%	-17.89%	0.01%	-14.03%	0.00%	-14.10%	0.35%	-15.67%	-4.55%	-11.11%
2009	1.68%	-1.04%	2.19%	-2.96%	0.35%	-17.59%	0.00%	-19.32%																

Figure 4-72. Habitat summary table for red shiner (*Cyprinella lutrensis*), Braided site, with LWD and a hypothetical withdrawal rate of 10 ft^3/sec.

Publishing support provided by:
Denver Publishing Service Center
For more information concerning this publication, contact:
Center Director, USGS Fort Collins Science Center
2150 Centre Ave., Bldg. C
Fort Collins, CO 80526-8118
(970)226-9398
Or visit the Fort Collins Science Center Web site at:
http://www.fort.usgs.gov/