Prepared in cooperation with the National Park Service

Hydrogeomorphic Classification of Wetlands on Mt. Desert Island, Maine, Including Hydrologic Susceptibility Factors for Wetlands in Acadia National Park

Scientific Investigations Report 2006–5162

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

Cover. Photograph shows Bass Harbor Marsh, Tremont, Maine. (Photograph by Charles W. Culbertson, U.S. Geological Survey)

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Conversion Factors and Datums

Multiply	By	To obtain
	Length	
centimeter (cm)	0.3937	inch (in.)
millimeter (mm)	0.0394	inch (in.)
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
	Area	
hectare (ha)	2.471	acre
square kilometer (km^2)	0.3861	square mile (mi^2)

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

$$°F=(1.8\times°C)+32$$

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

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Hydrogeomorphic Classification of Wetlands on Mt. Desert Island, Maine, Including Hydrologic Susceptibility Factors for Wetlands in Acadia National Park

By Martha G. Nielsen

Abstract

The U.S. Geological Survey, in cooperation with the National Park Service, developed a hydrogeomorphic (HGM) classification system for wetlands greater than 0.4 hectares (ha) on Mt. Desert Island, Maine, and applied this classification using map-scale data to more than 1,200 mapped wetland units on the island. In addition, two hydrologic susceptibility factors were defined for a subset of these wetlands, using 11 variables derived from landscape-scale characteristics of the catchment areas of these wetlands. The hydrologic susceptibility factors, one related to the potential hydrologic pathways for contaminants and the other to the susceptibility of wetlands to disruptions in water supply from projected future changes in climate, were used to indicate which wetlands (greater than 1 ha) in Acadia National Park (ANP) may warrant further investigation or monitoring.

The HGM classification system consists of 13 categories: Riverine-Upper Perennial, Riverine-Nonperennial, Riverine-Tidal, Depressional-Closed, Depressional-Semiclosed, Depressional-Open, Depressional-No Ground-Water Input, Mineral Soil Flat, Organic Soil Flat, Tidal Fringe, Lacustrine Fringe, Slope, and Hilltop/Upper Hillslope. A dichotomous key was developed to aid in the classification of wetlands. The National Wetland Inventory maps produced by the U.S. Fish and Wildlife Service provided the wetland mapping units used for this classification. On the basis of topographic map information and geographic information system (GIS) layers at a scale of 1:24,000 or larger, 1,202 wetland units were assigned a preliminary HGM classification. Two of the 13 HGM classes (Riverine-Tidal and Depressional-No Ground-Water Input) were not assigned to any wetlands because criteria for determining those classes are not available at that map scale, and must be determined by more site-specific information. Of the 1,202 wetland polygons classified, which cover 1,830 ha in ANP, 327 were classified as Slope, 258 were Depressional (Open, Semiclosed, and Closed), 231 were Riverine (Upper Perennial and Nonperennial), 210 were Soil Flat (Mineral and Organic), 68 were Lacustrine Fringe, 51 were Tidal Fringe, 22 were Hilltop/Upper Hillslope, and another 35 were small open water bodies. Most small, isolated wetlands classified on the island are Slope wetlands. The least common, Hilltop/Upper Hillslope wetlands, only occur on a few hilltops and shoulders of hills and mountains. Large wetland complexes generally consist of groups of Depressional wetlands and Mineral Soil Flat or Organic Soil Flat wetlands, often with fringing Slope wetlands at their edges and Riverine wetlands near streams flowing through them.

The two analyses of wetland hydrologic susceptibility on Mt. Desert Island were applied to 186 wetlands located partially or entirely within ANP. These analyses were conducted using individually mapped catchments for each wetland. The 186 wetlands were aggregated from the original 1,202 mapped wetland polygons on the basis of their HGM classes. Landscape-level hydrologic, geomorphic, and soil variables were defined for the catchments of the wetlands, and transformed into scaled scores from 0 to 10 for each variable. The variables included area of the wetland, area of the catchment, area of the wetland divided by the area of the catchment, the average topographic slope of the catchment, the amount of the catchment where bedrock crops out with no soil cover or excessively thin soil cover, the amount of storage (in lakes and wetlands) in the catchment, the topographic relief of the catchment, the amount of clay-rich soil in the catchment, the amount of manmade impervious surface, whether the wetland had a stream inflow, and whether the wetland had a hydraulic connection to a lake or estuary. These data were determined using a GIS and data layers mapped at a scale of 1:24,000 or larger.

These landscape variables were combined in different ways for the two hydrologic susceptibility factors, according to the purposes of each. For the contaminant delivery analysis, the variables related to the relative importance of direct precipitation, surface water, and ground water as a water source for each wetland were grouped, and the scaled scores summed for each wetland. Relatively few wetlands scored high on the relative importance of precipitation as a pathway

for contamination. Many of the highest-scoring wetlands for surface water as a potential source of contamination are in the eastern part of the island. The distribution of wetlands scoring highest for ground water as a potential source of contamination are more evenly distributed across the island.

For the analysis of susceptibility to water-supply disruptions under potential future climate change (greater annual precipitation and warmer temperatures, particularly in the summer, which may result in increased evapotranspiration), variables related to greater susceptibility (more anticipated water-supply disruptions) were grouped and given a negative value. Variables related to less susceptibility (fewer anticipated water-supply disruptions) were grouped and given positive scores. The scaled negative and positive scores for each wetland were summed to determine the final score. The 20 lowest-scoring wetlands are those that are likely to be the most vulnerable and would experience the most water-supply shortages should predictions of future climate conditions hold true. Many of these wetlands have relatively small catchment areas compared to the size of the wetland itself, most have little or no opportunity for surface-water storage in the catchment, and some have a large amount of rock cropping out (areas with little to no soil cover) in their catchments. Wetlands with the highest scores (those likely to be least vulnerable) have soils relatively favorable to ground-water recharge, relatively large catchment sizes, and many have a hydraulic connection to a lacustrine or estuarine water body.

Introduction

Wetlands in Acadia National Park (ANP), Mt. Desert Island, Maine (fig. 1), are a significant ecological resource that have not yet been fully categorized and understood. Wetland vegetation has been mapped (Lubinski and others, 2003) and wetlands have been delineated and described (Calhoun and others, 1994), but the hydrology of wetlands on Mt. Desert Island, where the bulk of ANP is located, has not been categorized and described. Wetland hydrology, including water source and hydrodynamics, is typically considered the single most important factor controlling wetland ecosystem processes (Mitsch and Gosselink, 2000). A categorization based on hydrology and hydrologic function could be used to analyze the distribution of vegetation types, invasive species, invertebrates, and to assist in the development of a wetland monitoring plan. The development of such a plan for the shallow-water (less than 2 m), nonmarine wetlands, is a high priority in the Water Resources Management Plan for the park (Kahl and others, 2000). For the effective implementation of a wetland monitoring plan, the wetlands in the park would need to be categorized and classified in a way that helps park managers evaluate risks and current conditions and prioritize wetlands for monitoring. Besides the hydrologic organization needed, additional information is needed to further interpret differences in the biological structure and geochemical signatures found in wetlands, and to identify possible agents of observed changes in these structures and their signatures over time. Some possible agents of change associated with wetland hydrology at ANP include the delivery of chemical contaminants and climate change. The susceptibility of wetlands to these two hydrologically related agents are some of the additional factors that park managers may consider in the development of a wetland monitoring plan.

In 2003, in cooperation with the Water Resources Division of the National Park Service, the U.S. Geological Survey (USGS) designed a study to classify the hydrology of wetlands on Mt. Desert Island according to hydrogeomorphic (HGM) principles (Brinson, 1993), and to analyze hydrologic susceptibility factors for wetlands. This report is the second of two reports from that study. The first report from the study was a preliminary HGM classification for wetlands on Mt. Desert Island, including ANP, which presented an approach that uses the HGM concept in a way that can be applied to all wetlands in a region within a relatively short amount of time (Nielsen and others, 2006). The preliminary HGM classification included 13 HGM classes and subclasses, which are defined and described in that report. After the method was developed, the HGM classification system was applied to all the wetlands on the island, and that is described in the current report.

This study also was designed to provide information on potential hydrologic stressors to wetlands in ANP by classifying wetlands according to two hydrologic susceptibility characterizations: the delivery pathway (precipitation, surface water, and ground water) for potential contaminants to enter individual wetlands, and the potential for water-supply disruptions to affect wetlands as a result of projected future climate changes. Two climate models have projected an increase in temperature for New England of 2.5 to 5ºC over the next 100 years, with a possible increase in precipitation (primarily during the fall, winter, and spring) as well (Northeast Climate Impacts Assessment, 2006; Barron, 2001; Houghton and others, 2001; National Assessment Synthesis Team, 2001). This may bring about a water deficit during the summer growing season for wetlands (Brooks, 2004), but may have other effects on wetland hydrology during the rest of the year.

The HGM classification of wetlands can help determine which wetlands are hydrologically similar, and which might be representative of others in a group. The characterizations of hydrologic susceptibility can be used to address two issues. The first is helping determine the most likely path that contaminants would take to reach a wetland, should chemical contaminants or excessive nutrients be found in the catchment. This is important for understanding how long it could take for a problem to show up in the wetland, what might be done to monitor the arrival of contaminants, or how to design an early-warning system for detection of problems. (As of February 2006, ongoing research [G.R. Guntenspergen, U.S. Geological Survey, Patuxent Wildlife Research Center, written commun., 2004] is addressing the likelihood of finding various contaminants in the catchments of park wetlands.) The second

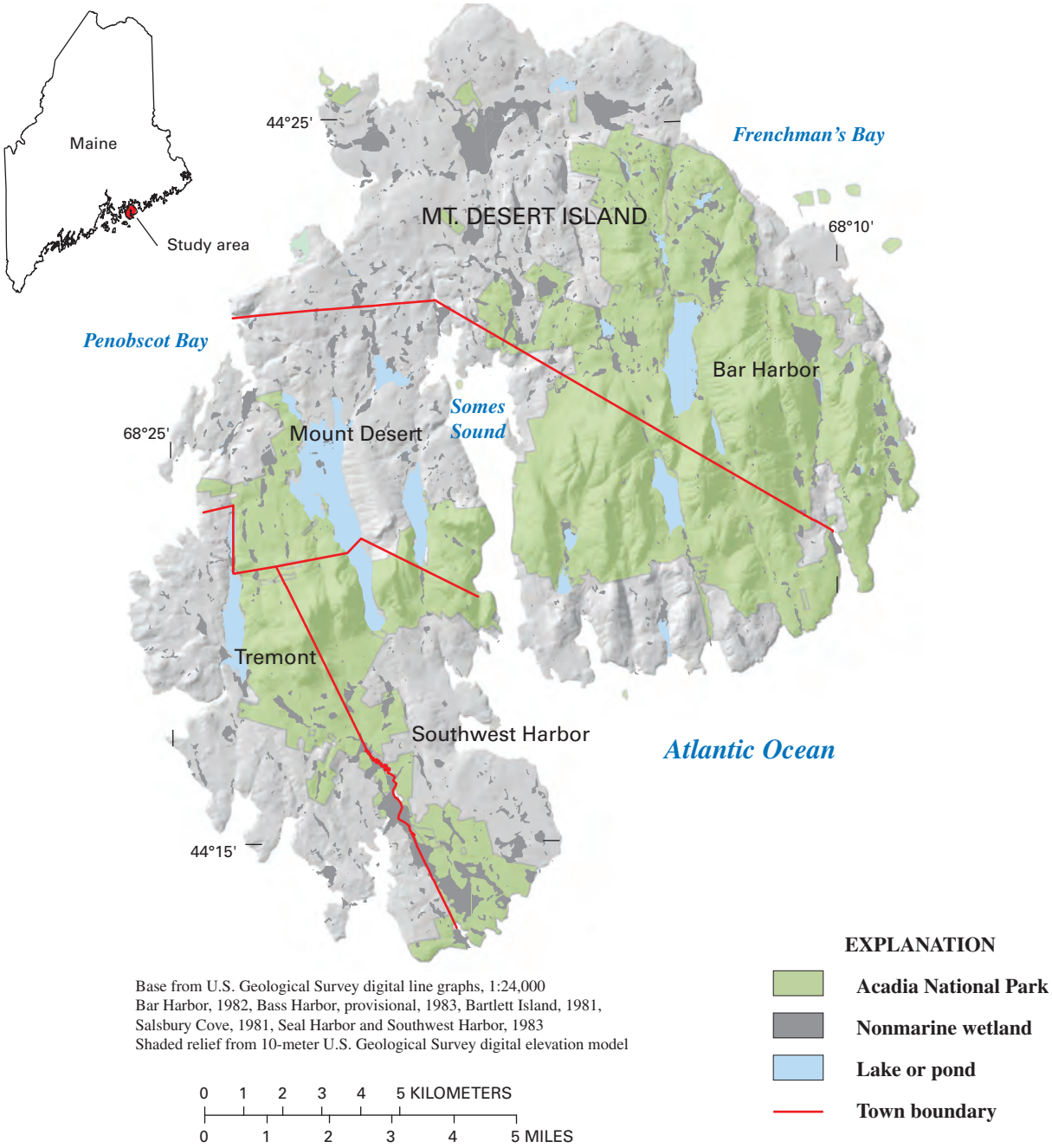


Figure 1. Extent of shallow-water, nonmarine wetlands on Mt. Desert Island, Maine.

issue addressed in this study is, given what is known about the landscape and hydrology of the island, which wetlands are likely to be more susceptible to disruptions in water supply if the climate were to change, and which are likely to be less susceptible. This is important for understanding the fate of various ecosystems in the future.

Traditional water-budget studies of wetlands could be used to provide a highly accurate assessment of these issues, but that approach would be impossible to apply at the scale needed for this study. Therefore, landscape-level data are used to conduct the analysis, providing an initial evaluation of these wetlands that can be used to assist water-resource managers with decisions on future monitoring and data collection.

Purpose and Scope

This report describes the results of a study to use a hydrogeomorphic approach to classify wetlands on Mt. Desert Island, Maine. A preliminary HGM classification system was described in Nielsen and others (2006); a final HGM classification system is presented here and includes a list of the initial HGM classification for 1,202 mapped wetland polygons (individually, or in groups, larger than 0.4 ha in size) on Mt. Desert Island. The initial classification for these wetlands is shown on a plate (field verification of the classification would be required for a confirmed HGM classification for each wetland). The report also describes an approach and results of an analysis of the susceptibility of wetlands larger than 1 ha in Acadia National Park, Mt. Desert Island, Maine, to two hydrologic stresses. GIS-derived scores based on catchment characteristics for 186 individual wetlands are presented (1) for the relative importance of three hydrologic pathways for potential contaminants (precipitation, surface water, and ground water), and (2) for susceptibility to changes in wetland hydrologic regime under likely scenarios for future climate change in northern New England. Wetland and catchment characteristics are discussed for the highest-scoring wetlands for each water source and for the most susceptible and least susceptible wetlands to potential future climate-related changes in hydrology.

Previous Studies

Hydrogeomorphic characterization is not new, although prior to 2006, no HGM classification system had been published for northern New England. Nielsen and others (2006) presented a summary of the HGM concept as it relates to the development of an HGM classification of Mt. Desert Island wetlands. In short, the HGM approach is based on classification (hydrological segregation) that results in an organization of wetlands according to different potential functions and benefits. It is based on three fundamental factors that influence wetland function: position in the landscape, dominant source of water, and hydrodynamics, which refers to the flow and fluctuations of water levels in a wetland over time (Brinson, 1993; Cole and others, 1997; Schaffer and others, 1999).

The concept of classifying wetlands according to hydrologic risk factors also is not new (Detenbeck and others, 2000; Gilvear and McInnes, 1994; Lemly, 1996); however, no published studies were found that specifically address chemical transport pathways for wetlands. Projected future changes in climate (increases in temperature and possibly precipitation in the fall, winter, and spring) are widely recognized as being likely to have an impact on various types of wetlands (Winter, 2000, Burkett and Kusler, 2000). However, no specific studies have been published that address the variations in hydrologic response that may be found in the types of wetlands in New England under the climate change scenarios proposed for New England and northeastern North America (Northeast Climate Impacts Assessment, 2006; Houghton and others, 2001; Barron, 2001; Huntington, 2003). One example of categorizing wetlands according to hydrologic vulnerability is discussed in Gilvear and McInnes (1994). In that study, 399 Scottish wetlands grouped into 12 hydrologic classes were assigned to low, moderate, or high levels of vulnerability for 6 hydrologic risk factors, on the basis of the sources of water for the 12 hydrologic classes.

The concept of “ecological risk assessment” for wetlands (Lemly, 1996) is another example of hydrologic vulnerability analysis. It provides a more structured way to evaluate many types of data for wetlands to create a holistic and complete evaluation of the factors that relate to wetland function and health with respect to potential risks posed by human activity and other factors. The ecosystem response to stresses is determined by physical properties, climate, and biotic factors (Lemly, 1996). The physical properties that are important in the risk characterization of wetlands include hydrology, geomorphic setting, and soils. Lemly points out that the important hydrologic parameters for assessing exposure to chemical stressors include the type of water input and flow (direct precipitation, surface flow, subsurface flow, etc.) to wetlands.

The implementation of ecological risk assessment for wetlands is still in its early stages, and approaches and methods are still being tested. Detenbeck and others (2000) used GIS coverages in an ecological risk assessment framework for evaluating resistance and resilience of wetlands and other aquatic ecosystems to hydrology-related stressors in the western Lake Superior Basin. The study presented in this report builds on that approach; hydrologic, geomorphic, and soils variables are evaluated across a large geographic area and across a wide variety of wetland types in a cost-efficient manner using GIS coverages as a way of screening wetlands for two specific hydrology-related stresses (possible delivery of contaminants and climate changes).

Description of Study Area

Mt. Desert Island encompasses 285 km^2 (110 mi^2) and is the largest island on the Atlantic Coast of the United States north of Cape Cod, Massachusetts (fig. 1). Rainfall is about 145 cm/yr (National Oceanic and Atmospheric

Administration, 2002). ANP covers more than 50 percent of the island. Wetlands cover 6 to 10 percent of the island (depending on how the wetlands are mapped), and 11 percent of ANP (including areas not on Mt. Desert Island) (Calhoun and others, 1994; Lubinski and others, 2003). Of these, 32 percent are palustrine freshwater and estuarine wetlands (nonlacustrine and nonmarine). More than 75 percent of the island is forested.

The bedrock of Mt. Desert Island consists primarily of granitic and other igneous intrusive rocks, and metamorphic rocks of various types (Gilman and others, 1988). The fractured nature of these rocks allows limited amounts of ground water to accumulate and flow in the bedrock, providing ground-water-flow paths that may provide water to wetlands in low-lying areas of the island.

A discontinuous layer of glacial and post-glacial sediments overlies the bedrock in most places. Most of the upper-elevation mountains (areas above 300 ft in elevation), as well as many areas at lower elevations, are mapped as bare bedrock and very thin drift (Gilman and others, 1988). The glacial sediments covering the rest of the island are mostly till or fine-grained glaciomarine sediments. The only named surficial geological unit is the Presumpscot Formation, which is a silt and clay deposit of variable thickness and extent that was deposited in seawater during and after glacial retreat (prior to isostatic rebound) when sea level was between 100–120 m higher than it is today (Smith, 1985; Lowell, 1989). Wetlands across the island are developed anywhere that water can accumulate and drain slowly, which may be directly over poorly fractured bedrock, till, or the glaciomarine Presumpscot Formation silts and clays.

Additional details of the geology and geography of the study area are given in Nielsen and others (2006), and Nielsen (2002).

Hydrogeomorphic Classification System for Wetlands on Mt. Desert Island

After the preliminary HGM classification system for Mt. Desert Island was developed (Nielsen and others, 2006), it was applied to all wetland units on the island mapped in the National Wetland Inventory (NWI) (U.S. Fish and Wildlife Service, 1998) except for isolated wetlands less than 0.4 ha (1 acre) in size. The size for isolated wetlands was limited to those greater than 0.4 ha because the target mapping size limit of the NWI maps is 0.4 ha (Tiner, 1997). Many wetland polygons smaller than 0.4 ha were included in the analysis, but these were all part of larger contiguous wetland areas. Overall, 1,202 wetland units were classified, including an additional wetland type (Hilltop/Upper Hillslope), that had not been identified in the preliminary HGM classification (Nielsen and others, 2006). That type is described in the following section, as part of the final HGM classification system for Mt. Desert Island wetlands.

The final HGM classification system and a short description of the 13 types for Mt. Desert Island is shown in table 1. The derivation of the classification system and maps showing examples of each type are found in Nielsen and others (2006), with the exception of the Hilltop/Upper Hillslope type, which was added for this report.

Riverine Wetlands

Riverine wetlands on Mt. Desert Island are found in riparian corridors associated with small first- and second-order streams (higher-order streams do not exist on the island). The streams may be perennial, intermittent, or tidal. Water sources for these wetlands include overbank flow from the channel during precipitation and snowmelt events, shallow subsurface connections between the wetland and stream channel, direct precipitation, overland flow from adjacent uplands during precipitation and snowmelt events, and from ground water. At the headwaters of streams, these wetlands may merge with slope or depressional wetlands as the stream channel disappears (Smith and others, 1995). Water flow is bi-directional—the stream provides the wetland with water when streamflows are high, and the wetlands slowly drain back to the stream during low flows. A high water table in the soils and sediments near the stream may also provide a secondary source of water to these wetlands. In a large wetland with a stream running through it, only the part affected by the stream would be classified as riverine. On Mt. Desert Island, all streams are small, and flooding usually cannot reach a great distance into an adjacent wetland. For this classification, wetland areas adjacent to a stream, but further than 50 m from it, are not considered to be affected by the stream and are not classified as riverine. This is an arbitrary distance, as data on how far a stream's effect extends into adjacent wetlands are not available.

One variable that does affect the formation of riverine wetlands is the presence of beavers and their dams. Beaver-related flow restriction often causes wetland formation in areas where a wetland may not otherwise form or may otherwise be much smaller. Human activities also may cause flow restrictions in streams, resulting in changes in the size or presence of wetlands. Although beaver dams and other flow restrictions do not necessarily affect the sources of water to wetlands, they can be important in the character of the hydrology of a wetland. This HGM classification does not specifically incorporate sources of flow restriction, because they are not apparent at the 1:24,000 scale of maps used in the classification. This HGM classification does allow for the presence of beaver dams and other flow restrictions to be noted for wetlands where they are known to exist. This additional information would assist in the interpretation of future site-specific hydrodynamic data.

Table 1. Hydrogeomorphic classification for wetlands on Mt. Desert Island, Maine, with landscape setting and source of water.

Hydrogeomorphic class		Landscape setting	Source of water
Number	Name		
1	Riverine-Upper Perennial	Within 50 meters of a perennial stream, roughly same altitude as the stream	Primarily lateral exchange with perennial 1st/2nd order stream; may also have ground-water inflow.
2	Riverine-Nonperennial	Within 50 meters of an intermittent stream, roughly same altitude as the stream	Primarily lateral exchange with intermittent/nonperennial stream; may also have ground-water inflow.
3	Riverine-Tidal	Within 50 meters of a tidal stream, roughly same altitude as the stream	Primarily lateral exchange with tidal freshwater stream; flooding from tidal freshwater stream; may also have ground-water inflow.
4	Depressional-Closed	In a topographic depression (hills on two or more sides), no surface inflow or outflow	Inflow from ground water, overland flow, and(or) precipitation.
5	Depressional-Semiclosed	In a topographic depression (hills on two or more sides), some surface-water outflow	Inflow from ground water, overland flow, and(or) precipitation.
6	Depressional-Open	In a topographic depression (hills on two or more sides), surface-water inflow and outflow	Inflow from stream inflow upstream and ground water, overland flow, and(or) precipitation.
7	Depressional-No Ground-Water Input	In a topographic depression (hills on two or more sides), but underlain by Presumpscot Formation, may have surface-water inflows or outflows	Precipitation and overland flow and(or) stream inflow from upstream.
8	Mineral Soil Flat	Wide, flat area, low topographic relief in surrounding area, mineral soils	Precipitation.
9	Organic Soil Flat	Wide, flat area, low topographic relief in surrounding area, organic soils	Precipitation.
10	Tidal Fringe	Adjacent to tidal saltwater body/estuary, within 50 meters or limit of saltwater influence	Overbank flow (lateral exchange) from estuary or other saltwater body.
11	Lacustrine Fringe	Adjacent to large open-water lake/pond (within 100 meters, same altitude, lake/pond must be large enough to control water level in wetland)	Overbank flow (lateral exchange) from lake, may also have ground-water inflow.
12	Slope	On a sloping surface or hillside	Return flow (discharge) from ground water.
13	Hilltop/Upper Hillslope	At or near the top of a mountain or hill, or shoulder of a mountain or hill, having a very small catchment area	Precipitation and overland flow.

Riverine–Upper Perennial

These wetlands are associated with perennial streams in areas of high ground-water levels. Upper Perennial Riverine wetlands lose surface water to the adjacent channel after flooding, to evapotranspiration, or as seepage to ground water if the stream is a losing stream at the wetland location. These wetlands may be wooded or have shrub-scrub or emergent vegetation. Wetlands that are adjacent to streams, but do not receive flow from the stream (flow is uni-directional towards the stream), are not considered riverine wetlands.

Riverine–Nonperennial

Nonperennial riverine wetlands on Mt. Desert Island are differentiated from upper perennial riverine wetlands in that the dominant source of water is from intermittent or ephemeral streams (as mapped on a 7.5-minute USGS topographic map). Additional water sources to the wetland can be from overland flow, precipitation, tributary inflow, interflow from surrounding uplands, and ground water.

Riverine–Tidal

Tidal riverine wetlands on are found along the coast and in estuaries. These wetlands are under the hydrologic influence of the tides in the Atlantic Ocean and its estuaries, but are not saline. They interface with tidal fringe wetlands (including salt marshes), but are distinguished when tidal flow (bidirectional flow) is diminished relative to river or streamflow as the dominant water source. Salinities of 5 parts per thousand (ppt) or less are required in these wetlands (Smith and others, 1995). Additional water sources may be ground-water discharge and precipitation. Tidal riverine wetlands do not tend to dry out for long periods because water-table elevations are controlled primarily by sea surface elevation. These wetlands lose water by tidal exchange, overland flow to tidal creek channels, and by evapotranspiration. Organic matter often accumulates in higher elevation marsh areas (Smith and others, 1995). Because salinities and the extent of tidal influence on coastal streams are not shown on 1:24,000-scale maps, these wetlands can be differentiated from other coastal riverine wetlands only after collecting information in the field.

Depressional Wetlands

Depressional wetlands on Mt. Desert Island are a major class of wetlands that form in topographic depressions or basins (which may be closed, semiclosed, or open) where inflowing surface water accumulates. Water sources for these wetlands include direct precipitation, ground-water discharge, overland flow, and shallow subsurface seepage from adjacent uplands (“interflow”). The local hydrologic gradient is primarily from the uplands surrounding the wetland toward the center of the depression. Gaps in the surrounding uplands may allow for stream inlets and(or) outlets. Water flows out of depressional wetlands through evapotranspiration, ground-water recharge, or, if stream channels exist, through perennial or intermittent surface-water flow (Smith and others, 1995). Peat deposits may develop in some depressional wetlands. Depressional wetlands may have open water in the center, but the depth of water generally does not exceed 2 m and is usually much less (open water bodies with depths greater than 2 m are defined as lacustrine wetlands or water bodies in the NWI, rather than palustrine wetlands (Cowardin and others, 1979)).

Depressional–Closed

Closed depressional wetlands lack any discernable surface-water inlets or outlets. Flow is from ground-water discharge, overland flow, and shallow seepage from adjacent uplands (“interflow”); outflow is through ground-water seepage and evapotranspiration. Vernal pools and kettle-hole wetlands are examples of closed depressional wetlands.

Depressional–Semiclosed

Semiclosed depressional wetlands are similar to closed depressional wetlands, although they have one or more surface-water outlets (Smith and others, 1995), and are much more common than closed depressional wetlands. They have no discernable surface-water inlet, and sources of water are from precipitation, overland flow, ground-water discharge, and shallow seepage from adjacent uplands (“interflow”). Water drains these wetlands through intermittent or perennial streams, ground-water recharge, and(or) evapotranspiration. Peat deposits may develop in some semiclosed depressional wetlands.

Depressional–Open

Open depressional wetlands are distinguished from other depressional wetlands by discernable surface-water inlets and outlets (Smith and others, 1995). These wetlands may be further differentiated into open, ground-water depressional wetlands—where the primary source of water is ground water—and open, surface-water depressional wetlands—where the primary source of water is surface-water runoff, precipitation, overland flow, or interflow. These wetlands are supported by a locally high water table and are common on Mt. Desert Island (Calhoun and others, 1994). These wetlands exist in till, glaciomarine, and bedrock settings. Open depressional wetlands may have a corridor of riverine wetland along a stream within the wetland.

Depressional–No Ground-Water Input

In depressional settings where the glaciomarine Presumpscot Formation forms a thick blanket of low-permeability sediments below the wetland, a depressional

wetland may be cut off from ground-water inflow. If a wetland in a depression is in an area where the hydraulic head in the underlying aquifer is higher than in the wetland, and ground water would normally discharge to the wetland were it not for the low-permeability sediments, that wetland would be classified as depressional with no ground-water input. The presence of the Presumpscot Formation itself, however, does not automatically mean that water cannot flow from the ground water to the wetland. The Presumpscot Formation is fractured in many places, and the thickness may vary from less than a meter to more than 20 m (unpublished well logs from the Maine Geological Survey). Most wetlands that are developed on glaciomarine deposits in depressional settings on Mt. Desert Island probably receive some ground-water inflow because of the variation in thickness and fracturing of the deposits, and would be considered semiclosed depressional or open ground-water depressional wetlands. This particular subclass should be used only when sufficient field data have been collected to rule out ground-water discharge to the wetland, and cannot be assigned using map data alone.

Mineral Soil Flat

Mineral soil flats are wetlands developed on relatively flat ground, which includes interfluves (flat areas between streams draining in the same general direction), other relatively flat upland areas, and large flood-plain terraces (Smith and others, 1995). The dominant source of water is precipitation. Mineral soil flats are distinguished from depressional and slope wetlands in that they receive virtually no ground-water inputs, although the water level is maintained by a locally high water table, which prevents drainage of runoff and precipitation. Water drains these wetlands through overland flow, evapotranspiration, and seepage to ground water. Vertical drainage tends to be poor, because of clayey soils, hardpans, slow rates of lateral drainage, and low hydraulic gradients (Smith and others, 1995). On Mt. Desert Island, the clay-rich Presumpscot Formation commonly is present at depth beneath these wetlands. Mineral soil flats can eventually become organic soil flats if peat accumulates. Common examples of mineral soil flat wetlands are various types of forested wetlands with hydric (seasonally water-saturated) soils. Riverine wetlands may be found near streams within larger areas of soil flat wetlands.

Organic Soil Flat

Organic soil flat wetlands, also referred to as extensive peatlands, are differentiated from mineral soil flats primarily by the vertical accretion of organic matter (Smith and others, 1995). Organic soil flat wetlands are common on flat interfluves; they also may have been former large depressional wetlands that have become filled with peat to form relatively large, flat surface areas (Smith and others, 1995). The dominant source of water is precipitation. Water loss is by evapotranspiration, streamflow, overland flow, and seepage to ground water. Organic soil flats share many characteristics with raised bogs but do not have the convex upward form of bogs and the low-nutrient conditions for plants that bogs provide.

Tidal Fringe

Tidal fringe wetlands are found bordering estuaries and along the coast; water levels are under the influence of local tidal fluctuations (Smith and others, 1995). These wetlands may merge landward with other types of wetlands, including riverine wetlands, mineral soil flats, or organic soil flats. Pore-water salinities of 5 to 30 parts per thousand distinguish tidal fringe wetlands from riverine-tidal wetlands (Smith and others, 1995). Because salt marshes are within this salinity range, they are considered tidal fringe wetlands. Water sources also include direct precipitation and may include ground-water discharge. Tidal fringe wetlands lose water through tidal exchange, evapotranspiration, and overland or subsurface flow to tidal creek channels (Smith and others, 1995). Tidal fringe wetlands seldom dry out because they are frequently flooded by high tides, especially bi-monthly spring tides, and water-table elevations are controlled primarily by sea-level elevation. Organic matter tends to accumulate at higher elevation marsh areas where flooding is less frequent and shoreline wave erosion is not a factor.

Lacustrine Fringe

Lacustrine fringe wetlands on Mt. Desert Island are located adjacent to lakes and ponds where the water level of the lake maintains the water level in the wetland (Smith and others, 1995). Water also enters these wetlands through direct precipitation and ground-water discharge. Ground-water discharge may dominate where lacustrine fringe wetlands come into contact with adjacent uplands or slope wetlands. Lacustrine fringe wetlands lose water through overland or subsurface flow to the lake or pond (following flooding), and by evapotranspiration. Organic matter may accumulate in areas protected from shoreline wave erosion. Water can be up to 2 m deep in some areas. Wetlands that are adjacent to small ponds (often considered a part of the wetland itself), and that do not have another independent source of water (such as stream inflows), are not included in the lacustrine fringe subclass, but are generally classified as depressional wetlands of some sort. For this HGM classification system, portions of wetlands adjacent to a lake or pond, but further than 100 m from it, are not considered to be affected by the water body and, therefore, are not classified as lacustrine fringe. The 100 m is an arbitrary distance, because data are not readily available that could help determine how far the a water body's influence may extend into an adjacent wetland. This distance may vary with lake level, elevation of the wetland, vegetation, and other factors.

Slope

Slope wetlands normally exist on sloped land where ground water discharges to the land surface (Smith and others, 1995). Many geologic settings can produce this effect; on Mt. Desert Island this may occur because a lower-permeability layer (fractured bedrock, for example) forces ground water to the surface saturating the surficial soils. Elevation gradients range from slight slopes to steep hillsides. Slope wetlands are distinguished from depressional wetlands because there is no basin shape, and the wetlands are on sloping surfaces. The dominant water source is ground water, but precipitation and interflow from surrounding uplands also may contribute water. Slope wetlands lose water by evapotranspiration, by saturated flow back into ground water on their downslope side, and overland surface flow. Some slope wetlands appear on a topographic map to be similar to riverine wetlands, but these slope wetlands are always slightly higher in elevation than the stream and supply the stream with water rather than receive water from the stream.

Hilltop/Upper Hillslope

Wetlands developed in small depressions on the tops of hills or ridges are classified as hilltop/upper hillslope wetlands. These wetlands are generally elevated above the regional ground-water system, and are located in ground-water recharge areas. The only source of water is precipitation and runoff from immediately adjacent uplands. These wetlands are distinguished from depressional wetlands in that they are located where ground-water discharge cannot occur—they are on higher ground, they have very small catchment areas, and are found at or near the top of a hill. Water drains these wetlands through evapotranspiration and in some cases, by slow seepage to ground water. These wetlands are formed where drainage is slowed by the bottom sediments in the wetland and(or) by the lack of fractures in bedrock underlying them. Hilltop/upper hillslope wetlands may form on bedrock or on unconsolidated sediments.

Dichotomous Key for the Identification of Wetland Subclasses

To assist in the classification of wetlands using the HGM subclasses, a dichotomous key was developed for Mt. Desert Island (table 2). The key consists of a series of paired choices called couplets. Each couplet presents the user with two alternative choices that distinguish one group of wetlands from another. The user chooses one alternative, and the answer determines which couplet is referred to next, until a wetland type is determined. The key was developed to be used with GIS data as much as possible.

Hydrogeomorphic Classification of Wetlands on Mt. Desert Island

An initial classification of 1,202 wetland polygons on Mt. Desert Island was accomplished using available map data at a scale of 1:24,000. The base data used were the NWI polygons from the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service, 1998). All the wetland polygons in the Estuarine and Palustrine systems (Cowardin and others, 1979) on the island were classified, except for isolated wetland polygons less than 0.4 ha (1 acre) in size. Many polygons less than 0.4 ha were classified but all are part of larger contiguous wetland areas, which were divided into smaller polygons on the basis of vegetation type and other factors. The additional data layers used in the classification included the USGS digital topographic maps (Bar Harbor, Bartlett Island, Bass Harbor, Salsbury Cove, Seal Cove, Southwest Harbor, Swans Island, and Tremont 7.5-minute quadrangles), and soils data from the National Resources Conservation Service (Jordan, 1998) in digital format (scale 1:20,000). This HGM classification was applied to each of these wetlands, producing a GIS coverage of classified wetlands for the island. Appendix 1 describes the specific steps used in applying the dichotomous key and the HGM classification system to the wetland polygons on the island.

Each of the 1,202 wetland polygons was given a number. First, all the wetlands (larger than 0.4 ha) were numbered from west to east, and north to south on the island. Wetland areas consisting of several contiguous wetland polygons were treated as one wetland in the numbering system. Then, within each of these wetland areas with more than one polygon, the individual polygons were given a sequential letter. For example, one wetland area was given the number 14 (near Hulls Cove, in the town of Bar Harbor, see plate 1). This wetland area consisted of five contiguous wetland polygons. The wetland polygons were numbered 14-a, 14-b, 14-c, 14-d, and 14-e. The next wetland area (15, adjacent to Hamilton Pond, near Salsbury Cove, in the town of Bar Harbor, see plate 1) consisted of only one polygon, so its number was simply 15. A list of all 1,202 wetlands and their resulting classifications is given in appendix 2. Plate 1 shows the locations and distribution of the wetlands.

The number of wetlands in each HGM subclass is shown in table 3. The 1,202 mapped wetland polygons range in size from less than 0.1 to 41.8 ha. Two of the HGM subclasses were not assigned to any wetlands (Riverine-Tidal, and Depressional-No Ground Water Input), because the information needed to determine that a wetland falls into those classes is not available at this map scale and must be determined on the basis of site-specific field data. Most small, isolated wetlands classified on the island are Slope wetlands. The least common are the Hilltop/Upper Hillslope wetlands, which only occur on a few hilltops and shoulders of hills and mountains. Large wetland complexes generally comprise groups of Depressional wetlands and Mineral Soil Flat or Organic Soil Flat wetlands, often with fringing Slope wetlands

Table 2. Hydrogeomorphic classification key for Mt. Desert Island, Maine.

1. Is the wetland adjacent to saltwater or an estuary?	
Yes	Tidal Fringe
No	2
2. Is the wetland immediately adjacent to an open-water lake/pond?	
Yes	3
No	5
3. Is the wetland area within 100 meters of the lake/pond and at the same elevation?	
Yes	4
No	5
4. Is the pond large enough to supply water to the wetland, or does the pond have an independent source of water such as a stream flowing into it?	
Yes	Lacustrine Fringe
No	5
5. Is there a river or stream running through the wetland?	
Yes	6
No	9
6. Does the stream appear to be the dominant source of water for the wetland (that is, is the stream at the same altitude as most of the wetland, and is the wetland area within 50 meters of the stream)?	
Yes	7
No	9
7. Is the stream tidal or nontidal?	
Tidal	Riverine-Tidal
Nontidal	8
8. Is the stream perennial or nonperennial?	
Perennial	Riverine-Upper Perennial
Nonperennial	Riverine-Nonperennial
9. Is the wetland situated at the top or near the top of a hill, having very little opportunity for ground water inflow, and does it have a very small catchment area?	
Yes	Hilltop/Upper Hillslope
No	10
10. Is the wetland on a sloping surface (does it cross contour lines or otherwise appear to be on a slope)?	
Yes	Slope
No	11
11. Does the wetland appear to be in a topographic basin or depression (nearby hills on two or more sides)?	
Yes	12
No	16
12. Is the wetland set in a large, low-slope area, where the only obvious source of water is precipitation?	
Yes	16
No	13
13. Is the wetland underlain by Presumpscot Formation clays, and has field data shown that there is no ground-water input to the wetland?	
Yes	Depressional with No Ground-Water Input
No	14
14. Does the wetland have surface-water outflows?	
Yes	15
No	Depressional-Closed
15. Does the wetland have surface-water inflows?	
Yes	Depressional-Open
No	Depressional-Semiclosed
16. Is the wetland underlain by soils that are...	
Peat-type, organic rich	Organic Soil Flat
Non-peat soils	Mineral Soil Flat

Table 3. Distribution of hydrogeomorphic classes of wetlands on Mt. Desert Island, Maine.

[ha, hectares; --, no information]

Hydrogeomorphic class	Number of wetlands	Size range (ha)	Median size (ha)	Total wetland area in study (ha)
Riverine-Upper Perennial	185	0.1–12.9	0.8	253
Riverine-Nonperennial	46	.1–6.0	.7	42
Riverine-Tidal	0	--	--	--
Depressional-Closed	64	.1–5.4	.6	63
Depressional-Semiclosed	111	.1–17.2	.8	204
Depressional-Open	83	.1–11.5	1.0	146
Depressional-No Ground-Water Input	0	--	--	--
Mineral Soil Flat	89	.1–5.6	.5	73
Organic Soil Flat	121	.1–41.8	1.1	415
Slope	327	.1–9.6	.7	358
Small Pond/Open Water	35	.4–5.0	.9	57
Tidal Fringe	51	.1–11.4	.9	120
Lacustrine Fringe	68	<.1–11.8	.6	86
Hilltop/Upper Hillslope	22	.1–1.6	.5	14
Total	1,202	<.1–41.8	Median size of all wetlands: 0.7	1,830

at their edges and Riverine wetlands near streams flowing through them.

Some of the wetland polygons mapped in the NWI as Palustrine wetlands coincided with open water bodies and small ponds on the topographic maps. After checking aerial photos (digital black and white orthophotos from 1995) to determine how much of the mapped wetland polygon was actually open water, these polygons were divided into two groups: those that had 50 percent or less open water were treated as any other polygon unit in the classification; and polygons that showed more than 50 percent open water on the aerial photos were further divided into two more groups based on size. These groups were (1) polygons that were 0.2 ha or larger in size were not put in the HGM classification system, but were tagged as “open water,” and (2) polygons smaller than 0.2 ha were classified with their largest adjacent polygon neighbor.

The mapped wetland polygons in the dataset used in this analysis cover 1,830 ha (4,520 acres) on Mt. Desert Island, ranging in size from less than 0.1 ha (which are very small polygons in contiguous wetland groups larger than 0.4 ha in size) to 41.8 ha. The most common wetlands on Mt. Desert Island are Slope wetlands (327 polygons, covering 358 ha), and Riverine-Upper Perennial (185 polygons, covering 253 ha). There are 258 Depressional wetlands overall, covering 413 ha. The least common type are the Hilltop/Upper Hillslope wetlands (22 polygons, covering only 14 ha). The largest individually mapped wetland polygons on the island were some of the Organic Soil Flat wetlands, at 41.8 ha; this group also had the largest median size (1.1 ha) on the island, and the largest total area (415 ha). Mineral Soil Flat and Hilltop/Upper Hillslope wetlands had the smallest median size (0.5 ha). This distribution shows a large variety of wetlands in size and in type on the island.

Because of the size restriction, the overall distribution of wetland types on the island may be somewhat different than presented above. Many of the small wetlands not included are either vernal pools, which are Depressional wetlands, Slope wetlands, or small wetlands found at high elevations, which could be Hilltop/Upper Hillslope wetlands or Slope wetlands. It is also possible that some of these smallest wetlands do not fit well into any of these HGM classes and should be grouped into a new class. This would have to be determined after attempting to classify the small isolated wetlands that were not included in this project.

Any wetland classification application that relies on remotely obtained data has some error associated with it. The NWI maps have been evaluated for the accuracy of the designation of areas as wetlands, and the results indicate that the accuracy rate varies considerably from region to region (Kudray and Gale, 2000). In some Maine areas, the accuracy was high, greater than 95 percent (Nichols, 1994). This HGM classification of wetlands on Mt. Desert Island also has an associated error in the interpretation of HGM class from the

map-scale data. An earlier test of the method on 20 wetlands (Nielsen and others, 2006) indicated an error rate from 12 to 18 percent, with the 12-percent error for undisturbed wetlands and the 18-percent error for disturbed wetlands. Another review of 100 of the wetlands classified for this study calculated an error rate of 15 percent (G.R. Guntenspergen, U.S. Geological Survey, Patuxent Wildlife Research Center, oral commun., 2006). Thus, this initial (not field verified) HGM classification has an accuracy of about 85 percent.

Hydrologic Susceptibility Factors for Wetlands in Acadia National Park, Mt. Desert Island

The development of a wetland monitoring plan is an important long-term goal in ANP's Water Resources Management Plan (Kahl and others, 2000). Because of the large number of wetlands in the park, and the limited resources available for future monitoring, the monitoring plan must be designed for efficient implementation. An efficient plan includes criteria to selectively monitor a representative subset of the several hundred wetlands in the park, as well as specific wetlands of special concern. In the selection of representative wetlands for monitoring, many variables must be analyzed, including (but not limited to) location, presence of endangered species or critical habitat, wetland size, proximity to known disturbance factors, and several hydrological factors. Hydrologic factors include (1) the HGM classification, (2) an initial analysis of hydrologic mechanisms by which any contaminants generated in a wetland catchment might reach the wetland, and (3) an analysis of possible susceptibility to water-supply disruptions under projected future climate-change scenarios.

Understanding the hydrologic mechanisms for contaminant flow in a wetland is important because if potential sources of contamination are identified in the catchment, the proper pathway (ground water or stream inflow, for example) can be evaluated further to create an early-detection program. This information could also be used in providing a first estimate into the travel time for contaminants to reach a given wetland (surface-water delivery is faster than ground-water-delivery). Several landscape-scale variables relating to these pathways (see "Methods Used to Determine Variables for Susceptibility Factors," below) are evaluated for a subset of the island's wetlands (see "Selection of Wetlands for Susceptibility Factor Scoring," below), and the variables are grouped in a scoring system for the preliminary identification of dominant pathways for each wetland. This scoring system is only useful as a tool to organize wetlands on the island and help evaluate which wetlands might be further investigated. (Any inference about sources of water and contaminant delivery pathways for the wetland should be verified by collecting field data for wetlands selected for further investigation.)

Another hydrologic factor used to organize and stratify wetlands is to understand the possible fate of wetlands if the climate in New England changes in the future. This factor will assist in understanding whether certain wetlands are (1) more at risk than others of receiving less water during the growing season, drying out, and shifting in ecological function, and (2) less susceptible than others to potential disruptions in water supply under projected climate-change scenarios for the future. Winter (2000) indicated that certain landscape settings make some wetlands more susceptible to hydrologic alteration under projected future climate change than others. As a result, those changes can result in shifts in wetland ecological and hydrologic function (Burkett and Kusler, 2000). Landscape-scale variables related to potential changes in hydrologic regime for projected climate change are evaluated for the candidate wetlands in the section "Methods Used to Determine Variables for Susceptibility Factors." These variables are then grouped in a separate scoring system to indicate vulnerability to water-supply disruptions. As with the hydrologic pathways scores, the vulnerability scores determined using GIS are intended only to help organize wetlands on Mt. Desert Island and help evaluate which might be further investigated for final inclusion in a monitoring program. The scores do not substitute for the collection of field data, which are the best method of determining exact sources of water to wetlands.

A subset of wetlands in Acadia National Park and larger than 1 ha were analyzed for the two factors described above. The factor scores for each wetland are based on the landscape characteristics of the individual watershed ("catchment") that drains into each wetland, and the size of the wetland.

Methods Used to Determine Variables for Susceptibility Factors

The availability of GIS data makes the determination of landscape-level statistics for any given area readily available for Mt. Desert Island. Any GIS-derived landscape-level statistic can be used as a variable in a geographic analysis such as in this study, but data should be used that are similar to the scale of the wetland polygon data (1:24,000) and the scale at which the wetland catchments were determined (1:24,000). Landscape-level GIS data including topography, hydrography, vegetation, surficial and bedrock geology, transportation, and soils are all available at scales between 1:20,000 and 1:50,000. These data were used to calculate statistics (variables) for the catchment areas of these wetlands. Out of all the possible variables that can be determined for this area, the following 10 were selected for their relevance to water supply and water availability: wetland area, wetland catchment area, catchment slope, total relief of catchment, percent of catchment with little to no soil, percent of catchment covered by clay soils, percent storage in catchment, percent impervious area in catchment, surface-water inflows to wetland, and lacustrine/tidal influence on wetland. How each variable was determined using the GIS layers is described in table 4.

Table 4. Landscape-scale variables used in assigning wetland susceptibility scores for wetlands on Mt. Desert Island, Maine.

[GIS, geographic information system; SSURGO, Soil Survey Geographic Database; NWI, National Wetland Inventory; NRCS, Natural Resources Conservation Service (U.S. Department of Agriculture); USGS, U.S. Geological Survey; HGM, hydrogeomorphic]

Variable	GIS layer used	How the variable was determined
Wetland area	NWI wetlands	Simple area calculation.
Catchment area	Catchments determined for this study (see "Determining Catchment Areas for Wetlands" in text)	Simple area calculation.
Wetland area divided by catchment area	Wetland Areas (NWI) and Catchments	Simple division.
Catchment slope	Digital Elevation Model (10 meters)	Slope calculated as a percent; average for the catchment.
Catchment total relief	Digital Elevation Model (10 meters)	Maximum elevation minus minimum elevation.
Percent bare (no soil) in catchment	SSURGO soils data from NRCS, and surficial geology data	Soil map shows areas with very little to no soil cover, as does the surficial geology map. These two were merged to create an extent of "bare soil" on the island. This was used to calculate the percent of each catchment with little or no soil.
Percent clay soil in catchment	SSURGO soils data from NRCS, and surficial geology data	Soil unit descriptions were used to make a map of the extent of the clay soils in the area, which are interpreted to be Presumpscot Formation, on basis of the surficial geology map of the island. This was used to calculate the percent of each catchment underlain by clay soils.
Percent storage in catchment	NWI wetlands and hydrography from USGS digital line graphs (1:24,000)	Wetlands and ponds provide storage for runoff generated in the catchment. The total wetland area and pond/lake area in each catchment were added together to get the percent storage in each catchment.
Percent impervious area in catchment	Roads (USGS digital line graphs) and urban land-use areas (National Park Service vegetation map)	Urban land use was multiplied by 0.25. Roads were assigned a width on the basis of their class, which was used with the total length of roads in each catchment to calculate total impervious area.
Surface-water (stream) inflows	HGM classification	Wetlands classified as Riverine, Lacustrine Fringe, Tidal Fringe, and Depressional-Open were given a "yes" score. Others were "no."
Lacustrine/Tidal influence	HGM classification, hydrography from USGS digital line graphs (1:24,000)	Wetlands classified as Lacustrine Fringe and Tidal Fringe were given a score for this variable. The degree of lacustrine influence was determined by dividing the wetland area by the area of the adjacent water body.

Scaling of Variables

Because some of the variables represent percentages of a catchment area, and others represent other types of measurements, the raw values were first normalized so each variable was reported in reference to a common scale (0 to 1) by dividing each value by the maximum value for that variable. Next, the normalized range (from 0 to 1.00) was divided into 10 equal-size intervals. The normalized value was then converted to a scaled integer based on its position within the range for that variable. Variables that were continuous (not having zero values, such as catchment area) were assigned scaled integer values from 1 to 10. Variables that are either zero or a positive value (such as percentage of clay soils in the catchment) were assigned scaled integer values from 0 to 10. Variables that were binary (presence or absence of surface-water inflow) were scored as either 0 or 5, where 5 represents an average positive value.

Methods Used to Determine Susceptibility Factor Scores

The specific measures used to determine susceptibility factor scores for potential hydrologic pathways for contaminant delivery to wetlands and potential changes in wetland hydrologic regime considering projected climate change for eastern North America are similar. First, wetland polygons were aggregated into contiguous units based on their HGM classification. Second, using a GIS, catchment areas for each of these aggregated wetlands were delineated. Next, landscape-scale geographic variables were determined for each of the wetland catchments. The landscape-scale variables were converted to scores for each of the two susceptibility factors, using a different combination of variables and scoring metrics for each.

Selection of Wetlands for Susceptibility Factor Scoring

Once the NWI polygons were classified using the HGM classification system for Mt. Desert Island, they were aggregated based on their HGM classes. Thus, contiguous wetland polygons with the same HGM classification were merged together into one polygon for this part of the study (fig. 2). Wetlands located partially or totally within the legislative boundary of ANP, on Mt. Desert Island, were included in this analysis.

Because the catchment area for each wetland was determined using topographic maps, a size limit also was imposed. Wetlands smaller than 1 ha were not included, because in many cases a more-detailed topographic survey would be needed to confidently map the catchment area, and many of the GIS data layers used in determining the hydrologic factors are not suitable for use at scales greater than 1:24,000. If an analysis similar to the one described in this study was needed for wetlands less than 1 ha, a more qualitative analysis could be completed using either the general area upgradient from these wetlands or a buffer area around the wetlands, which does not consider hydrologic gradients. Because of the size limit and restriction to wetlands within ANP, the total number of wetland polygons used for the susceptibility scoring was 186, out of the original 1,202.

Determining Catchment Areas for Wetlands

The catchment area for each of the 186 wetland polygons was determined using existing topographic data and a base watershed boundary map of Mt. Desert Island. The watershed boundary map was jointly developed by the USGS and University of Minnesota[1],) using Arc Hydro tools (Maidment, 2003) and an iterative approach to verify that the catchment boundaries followed the mapped topography. Catchments for individual wetlands were then delineated by identifying the catchment divides at the edges of the wetland polygon, and tracing those divides uphill to the nearest mapped divides on the base watershed boundary map.

Because many wetlands are upgradient or downgradient from one another, catchment areas for many wetlands overlap. A series of wetlands with nested catchment areas is shown in figure 3. It is recognized that in some cases where ground water discharges to a wetland, the subsurface catchment area for that ground-water discharge zone may not match the topographic catchment (Tiedeman and others, 1997). Because subsurface catchment areas (and the ground-water discharge zones) cannot be defined using existing information, it was assumed that the topographic catchments represent surface runoff and ground-water discharge to the wetlands.

[1] Collaborators on the watershed delineation were Glenn Guntenspergen (U.S. Geological Survey, Patuxent Wildlife Research Center), Martha Nielsen (U.S. Geological Survey, Maine Water Science Center), and Tom Hollenhorst (University of Minnesota—Duluth, Natural Resources Research Institute).

Hydrologic Pathways for Contaminants Entering Wetlands

Chemical contamination from human activities, including nutrient enrichment, is an important factor in the habitat degradation of many wetlands. Chemical contaminants may enter wetlands from direct precipitation, runoff (overland flow and channelized stream inflow), and ground-water inflow. This analysis suggests the relative importance of each of these pathways in the delivery of chemical contaminants potentially found in a wetland catchment (or generated in the atmosphere, in the case of direct precipitation). Specific threats posed by various contamination sources in a wetland catchment are not addressed in this study.

Measures Indicating Dominant Pathways for Potential Contamination in Acadia National Park Wetlands

Direct Precipitation: All wetlands receive direct precipitation; therefore, the wetlands for which direct precipitation is a primary pathway are those that get most of their water from precipitation, rather than runoff or ground water. Wetlands with small catchment areas relative to the size of the wetland usually receive a larger percentage of their water inputs from direct precipitation than wetlands with larger catchments. The measure of the relative risk posed by direct precipitation is calculated as the area of the wetland divided by the area of the catchment.

Runoff: Most wetlands also receive runoff as part of their water budget. The threat of chemical contamination being delivered from runoff is related not only to the catchment area, but also to the speed at which the runoff reaches the wetland. Speed of runoff delivery is important because time for chemical attenuation and transformation before contaminated water reaches the wetland is reduced, and the opportunity for runoff to enter the ground-water system decreases with faster runoff speed. The measure used in this study of the relative risk posed by runoff includes factors related to speed of runoff (slope of the catchment, percent of the catchment covered by very thin soils or no soil cover at all, and amount of manmade impervious surface in the catchment), stream channel inflows to the wetland, and catchment size.

Ground water: Many wetlands also receive ground-water inflow. Ground-water inflow to wetlands occurs where the hydraulic head in the aquifer (below the wetland) is higher than the hydraulic head (water surface) in the wetland and there is a hydraulic connection between the underlying aquifer and the wetland. The greater the head in the aquifer relative to the head in the wetland, the greater the potential for ground-water inflow. Head is a measure of the potential energy of the water; in a wetland, the head is the water surface. In an aquifer, the head is the level to which water will rise in a well. The larger and steeper the catchment area, the greater the potential energy (head) that can be generated in an aquifer.

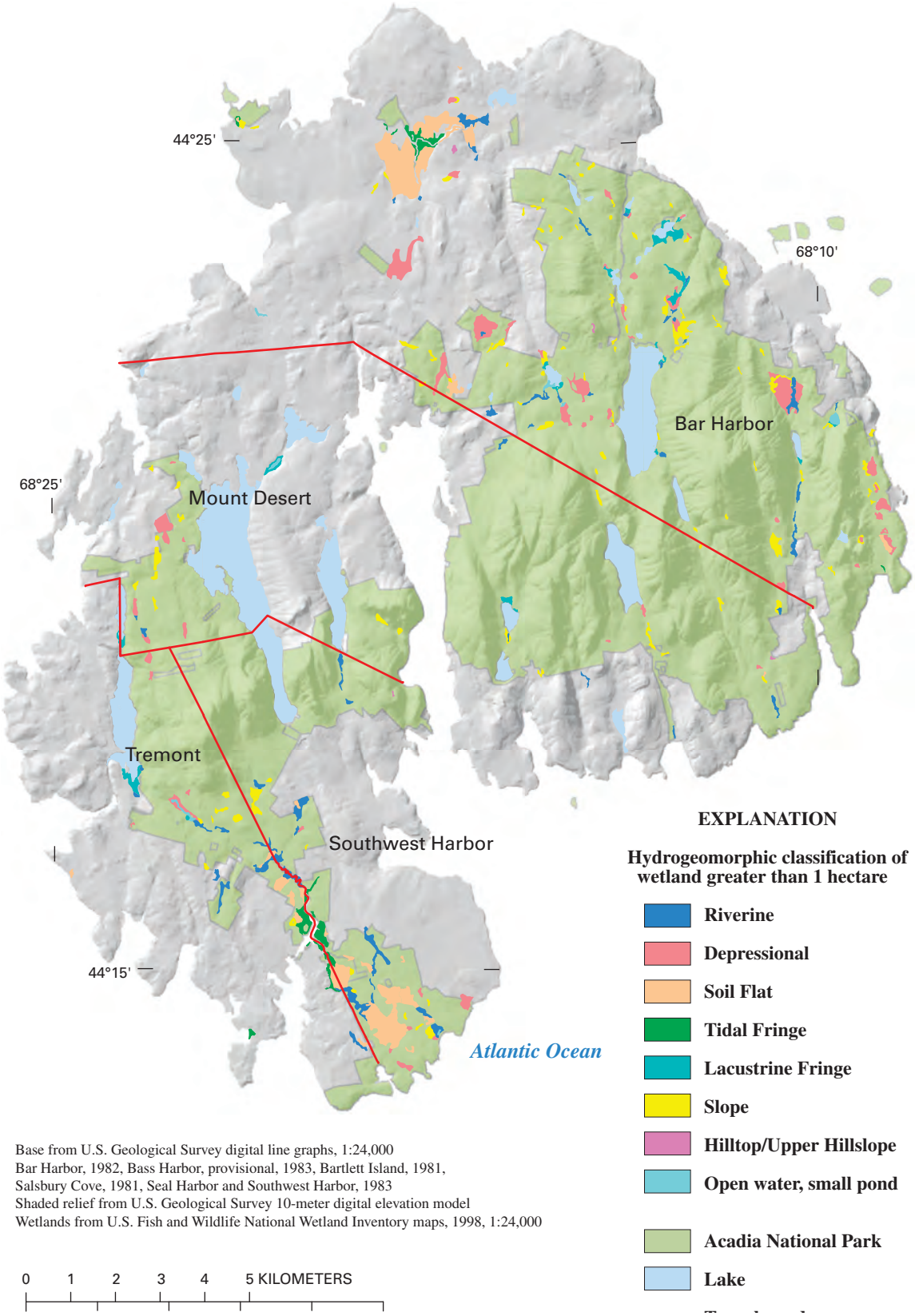


Figure 2. Hydrogeomorphic classification of wetlands greater than 1 hectare in size in Acadia National Park, Mt. Desert Island, Maine.

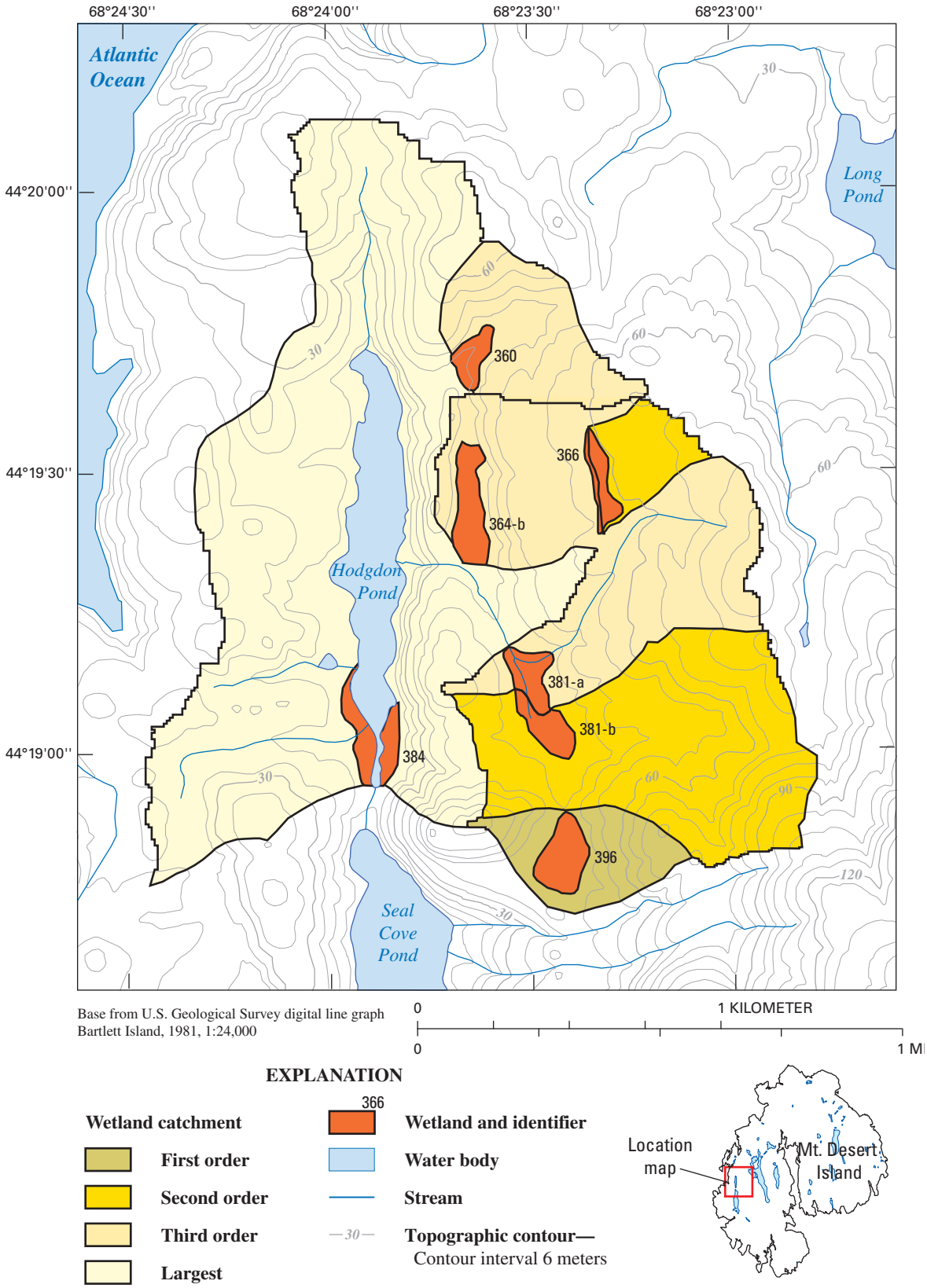


Figure 3. Example of wetlands in relation to their catchment areas in Acadia National Park, Mt. Desert Island, Maine.

The potential amount of ground-water recharge to the aquifer within the wetland catchment and the ability of the soils under the wetland to actually transmit ground water also are important for ground-water delivery to wetlands. Specifically, the composition and texture of soils and sediments in wetland catchment areas are important factors for ground-water delivery (O'Brien and Motts, 1980). Clay soils in the catchment area inhibit recharge to the aquifer, and clay soils underlying the wetland can decrease ground-water inflow from the aquifer. Finally, a lack of stream channels entering a wetland probably indicates a greater likelihood that water enters the wetland from ground water rather than surface runoff. The measure used in this study for the relative risk posed by contamination entering a wetland through ground water includes factors related to the size and total relief of the wetland catchment area, the amount of clay soils present in the catchment, and lack of stream inflows.

The water-source variables that were combined to determine the scores for a particular water source as a potential transport mechanism for contamination for each of the wetlands are shown in table 5. The individual scaled variables for each component were summed to get the final scores for each water source. The minimum possible scores for precipitation, runoff, and ground water are 1, 2, and 3, respectively. The maximum possible scores are 10, 45, and 35. Because data on the relative importance of each of the components in representing the final factor score are not available, each component is given equal weight in determining the final score. Further data collection would be necessary to include weighting of the various variables in determining the scores.

Potential Changes in Wetland Hydrologic Regime Considering Projected Future Climate Change

There is growing consensus about the possibility that our climate is changing. Changes in the amount and timing of precipitation and runoff have been reported, some focusing on the northeastern United States (Houghton and others, 2001), and particularly in Maine. Hodgkins and others (2005b) described changes in hydrology that are related to climate variables such as summertime low flows in streams and rivers in New England over the last 100 years. Other observed changes include changes in the proportion of precipitation occurring as snow in New England over the last 50 years (Huntington and others, 2004), changes in the timing of lake ice-out and river ice-out (Hodgkins and others, 2002, Dudley and Hodgkins, 2002), and changes in the number and timing of ice-affected flow days in northern New England rivers (Hodgkins and others, 2005a).

Projections for Climate Changes in Northeastern North America

Several climate change models have been used to predict changes in climate in the next century for northeastern North America, including the Hadley climate model, the Canadian model, and the Geophysical Fluid dynamics Laboratory (GDFL) model (National Assessment Synthesis Team, 2001; Northeast Climate Impacts Assessment, 2006). These

Table 5. Variables used to determine the potential of a particular source of water being a transport mechanism for contaminant delivery to wetlands at Acadia National Park, Maine.

[ha, hectares, m, meters]

Source of water	Variables used	Range in raw scores	Range in scaled scores
Precipitation	Area of the wetland divided by area of catchment	0.0005 to 0.72	1 to 10
Runoff	Average catchment slope (percent rise)	0.84 to 50	1 to 10
	Percent of catchment having little or no soil	0 to 100	0 to 10
	Percent impervious surface in catchment	0 to 29	0 to 10
	Stream inflow channel	0 or 1	0 and 5
	Size of catchment	2.1 to 2,500 ha	1 to 10
Ground water	Catchment relief	1.4 to 430 m	1 to 10
	Size of catchment	2.1 to 2,500 ha	1 to 10
	Percent of catchment with clay soils	0 to 100	1 to 10
	Lack of stream inflow	0 or 1	0 and 5

predictions, plus inferences based on observed changes in climate over the last century, indicate that temperatures in New England are expected to increase by 3.5 to over 6.5°C over the next 100 years, continuing an increase of 2°C in coastal New England over the last century (Barron, 2001). The models differ slightly in their predictions of future precipitation, but an annual increase of 10 percent seems likely (Northeast Climate Impacts Assessment, 2006), and winter precipitation could increase as much as 16 percent. This potential increase in precipitation, however, does not necessarily translate into more water for wetlands, as projected temperature increases would result in increased evapotranspiration and reduced runoff (Huntington, 2003; Houghton and others, 2001). These projected increases in precipitation would be largest during the fall, winter, and spring in New England (Barron, 2001; Houghton and others, 2001), and are not expected to coincide with seasonal increases in evapotranspiration during the summer; the net result may possibly be a water deficit for many wetlands during the growing season (Brooks, 2004).

Wetland Hydrology Implications of Projected Climate Changes

Changes in wetland hydrology are expected under these future climate-change predictions (Brooks, 2004; Burkett and Kusler, 2000; Winter, 2000; Meyer and others, 1999). The projected increases in precipitation are modeled to occur largely as increases in extreme precipitation events in the spring and fall (Houghton and others, 2001, p. 573). Ground-water recharge in northeastern North America occurs primarily during spring and fall, when evaporation potential is low and precipitation is plentiful (Randall and others, 1988). Therefore, ground-water recharge could increase with the projected climate scenario, while growing-season runoff could decrease (Huntington, 2003). Wetlands receiving a large amount of ground water are expected to be more resilient to long-term climate change than other wetlands (Winter, 2000), as non-growing-season precipitation is stored in aquifers as recharge and slowly released to wetlands during the growing season. Wetlands receiving a large amount of water from static water bodies, such as lakes and estuaries, which can store water over longer periods of time than just a few weeks, could also be less likely to have disruptions in water supply under projected future climate change. Wetlands receiving most of their water from precipitation, however, are expected to be highly vulnerable to climate change effects (Winter, 2000).

The HGM classification described earlier in this report can provide a first step in evaluating water-supply risks, as probable water sources are defined for each wetland type. The probable water sources for each type, however, describe just a generic likelihood, rather than a wetland-specific breakdown of amounts of water from direct precipitation, overland flow, streamflow inputs, lake storage, and ground water.

Variables Used for Analysis of Vulnerability to Wetland Water-Supply Disruptions

To assess the vulnerability of wetlands at ANP to possible disruptions or changes in water supply, many of the same variables listed in the previous section are evaluated, but are combined in different ways. As in the previous section, information about the geometry, soils, and morphology in each wetland's catchment are evaluated with respect to the amount, speed, and timing of runoff and ground-water inflow. The individual variables considered in the previous section were re-grouped according to whether they (a) favored sustained water supply under a climate change prediction of warmer summers with less surface-water runoff and more evapotranspiration, and warmer but possibly wetter springs and falls, or (b) indicated more disruptions in water supply under those conditions. The groupings and ranges in scores are listed in table 6. The variables related to possible disruptions in water supply for wetlands under future climate scenarios were multiplied by -1, because these variables measure conditions relating to a lack of sustained water supply (runoff- and precipitation-dominated systems); they are listed as "negative water-supply variables" in table 6. The variables related to sustained water supply under future climate conditions are kept as positive numbers (lacustrine-, tidal-, and ground-water-dominated systems), and are listed as "positive water-supply variables" in table 6. The scaled integer values (table 5) for each variable were used for as the scores for each variable, as follows: for each wetland, the average of the 5 negative and 4 positive variables was calculated. The average negative scores for all wetlands were again normalized (to the overall lowest score) to get an average scaled negative score (ranging from -1.0 to -0.15) for each wetland. Similarly, the average positive scores for all wetlands were normalized to the largest average, resulting in an average scaled positive score (ranging from +0.13 to +1.0) for each wetland. These two values, one negative and one positive, were then added together to get a final net score for each wetland.

If the scores of the positive variables outweighed the negative, the final net score was positive. If the negative scores outweighed the positive, the final net score was negative. Thus, a wetland with about equal dominance of stream inflow and ground-water inflow would have a relatively neutral score; a wetland dominated by ground water and lacustrine inflow would have a highly positive score, and a wetland dominated by direct precipitation and overland flow would get a highly negative score. Overall, wetlands with a final net score less than 1 have considered to be more at risk of potential water-supply disruptions than wetlands with a positive net score. The magnitude of the final net score is also a general indication of how well protected or vulnerable a wetland could be from water-supply disruptions.

This scoring system is intended only to give a rough estimate of the status of any given wetland in the overall population of ANP wetlands with respect to their future water-supply robustness, and is not meant as an absolute measure of

Table 6. Variable grouping and scoring for wetland susceptibility to water-supply disruptions under future climate conditions, Mt. Desert Island, Maine.

Variables	Range in raw scores	Range in scaled scores	Range in average scaled scores
Negative water-supply variables			
Precipitation dominance (wetland area divided by catchment area)	0.72 to .0005	- 10 to -1	
Slope of catchment	50 to 0.84	-10 to -1	
Bare soil, in percent of catchment	100 to 0	-10 to 0	
Catchment size, in hectares (reversed for this analysis, larger catchment is higher score)	2.1 to 2,500	-10 to -1	
Storage in catchment, in percent	0 to 25	-10 to -1	
	Range in average scores:	-7.8 to -1.2	-1.0 to -0.15
Positive water-supply variables			
Lacustrine/tidal influence	0 or 5	0 to 10	
Topographic relief in catchment, in meters	1.4 to 430	1 to 10	
Percent clay soils in catchment (reversed for this analysis, higher percentage is lower score)	100 to 0	0 to 10	
Size of catchment, in meters	2.1 to 2,500	1 to 10	
	Range in average scores:	1 to 8	0.13 to 1.0

susceptibility. Furthermore, these variables do not represent an exhaustive list of factors that relate to future water supply; local weather patterns, prevailing winds, and vegetation type also may play a role, but their quantification was beyond the scope of this study.

Results of Analysis for Hydrologic Pathways for Contaminants and Susceptibility to Disruptions in Water Supply from Future Changes in Climate

There are 186 mapped wetlands in ANP larger than 1 ha (fig. 3). The 1,202 wetlands classified using the HGM classification were aggregated on the basis of HGM class. Of these, 186 wetlands were located totally or partially within the boundaries of ANP. The catchment area for each of these wetlands was determined using topographic contours and digitized into a GIS.

Wetland Scores for Hydrologic-Contamination Pathways

All the final scores for each factor related to contamination pathways for wetlands are listed for each wetland catchment in appendix 3. Highlights and important results of the precipitation, surface water, and ground water analyses are discussed in the following sections.

Precipitation

Most of the wetlands scored relatively low on the scale of precipitation as a potential major pathway (fig. 4) (less than 5 on a scale of 1 to 10). One wetland (470-qq) scored higher for the area divided by the catchment area than all other wetlands. The 13 highest-scoring wetlands, which are shown in figure 4, are listed in table 7. Many of these wetlands are in the southern part of the island, including many of the extensive peatlands in that area, or are in the north-central part of the island. These wetlands receive minimal surface-water runoff and may receive little to no ground-water discharge.

Surface Water

Many of the highest-scoring wetlands for surface water as a potential source of contamination are in the eastern part of the island (fig. 5). The 16 highest-scoring wetlands for surface water as a potential pathway for contaminant delivery are listed in table 8. Most of these are Riverine and Depressional-Open wetlands. All of the 16 scored relatively high on at least one of the five individual scaled variables to rank high in the combined surface-water score. Most have high catchment slopes and high amounts of bare soil; one wetland (125) scored the highest on the impervious-surface-in-the-

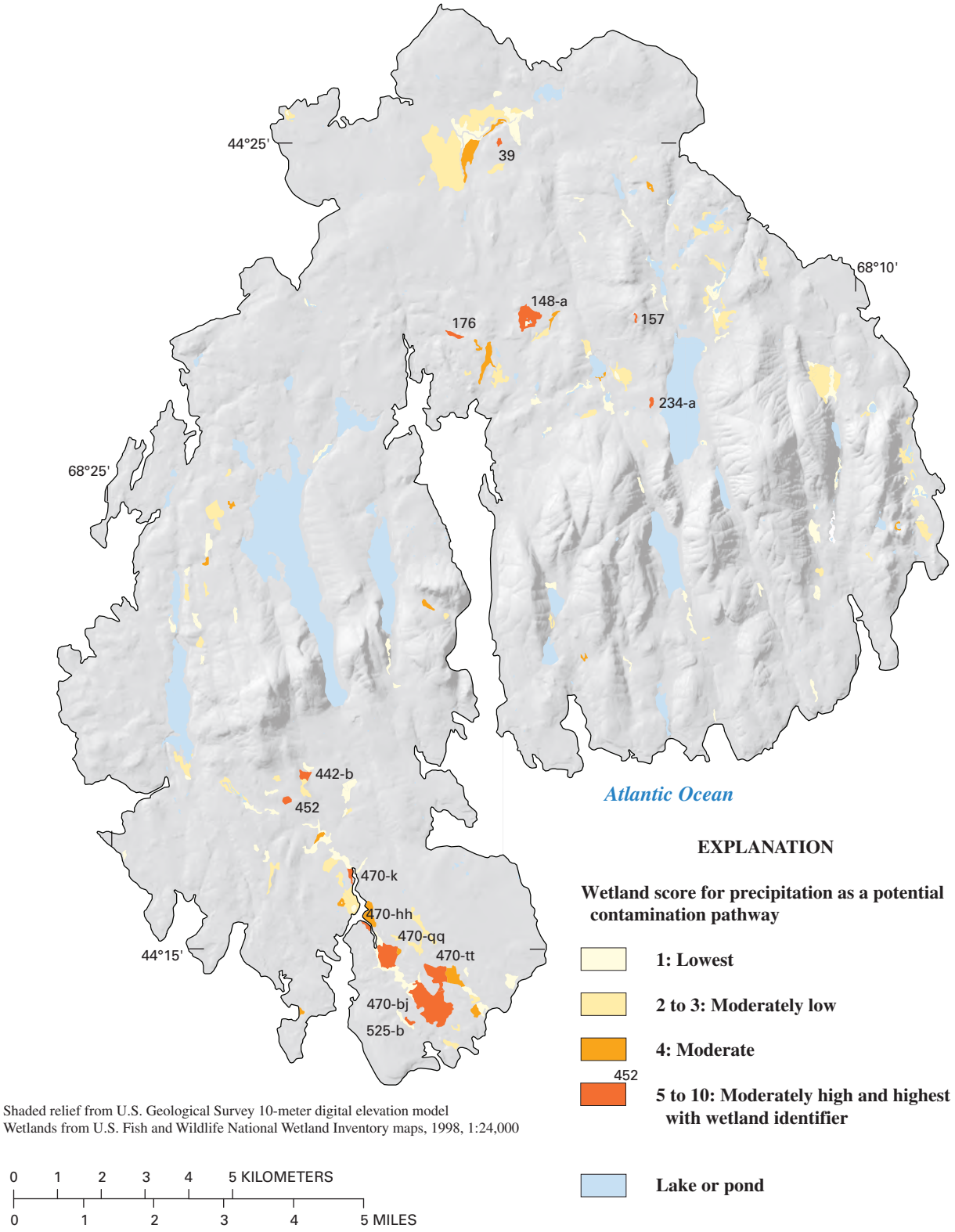


Figure 4. Wetland scores for precipitation as a potential pathway for contaminant delivery.

Table 7. Wetlands with highest scores for precipitation as a potential pathway for contamination, Mt. Desert Island, Maine.

[Locations of wetlands shown on fig. 4; HGM, hydrogeomorphic. Score is on a scale of 1 to 10, scores for 186 wetlands are given in appendix 3.]

Wetland identifier	HGM Class	Precipitation scaled score
470-qq	Soil Flat-Organic	10
157	Hilltop/Upper Hillslope	7
470-k	Soil Flat-Organic	7
525-b	Soil Flat-Organic	7
148-a	Depressional-Semiclosed	6
470-tt	Soil Flat-Organic	6
176	Slope	5
234-a	Depressional-Semiclosed	5
39	Hilltop/Upper Hillslope	5
442-b	Slope	5
452	Slope	5
470-bj	Soil Flat-Organic	5
470-hh	Tidal Fringe	5

catchment-area variable. All but three of these wetlands (125, 274-b, and 296, which are all slope wetlands) have stream inflows. Surface-water runoff can deliver contaminants by overland flow and streams, therefore, having a stream inflow is not a requirement for a high surface-water score, and these wetlands could receive contaminants from overland flow. Four of the wetlands (271, 123-d, 123-f, and 123-i) also scored high on the ground-water combined score (see table 9).

Ground Water

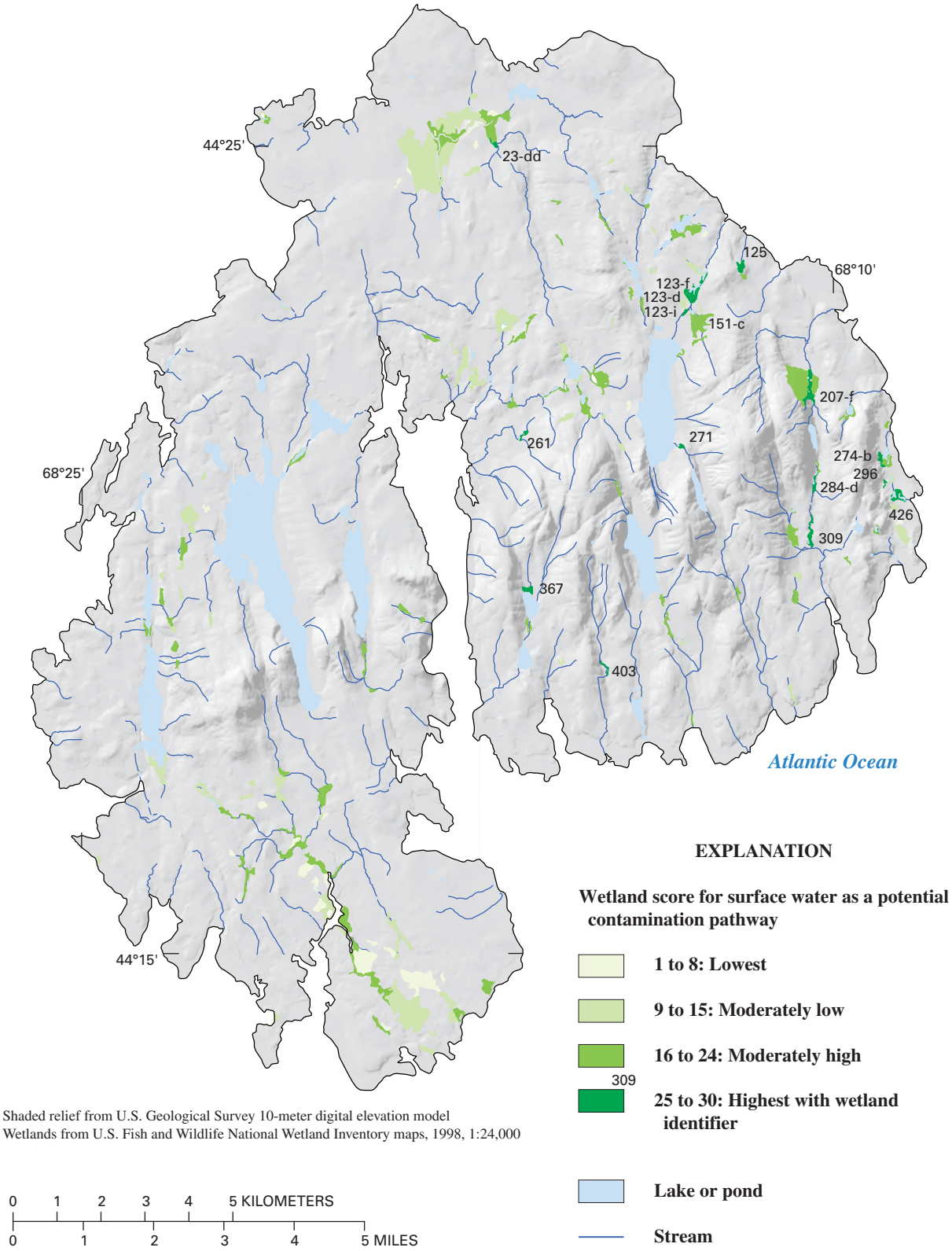
The distribution of wetlands scoring highest on the combined ground-water score is more evenly distributed across the island (fig. 6). The scaled scores for each of the individual variables and composite scores for the 13 highest-scoring wetlands are listed in table 9 (because of ties in the composite scores, tables 7–9 do not have the same number of wetlands shown). These wetlands represent a wider variety of types than the highest-scoring wetlands in the other groups. Almost all of the wetlands in table 9 had high scores for lack of clay soils, indicating a greater possibility for ground-water recharge in the catchment. Most of the high-scoring wetlands had relatively large catchments, and four were in areas with a high amount of topographic relief (see fig. 1). Three wetlands (271, 123-d, and 123-i) also appeared on the list of high scores for surface water (table 8), and are thus vulnerable from more than one pathway.

The results of these three analyses indicate that there is considerable variation in the degree to which precipitation, surface water, or ground water may serve as a pathway for potential contaminants entering wetlands on the island, at least when investigated at the landscape scale. This analysis is not a substitute for field-level data collection, and the accuracy of the comparisons between wetlands can only be determined by collecting a large amount of hydrologic data. Before wetlands are actually selected for monitoring, other variables to evaluate for these wetlands include whether possible point or non-point sources of pollution are present in the vicinity of the wetland, whether the wetland is part of a critical habitat for a species of concern to the park, and any other possible risks to the wetlands integrity. If the actual water budget for a particular wetland is needed, that data will need to be collected in the field using accepted methods for wetland water-budget studies.

Two variables that were not included in the analysis for ground water (the presence of clay soils beneath a wetland, and the amount of bare bedrock in a catchment) could have produced different final scores if they had been used. Clay soils underlying a wetland might indicate a reason for ground water to be prevented from discharging to the wetland. However, Nielsen, and others (2006) suggested that clay soil was not always a reliable predictor of no ground-water inflow, because gaps or fractures in the clay create pathways for deep ground water to enter wetlands. The amount of bare bedrock in the catchment could have been subtracted from the catchment area without clay soils to improve the score of ground-water recharge potential, because bare bedrock has a reduced recharge rate compared to unconsolidated, non-clay soils (Gerber and Hebson, 1996).

Nevertheless, the results of this study can help natural resource managers in ANP analyze the overall population of wetlands for consideration in a wetland monitoring plan. Wetlands with scores on the higher end of any of these three potential contaminant-delivery pathways would be candidates for further investigation. Other variables that may be considered when determining which of the park wetlands to monitor include actual sources of contaminants that are considered a threat to the wetland; uniqueness of the wetland habitat; the presence of species of special concern to the park; if the Park Service owns all the land in the wetland catchment, or if it is otherwise protected; if road building or other human activities are potential future threats to the wetland; and how well the wetland represents others in its HGM class.

If it becomes necessary to further investigate water sources to any of these wetlands, the specific contributions of precipitation, surface runoff, and ground water can be determined by collecting additional data. These additional data could include more detailed catchment mapping, collection of precipitation data, hydroperiod data collection, streamflow measurements into and out of the wetland over a range of runoff conditions, and ground-water-level data using shallow piezometers in and around the wetland.



Shaded relief from U.S. Geological Survey 10-meter digital elevation model
Wetlands from U.S. Fish and Wildlife National Wetland Inventory maps, 1998, 1:24,000

Figure 5. Wetland scores for surface water as a potential pathway for contaminant delivery.

Table 8. Wetlands with highest scores for surface water as a potential pathway for contamination, Mt. Desert Island, Maine.

[Locations of wetlands shown on figure 5; HGM, hydrogeomorphic. Scaled scores are from 1 to 10, scores for 186 wetlands are given in appendix 3.]

Wetland identifier	HGM Class	Scaled variable scores for wetland catchments					Sum of surface-water scores
		Catchment size	Bare soil in catchment	Slope of catchment	Stream inflow	Impervious surface in catchment	
271	Depressional-Open	8	8	8	5	1	30
284-d	Riverine-Upper Perennial	7	7	8	5	1	28
403	Riverine-Upper Perennial	8	8	6	5	1	28
123-f	Depressional-Open	10	5	5	5	2	27
207-f	Riverine-Upper Perennial	8	5	6	5	3	27
123-d	Lacustrine Fringe	10	5	4	5	2	26
123-i	Riverine-Upper Perennial	9	5	5	5	2	26
125	Slope	5	7	4	0	10	26
274-b	Slope	5	8	10	0	3	26
296	Slope	5	9	10	0	2	26
303	Depressional-Open	7	5	6	5	3	26
309	Riverine-Upper Perennial	7	6	6	5	2	26
367	Lacustrine Fringe	6	7	6	5	2	26
23-dd	Riverine-Upper Perennial	9	6	3	5	2	25
261	Riverine-Upper Perennial	6	10	4	5	0	25
426	Riverine-Upper Perennial	8	3	5	5	4	25

Table 9. Wetlands with highest scores for ground water as a potential pathway for contamination, Mt. Desert Island, Maine.

[Locations of wetlands shown on figure 6; HGM, hydrogeomorphic. Scaled scores are from 1 to 10, scores for 186 wetlands are given in appendix 3.]

Wetland identifier	HGM Class	Scaled variable scores for wetland catchments				Sum of ground-water scores
		Topographic relief	Catchment size	Lack of clay soils	Lack of stream inflow	
331	Depressional-Open	10	8	10	5	33
273-a	Lacustrine Fringe	7	10	9	5	31
123-d	Lacustrine Fringe	10	10	9	0	29
123-f	Depressional-Open	10	10	9	0	29
295	Slope	8	6	10	5	29
368	Slope	8	7	9	5	29
123-i	Riverine-Upper Perennial	10	9	9	0	28
345	Slope	6	8	9	5	28
447-d	Soil Flat-Organic	8	8	7	5	28
237-d	Open Water	7	6	9	5	27
23-i	Soil Flat-Organic	6	9	7	5	27
271	Depressional-Open	9	8	10	0	27
284-a	Depressional-Semiclosed	8	5	9	5	27

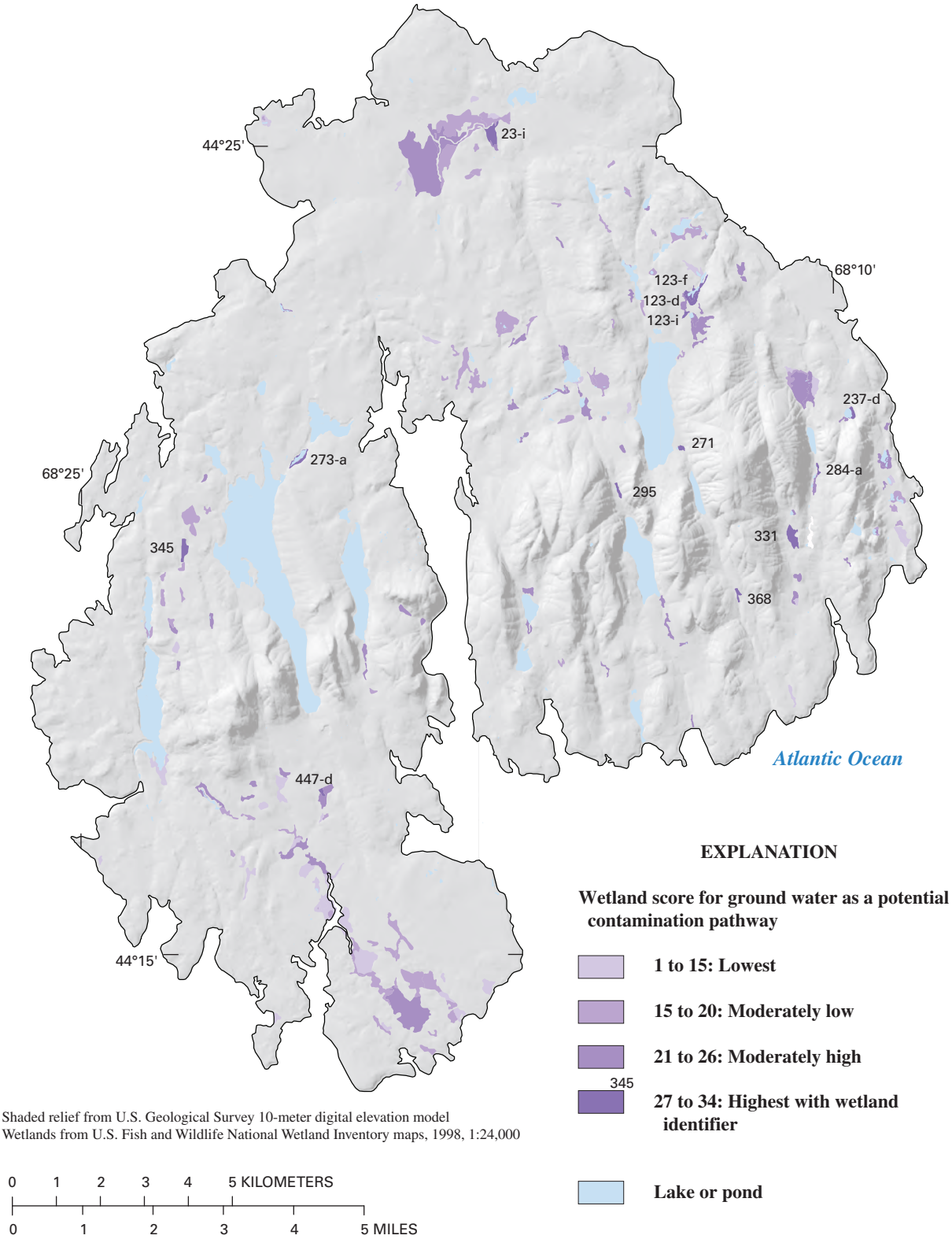


Figure 6. Wetland scores for ground water as a potential pathway for contaminant delivery.

Wetland Scores for Vulnerability to Water-Supply Disruptions Under Possible Future Climate Change

The final scores, considering positive and negative variables for vulnerability to water-supply disruptions, ranged from -0.63 to +0.74 (All the raw and scaled scores for each of the 186 wetlands are given in appendix 3). The lowest-scoring wetlands are considered most susceptible to water-supply disruptions under possible future climate change, and the highest-scoring ones are considered least susceptible. Many wetlands fell in the middle, with positive and negative factors essentially canceling each other out. The locations and scoring distributions of the ANP wetlands on Mt. Desert Island are shown on figure 7.

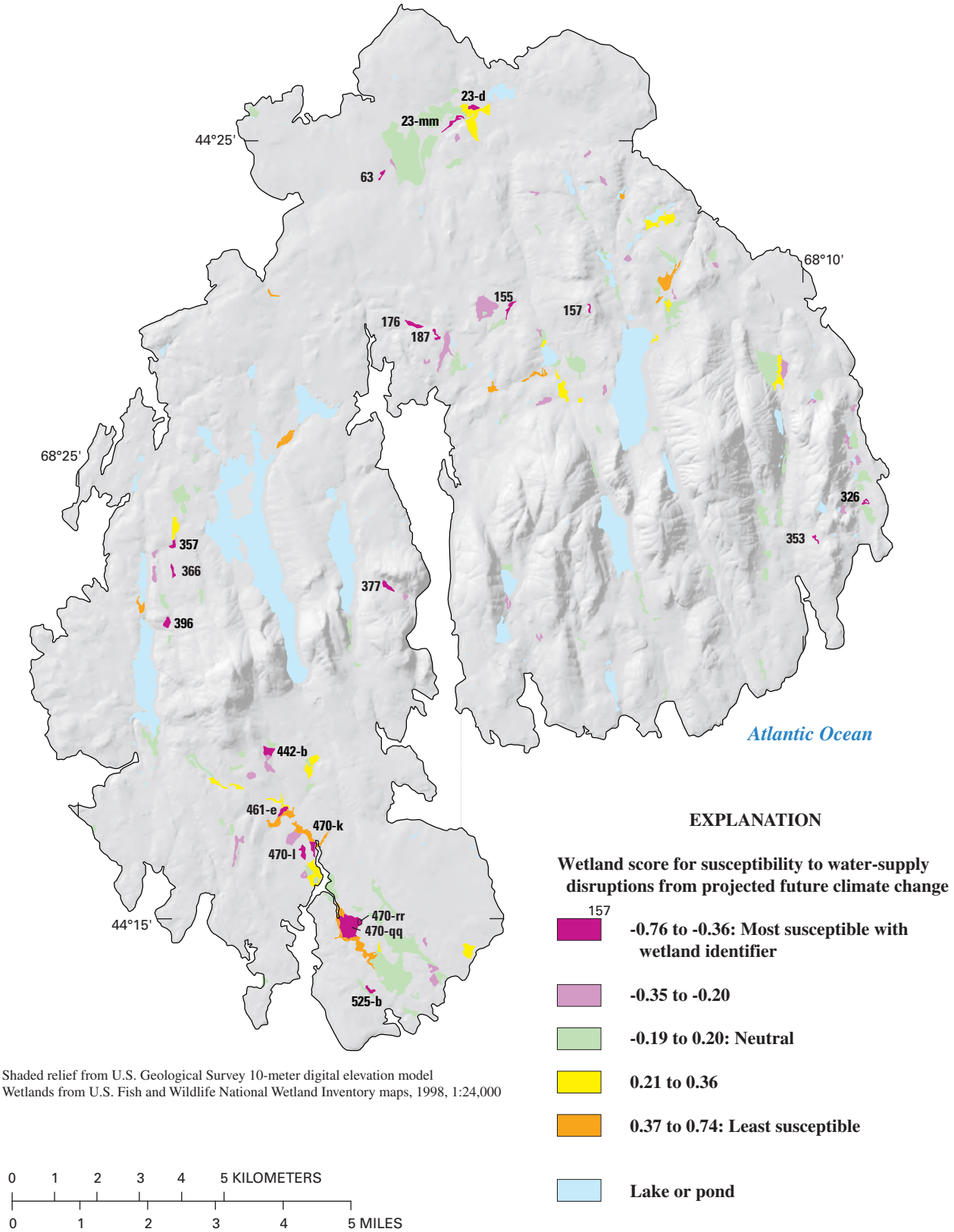
Table 10 lists the 20 lowest-scoring wetlands in this classification (also see fig. 7). Most of these have small catchments; some have a great amount of bare bedrock in the catchment (50 to 100 percent of the catchment); and most of them have little or no opportunity for surface-water storage in the catchment, which could hold water during precipitation events and slowly release that water to the wetlands during drier periods. None have a lacustrine or estuarine influence.

The highest scoring wetlands for sustained water supply are given in table 11 (also see fig. 7). Many of these have soils relatively favorable to ground-water recharge (high score on lack of clay in the catchment), and large catchment sizes. Many of these wetlands have a hydraulic connection to a lacustrine or estuarine water body.

This analysis of vulnerability is intended to be more qualitative than quantitative as to where wetlands fall with respect to each other along a gradient of susceptibility to future water-supply disruptions. Future climate conditions and the exact variables that could be used to predict future hydrologic conditions are unknown; the relative importance of the variables chosen in predicting future water supply has not been studied, and other factors could be included in the future that were not considered in this study. Nevertheless, this analysis can be used for its intended purpose as a screening tool and to help segregate wetlands by landscape characteristics that indicate either the possibility of a sustained future water supply, or the possibility of a disruption to the wetland water supply.

Wetlands scoring on the low end of this scale, particularly those listed in table 10, are ones in which the characteristics of the catchment and wetland together indicate that in the future if climate change trends towards warmer conditions in the summer, enhanced evapotranspiration, and little to no increase in normal summertime precipitation, these wetlands will probably experience water-supply disruptions more than they have in the past. Further investigation of these wetlands may be warranted, especially if they harbor species of special concern to ANP managers or contain unique or rare habitats. In addition, the threat of human disturbances, either physical or chemical may indicate a need for future monitoring.

This analysis did not evaluate whether any of these wetlands are currently (2006) considered disturbed, and if any human disturbances, such as road building or ditching, affect the validity of the results. These disturbances could affect the water balance in a wetland and its ability to retain water in a warmer climate. The results of the analyses described in this report are considered to be less applicable to any wetlands that are currently (2006) hydrologically altered from their natural condition.



Shaded relief from U.S. Geological Survey 10-meter digital elevation model
Wetlands from U.S. Fish and Wildlife National Wetland Inventory maps, 1998, 1:24,000

Figure 7. Wetland scores for susceptibility to disruptions in water supply from projected future climate change.

Table 10. Twenty lowest-scoring wetlands for sustained water supply under projected future climate change.

[Locations of wetlands are shown on fig. 7. Raw scores are listed in appendix 3, table 3-1.]

Wetland identifier	Rank	Hydrogeomorphic class	Scaled integer for wetland area	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
				Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive score	
157	1	Hilltop/Upper Hillslope	7	-7	-2	-10	-10	-10	-7.8	**-1.00**	0	1	1	10	3	**0.38**	**-0.63**
176	2	Slope	5	-5	-3	-10	-7	-10	-7	**-0.95**	0	4	1	5	2.5	**0.31**	**-0.63**
470-k	3	Soil Flat-Organic	7	-7	-1	0	-8	-10	-5.2	**-0.70**	0	3	1	0	1	**0.13**	**-0.58**
525-b	4	Soil Flat-Organic	7	-7	-1	0	-9	-9	-5.2	**-0.70**	0	2	1	2	1.25	**0.16**	**-0.55**
63	5	Slope	3	-3	-1	0	-8	-10	-4.4	**-0.56**	0	3	1	0	1	**0.13**	**-0.44**
187	6	Slope	4	-4	-2	-10	-8	-10	-6.8	**-0.87**	0	3	1	10	3.5	**0.44**	**-0.43**
470-qq	7	Soil Flat-Organic	10	-10	-1	0	-6	-8	-5	**-0.64**	0	5	1	1	1.75	**0.22**	**-0.42**
442-b	8	Slope	5	-5	-2	-4	-7	-9	-5.4	**-0.69**	0	4	2	3	2.25	**0.28**	**-0.41**
461-e	9	Soil Flat-Organic	4	-4	-1	0	-8	-7	-4	**-0.51**	0	3	1	0	1	**0.13**	**-0.39**
377	10	Slope	4	-4	-9	-7	-7	-10	-7.4	**-0.95**	0	4	4	10	4.5	**0.56**	**-0.39**
366	11	Slope	3	-3	-1	-10	-8	-10	-6.4	**-0.82**	0	3	1	10	3.5	**0.44**	**-0.38**
470-l	12	Soil Flat-Organic	3	-3	-1	0	-7	-10	-4.2	**-0.54**	0	4	1	0	1.25	**0.16**	**-0.38**
353	13	Depressional-Semiclosed	2	-2	-5	-10	-7	-10	-6.8	**-0.87**	0	4	2	10	4	**0.50**	**-0.37**
155	14	Depressional-Closed	4	-4	-2	-10	-7	-6	-5.8	**-0.74**	0	4	1	7	3	**0.38**	**-0.37**
396	15	Depressional-Open	3	-3	-2	-7	-7	-10	-5.8	**-0.74**	0	4	1	7	3	**0.38**	**-0.37**
357	16	Slope	4	-4	-2	-6	-8	-10	-6	**-0.77**	0	3	1	9	3.25	**0.41**	**-0.36**
326	17	Depressional-Closed	4	-4	-2	-2	-8	-9	-5	**-0.64**	0	3	1	5	2.25	**0.28**	**-0.36**
470-rr	18	Slope	4	-4	-2	0	-9	-10	-5	**-0.64**	0	2	1	6	2.25	**0.28**	**-0.36**
23-mm	19	Slope	2	-2	-2	0	-7	-9	-4	**-0.51**	0	4	1	0	1.25	**0.16**	**-0.36**
23-d	20	Soil Flat-Organic	3	-3	-1	0	-7	-9	-4	**-0.51**	0	4	1	0	1.25	**0.16**	**-0.36**

Table 11. Twenty highest-scoring wetlands for sustained water supply under projected future climate change.

[Locations of wetlands are shown on fig. 7. Raw scores are listed in appendix 3, table 3-1.]

Wetland identifier	Rank	Hydrogeomorphic class	Scaled integer for wetland area	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
				Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive score	
23-bb	1	Tidal Fringe	1	-1	-2	-3	-1	-3	-2	**-0.26**	10	10	6	6	8	**1.00**	**0.74**
23-ee		Tidal Fringe	1	-1	-2	-3	-1	-3	-2	**-0.26**	10	10	6	6	8	**1.00**	**0.74**
23-m		Tidal Fringe	1	-1	-2	-3	-1	-3	-2	**-0.26**	10	10	6	6	8	**1.00**	**0.74**
470-ll	2	Tidal Fringe	1	-1	-1	-1	-2	-1	-1.2	**-0.15**	10	9	2	7	7	**0.90**	**0.75**
273-a	3	Lacustrine Fringe	1	-1	-3	-2	-1	-1	-1.6	**-0.21**	3	10	7	9	7.25	**0.94**	**0.73**
123-d	4	Lacustrine Fringe	1	-1	-4	-5	-1	-1	-2.4	**-0.31**	2	10	10	9	7.75	**1.00**	**0.69**
273-b	5	Open Water	1	-1	-3	-2	-1	-1	-1.6	**-0.21**	0	10	7	9	6.5	**0.81**	**0.61**
123-f	6	Depressional-Open	1	-1	-5	-5	-1	-1	-2.6	**-0.33**	0	10	10	9	7.25	**0.91**	**0.57**
123-i	7	Riverine-Upper Perennial	1	-1	-5	-5	-2	-1	-2.8	**-0.36**	0	9	10	9	7	**0.88**	**0.52**
206-f	8	Riverine-Upper Perennial	1	-1	-3	-4	-2	-5	-3	**-0.38**	0	9	9	8	6.5	**0.81**	**0.43**
470-a	9	Riverine-Upper Perennial	1	-1	-3	-2	-1	-6	-2.6	**-0.33**	0	10	8	6	6	**0.75**	**0.42**
228	10	Riverine-Upper Perennial	1	-1	-3	-4	-2	-6	-3.2	**-0.41**	0	9	9	8	6.5	**0.81**	**0.40**
461-f	11	Riverine-Upper Perennial	1	-1	-3	-3	-1	-6	-2.8	**-0.36**	0	10	8	6	6	**0.75**	**0.39**
470-aa	12	Tidal Fringe	1	-1	-2	0	-3	-7	-2.6	**-0.33**	10	8	2	3	5.75	**0.72**	**0.39**
470-vv	13	Riverine-Upper Perennial	1	-1	-1	-1	-3	-1	-1.4	**-0.18**	0	8	2	8	4.5	**0.56**	**0.38**
384	14	Lacustrine Fringe	1	-1	-2	-4	-3	-5	-3	**-0.38**	6	8	3	7	6	**0.75**	**0.37**
74-a/b	15	Lacustrine Fringe	1	-1	-3	-6	-3	-6	-3.8	**-0.49**	5	8	5	9	6.75	**0.84**	**0.36**
206-k	16	Riverine-Upper Perennial	1	-1	-3	-5	-3	-7	-3.8	**-0.49**	0	8	9	9	6.5	**0.81**	**0.33**
23-b	17	Riverine-Upper Perennial	1	-1	-2	-3	-2	-2	-2	**-0.26**	0	9	5	4	4.5	**0.56**	**0.31**
227-b	18	Depressional-Open	1	-1	-3	-5	-3	-8	-4	**-0.51**	0	8	9	9	6.5	**0.81**	**0.30**
191-a	19	Lacustrine Fringe	1	-1	-4	-5	-6	-9	-5	**-0.64**	10	5	5	10	7.5	**0.94**	**0.30**
207-f	20	Riverine-Upper Perennial	1	-1	-6	-5	-3	-3	-3.6	**-0.46**	0	8	9	6	5.75	**0.72**	**0.26**

Summary and Conclusions

As an aid to developing a wetland monitoring program for Acadia National Park (ANP) on Mt. Desert Island, Maine, the U.S. Geological Survey, in cooperation with the National Park Service, developed a hydrogeomorphic (HGM) classification system for wetlands greater than 0.4 hectare (ha) (1 acre) on the island. The 13 HGM classes used are: Riverine-Upper Perennial, Riverine-Nonperennial, Riverine-Tidal, Depressional-Closed, Depressional-Semiclosed, Depressional-Open, Depressional-No Ground-Water Input, Mineral Soil Flat, Organic Soil Flat, Tidal Fringe, Lacustrine Fringe, Slope, and Hilltop/Upper Hillslope.

On the basis of topographic map information and geographic information system (GIS) layers at a scale of 1:24,000 or larger, 1,202 wetland polygons on Mt. Desert Island were classified into 11 of these HGM classes. A dichotomous key was developed to aid in the classification. The wetland polygons used in the classification were palustrine and estuarine wetlands shown in the National Wetland Inventory (NWI) maps produced by the U.S. Fish and Wildlife Service (1998), available as GIS coverages. Two of the 13 HGM classes (Depressional-No Ground-Water Input, and Riverine-Tidal) were not assigned to any wetlands because criteria for determining those classes are not available at that map scale, and must be determined with more site-specific information. Isolated wetlands less than 0.4 ha were not considered because the published accuracy of the NWI maps is 1 acre, and the number of wetlands analyzed was kept to a manageable size within the scope of the study.

Of the 1,202 wetland polygons classified, which cover 1,830 ha (4,520 acres) in ANP, 327 were classified as Slope, 258 were Depressional, 231 were Riverine, 210 were Soil Flat, 68 were Lacustrine Fringe, 51 were Tidal Fringe, 22 were Hilltop/Upper Hillslope, and the final 35 were small open water bodies. The wetland polygons classified ranged in size from 0.1 ha (these were small polygons that were part of a contiguous group of polygons that as a whole was larger than 0.4 ha) to 42 ha. Any wetland classification application that relies on remotely obtained data has some inherent error associated with it. On the basis of a previous test of the method used in this analysis (Nielsen and others, 2006), this classification is assumed to have an error rate of about 15 percent.

Because of the size restriction, the overall distribution of wetland types on the island may be somewhat different than presented above. Many of the small wetlands not included are either vernal pools, which are Depressional wetlands, Slope wetlands, or small wetlands found at high elevations, which could be Hilltop/Upper Hillslope wetlands or Slope wetlands. It is also possible that some of these smallest wetlands do not fit well into any of these HGM classes and should be grouped into a new class. This would have to be determined after attempting to classify the small isolated wetlands that were not included in this project.

This HGM classification of wetlands will be a useful resource for ANP managers, as it characterizes wetland water flow for the park's wetlands, and provides an organizing variable that can be used to analyze the distribution of vegetation types, invasive species, invertebrates, and other wildlife. It will also be used to help stratify wetlands for inclusion in a wetland monitoring plan for the park.

For planning purposes within ANP, further information on wetlands has been needed for future wetland monitoring purposes, including possible contamination pathways for park wetlands and possible effects of climate changes on park wetlands. To provide this information, two scoring systems were developed for wetlands larger than 1 ha in ANP. The first scoring system was developed to help understand the potential hydrologic pathways of contamination that are present for wetlands in the park, and which wetlands have the highest susceptibility to contamination from which pathways (precipitation, surface water, or ground water). This information can be used to determine the types of wetland monitoring needed to detect early signs of problems in wetlands that have had specific potential sources of contaminants identified in their catchments.

Another consideration for future wetland monitoring is wetland susceptibility to disruptions in water supply from potential future climate changes. Climate studies indicate possible increases in precipitation and summer temperatures. This climate change may favor ground-water recharge, but will likely cause runoff shortages during the summer. A second scoring system was developed and used to evaluate conditions within wetland catchments that could indicate changes in wetland hydrologic regime under projected climate change for eastern North America.

Similar individual variables were evaluated for each of these two scoring systems. These variables include the area of the wetland catchment, the area of the wetland compared to the catchment area, the slope of the catchment, the amount of the catchment that was mapped as "bare rock" or "excessively thin soil," the amount of surface-water storage in the catchment, the vertical relief of the catchment, the amount of relatively impermeable clay soils in the catchment, the amount of impervious surface in the catchment, whether a stream ran through the wetland, and whether the wetland was hydrologically connected to a surface-water body or estuary. These variables were used in various combinations to produce (1) scaled scores for the relative importance of precipitation, surface water, and ground water as potential pathways for contamination and (2) the susceptibility of each wetland to disruptions in future water supply (climate change effects).

Relatively few wetlands scored high on the importance of precipitation as a pathway for contamination. Most of the wetlands that scored above 4 (on a scale of 1 to 10) are in the southern part of the island, including many of the extensive peatlands in that area, or are in the north-central part of the island. Many of the highest-scoring wetlands for surface water as a potential pathway of contamination are in the eastern part of the island. The distribution of wetlands scoring highest

for ground water as a potential pathway are more evenly distributed across the island. Most of these had relatively large catchments, and four were in areas with a high amount of topographic relief. Four wetlands scored high for both ground water and surface water as potential pathways, indicating possible dual vulnerability if sources of contaminants are found within their catchments.

The effect of direct precipitation and surface-water runoff (negative variables for sustained water supply) were balanced against the effect of lacustrine/estuarine and possible ground-water sources (positive variables for sustained water supply) to produce an overall scaled score for disruptions in future water supply. For these water-supply scores, the wetlands with the lowest scores are the most vulnerable to changes in hydrology brought about by potential future changes in climate. Many of these wetlands have relatively small catchment areas (compared to the size of the wetland itself), most have little or no opportunity for surface-water storage in the catchment, and some of them have a large amount of bare rock and very thin soil cover in their catchments. Wetlands with the highest scores have soils relatively favorable to ground-water recharge, relatively large catchment sizes, and many have a hydraulic connection to a lacustrine or estuarine water body.

Small wetlands (less than 1 ha) were not scored for either analysis, but many small wetlands in the park have similar characteristics to wetlands that were scored for water-supply and contaminant-pathway susceptibility.

The landscape analyses presented in this report are not intended to replace the collection of field data for definitive information on the sources of water for individual wetlands, or as a definitive prediction of future water-supply conditions. Although field data will always provide the most accurate information, this analysis can provide a broad-brush screening tool and help segregate wetlands by landscape characteristics that indicate either the possibility of a sustained or disrupted future water supply, to the wetland.

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Appendixes 1–3

Appendix 1. Steps in Assigning Hydrogeomorphic Classifications to Wetland Polygons

Resources used:

National Wetland Inventory polygons of wetlands for the Bar Harbor, Bass Harbor, Bartlett Island, Newbury Neck, Salsbury Cove, Seal Harbor, Southwest Harbor, and Swans Island U.S. Geological Survey (USGS) topographic quadrangles (scale 1:24,000). Isolated polygons less than (<) 0.4 hectares (ha) in size were screened from the analysis, but polygons < 0.4 ha were included if they were part of a set of contiguous polygons. Accessed online at *http://apollo.ogis.state.me.us/catalog/catalog.asp?state=2&extent=huc#nwi*

Digital Line Graphs (DLGs) for the USGS topographic quadrangles listed above, for ponds, streams, rivers, roads, coastline, and contour lines (scale 1:24,000). Accessed online January 10, 2006 at *http://apollo.ogis.state.me.us/catalog/catalog.asp?state=2&extent=huc#hyd24* and *http://apollo.ogis.state.me.us/catalog/catalog.asp?state=2&extent=town#contours*

Digital Raster Graphs (DRGs) for the USGS topographic quadrangles listed above (scale 1:24,000). Accessed online January 10, 2006 at *http://apollo.ogis.state.me.us/catalog/catalog.asp?state=2&extent=24k#drgclip*

National Resources Conservation Service (NRCS) SSURGO soils polygons for Hancock County, Maine (scale 1:20,000). Accessed online January 10, 2006 at *http://apollo.ogis.state.me.us/catalog/catalog.asp?state=2&extent=county* Soil unit descriptions are found in Jordan, 1998.

Digital Orthophoto quadrangles for the USGS topographic quadrangles listed above, scale 1:12,000. Accessed online January 10, 2006 at *http://apollo.ogis.state.me.us/catalog/catalog.asp?state=2&extent=24k#medoq*

Steps in assigning hydrogeomorphic (HGM) classes (following the key, table 2):

1. Wetland polygons sharing an edge with saltwater or estuaries were tagged as Tidal Fringe and removed from the remaining set (using the 1:24:000 coastline coverage as a spatial reference for the coastline).

2. Wetland polygons sharing an edge or overlapping with any lake or pond polygons were tagged. The 1:24,000 scale "ponds" coverage was used as the reference. A 100-meter (m) buffer distance was set around these water bodies, and those wetlands within the 100-m buffer were assigned the lacustrine fringe category if there were no topographic contours crossing the wetland. If a wetland polygon had a large area outside this buffer zone, the wetland polygon was divided along the 100-m buffer line, and the portion inside the buffer zone was assigned to the lacustrine fringe category, and the portion outside the buffer zone was left untagged. Small portions of lacustrine fringe wetlands lying outside the 100-m buffer were kept with the parent polygon. If topographic contours crossed the wetland, it was not considered to be at the same elevation as the lake or pond and was not assigned to the lacustrine fringe category.

   Some of the NWI wetland polygons consisted largely or entirely of open water, and appeared as ponds on the topographic maps. The NWI polygons that coincided with ponds on the topographic maps were compared to the digital orthophoto of that area. If the polygon was more than 50 percent open water on the orthophoto, the polygon was not given an HGM classification, but was tagged as "open water." Polygons less than 50 percent open water on the orthophoto were assigned an HGM classification.

3. The 1:24,000-scale streams and 1:24,000 rivers data layers were overlaid on the remaining untagged wetland polygons. A 50-m buffer zone was set around the streams and rivers. Wetland polygons touching the stream and within the 50-m buffer distance were set as candidate riverine wetlands. If a contour line crossed the wetland polygon, the polygon was then removed from the candidate set, and the remaining candidates were classified as Riverine wetlands. Riverine wetlands associated with a perennial stream (as defined on the topographic maps) were classified as Riverine-Perennial. Riverine wetlands associated with nonperennial streams were classified as Riverine-Nonperennial. Because tidal effects cannot be differentiated on a topographic map, no wetlands were classified as Riverine-Tidal.

   Where a stream flowed through a large wetland polygon, and the 50-m buffer zone took up only a portion of the wetland polygon, the polygon was split along the 50-m buffer boundary. The wetland area within 50 m of the stream were classified as Riverine and the rest of the original polygon was not.

4. The contour line DLGs were then overlaid on the remaining wetlands. Any wetland with at least one contour crossing the area was a candidate Slope wetland. These candidates were each examined individually. If the contour line crossed the wetland only at the edge, it was assumed that

mapping errors in either the position of the contour line or the edge of the wetland made the confidence in the Slope classification tenuous, so these wetlands were dropped from being candidate Slope wetlands. The remaining candidate wetlands were classified as Slope wetlands.

5. Wetlands that were not classified as Slope, Riverine, Lacustrine Fringe, or Tidal Fringe were examined next, using the DRGs of the topographic maps. Any that were at the top of a hill or near the top of a hill, and could only have a very small catchment area were tagged as Hilltop/Upper Hillslope.

6. The remaining wetlands were examined individually, again using the DRGs of the topographic maps, to determine if they were surrounded on at least two sides by hills or mountains. These were the candidates for the Depressional wetlands. Any of the remaining wetlands that were not surrounded on at least two sides by hills or mountains became candidate Soil Flat wetlands.

7. The candidate Soil Flat wetlands were compared to the NRCS soils classification maps (SSURGO polygons). Any soil units with descriptions that included the word "peat" were grouped and compared to these wetlands. Wetland polygons that were covered by more than 50 percent soils classified as peaty were classified as Soil Flat-Organic wetlands. Those wetland polygons that were in areas where soils were not described as peaty (or less than 50 percent peaty) were the Soil Flat-Mineral wetlands.

8. The Depressional wetlands were subdivided on the basis of whether or not there were mapped streams flowing into or out of them, as mapped on the 1:24,000 topographic maps. For this classification step, adjacent NWI polygons that fell in the Depressional class were combined as one wetland. Depressional wetlands with no mapped streams entering the wetland or draining out were classified as Depressional-Closed. Depressional wetlands with stream outlets but no inflowing streams were classified as Depressional-Semiclosed. Depressional wetlands with both stream inflows and outflows were classified as Depressional-Open.

Reference Cited

Jordan, G.B., 1998, Soil survey of Hancock County area, Maine: U.S. Department of Agriculture, Natural Resources Conservation Service, 278 p., 103 map sheets.

Appendix 2. Hydrogeomorphic Classification of Wetlands on Mt. Desert Island, Maine

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
2-a	0.3	Soil Flat-Mineral	Northeast Creek
2-b	0.5	Soil Flat-Mineral	Northeast Creek
3	0.5	Soil Flat-Mineral	Hulls Cove
4-a	0.3	Hilltop/Upper Hillslope	Northeast Creek
4-b	1.1	Hilltop/Upper Hillslope	Northeast Creek
4-c	0.2	Hilltop/Upper Hillslope	Northeast Creek
4-d	0.1	Hilltop/Upper Hillslope	Northeast Creek
4-e	0.1	Hilltop/Upper Hillslope	Northeast Creek
5	0.5	Soil Flat-Mineral	Northeast Creek
6	0.7	Slope	Northeast Creek
7-a	0.2	Depressional-Semiclosed	Northeast Creek
7-b	0.1	Soil Flat-Mineral	Northeast Creek
7-c	1.0	Slope	Northeast Creek
8-a	0.5	Slope	Hulls Cove
8-b	0.2	Slope	Hulls Cove
9-a	0.5	Slope	Northeast Creek
9-b	3.2	Riverine-Upper Perennial	Northeast Creek
10	0.5	Slope	Northeast Creek
11	0.5	Slope	Jones Marsh
12	0.6	Depressional-Closed	Northeast Creek
13	0.9	Slope	Hulls Cove
14-a	0.6	Slope	Hulls Cove
14-b	0.5	Slope	Hulls Cove
14-c	4.9	Slope	Hulls Cove
14-d	0.6	Slope	Hulls Cove
14-e	0.3	Slope	Hulls Cove
15	0.7	Depressional-Semiclosed	Hulls Cove
16	0.2	Lacustrine Fringe	Northeast Creek
17-a	0.9	Slope	Northeast Creek
17-b	2.1	Depressional-Open	Northeast Creek
17-c	0.1	Riverine-Upper Perennial	Northeast Creek
18	0.5	Lacustrine Fringe	Northeast Creek
19-a	0.3	Tidal Fringe	Jones Marsh
19-b	1.3	Tidal Fringe	Jones Marsh
19-c	3.7	Tidal Fringe	Jones Marsh
20-a	0.2	Soil Flat-Organic	Hulls Cove
20-b	0.4	Slope	Hulls Cove
20-c	6.1	Soil Flat-Organic	Hulls Cove
20-d	0.3	Soil Flat-Organic	Hulls Cove
20-e	7.0	Soil Flat-Organic	Hulls Cove
20-f	1.2	Riverine-Upper Perennial	Hulls Cove
20-g	12.9	Riverine-Upper Perennial	Hulls Cove
20-h	0.7	Soil Flat-Organic	Hulls Cove
20-i	4.9	Soil Flat-Organic	Hulls Cove
20-j	0.8	Slope	Hulls Cove

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
20-k	1.4	Soil Flat-Organic	Hulls Cove
20-l	14.4	Soil Flat-Organic	Hulls Cove
20-m	1.1	Slope	Hulls Cove
20-n	1.4	Riverine-Upper Perennial	Hulls Cove
20-o	7.5	Soil Flat-Organic	Hulls Cove
20-p	1.2	Riverine-Upper Perennial	Hulls Cove
20-q	2.1	Riverine-Upper Perennial	Hulls Cove
20-r	0.5	Soil Flat-Organic	Hulls Cove
20-s	2.3	Soil Flat-Organic	Hulls Cove
20-t	0.4	Soil Flat-Organic	Hulls Cove
20-u	1.0	Depressional-Semiclosed	Hulls Cove
20-v	4.4	Slope	Hulls Cove
20-w	1.5	Depressional-Semiclosed	Hulls Cove
20-x	0.1	Riverine-Upper Perennial	Hulls Cove
20-y	0.6	Slope	Hulls Cove
21	0.8	Tidal Fringe	Jones Marsh
22-a	0.4	Slope	Hulls Cove
22-b	1.9	Slope	Hulls Cove
22-c	0.1	Soil Flat-Organic	Hulls Cove
23-a	31.1	Soil Flat-Organic	Northeast Creek
23-aa	0.1	Soil Flat-Mineral	Northeast Creek
23-b	9.5	Riverine-Upper Perennial	Northeast Creek
23-bb	5.8	Tidal Fringe	Northeast Creek
23-c	1.4	Riverine-Upper Perennial	Northeast Creek
23-cc	41.8	Soil Flat-Organic	Northeast Creek
23-d	2.5	Soil Flat-Organic	Northeast Creek
23-dd	0.9	Riverine-Upper Perennial	Northeast Creek
23-e	0.4	Soil Flat-Mineral	Northeast Creek
23-ee	1.3	Tidal Fringe	Northeast Creek
23-f	0.1	Riverine-Upper Perennial	Northeast Creek
23-ff	0.6	Soil Flat-Mineral	Northeast Creek
23-g	0.6	Soil Flat-Organic	Northeast Creek
23-gg	0.4	Riverine-Upper Perennial	Northeast Creek
23-h	0.1	Tidal Fringe	Northeast Creek
23-hh	9.1	Soil Flat-Organic	Northeast Creek
23-i	9.1	Soil Flat-Organic	Northeast Creek
23-ii	3.2	Soil Flat-Organic	Northeast Creek
23-j	0.2	Tidal Fringe	Northeast Creek
23-jj	0.4	Riverine-Upper Perennial	Northeast Creek
23-k	0.2	Soil Flat-Mineral	Northeast Creek
23-kk	1.3	Soil Flat-Organic	Northeast Creek
23-l	0.6	Tidal Fringe	Northeast Creek
23-ll	16.6	Soil Flat-Organic	Northeast Creek
23-m	11.1	Tidal Fringe	Northeast Creek
23-mm	1.3	Slope	Northeast Creek

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
23-n	0.1	Tidal Fringe	Northeast Creek
23-nn	1.1	Soil Flat-Organic	Northeast Creek
23-o	3.7	Soil Flat-Mineral	Northeast Creek
23-oo	0.6	Soil Flat-Organic	Northeast Creek
23-p	0.1	Tidal Fringe	Northeast Creek
23-pp	1.4	Soil Flat-Organic	Northeast Creek
23-q	0.1	Tidal Fringe	Northeast Creek
23-qq	0.7	Riverine-Upper Perennial	Northeast Creek
23-r	0.7	Tidal Fringe	Northeast Creek
23-rr	0.3	Tidal Fringe	Northeast Creek
23-s	1.1	Soil Flat-Organic	Northeast Creek
23-ss	0.1	Tidal Fringe	Northeast Creek
23-t	2.1	Soil Flat-Mineral	Northeast Creek
23-tt	1.3	Soil Flat-Mineral	Northeast Creek
23-u	0.3	Tidal Fringe	Northeast Creek
23-uu	7.9	Soil Flat-Organic	Northeast Creek
23-v	1.9	Soil Flat-Mineral	Northeast Creek
23-vv	0.5	Soil Flat-Mineral	Northeast Creek
23-w	0.1	Soil Flat-Mineral	Northeast Creek
23-x	15.1	Soil Flat-Organic	Northeast Creek
23-y	0.3	Soil Flat-Mineral	Northeast Creek
23-z	0.2	Soil Flat-Mineral	Northeast Creek
24-a	1.4	Soil Flat-Mineral	Hulls Cove
24-b	0.7	Soil Flat-Mineral	Hulls Cove
25	0.4	Soil Flat-Mineral	Hulls Cove
26-a	1.6	Tidal Fringe	Jones Marsh
26-b	0.5	Soil Flat-Mineral	Jones Marsh
26-c	2.1	Slope	Jones Marsh
27-a	0.2	Tidal Fringe	Jones Marsh
27-b	0.1	Soil Flat-Mineral	Jones Marsh
27-c	0.2	Tidal Fringe	Jones Marsh
28-a	10.0	Tidal Fringe	Jones Marsh
28-b	0.1	Soil Flat-Organic	Jones Marsh
28-c	7.8	Slope	Jones Marsh
28-d	16.0	Soil Flat-Organic	Jones Marsh
28-e	1.7	Soil Flat-Organic	Jones Marsh
28-f	2.7	Soil Flat-Organic	Jones Marsh
28-g	1.2	Slope	Jones Marsh
28-h	2.9	Soil Flat-Organic	Jones Marsh
29	4.4	Tidal Fringe	Jones Marsh
30	0.7	Soil Flat-Mineral	Jones Marsh
31	0.9	Slope	Jones Marsh
32	0.8	Slope	Hulls Cove
33	0.7	Slope	Jones Marsh
34	0.4	Soil Flat-Mineral	Jones Marsh

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
35	0.9	Soil Flat-Mineral	Jones Marsh
36	0.5	Soil Flat-Mineral	Jones Marsh
37	0.8	Soil Flat-Mineral	Hulls Cove
38-a	1.5	Slope	Jones Marsh
38-b	0.7	Slope	Jones Marsh
39	1.6	Hilltop/Upper Hillslope	Northeast Creek
40-a	0.1	Soil Flat-Organic	Jones Marsh
40-b	2.6	Tidal Fringe	Jones Marsh
41	1.4	Riverine-Nonperennial	Northeast Creek
42-a	0.6	Depressional-Semiclosed	Hulls Cove
42-b	0.9	Depressional-Semiclosed	Hulls Cove
42-c	0.6	Depressional-Semiclosed	Hulls Cove
42-d	0.9	Riverine-Nonperennial	Hulls Cove
43	0.6	Slope	Hulls Cove
44	0.4	Soil Flat-Organic	Jones Marsh
45-a	0.8	Riverine-Upper Perennial	Northeast Creek
45-b	0.1	Riverine-Upper Perennial	Northeast Creek
46	1.7	Soil Flat-Mineral	Jones Marsh
47	0.7	Soil Flat-Mineral	Jones Marsh
48	0.4	Slope	Northeast Creek
49-a	0.3	Soil Flat-Organic	Jones Marsh
49-b	0.4	Soil Flat-Organic	Jones Marsh
50-a	0.4	Soil Flat-Mineral	Jones Marsh
50-b	0.1	Soil Flat-Mineral	Jones Marsh
50-c	0.6	Soil Flat-Organic	Jones Marsh
50-d	4.7	Soil Flat-Mineral	Jones Marsh
50-e	0.3	Soil Flat-Mineral	Jones Marsh
50-f	0.1	Soil Flat-Mineral	Jones Marsh
51-a	0.1	Slope	Northeast Creek
51-b	0.5	Slope	Northeast Creek
52	0.5	Depressional-closed	Hulls Cove
53	1.4	Slope	Hulls Cove
54	0.6	Slope	Hulls Cove
55	0.5	Slope	Northeast Creek
55	0.9	Riverine-Upper Perennial	Northeast Creek
56	0.4	Slope	Hulls Cove
57-a	3.0	Depressional-Semiclosed	Northeast Creek
57-b	1.3	Slope	Northeast Creek
57-c	0.6	Slope	Northeast Creek
58-a	0.7	Riverine-Upper Perennial	Hulls Cove
58-b	0.3	Lacustrine Fringe	Hulls Cove
59	0.8	Slope	Hulls Cove
60	1.0	Slope	Northeast Creek
61-a	8.8	Riverine-Upper Perennial	Northeast Creek
61-b	2.1	Riverine-Upper Perennial	Northeast Creek

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
61-c	0.8	Slope	Northeast Creek
61-d	0.7	Slope	Northeast Creek
62	5.2	Soil Flat-Organic	Jones Marsh
63-a	1.1	Slope	Jones Marsh
63-b	0.4	Slope	Jones Marsh
64-a	0.7	Slope	Jones Marsh
64-b	0.1	Soil Flat-Mineral	Jones Marsh
65	2.9	Slope	Jones Marsh
66-a	0.4	Depressional-Semiclosed	Hulls Cove
66-b	1.7	Depressional-Semiclosed	Hulls Cove
66-c	0.1	Depressional-Semiclosed	Hulls Cove
66-d	0.8	Depressional-Open	Hulls Cove
67	0.4	Soil Flat-Mineral	Jones Marsh
68-a	0.2	Slope	Northeast Creek
68-b	0.6	Riverine-Upper Perennial	Northeast Creek
69-a	5.8	Depressional-Semiclosed	Jones Marsh
69-b	0.3	Depressional-Semiclosed	Jones Marsh
70	0.6	Soil Flat-Organic	Jones Marsh
71-a	1.3	Soil Flat-Mineral	Jones Marsh
71-b	2.5	Soil Flat-Organic	Jones Marsh
71-c	0.5	Riverine-Upper Perennial	Jones Marsh
71-d	2.1	Soil Flat-Organic	Jones Marsh
71-e	0.5	Soil Flat-Mineral	Jones Marsh
72	0.8	Slope	Jones Marsh
74-a	0.6	Lacustrine Fringe	Hulls Cove
74-b	0.7	Lacustrine Fringe	Hulls Cove
74-c	0.8	Riverine-Nonperennial	Hulls Cove
74-d	0.7	Depressional-Semiclosed	Hulls Cove
75	0.7	Soil Flat-Mineral	Jones Marsh
76	0.5	Slope	Hulls Cove
77	1.0	Slope	Northeast Creek
78-a	1.2	Slope	Northeast Creek
78-b	0.6	Slope	Northeast Creek
79	0.6	Slope	Hulls Cove
80	3.3	Tidal Fringe	Jones Marsh
81-a	0.7	Slope	Hulls Cove
81-b	0.6	Slope	Hulls Cove
82	0.5	Slope	Hulls Cove
83	0.8	Slope	Hulls Cove
84	0.8	Slope	Hulls Cove
85-a	0.6	Depressional-Closed	Sunken Heath
85-b	0.8	Depressional-Closed	Sunken Heath
85-c	2.7	Slope	Sunken Heath
85-d	2.3	Slope	Sunken Heath
86	0.5	Riverine-Upper Perennial	Jones Marsh

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
87	0.5	Depressional-Semiclosed	Hulls Cove
88	1.5	Depressional-Closed	Northeast Creek
89-a	0.4	Depressional-Open	Brewer Mtn
89-b	0.5	Depressional-Open	Brewer Mtn
89-c	0.7	Depressional-Open	Brewer Mtn
90	0.7	Slope	Brewer Mtn
91	0.5	Riverine-Upper Perennial	Jones Marsh
92	0.6	Soil Flat-Mineral	Town Hill
93-a	0.5	Lacustrine Fringe	Town Hill
93-b	0.2	Lacustrine Fringe	Town Hill
94-a	1.1	Riverine-Nonperennial	Sunken Heath
94-b	1.4	Riverine-Nonperennial	Sunken Heath
95	1.4	Lacustrine Fringe	Brewer Mtn
96	1.2	Slope	Town Hill
97	0.5	Slope	Sunken Heath
98	0.9	Slope	Sunken Heath
100-a	11.8	Lacustrine Fringe	Brewer Mtn
100-b	0.3	Lacustrine Fringe	Brewer Mtn
100-c	0.1	Lacustrine Fringe	Brewer Mtn
101	1.0	Slope	Sunken Heath
102-a	0.6	Slope	Brewer Mtn
102-b	0.6	Slope	Brewer Mtn
103-a	0.7	Riverine-Upper Perennial	Brewer Mtn
103-b	1.2	Slope	Brewer Mtn
104-a	1.7	Slope	Town Hill
104-b	0.1	Depressional-Closed	Town Hill
105	0.5	Slope	Sunken Heath
106-a	17.2	Depressional-Semiclosed	Town Hill
106-b	7.2	Depressional-Semiclosed	Town Hill
106-c	4.0	Depressional-Semiclosed	Town Hill
107	0.7	Riverine-Upper Perennial	Town Hill
108-a	1.3	Slope	Sunken Heath
108-b	0.1	Slope	Sunken Heath
109-a	2.6	Riverine-Upper Perennial	Sunken Heath
109-b	0.5	Slope	Sunken Heath
109-c	0.5	Riverine-Upper Perennial	Sunken Heath
109-d	3.3	Slope	Sunken Heath
109-e	2.6	Riverine-Upper Perennial	Sunken Heath
109-f	0.1	Riverine-Upper Perennial	Sunken Heath
110-a	0.7	Soil Flat-Mineral	Sunken Heath
110-b	0.2	Soil Flat-Mineral	Sunken Heath
111-a	0.1	Depressional-Closed	Sunken Heath
111-b	0.8	Depressional-Closed	Sunken Heath
112-a	0.5	Soil Flat-Mineral	Town Hill
112-b	0.4	Slope	Town Hill

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
112-c	0.2	Soil Flat-Mineral	Town Hill
113-a	1.5	Slope	Sunken Heath
113-b	0.1	Slope	Sunken Heath
113-c	0.1	Slope	Sunken Heath
113-d	0.1	Slope	Sunken Heath
114	9.6	Slope	Sunken Heath
115	0.4	Slope	Brewer Mtn
116	0.9	Hilltop/Upper Hillslope	Town Hill
117-a	0.3	Lacustrine Fringe	Brewer Mtn
117-b	0.2	Lacustrine Fringe	Brewer Mtn
118-a	3.2	Depressional-Semiclosed	Sunken Heath
118-b	2.5	Depressional-Semiclosed	Sunken Heath
118-c	0.3	Slope	Sunken Heath
118-d	1.4	Depressional-Closed	Sunken Heath
118-e	0.3	Slope	Sunken Heath
119	0.6	Slope	Sunken Heath
120	0.4	Depressional-Closed	Brewer Mtn
121	0.4	Slope	Brewer Mtn
122-a	0.7	Lacustrine Fringe	Brewer Mtn
122-b	2.1	Lacustrine Fringe	Brewer Mtn
122-c	2.2	Depressional-Open	Brewer Mtn
122-d	0.6	Slope	Brewer Mtn
123-a	8.0	Depressional-Open	Brewer Mtn
123-b	1.1	Riverine-Upper Perennial	Brewer Mtn
123-c	0.7	Depressional-Semiclosed	Brewer Mtn
123-d	4.8	Lacustrine Fringe	Brewer Mtn
123-e	0.0	Lacustrine Fringe	Brewer Mtn
123-f	4.7	Depressional-Open	Brewer Mtn
123-g	3.4	Depressional-Open	Brewer Mtn
123-h	0.9	Riverine-Upper Perennial	Brewer Mtn
123-i	1.2	Riverine-Upper Perennial	Brewer Mtn
124	0.5	Slope	Town Hill
125	3.9	Slope	Brewer Mtn
126	0.4	Soil Flat-Mineral	Brewer Mtn
127-a	0.6	Depressional-Semiclosed	Brewer Mtn
127-b	1.4	Depressional-Semiclosed	Brewer Mtn
128-a	0.9	Riverine-Upper Perennial	Town Hill
128-b	2.1	Riverine-Upper Perennial	Town Hill
128-c	0.6	Soil Flat-Mineral	Town Hill
128-d	0.3	Soil Flat-Mineral	Town Hill
129	1.3	Slope	Brewer Mtn
130	0.8	Slope	Sunken Heath
131-a	0.5	Hilltop/Upper Hillslope	Sunken Heath
131-b	0.4	Hilltop/Upper Hillslope	Sunken Heath
132	0.7	Slope	Indian Point

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
133-a	3.8	Riverine-Upper Perennial	Town Hill
133-b	2.1	Riverine-Upper Perennial	Town Hill
133-c	2.3	Riverine-Upper Perennial	Town Hill
133-d	0.8	Riverine-Upper Perennial	Town Hill
134	1.4	Slope	Sunken Heath
135-a	0.4	Slope	Brewer Mtn
135-b	1.5	Slope	Brewer Mtn
136-a	0.6	Riverine-Upper Perennial	Sunken Heath
136-b	1.5	Riverine-Upper Perennial	Sunken Heath
136-c	1.5	Riverine-Upper Perennial	Sunken Heath
137	1.3	Slope	Town Hill
138	5.4	Slope	Indian Point
140	2.6	Slope	Town Hill
141-a	5.9	Riverine-Upper Perennial	Sunken Heath
141-b	0.2	Soil Flat-Organic	Sunken Heath
141-c	0.4	Soil Flat-Organic	Sunken Heath
141-d	0.2	Riverine-Upper Perennial	Sunken Heath
141-e	0.2	Depressional-Semiclosed	Sunken Heath
141-f	0.3	Depressional-Semiclosed	Sunken Heath
141-g	4.9	Depressional-Semiclosed	Sunken Heath
141-h	4.4	Slope	Sunken Heath
142	1.5	Slope	Bar Harbor
143	1.1	Slope	Brewer Mtn
144-a	1.5	Open Water	Indian Point
144-b	0.1	Lacustrine Fringe	Indian Point
145	2.8	Slope	Town Hill
146-a	1.1	Riverine-Upper Perennial	Sunken Heath
146-b	1.6	Soil Flat-Organic	Sunken Heath
146-c	1.2	Slope	Sunken Heath
147	0.6	Soil Flat-Mineral	Town Hill
148-a	3.3	Depressional-Semiclosed	Sunken Heath
148-b	6.3	Depressional-Semiclosed	Sunken Heath
148-c	6.3	Depressional-Semiclosed	Sunken Heath
148-d	2.9	Depressional-Semiclosed	Sunken Heath
148-e	0.1	Depressional-Semiclosed	Sunken Heath
148-f	0.4	Depressional-Semiclosed	Sunken Heath
148-g	0.3	Depressional-Semiclosed	Sunken Heath
148-h	0.8	Riverine-Upper Perennial	Sunken Heath
149	0.6	Slope	Brewer Mtn
150	1.4	Depressional-Closed	Town Hill
151-a	0.7	Depressional-Open	Brewer Mtn
151-b	1.5	Depressional-Open	Brewer Mtn
151-c	1.9	Depressional-Open	Brewer Mtn
151-d	8.3	Depressional-Open	Brewer Mtn
151-e	0.7	Slope	Brewer Mtn

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
151-f	2.5	Depressional-Open	Brewer Mtn
151-g	0.3	Slope	Brewer Mtn
151-h	0.3	Riverine-Upper Perennial	Brewer Mtn
151-i	0.3	Riverine-Upper Perennial	Brewer Mtn
151-j	0.7	Open Water	Brewer Mtn
152	0.5	Soil Flat-Organic	Town Hill
153-a	1.1	Riverine-Upper Perennial	Indian Point
153-b	0.0	Riverine-Upper Perennial	Indian Point
153-c	5.9	Depressional-Open	Indian Point
153-d	0.9	Riverine-Upper Perennial	Indian Point
153-e	2.8	Slope	Indian Point
153-f	5.6	Soil Flat-Mineral	Indian Point
154	0.6	Slope	Indian Point
155-a	1.3	Depressional-Closed	Sunken Heath
155-b	0.5	Slope	Sunken Heath
155-c	0.5	Depressional-Closed	Sunken Heath
155-d	0.9	Depressional-Closed	Sunken Heath
156	1.2	Depressional-Open	Town Hill
157	1.0	Hilltop/Upper Hillslope	Sunken Heath
158	0.9	Slope	Brewer Mtn
159	0.9	Depressional-Open	Brewer Mtn
160	3.8	Slope	Town Hill
161	0.5	Slope	Sunken Heath
162	1.3	Slope	Town Hill
163	0.8	Soil Flat-Mineral	Town Hill
164	0.5	Slope	Town Hill
165	0.8	Depressional-Open	Town Hill
166	0.6	Soil Flat-Organic	Indian Point
167	0.5	Slope	Indian Point
168	0.5	Hilltop/Upper Hillslope	Indian Point
169	1.8	Depressional-Semiclosed	Brewer Mtn
170	0.7	Slope	Sunken Heath
171-a	0.3	Depressional-Closed	Brewer Mtn
171-b	0.1	Depressional-Closed	Brewer Mtn
171-c	0.3	Depressional-Closed	Brewer Mtn
172	0.8	Soil Flat-Mineral	Town Hill
173	0.9	Slope	Brewer Mtn
174-a	3.1	Slope	Sunken Heath
174-b	1.0	Slope	Sunken Heath
175	0.7	Slope	Sunken Heath
176	3.3	Slope	Town Hill
177-a	1.1	Soil Flat-Organic	Indian Point
177-b	0.6	Soil Flat-Organic	Indian Point
178	0.6	Lacustrine Fringe	Brewer Mtn
179	2.1	Depressional-Open	Brewer Mtn

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
180-a	1.1	Tidal Fringe	Town Hill
180-b	0.1	Tidal Fringe	Town Hill
180-c	6.7	Tidal Fringe	Town Hill
180-d	0.9	Tidal Fringe	Town Hill
180-e	0.4	Tidal Fringe	Town Hill
181-a	0.4	Slope	Sunken Heath
181-b	0.1	Slope	Sunken Heath
182	0.5	Slope	Brewer Mtn
183-a	0.7	Slope	Bar Harbor
183-b	0.3	Slope	Bar Harbor
183-c	0.2	Depressional-Closed	Bar Harbor
183-d	0.2	Depressional-Closed	Bar Harbor
184	1.8	Slope	Town Hill
185	0.4	Slope	Sunken Heath
186-a	0.2	Depressional-Semiclosed	Sunken Heath
186-b	0.7	Depressional-Semiclosed	Sunken Heath
186-c	2.6	Depressional-Semiclosed	Sunken Heath
186-d	0.3	Depressional-Semiclosed	Sunken Heath
186-e	0.4	Slope	Sunken Heath
186-f	0.9	Lacustrine Fringe	Sunken Heath
186	0.4	Lacustrine Fringe	Sunken Heath
187-a	1.8	Slope	Sunken Heath
187-b	0.1	Slope	Sunken Heath
188-a	2.0	Soil Flat-Mineral	Indian Point
188-b	0.5	Slope	Indian Point
189-a	8.4	Soil Flat-Organic	Sargent Mtn
189-b	0.6	Slope	Sargent Mtn
189-c	0.3	Soil Flat-Organic	Sargent Mtn
189-d	11.0	Depressional-Semiclosed	Sargent Mtn
189-e	1.0	Soil Flat-Organic	Sargent Mtn
190-a	2.9	Slope	Indian Point
190-b	2.7	Soil Flat-Mineral	Indian Point
190-c	4.6	Slope	Long Pond North
190-d	3.1	Riverine-Upper Perennial	Long Pond North
190-e	0.8	Depressional-Open	Long Pond North
190-f	3.8	Depressional-Semiclosed	Long Pond North
190-g	0.8	Depressional-Semiclosed	Long Pond North
190-h	3.3	Riverine-Upper Perennial	Long Pond North
191-a	1.0	Lacustrine Fringe	Brewer Mtn
191-b	0.3	Lacustrine Fringe	Brewer Mtn
191-c	0.7	Riverine-Nonperennial	Brewer Mtn
192	0.4	Slope	Sunken Heath
193	2.3	Slope	Town Hill
194	0.5	Slope	Town Hill
195	0.8	Slope	Indian Point

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
196	0.4	Open Water	Sunken Heath
197	0.5	Slope	Sunken Heath
198	2.6	Open Water	Pretty Marsh
199-a	0.4	Depressional-Closed	Bar Harbor
199-b	0.3	Depressional-Closed	Bar Harbor
200	0.6	Slope	Indian Point
201	0.5	Depressional-Semiclosed	Sunken Heath
202	0.4	Open Water	Sunken Heath
203-a	2.0	Riverine-Upper Perennial	Sunken Heath
203-b	0.2	Slope	Sunken Heath
203-c	0.1	Riverine-Upper Perennial	Sunken Heath
204-a	2.0	Depressional-Closed	Somesville
204-b	1.5	Depressional-Closed	Somesville
205-a	0.1	Slope	Bar Harbor
205-b	0.2	Slope	Bar Harbor
205-c	0.2	Slope	Bar Harbor
205-d	0.1	Slope	Bar Harbor
206-a	0.3	Lacustrine Fringe	Sargent Mtn
206-b	2.3	Open Water	Sargent Mtn
206-c	2.1	Lacustrine Fringe	Sargent Mtn
206-d	0.1	Lacustrine Fringe	Sargent Mtn
206-e	0.1	Depressional-Open	Sargent Mtn
206-f	3.1	Riverine-Upper Perennial	Sargent Mtn
206-g	0.1	Riverine-Upper Perennial	Sargent Mtn
206-h	0.3	Riverine-Upper Perennial	Sargent Mtn
206-i	0.2	Riverine-Upper Perennial	Sargent Mtn
206-j	1.3	Riverine-Upper Perennial	Sargent Mtn
206-k	0.7	Riverine-Upper Perennial	Sargent Mtn
206-l	0.1	Riverine-Upper Perennial	Sargent Mtn
206-m	0.4	Riverine-Upper Perennial	Sargent Mtn
206-n	0.1	Riverine-Upper Perennial	Sargent Mtn
206-o	0.1	Riverine-Upper Perennial	Sargent Mtn
206-p	0.4	Lacustrine Fringe	Sunken Heath
206-q	0.4	Lacustrine Fringe	Sunken Heath
207-a	0.3	Depressional-Semiclosed	Dorr Mtn
207-b	1.7	Depressional-Open	Dorr Mtn
207-c	0.1	Slope	Dorr Mtn
207-d	0.1	Slope	Dorr Mtn
207-e	1.4	Depressional-Open	Dorr Mtn
207-f	4.4	Riverine-Upper Perennial	Dorr Mtn
207-g	2.9	Depressional-Open	Dorr Mtn
207-h	2.1	Slope	Dorr Mtn
207-i	4.7	Depressional-Open	Dorr Mtn
207-j	0.4	Depressional-Open	Dorr Mtn
207-k	11.5	Depressional-Open	Dorr Mtn

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
207-l	2.0	Depressional-Open	Dorr Mtn
207-m	0.7	Depressional-Open	Dorr Mtn
207-n	0.1	Riverine-Upper Perennial	Dorr Mtn
207-o	1.1	Slope	Dorr Mtn
207-p	0.1	Riverine-Upper Perennial	Dorr Mtn
207-q	2.2	Depressional-Open	Dorr Mtn
207-r	1.7	Depressional-Open	Dorr Mtn
207-s	0.8	Depressional-Open	Dorr Mtn
207-t	3.1	Riverine-Upper Perennial	Dorr Mtn
207-u	0.1	Depressional-Open	Dorr Mtn
207-v	0.6	Depressional-Open	Dorr Mtn
207-w	0.6	Depressional-Open	Dorr Mtn
208	0.9	Slope	Sunken Heath
209	0.5	Hilltop/Upper Hillslope	Sunken Heath
210-a	1.9	Depressional-Open	Long Pond North
210-b	0.7	Depressional-Open	Long Pond North
210-c	0.4	Riverine-Upper Perennial	Long Pond North
210-d	1.7	Lacustrine Fringe	Long Pond North
210-e	0.7	Slope	Long Pond North
210-f	5.0	Open Water	Long Pond North
210-g	0.0	Lacustrine Fringe	Long Pond North
210-h	1.0	Lacustrine Fringe	Long Pond North
210-i	1.6	Depressional-Semiclosed	Long Pond North
211-a	3.6	Depressional-Closed	Somesville
211-b	0.6	Depressional-Closed	Somesville
211-c	1.3	Slope	Somesville
212-a	0.4	Slope	Sargent Mtn
212-b	3.5	Depressional-Open	Sargent Mtn
212-c	0.7	Riverine-Nonperennial	Sargent Mtn
212-d	1.3	Depressional-Semiclosed	Sargent Mtn
212-e	8.3	Depressional-Open	Sargent Mtn
212-f	0.3	Slope	Sargent Mtn
213	1.6	Slope	Somesville
214-a	0.7	Depressional-Closed	Somesville
214-b	0.9	Slope	Somesville
216-a	1.4	Riverine-Upper Perennial	Sargent Mtn
216-b	0.4	Depressional-Open	Sargent Mtn
216-c	0.5	Depressional-Open	Sargent Mtn
217	1.2	Slope	Somesville
218	1.6	Slope	Pretty Marsh
219	0.9	Depressional-Semiclosed	Pretty Marsh
220-a	1.0	Slope	Long Pond North
220-b	0.3	Soil Flat-Mineral	Long Pond North
221	1.3	Open Water	Sargent Mtn
222	0.6	Slope	Somesville

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
223	2.1	Depressional-Closed	Somesville
224	1.0	Slope	Long Pond North
225-a	2.7	Riverine-Upper Perennial	Long Pond North
225-b	2.1	Slope	Long Pond North
225-c	1.7	Depressional-Open	Long Pond North
226	0.6	Riverine-Upper Perennial	Dorr Mtn
227-a	0.7	Depressional-Open	Sargent Mtn
227-b	3.4	Depressional-Open	Sargent Mtn
227-c	3.7	Depressional-Open	Sargent Mtn
227-d	0.4	Depressional-Open	Sargent Mtn
227-e	0.3	Slope	Sargent Mtn
228-a	1.9	Riverine-Upper Perennial	Sargent Mtn
228-b	0.3	Riverine-Upper Perennial	Sargent Mtn
228-c	0.9	Riverine-Upper Perennial	Sargent Mtn
228-d	0.5	Riverine-Upper Perennial	Sargent Mtn
229-a	0.0	Soil Flat-Mineral	Somesville
229-b	0.4	Soil Flat-Mineral	Somesville
229-c	0.1	Soil Flat-Mineral	Somesville
230	0.5	Slope	Long Pond North
231	1.3	Riverine-Upper Perennial	Long Pond North
232-a	1.7	Soil Flat-Organic	Somesville
232-b	0.2	Soil Flat-Organic	Somesville
233-a	5.4	Slope	Somesville
233-b	1.0	Soil Flat-Organic	Somesville
233-c	0.2	Soil Flat-Organic	Somesville
234-a	2.0	Depressional-Semiclosed	Eagle Lake
234-b	1.0	Slope	Eagle Lake
234-c	0.2	Depressional-Open	Eagle Lake
234-d	0.3	Riverine-Nonperennial	Eagle Lake
236	3.3	Depressional-Open	Long Pond North
237-a	0.7	Depressional-Open	Dorr Mtn
237-b	0.6	Slope	Dorr Mtn
237-c	0.7	Depressional-Open	Dorr Mtn
237-d	1.9	Open Water	Dorr Mtn
237-e	2.7	Open Water	Dorr Mtn
238-a	0.1	Riverine-Nonperennial	Sargent Mtn
238-b	0.4	Riverine-Upper Perennial	Sargent Mtn
239-a	0.4	Depressional-Open	Sargent Mtn
239-b	0.4	Open Water	Sargent Mtn
241	0.5	Riverine-Upper Perennial	Long Pond North
242-a	0.2	Slope	Somesville
242-b	0.4	Slope	Somesville
243	1.2	Slope	Sargent Mtn
244	1.5	Depressional-Closed	Long Pond North
245	1.7	Slope	Long Pond North

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
246	0.5	Soil Flat-Mineral	Eagle Lake
248	4.1	Depressional-Semiclosed	Sargent Mtn
249-a	0.1	Riverine-Upper Perennial	Sargent Mtn
249-b	1.0	Depressional-Open	Sargent Mtn
250	0.6	Slope	Long Pond North
252-a	0.7	Depressional-Open	Sargent Mtn
252-b	0.1	Depressional-Open	Sargent Mtn
252-c	0.2	Depressional-Open	Sargent Mtn
253-a	0.9	Slope	Somesville
253-b	1.0	Lacustrine Fringe	Somesville
254	1.3	Slope	Dorr Mtn
256-a	0.9	Riverine-Upper Perennial	Sargent Mtn
256-b	0.2	Riverine-Upper Perennial	Sargent Mtn
257	0.7	Lacustrine Fringe	Eagle Lake
258-a	4.8	Open Water	Dorr Mtn
258-b	3.8	Open Water	Dorr Mtn
258-c	1.0	Lacustrine Fringe	Dorr Mtn
259	1.0	Soil Flat-Mineral	Pretty Marsh
261-a	0.5	Slope	Sargent Mtn
261-b	0.8	Riverine-Upper Perennial	Sargent Mtn
261-c	1.1	Riverine-Upper Perennial	Sargent Mtn
261-d	0.3	Riverine-Upper Perennial	Sargent Mtn
261-e	0.4	Riverine-Upper Perennial	Sargent Mtn
261-f	0.2	Riverine-Upper Perennial	Sargent Mtn
262-a	1.6	Slope	Somesville
262-b	0.2	Slope	Somesville
263	0.8	Riverine-Upper Perennial	Long Pond North
264-a	0.5	Riverine-Upper Perennial	Long Pond North
264-b	0.7	Open Water	Long Pond North
264-c	0.3	Lacustrine Fringe	Long Pond North
264-d	0.2	Lacustrine Fringe	Long Pond North
265-a	0.9	Tidal Fringe	Pretty Marsh
265-b	1.3	Tidal Fringe	Pretty Marsh
266-a	2.2	Riverine-Upper Perennial	Sargent Mtn
266-b	0.1	Riverine-Upper Perennial	Sargent Mtn
268	1.9	Riverine-Upper Perennial	Long Pond North
269	0.7	Lacustrine Fringe	Eagle Lake
270-a	0.3	Slope	Eagle Lake
270-b	0.8	Slope	Eagle Lake
270-c	0.1	Slope	Eagle Lake
270-d	0.3	Slope	Eagle Lake
271-a	1.2	Depressional-Open	Eagle Lake
271-b	0.3	Riverine-Upper Perennial	Eagle Lake
272	0.6	Depressional-Closed	Long Pond North
273-a	5.3	Lacustrine Fringe	Long Pond North

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
273-b	2.1	Open Water	Long Pond North
274-a	2.2	Depressional-Semiclosed	Dorr Mtn
274-b	2.5	Slope	Dorr Mtn
274-c	4.2	Depressional-Semiclosed	Dorr Mtn
274-d	0.1	Depressional-Semiclosed	Dorr Mtn
274-e	0.2	Slope	Dorr Mtn
274-f	0.1	Depressional-Semiclosed	Dorr Mtn
274-g	0.3	Depressional-Semiclosed	Dorr Mtn
274-h	0.3	Slope	Dorr Mtn
275-a	0.6	Riverine-Nonperennial	Long Pond North
275-b	0.7	Slope	Long Pond North
275-c	0.3	Riverine-Nonperennial	Long Pond North
275-d	0.1	Riverine-Nonperennial	Long Pond North
276	4.1	Slope	Somesville
277	0.6	Lacustrine Fringe	Long Pond North
278	0.4	Slope	Somesville
279	0.8	Slope	Dorr Mtn
280	0.6	Depressional-Closed	Pretty Marsh
281	0.5	Open Water	Somesville
282	0.9	Slope	Pretty Marsh
283	0.6	Slope	Eagle Lake
284-a	0.6	Depressional-Semiclosed	Dorr Mtn
284-b	0.7	Slope	Dorr Mtn
284-c	0.1	Riverine-Upper Perennial	Dorr Mtn
284-d	0.5	Riverine-Upper Perennial	Dorr Mtn
284-e	1.1	Riverine-Upper Perennial	Dorr Mtn
284-f	0.1	Riverine-Upper Perennial	Dorr Mtn
284-g	1.0	Riverine-Nonperennial	Dorr Mtn
285	3.1	Slope	Pretty Marsh
286	1.8	Slope	Pretty Marsh
287-a	0.7	Lacustrine Fringe	Long Pond North
287-b	0.2	Lacustrine Fringe	Long Pond North
288	0.5	Soil Flat-Mineral	Long Pond North
289	1.8	Open Water	Pretty Marsh
290	1.4	Slope	Pretty Marsh
291-a	0.7	Depressional-Semiclosed	Pretty Marsh
291-b	4.4	Tidal Fringe	Pretty Marsh
291-c	0.6	Depressional-Semiclosed	Pretty Marsh
291-d	0.5	Tidal Fringe	Pretty Marsh
292-a	1.1	Slope	Dorr Mtn
292-b	0.8	Depressional-Semiclosed	Dorr Mtn
292-c	0.3	Depressional-Semiclosed	Dorr Mtn
292-d	0.1	Depressional-Semiclosed	Dorr Mtn
293-a	0.7	Hilltop/Upper Hillslope	Somesville
293-b	0.8	Hilltop/Upper Hillslope	Somesville

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
293-c	0.2	Hilltop/Upper Hillslope	Somesville
295-a	0.2	Depressional-Open	Eagle Lake
295-b	0.5	Slope	Eagle Lake
295-c	1.7	Slope	Eagle Lake
296-a	0.7	Slope	Dorr Mtn
296-b	0.4	Depressional-Semiclosed	Dorr Mtn
296-c	0.2	Slope	Dorr Mtn
297	1.9	Riverine-Upper perennial	Somesville
298	1.0	Depressional-Closed	Pretty Marsh
299	0.9	Depressional-Closed	Pretty Marsh
300	0.5	Depressional-Closed	Pretty Marsh
301	0.4	Slope	Somesville
302-a	0.2	Depressional-Semiclosed	Dorr Mtn
302-b	0.6	Slope	Dorr Mtn
303-a	6.7	Depressional-Semiclosed	Dorr Mtn
303-b	0.1	Depressional-Semiclosed	Dorr Mtn
305-a	0.8	Lacustrine Fringe	Long Pond North
305-b	0.2	Lacustrine Fringe	Long Pond North
306	0.5	Lacustrine Fringe	Long Pond North
307	0.8	Depressional-Closed	Pretty Marsh
308	2.6	Depressional-Open	Somesville
309-a	0.3	Slope	Dorr Mtn
309-b	0.3	Riverine-Nonperennial	Dorr Mtn
309-c	0.6	Riverine-Nonperennial	Dorr Mtn
309-d	0.2	Slope	Dorr Mtn
309-e	0.9	Riverine-Nonperennial	Dorr Mtn
309-f	0.1	Slope	Dorr Mtn
309-g	0.6	Riverine-Nonperennial	Dorr Mtn
309-h	0.3	Slope	Dorr Mtn
309-i	0.7	Riverine-Upper Perennial	Dorr Mtn
309-j	0.4	Riverine-Upper Perennial	Dorr Mtn
309-k	0.5	Riverine-Upper Perennial	Dorr Mtn
309-l	2.4	Riverine-Upper Perennial	Dorr Mtn
310-a	0.6	Depressional-Closed	Pretty Marsh
310-b	0.5	Depressional-Closed	Pretty Marsh
311	0.4	Slope	Somesville
312-a	0.2	Slope	Dorr Mtn
312-b	0.8	Depressional-Semiclosed	Dorr Mtn
312-c	1.1	Depressional-Semiclosed	Dorr Mtn
312-d	0.2	Depressional-Semiclosed	Dorr Mtn
312-e	0.5	Slope	Dorr Mtn
313	1.4	Slope	Pretty Marsh
315-a	2.6	Depressional-Semiclosed	Pretty Marsh
315-b	5.4	Depressional-Semiclosed	Pretty Marsh
315-c	7.2	Depressional-Semiclosed	Pretty Marsh

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
316-a	0.4	Slope	Eagle Lake
316-b	0.2	Slope	Eagle Lake
317	1.7	Slope	Long Pond North
318-a	4.2	Open Water	Somesville
318-b	1.0	Open Water	Somesville
318-c	0.2	Slope	Somesville
318-d	0.1	Slope	Somesville
318-e	0.2	Lacustrine Fringe	Somesville
319	0.7	Lacustrine Fringe	Long Pond North
320-a	0.9	Open Water	Dorr Mtn
320-b	0.3	Slope	Dorr Mtn
321-a	1.0	Slope	Somesville
321-b	0.4	Hilltop/Upper Hillslope	Somesville
322	0.5	Depressional-Semiclosed	Pretty Marsh
324	3.2	Depressional-Closed	Long Pond North
325-a	0.3	Riverine-Upper Perennial	Eagle Lake
325-b	0.1	Riverine-Nonperennial	Eagle Lake
325-c	0.3	Slope	Eagle Lake
326	1.3	Depressional-Semiclosed	Dorr Mtn
327	1.1	Lacustrine Fringe	Somesville
329-a	2.3	Open Water	Dorr Mtn
329-b	2.4	Open Water	Dorr Mtn
330-a	0.4	Depressional-Closed	Somesville
330-b	0.3	Depressional-Closed	Somesville
331-a	5.1	Depressional-Open	Dorr Mtn
331-b	0.7	Slope	Dorr Mtn
331-c	1.2	Depressional-Open	Dorr Mtn
331-d	0.2	Depressional-Open	Dorr Mtn
331-e	0.5	Depressional-Open	Dorr Mtn
331-f	1.4	Slope	Dorr Mtn
332-a	0.3	Depressional-Open	Pretty Marsh
332-b	0.2	Depressional-Open	Pretty Marsh
333-a	0.3	Depressional-Closed	Somesville
333-b	0.4	Depressional-Closed	Somesville
334-a	1.3	Slope	Dorr Mtn
334-b	0.8	Depressional-Closed	Dorr Mtn
335	0.9	Depressional-Closed	Long Pond North
336-a	4.1	Depressional-Semiclosed	Dorr Mtn
336-b	2.5	Soil Flat-Organic	Dorr Mtn
336-c	1.7	Soil Flat-Organic	Dorr Mtn
337	0.9	Slope	Pretty Marsh
338	0.5	Slope	Somesville
339-a	0.6	Depressional-Open	Long Pond North
339-b	0.3	Slope	Long Pond North
339-c	0.2	Depressional-Open	Long Pond North

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
340	0.5	Slope	Somesville
341	0.5	Hilltop/Upper Hillslope	Eagle Lake
342	0.6	Slope	Eagle Lake
343	1.8	Slope	Pretty Marsh
345-a	4.1	Slope	Seal Cove Pond
345-b	2.0	Slope	Seal Cove Pond
346-a	0.3	Lacustrine Fringe	Sargent Mtn
346-b	0.5	Open Water	Sargent Mtn
347	0.4	Slope	Somesville
349-a	0.6	Depressional-Semiclosed	Pretty Marsh
349-b	0.2	Riverine-Nonperennial	Pretty Marsh
350	2.0	Depressional-Closed	Echo Lake
351-a	0.5	Tidal Fringe	Otter Creek
351-b	0.2	Tidal Fringe	Otter Creek
351-c	0.4	Riverine-Upper Perennial	Otter Creek
352-a	0.7	Depressional-Semiclosed	Otter Creek
352-b	0.1	Depressional-Semiclosed	Otter Creek
353-a	0.1	Slope	Otter Creek
353-b	0.2	Slope	Otter Creek
353-c	0.2	Slope	Otter Creek
353-d	0.6	Depressional-Semiclosed	Otter Creek
354-a	0.8	Depressional-Closed	Echo Lake
354-b	0.1	Depressional-Closed	Echo Lake
356-a	0.3	Slope	Northeast Harbor
356-b	0.1	Slope	Northeast Harbor
357	1.8	Slope	Seal Cove Pond
358	1.2	Slope	Echo Lake
359	0.4	Slope	Seal Cove Pond
360	1.6	Slope	Seal Cove Pond
361	2.6	Depressional-Semiclosed	Otter Creek
362	0.5	Lacustrine Fringe	Seal Cove Pond
363	0.5	Slope	Northeast Harbor
364-a	0.4	Slope	Seal Cove Pond
364-b	1.6	Depressional-Semiclosed	Seal Cove Pond
364-c	1.8	Depressional-Semiclosed	Seal Cove Pond
364-d	0.5	Riverine-Upper Perennial	Seal Cove Pond
365-a	0.4	Lacustrine Fringe	Long Pond South
365-b	0.4	Riverine-Upper Perennial	Long Pond South
366-c	1.8	Slope	Seal Cove Pond
367-a	2.2	Lacustrine Fringe	Northeast Harbor
367-b	1.2	Lacustrine Fringe	Northeast Harbor
367-c	2.4	Open Water	Northeast Harbor
368-a	1.0	Slope	Otter Creek
368-b	1.1	Slope	Otter Creek
369-a	1.6	Slope	Otter Creek

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
369-b	1.1	Slope	Otter Creek
369-c	1.2	Depressional-Open	Otter Creek
370	0.5	Slope	Seal Cove Pond
371-a	2.0	Lacustrine Fringe	Northeast Harbor
371-b	0.4	Slope	Northeast Harbor
373-a	0.3	Lacustrine Fringe	Northeast Harbor
373-b	0.3	Lacustrine Fringe	Northeast Harbor
374	0.5	Riverine-Upper Perennial	Long Pond South
375	0.4	Slope	Echo Lake
376	2.1	Lacustrine Fringe	Seal Cove Pond
377	3.0	Slope	Echo Lake
378-a	0.4	Riverine-Nonperennial	Otter Creek
378-b	0.1	Riverine-Nonperennial	Otter Creek
379-a	0.3	Riverine-Upper Perennial	Long Pond South
379-b	2.4	Depressional-Semiclosed	Long Pond South
379-c	0.2	Depressional-Semiclosed	Long Pond South
379-d	0.2	Depressional-Semiclosed	Long Pond South
380-a	3.9	Riverine-Nonperennial	Northeast Harbor
380-b	0.1	Depressional-Semiclosed	Northeast Harbor
380-c	0.1	Riverine-Nonperennial	Northeast Harbor
380-d	0.4	Slope	Northeast Harbor
381-a	2.1	Riverine-Upper Perennial	Seal Cove Pond
381-b	2.1	Depressional-Semiclosed	Seal Cove Pond
382	1.4	Slope	Echo Lake
383-a	2.2	Slope	Northeast Harbor
383-b	0.5	Riverine-Upper Perennial	Northeast Harbor
384	3.6	Lacustrine Fringe	Seal Cove Pond
386	0.5	Depressional-Semiclosed	Seal Cove Pond
387	0.6	Depressional-Closed	Northeast Harbor
388	0.8	Riverine-Nonperennial	Seal Cove Pond
389	0.4	Soil Flat-Mineral	Otter Creek
390	0.8	Riverine-Nonperennial	Seal Cove Pond
391	1.3	Depressional-Semiclosed	Seal Cove Pond
393-a	0.4	Lacustrine Fringe	Echo Lake
393-b	1.8	Riverine-Upper Perennial	Echo Lake
393-c	1.1	Riverine-Upper Perennial	Echo Lake
394-a	0.9	Riverine-Nonperennial	Seal Cove Pond
394-b	0.9	Riverine-Nonperennial	Seal Cove Pond
395-a	0.1	Depressional-Semiclosed	Northeast Harbor
395-b	0.5	Slope	Northeast Harbor
395-c	0.5	Open Water	Northeast Harbor
396	3.1	Depressional-Closed	Seal Cove Pond
398	0.6	Hilltop/Upper Hillslope	Otter Creek
399	1.0	Slope	Seal Cove Pond
400-a	0.1	Depressional-Semiclosed	Otter Creek

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
400-b	0.8	Depressional-Semiclosed	Otter Creek
400-c	0.4	Slope	Otter Creek
401	1.4	Slope	Northeast Harbor
402	1.4	Depressional-Open	Seal Cove Pond
403	1.6	Riverine-Upper Perennial	Northeast Harbor
404-a	0.6	Soil Flat-Organic	Otter Creek
404-b	0.9	Slope	Otter Creek
405-a	0.3	Riverine-Nonperennial	Echo Lake
405-b	1.3	Riverine-Nonperennial	Echo Lake
406	1.3	Riverine-Nonperennial	Northeast Harbor
407	2.1	Slope	Seal Cove Pond
408	0.4	Soil Flat-Mineral	Seal Cove Pond
410	1.0	Depressional-Closed	Northeast Harbor
411-a	2.3	Riverine-Upper Perennial	Northeast Harbor
411-b	6.7	Lacustrine Fringe	Northeast Harbor
411-c	0.5	Riverine-Upper Perennial	Northeast Harbor
411-d	0.9	Open Water	Northeast Harbor
411-e	0.2	Lacustrine Fringe	Northeast Harbor
411-f	0.3	Lacustrine Fringe	Northeast Harbor
411-g	0.1	Lacustrine Fringe	Northeast Harbor
412-a	0.7	Riverine-Upper Perennial	Northeast Harbor
412-b	0.3	Riverine-Upper Perennial	Northeast Harbor
413	0.6	Slope	Seal Cove Pond
414	0.5	Hilltop/Upper Hillslope	Echo Lake
415	0.9	Hilltop/Upper Hillslope	Seal Cove Pond
416	1.5	Depressional-Closed	Seal Cove Pond
417-a	2.8	Riverine-Upper Perennial (Beaver influenced)	Otter Creek
417-b	0.2	Riverine-Upper Perennial (Beaver influenced)	Otter Creek
417-c	0.3	Riverine-Upper Perennial (Beaver influenced)	Otter Creek
417-d	0.5	Riverine-Upper Perennial (Beaver influenced)	Otter Creek
419	1.3	Riverine-Nonperennial	Echo Lake
420-a	0.7	Depressional-Closed	Seal Cove Pond
420-b	5.4	Depressional-Closed	Seal Cove Pond
420-c	2.4	Depressional-Closed	Seal Cove Pond
421	0.8	Slope	Northeast Harbor
422	0.5	Slope	Northeast Harbor
423	0.4	Depressional-Closed	Seal Cove Pond
424-a	1.7	Depressional-Closed	Echo Lake
424-b	0.2	Depressional-Closed	Echo Lake
424-c	0.1	Depressional-Closed	Echo Lake

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
425	3.3	Slope	Otter Creek
426	1.0	Riverine-Upper Perennial	Northeast Harbor
427	0.9	Slope	Northeast Harbor
428-a	6.3	Lacustrine Fringe	Seal Cove Pond
428-b	0.6	Slope	Seal Cove Pond
429	0.7	Depressional-Semiclosed	Seal Cove Pond
430	0.5	Depressional-Closed	Seal Cove Pond
431	0.7	Riverine-Upper Perennial	Seal Cove Pond
432-a	1.7	Depressional-Semiclosed	Seal Cove Pond
432-b	0.3	Slope	Seal Cove Pond
433-a	1.1	Slope	Northeast Harbor
433-b	0.3	Slope	Northeast Harbor
433-c	0.5	Slope	Northeast Harbor
434	0.5	Slope	Long Pond South
435-a	1.1	Lacustrine Fringe	Seal Cove Pond
435-b	0.8	Riverine-Upper Perennial	Seal Cove Pond
435-c	7.1	Lacustrine Fringe	Seal Cove Pond
435-d	2.2	Lacustrine Fringe	Seal Cove Pond
435-e	1.1	Riverine-Nonperennial	Seal Cove Pond
436-a	0.2	Slope	Echo Lake
436-b	0.4	Slope	Echo Lake
437	0.5	Hilltop/Upper Hillslope	Seal Cove Pond
438	0.7	Slope	Seal Cove Pond
440-a	2.8	Riverine-Upper Perennial	Long Pond South
440-b	0.7	Slope	Long Pond South
440-c	1.8	Slope	Long Pond South
440-d	1.5	Riverine-Upper Perennial	Long Pond South
440-e	0.5	Riverine-Upper Perennial	Long Pond South
441	1.0	Slope	Long Pond South
442-a	2.8	Riverine-Upper Perennial	Long Pond South
442-b	9.5	Slope	Long Pond South
443	0.5	Open Water	Seal Cove Pond
444	0.9	Depressional-Closed	Long Pond South
445	1.9	Slope	Long Pond South
446-a	7.2	Depressional-Semiclosed	Long Pond South
446-b	3.6	Open Water	Long Pond South
446-c	0.4	Depressional-Semiclosed	Long Pond South
446-d	0.2	Lacustrine Fringe	Long Pond South
446-e	0.8	Lacustrine Fringe	Long Pond South
446-f	0.9	Slope	Long Pond South
446-g	3.3	Riverine-Upper Perennial	Long Pond South
447-a	4.7	Riverine-Upper Perennial	Long Pond South
447-b	1.2	Riverine-Upper Perennial	Long Pond South
447-c	0.5	Riverine-Upper Perennial	Long Pond South
447-d	1.5	Soil Flat-Organic	Long Pond South

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
447-e	1.8	Riverine-Upper Perennial	Long Pond South
448-a	0.1	Riverine-Nonperennial	Echo Lake
448-b	1.5	Slope	Echo Lake
449	2.0	Slope	Echo Lake
450	2.3	Depressional-Closed	Long Pond South
451	0.4	Depressional-Semiclosed	Seal Cove Pond
452	3.0	Slope	Long Pond South
453	0.5	Open Water	Seal Cove Pond
454	0.6	Slope	Long Pond South
455	0.6	Depressional-Semiclosed	Seal Cove Pond
456-a	0.4	Riverine-Nonperennial	Seal Cove Pond
456-b	0.5	Depressional-Open	Seal Cove Pond
456-c	0.2	Depressional-Open	Seal Cove Pond
457-a	1.0	Riverine-Upper Perennial	Long Pond South
457-b	1.1	Depressional-Semiclosed	Long Pond South
457-c	0.2	Slope	Long Pond South
457-d	0.1	Riverine-Upper Perennial	Long Pond South
458-a	1.9	Riverine-Upper Perennial	Long Pond South
458-b	0.5	Riverine-Upper Perennial	Long Pond South
458-c	0.3	Riverine-Upper Perennial	Long Pond South
459-a	1.8	Depressional-Open	Seal Cove Pond
459-b	2.0	Depressional-Semiclosed	Seal Cove Pond
459-c	3.6	Depressional-Semiclosed	Seal Cove Pond
459-d	1.5	Depressional-Open	Seal Cove Pond
460	0.4	Open Water	Echo Lake
461-a	0.8	Riverine-Upper Perennial	Bass Harbor
461-b	1.6	Riverine-Upper Perennial	Bass Harbor
461-c	1.3	Riverine-Upper Perennial	Bass Harbor
461-d	0.2	Soil Flat-Organic	Bass Harbor
461-e	2.6	Soil Flat-Organic	Bass Harbor
461-f	2.5	Riverine-Upper Perennial	Bass Harbor
461-g	0.1	Slope	Bass Harbor
461-h	3.6	Riverine-Upper Perennial	Bass Harbor
461-i	0.6	Soil Flat-Organic	Bass Harbor
461-j	0.6	Riverine-Upper Perennial	Bass Harbor
461-k	1.4	Riverine-Upper Perennial	Bass Harbor
461-l	0.9	Riverine-Upper Perennial	Bass Harbor
462	0.5	Slope	Big Heath
463	0.6	Slope	Big Heath
464	1.4	Slope	West Tremont
465	0.9	Slope	West Tremont
466	0.6	Soil Flat-Organic	West Tremont
467-a	0.3	Riverine-Nonperennial	Big Heath
467-b	0.2	Riverine-Upper Perennial	Big Heath
467-c	0.2	Riverine-Upper Perennial	Big Heath

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
467-d	4.1	Riverine-Upper Perennial	Big Heath
467-e	0.2	Riverine-Upper Perennial	Big Heath
467-f	2.1	Riverine-Upper perennial	Big Heath
468	1.3	Depressional-Semiclosed	Bass Harbor
469	0.5	Soil Flat-Organic	West Tremont
470-a	2.5	Riverine-Upper Perennial	Bass Harbor
470-aa	2.4	Tidal Fringe	Big Heath
470-b	0.4	Soil Flat-Mineral	Bass Harbor
470-bb	0.3	Soil Flat-Organic	Big Heath
470-bc	0.4	Slope	Big Heath
470-bd	3.5	Soil Flat-Mineral	Big Heath
470-be	0.3	Riverine-Nonperennial	Big Heath
470-bf	1.2	Riverine-Upper Perennial	Big Heath
470-bg	0.6	Soil Flat-Mineral	Big Heath
470-bh	0.7	Soil Flat-Organic	Big Heath
470-bi	8.4	Soil Flat-Organic	Big Heath
470-bj	16.7	Soil Flat-Organic	Big Heath
470-bk	0.8	Riverine-Upper Perennial	Big Heath
470-bl	0.5	Riverine-Upper Perennial	Big Heath
470-bm	12.5	Soil Flat-Organic	Big Heath
470-bn	0.3	Slope	Big Heath
470-bo	0.2	Soil Flat-Mineral	Big Heath
470-bp	0.9	Depressional-Semiclosed	Big Heath
470-bq	3.8	Soil Flat-Mineral	Big Heath
470-br	1.4	Soil Flat-Organic	Big Heath
470-bs	2.0	Soil Flat-Mineral	Big Heath
470-bt	1.4	Soil Flat-Organic	Big Heath
470-bu	0.7	Depressional-Open	Big Heath
470-bv	0.3	Slope	Big Heath
470-bw	0.2	Slope	Big Heath
470-bx	0.9	Riverine-Upper Perennial	Seawall
470-by	1.3	Riverine-Upper Perennial	Seawall
470-bz	1.1	Riverine-Upper Perennial	Seawall
470-c	1.7	Riverine-Upper Perennial	Bass Harbor
470-ca	1.6	Soil Flat-Organic	Seawall
470-cb	1.0	Soil Flat-Organic	Seawall
470-cc	0.8	Tidal Fringe	Big Heath
470-cd	0.4	Soil Flat-Organic	Seawall
470-d	1.3	Riverine-Upper Perennial	Bass Harbor
470-dd	10.1	Tidal Fringe	Big Heath
470-e	7.3	Soil Flat-Organic	Bass Harbor
470-ee	0.7	Soil Flat-Mineral	Big Heath
470-f	0.2	Riverine-Upper Perennial	Bass Harbor
470-ff	0.2	Soil Flat-Mineral	Big Heath
470-g	0.3	Riverine-Upper Perennial	Bass Harbor

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
470-gg	0.2	Slope	Big Heath
470-h	1.0	Riverine-Upper Perennial	Bass Harbor
470-hh	1.8	Tidal Fringe	Big Heath
470-i	0.8	Riverine-Upper Perennial	Bass Harbor
470-ii	0.5	Tidal Fringe	Big Heath
470-j	0.2	Riverine-Upper Perennial	Bass Harbor
470-jj	0.4	Tidal Fringe	Big Heath
470-k	2.4	Soil Flat-Organic	Bass Harbor
470-kk	0.1	Tidal Fringe	Big Heath
470-l	3.0	Soil Flat-Organic	Bass Harbor
470-ll	7.3	Tidal Fringe	Big Heath
470-m	0.9	Tidal Fringe	Bass Harbor
470-mm	0.7	Tidal Fringe	Big Heath
470-n	0.2	Soil Flat-Organic	Bass Harbor
470-nn	1.0	Soil Flat-Organic	Big Heath
470-o	0.3	Soil Flat-Organic	Bass Harbor
470-oo	2.0	Soil Flat-Organic	Big Heath
470-p	0.5	Soil Flat-Mineral	Bass Harbor
470-pp	1.1	Soil Flat-Organic	Big Heath
470-q	0.3	Riverine-Nonperennial	Bass Harbor
470-qq	13.7	Soil Flat-Organic	Big Heath
470-r	0.3	Soil Flat-Organic	Bass Harbor
470-rr	1.2	Slope	Big Heath
470-s	0.8	Soil Flat-Organic	Bass Harbor
470-ss	3.2	Soil Flat-Organic	Big Heath
470-t	1.7	Soil Flat-Organic	Bass Harbor
470-tt	16.3	Soil Flat-Organic	Big Heath
470-u	0.3	Soil Flat-Organic	Bass Harbor
470-uu	9.9	Soil Flat-Organic	Big Heath
470-v	2.2	Slope	Bass Harbor
470-vv	11.8	Riverine-Upper Perennial	Big Heath
470-w	0.1	Soil Flat-Organic	Bass Harbor
470-ww	0.9	Soil Flat-Organic	Big Heath
470-x	2.8	Tidal Fringe	Bass Harbor
470-xx	0.9	Slope	Big Heath
470-y	1.4	Slope	Bass Harbor
470-yy	4.8	Soil Flat-Organic	Big Heath
470-z	11.4	Tidal Fringe	Bass Harbor
470-zz	1.0	Soil Flat-Organic	Big Heath
471-a	1.5	Soil Flat-Organic	West Tremont
471-b	2.9	Slope	West Tremont
471-c	1.2	Soil Flat-Organic	West Tremont
472-a	2.9	Depressional-Open	Big Heath
472-b	1.4	Slope	Big Heath
473-a	1.2	Soil Flat-Organic	West Tremont

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
473-b	0.2	Soil Flat-Organic	West Tremont
474-a	2.1	Riverine-Upper Perennial	Bass Harbor
474-b	0.2	Riverine-Upper Perennial	Bass Harbor
474-c	0.4	Depressional-Semiclosed	Bass Harbor
475	1.9	Riverine-Nonperennial	West Tremont
476-a	0.6	Riverine-Upper Perennial	Bass Harbor
476-b	0.4	Riverine-Upper Perennial	Bass Harbor
476-c	0.1	Riverine-Upper Perennial	Bass Harbor
476-d	0.8	Riverine-Upper Perennial	Bass Harbor
476-e	0.2	Riverine-Upper Perennial	Bass Harbor
476-f	0.2	Riverine-Upper Perennial	Bass Harbor
477	0.5	Soil Flat-Mineral	Seawall
478	6.0	Riverine-Nonperennial	Bass Harbor
479	0.6	Open Water	Big Heath
480	0.7	Soil Flat-Organic	West Tremont
481-a	0.2	Soil Flat-Mineral	Seawall
481-b	0.6	Open Water	Seawall
481-c	0.2	Slope	Seawall
482	0.4	Riverine-Upper Perennial	West Tremont
483	1.8	Tidal Fringe	West Tremont
484-a	0.8	Open Water	Seawall
484-b	0.3	Soil Flat-Organic	Seawall
484-c	0.3	Riverine-Upper Perennial	Seawall
484-d	1.3	Soil Flat-Organic	Seawall
485	0.8	Riverine-Upper Perennial	Big Heath
486-a	0.5	Slope	Seawall
486-b	0.9	Slope	Seawall
487	2.9	Slope	Bass Harbor
488-a	0.9	Open Water	Seawall
488-b	0.5	Soil Flat-Organic	Seawall
488-c	0.6	Riverine-Upper Perennial	Seawall
489	0.7	Slope	Seawall
490	2.1	Slope	Bass Harbor
491	2.4	Soil Flat-Organic	Seawall
492-a	0.8	Soil Flat-Mineral	Seawall
492-b	0.9	Soil Flat-Organic	Seawall
493	1.6	Depressional-Semiclosed	Bass Harbor
494-a	2.8	Riverine-Upper Perennial	Seawall
494-b	0.4	Depressional-Semiclosed	Seawall
495-a	8.7	Riverine-Upper Perennial	Big Heath
495-b	2.0	Riverine-Upper Perennial	Big Heath
495-c	2.9	Soil Flat-Organic	Big Heath
495-d	0.6	Riverine-Nonperennial	Big Heath
495-e	0.4	Riverine-Nonperennial	Big Heath
495-f	0.8	Riverine-Nonperennial	Big Heath

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

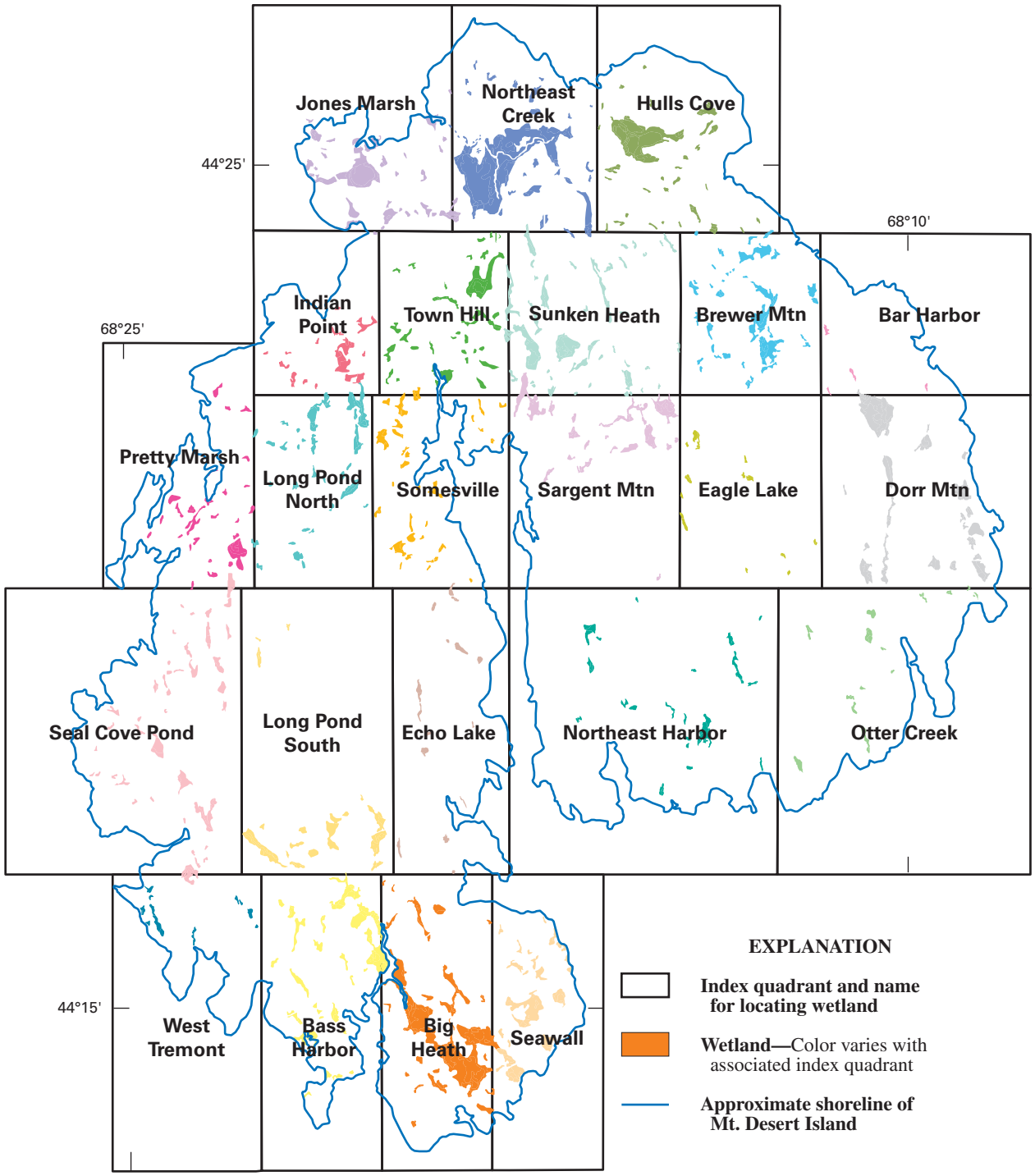
[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
496-a	3.5	Soil Flat-Organic	Seawall
496-b	0.2	Soil Flat-Mineral	Seawall
497	0.4	Riverine-Nonperennial	Bass Harbor
498	5.1	Slope	Bass Harbor
499	0.7	Slope	Seawall
500	1.0	Soil Flat-Mineral	Bass Harbor
501-a	2.6	Soil Flat-Organic	Seawall
501-b	0.5	Soil Flat-Organic	Seawall
501-c	2.0	Soil Flat-Organic	Seawall
501-d	0.6	Soil Flat-Organic	Seawall
501-e	0.2	Soil Flat-Organic	Seawall
501-f	0.4	Soil Flat-Organic	Seawall
501-g	0.3	Soil Flat-Organic	Seawall
501-h	0.1	Soil Flat-Organic	Seawall
502-a	0.7	Soil Flat-Organic	Seawall
502-b	0.4	Soil Flat-Organic	Seawall
502-c	20.4	Soil Flat-Organic	Seawall
502-d	0.6	Soil Flat-Organic	Seawall
502-e	0.4	Soil Flat-Mineral	Seawall
502-f	1.9	Slope	Seawall
502-g	0.1	Soil Flat-Mineral	Seawall
502-h	0.1	Soil Flat-Mineral	Seawall
502-i	1.3	Depressional-Open	Seawall
502-j	1.1	Depressional-Open	Seawall
502-k	0.5	Depressional-Open	Seawall
503	1.8	Soil Flat-Mineral	Big Heath
504-a	0.2	Soil Flat-Mineral	Big Heath
504-b	0.5	Soil Flat-Mineral	Big Heath
504-c	0.3	Soil Flat-Mineral	Big Heath
505	0.7	Soil Flat-Mineral	Bass Harbor
506	1.0	Soil Flat-Mineral	Big Heath
507	0.7	Soil Flat-Mineral	Bass Harbor
508	0.8	Slope	Bass Harbor
509-a	1.1	Slope	Bass Harbor
509-b	0.2	Slope	Bass Harbor
509-c	0.7	Depressional-Semiclosed	Bass Harbor
509-d	0.1	Slope	Bass Harbor
510	0.4	Soil Flat-Mineral	Bass Harbor
511	0.8	Riverine-Nonperennial	Big Heath
512-a	0.3	Slope	Bass Harbor
512-b	0.4	Riverine-Nonperennial	Bass Harbor
512-c	0.1	Depressional-Semiclosed	Bass Harbor
513	1.4	Depressional-Closed	Seawall
514	8.9	Tidal Fringe	Bass Harbor
515-a	3.1	Depressional-Open	Seawall

Table 2-1. Hydrogeomorphic classification of wetlands on Mt. Desert Island, Maine.—Continued

[ha, hectares; locations of wetlands, with identifiers, shown on plate 1; map quadrants shown on fig. 2-1]

Wetland identi-fier	Area, in ha	Hydrogeomorphic class	Map quadrant (fig. 2-1)
515-b	0.5	Depressional-Open	Seawall
515-c	1.7	Depressional-Open	Seawall
515-d	0.3	Depressional-Open	Seawall
515-e	0.1	Depressional-Open	Seawall
515-f	1.2	Depressional-Open	Seawall
516	0.7	Slope	Seawall
517	0.9	Slope	Big Heath
518	1.7	Slope	Big Heath
519-a	4.5	Riverine-Upper Perennial	Seawall
519-b	1.2	Slope	Seawall
519-c	1.5	Slope	Seawall
519-d	0.6	Open Water	Seawall
519-e	1.4	Slope	Seawall
519-f	0.9	Depressional-Semiclosed	Seawall
520	1.0	Slope	Seawall
521-a	0.2	Slope	Bass Harbor
521-b	2.1	Tidal Fringe	Bass Harbor
522	1.0	Slope	Big Heath
523	0.6	Depressional-Closed	Bass Harbor
524-a	0.1	Depressional-Closed	Big Heath
524-b	0.6	Depressional-Closed	Big Heath
525-a	3.9	Riverine-Nonperennial	Big Heath
525-b	1.4	Soil Flat-Organic	Big Heath
525-c	0.2	Soil Flat-Mineral	Big Heath
525-d	0.5	Soil Flat-Organic	Big Heath
526	1.4	Tidal Fringe	Bass Harbor
527-a	0.3	Slope	Big Heath
527-b	0.2	Slope	Big Heath
527-c	0.3	Depressional-Semiclosed	Big Heath
527-d	0.3	Depressional-Semiclosed	Big Heath
528	1.5	Soil Flat-Mineral	Big Heath
529	1.0	Depressional-Semiclosed	Bass Harbor
530	3.8	Depressional-Semiclosed	Big Heath
532	1.1	Hilltop/Upper Hillslope	Big Heath



Base from U.S. Geological Survey digital data, 1:24,000
Bar Harbor, 1982, Bartlett Island, 1981, Bass Harbor, provisional, 1983
Salsbury Cove, 1981, Seal Harbor and Southwest Harbor, 1983
U.S. Fish and Wildlife National Wetland Inventory maps, 1998, 1:24,000

0 1 2 3 4 5 KILOMETERS
0 1 2 3 4 5 MILES

Figure 2-1. Quadrants for indexing wetland locations, Mt. Desert Island, Maine.

Appendix 3. Susceptibility Scoring for Wetlands Greater Than 1 Hectare in Acadia National Park

Table 3-1. Raw scores for wetland and catchment variables used in susceptibility scoring.

[Locations of wetlands shown on plate 1; ha, hectares; m, meters]

Wetland identi-fier	Wetland area, in ha	Wetland catchment area, in ha	Catchment area properties						Other wetland properties	
			Percent bare bedrock	Mean slope, in percent	Percent imper-vious surface	Range in elevation (relief, in m)	Percent clay soils	Net storage, percent	Wetland as a percentage of adjacent lake area	Stream, lake, or tidal inflow
100-a	11.8	138	27.6	7.9	0	59.7	14	15	123	Yes
102	1.2	13.7	29.9	8.8	0	34.9	0	1		No
103-b	1.2	7.7	0.0	8.0	0	34.7	0	0		No
108	1.4	34	93.9	9.7	0	106.2	0	4		No
122-b	2.1	32.7	54.0	18.7	0	130.8	0	4	17	Yes
122-c	2.2	67.2	41.4	16.1	0	145.9	3	3		Yes
123-a	6.3	32.3	16.8	7.0	0	43.4	16	1	485	Yes
123-d	6.6	1,231	44.3	19.8	4	404.1	2	20	315	Yes
123-f	4.7	1,196	44.7	20.0	4	402.8	2	20		Yes
123-g	3.4	37.9	37.6	9.8	0	64	0	1		Yes
123-i	1.2	980	45.5	21.6	4	398.8	1	22		Yes
125	3.9	32.2	63.8	17.8	29	120.6	0	7		No
127	2.0	25.1	67.6	8.5	0	39	9	1		No
129	1.3	6.4	67.4	22.4	24	106.8	0	4		No
135	2.0	37.4	70.9	18.2	0	133	0	0		No
143	1.1	7.0	67.9	15.8	0	91.7	0	0		No
144	1.5	287	2.0	4.0	3	63.7	12	10		No
148-a	19.6	47.8	59.8	2.8	0	21.6	36	3		No
151-c	2.6	148	44.5	13.9	10	209.2	7	12		Yes
151-d	13.2	142	45.3	14.2	10	207.1	8	2		Yes
151-j	0.7	148	44.5	13.9	10	209.2	7	13		Yes
155	2.7	12	97.0	9.0	18	29.2	23	8		No
157	1.0	2.1	100.0	6.0	0	12.2	0	0		No
174	4.1	55.2	47.6	10.2	7	85.1	8	4		No
176	3.3	10.7	94.4	11.0	0	29.6	45	0		No
179	2.1	87.3	47.0	16.9	9	200.9	4	0		Yes
17-b	2.1	65.3	0.0	6.9	1	51.3	39	10		Yes
186-a	1.2	12.1	64.8	10.3	0	48.9	18	5		No
186-c	3.0	36.3	58.5	10.4	1	153.5	12	5		No
186-f	1.3	72.8	63.6	11.3	3	156.9	12	8	10	Yes
187	1.9	8.3	93.7	8.1	0	26.6	0	0		No
189-a	9.7	47.9	0.0	3.5	13	28.3	45	6		No
189-d	11.0	41.2	45.9	7.7	0	38.2	25	3		No
191-a	1.3	38	47.9	17.1	7	196.3	0	2	1	Yes
206-c	2.1	7.4	0.0	4.7	0	11.7	44	1	16	Yes
206-f	4.5	585.0	33.6	12.0	1	356	14	10		Yes
206-k	1.1	253	41.2	14.3	0	351.3	6	7		Yes
207-b	1.7	30.7	21.3	22.9	7	111.2	43	4		Yes
207-f	8.6	307	46.7	28.4	6	372	31	16		Yes
207-h	6.2	50.3	20.3	20.7	5	114.9	44	5		No

Table 3-1. Raw scores for wetland and catchment variables used in susceptibility scoring.—Continued

[Locations of wetlands shown on plate 1; ha, hectares; m, meters]

Wetland identifier	Wetland area, in ha	Wetland catchment area, in ha	Catchment area properties						Other wetland properties	
			Percent bare bedrock	Mean slope, in percent	Percent impervious surface	Range in elevation (relief, in m)	Percent clay soils	Net storage, percent	Wetland as a percentage of adjacent lake area	Stream, lake, or tidal inflow
207-i	5.9	36.5	25.5	13.7	10	65.8	48	0		Yes
207-k	22.4	128	41.0	25.5	2	335.6	36	7		Yes
212-b	13.0	164	16.9	10.7	3	148.2	23	2		Yes
217	1.2	14.6	90.2	7.2	0	29.1	0	0		No
227-b	7.5	244	42.8	14.7	0	348.7	6	4		Yes
228	3.3	715	39.5	11.9	1	374.3	11	10		Yes
234-a	2.0	5.7	11.1	4.3	0	17.4	47	7		No
237-b	1.3	13.2	46.8	18.6	18	143	17	0		No
237-d	4.6	66.2	75.2	31.6	5	278.7	8	3		No
23-a	33.3	183	0.0	4.9	1	54.5	47	5		No
23-b	11.0	734	20.3	6.8	3	189	56	18		Yes
23-bb	1.3	2,489	28.8	7.3	4	217.8	38	16		Yes
23-cc	87.2	557	18.2	4.5	5	79.6	41	9		No
23-d	2.5	17.4	0.0	4.2	0	29.9	100	0		No
23-dd	1.7	914	50.9	10.0	4	217.8	19	7		Yes
23-ee	5.8	2,489	28.8	7.3	4	217.8	38	16		Yes
23-hh	17.3	61.3	2.0	5.1	4	47.6	32	3		No
23-i	9.1	933	49.9	9.9	4	217.8	20	7		No
23-m	11.1	2,489	28.8	7.3	4	217.8	38	16		Yes
23-mm	1.3	13.8	0.0	6.3	0	30.7	100	1		No
23-o	3.7	13.3	0.0	11.0	0	25.6	24	0		No
248	4.1	20.3	32.3	11.7	0	80.4	25	0		No
249	1.0	60.9	6.6	7.5	0	149.9	0	6		Yes
254	1.3	14.5	77.0	27.0	13	154.7	0	0		No
261	1.9	98.8	100.0	18.4	0	333.3	0	1		Yes
26-a	1.6	16.5	0.0	1.1	23	4.6	100	15		Yes
26-c	2.1	16.5	0.0	1.1	23	4.6	100	3		No
270	1.6	15.6	25.8	13.1	0	98.4	0	0		No
271	1.5	257	74.8	39.8	3	381	0	6		Yes
273-a	5.3	1,856	17.4	11.5	2	284.2	7	24	145	Yes
273-b	2.1	1,856	17.4	11.5	2	284.2	7	25		Yes
274-a	6.8	46	53.4	36.6	8	305.2	39	7		No
274-b	2.7	32.2	73.6	50.0	6	301.3	19	0		No
284-a	1.3	37.1	70.0	37.9	3	335	8	0		No
284-d	2.7	139	69.4	35.5	3	337.4	7	1		Yes
290	1.4	13.2	0.0	8.2	1	23.4	2	0		No
292-a	1.1	14.1	9.1	11.5	9	104.1	70	10		No
292-b	1.1	14.1	9.1	11.5	9	104.1	70	10		No
295	2.2	94.6	78.3	33.3	0	313.6	0	1		No
296	0.9	27.7	81.2	47.7	4	285.8	17	1		No

Table 3-1. Raw scores for wetland and catchment variables used in susceptibility scoring.—Continued

[Locations of wetlands shown on plate 1; ha, hectares; m, meters]

Wetland identi-fier	Wetland area, in ha	Wetland catchment area, in ha	Catchment area properties						Other wetland properties	
			Percent bare bedrock	Mean slope, in percent	Percent imper-vious surface	Range in elevation (relief, in m)	Percent clay soils	Net storage, percent	Wetland as a percentage of adjacent lake area	Stream, lake, or tidal inflow
303	6.8	115	48.7	26.4	7	292.5	37	7		Yes
309-f	5.5	220	57.4	29.5	4	343.2	13	3		Yes
312	2.1	20.1	19.9	15.3	14	114.1	29	4		No
315	15.2	95.7	11.4	4.5	4	36.6	28	11		No
317	1.7	6.2	0.0	4.1	0	11.3	0	0		No
320	0.9	17.3	55.6	28.4	0	194.8	0	2		No
326	1.3	5	14.7	6.8	16	21.3	45	2		No
331	9.1	322.0	77.8	31.3	0	426.4	0	1		Yes
334-a	1.3	15.7	100.0	39.1	0	105.3	0	5		No
334-b	0.8	15.7	100.0	39.1	0	105.3	0	8		No
336-a	4.1	26	17.9	6.1	13	30.6	61	22		No
336-b	4.2	26	17.9	6.1	13	30.6	61	22		No
345	6.1	375	30.0	15.2	11	242.7	7	0		No
353	1.1	12.9	100.0	20.0	0	83.4	0	0		No
357	1.8	8.3	57.4	8.4	0	25	4	0		No
360	1.6	23.2	71.1	8.0	0	32	18	0		No
361	2.6	15	37.9	19.2	0	150.7	0	0		No
364-b	3.4	36.7	83.3	5.4	0	37.2	12	6		No
366	1.8	9.3	100.0	3.2	0	13.6	0	0		No
367	3.4	55.0	63.4	25.5	4	225.3	2	0	22	Yes
368	2.1	184	53.3	26.6	0	306.9	2	1		No
369-a	2.7	66.9	59.3	21.9	0	204.4	0	4		No
369-c	1.2	69.6	57.8	6.4	0	32.2	26	8		Yes
371	2.0	27.5	52.4	24.0	8	231.5	0	1		Yes
377	3.0	12	65.1	44.2	0	158.4	0	0		No
379	2.7	64.8	37.9	14.9	0	227.8	9	0		No
380	3.9	71.8	42.0	15.1	6	172	4	0		Yes
381-a	2.1	109	56.5	7.5	0	64.2	9	5		Yes
381-b	2.1	72.4	43.2	8.5	0	63.8	11	4		No
382	1.4	14.4	77.4	29.8	0	171.3	0	0		No
383-a	2.2	11.2	50.3	19.1	6	139.9	14	4		No
384	3.6	347	36.1	7.8	3	90.9	26	12	20	Yes
39	1.6	4.9	0.0	1.7	0	3.9	21	0		No
393	3.0	231	40.5	21.5	5	233.5	13	2		Yes
395	1.0	9.6	21.5	20.4	0	107.9	0	1		No
396	3.1	15.9	65.2	8.4	0	35.5	20	0		Yes
401	1.4	6.1	45.2	13.2	0	58.4	0	0		No
402	1.4	75.4	26.7	17.4	0	277.9	0	0		Yes
403	1.6	254	78.9	28.4	0	330.7	3	0		Yes
405	1.6	187	37.1	19.9	3	233.3	11	2		Yes

Table 3-1. Raw scores for wetland and catchment variables used in susceptibility scoring.—Continued

[Locations of wetlands shown on plate 1; ha, hectares; m, meters]

Wetland identi-fier	Wetland area, in ha	Wetland catchment area, in ha	Catchment area properties						Other wetland properties	
			Percent bare bedrock	Mean slope, in percent	Percent imper-vious surface	Range in elevation (relief, in m)	Percent clay soils	Net storage, percent	Wetland as a percentage of adjacent lake area	Stream, lake, or tidal inflow
417	3.3	76.9	0.0	8.1	0	60.6	21	2		Yes
419	1.3	52.6	42.3	16.2	3	167.6	12	0		Yes
426	1.0	375	30.0	21.4	11	206.5	0	2		Yes
435-a	10.4	82.5	0.0	8.4	4	72.1	53	3	10	Yes
435-e	1.1	34.4	0.0	7.3	8	52.6	40	1		Yes
442-a	2.8	188	54.1	26.7	0	304.1	5	0		Yes
442-b	4.5	15.1	33.2	9.5	0	57.7	66	1		No
442-b2	5.0	24.9	22.3	5.8	0	44.6	64	0		No
445	1.9	25.8	55.1	17.4	0	134.6	0	0		No
446-a	7.6	87.4	18.5	11.5	1	150.7	16	4		No
446-g	3.3	135	11.9	9.6	3	150.7	16	10		Yes
447-a	8.2	455	26.0	15.7	3	311.4	24	4		Yes
447-d	1.5	252	42.8	21.5	1	311.3	22	4		No
450	2.3	55	38.8	13.5	0	143.4	0	3		No
452	3.0	8.6	0.0	4.8	0	10.5	38	0		No
457-a	1.1	16.2	0.0	5.0	0	23.3	14	8		Yes
457-b	1.1	14.9	0.0	5.1	0	22.9	7	1		No
458	2.2	248	18.1	10.4	2	154.8	12	9		Yes
461-a	3.7	378	13.3	8.9	3	178.2	34	9		Yes
461-e	2.8	10.2	0.0	4.0	0	16.8	100	7		No
461-f	9.0	1,139	20.4	10.9	2	322.2	32	8		Yes
468	1.3	29	0.0	5.1	0	21	12	0		No
470-a	8.0	1,210	19.2	10.4	2	325.5	35	8		Yes
470-aa	2.4	266	0.0	5.6	4	67.9	62	6		Yes
470-bf	1.2	223	0.0	3.1	1	47.8	23	15		Yes
470-bj	54.7	178	0.2	2.9	8	34.8	10	7		No
470-by	3.4	89.2	3.2	3.3	2	21.5	43	14		Yes
470-ca	2.9	16.1	47.5	2.7	12	13.6	34	6		No
470-dd	10.1	46.4	0.0	2.4	16	13.4	91	2		Yes
470-e	7.3	39.1	0.2	2.5	0	25.7	83	0		No
470-hh	1.8	5.9	0.0	1.7	0	5.6	65	0		Yes
470-k	2.9	6	0.0	1.6	0	6.1	98	0		No
470-l	3.5	20.8	0.0	1.9	0	15.8	97	0		No
470-ll	7.3	567	0.1	3.2	3	51.7	22	25		Yes
470-qq	20.9	29.1	0.0	2.4	0	12.5	83	4		No
470-rr	1.2	4.7	0.0	5.5	0	11.9	38	1		No
470-t	3.1	17.2	0.0	1.7	0	14.6	73	12		No
470-tt	18.0	49.1	0.0	3.3	0	19.8	21	0		No
470-uu	11.4	42.1	0.0	3.4	0	20.5	44	0		No
470-v	2.2	9.2	0.0	1.6	0	10.6	61	1		No

Table 3-1. Raw scores for wetland and catchment variables used in susceptibility scoring.—Continued

[Locations of wetlands shown on plate 1; ha, hectares; m, meters]

Wetland identi-fier	Wetland area, in ha	Wetland catchment area, in ha	Catchment area properties						Other wetland properties	
			Percent bare bedrock	Mean slope, in percent	Percent imper-vious surface	Range in elevation (relief, in m)	Percent clay soils	Net storage, percent	Wetland as a percentage of adjacent lake area	Stream, lake, or tidal inflow
470-w	13.1	454	0.1	3.1	3	50.8	18	23		Yes
470-z	11.4	57	0.0	1.9	0	18.6	90	16		Yes
473	1.4	64.4	0.0	3.6	5	41.6	97	9		No
474	2.4	97.2	45.1	5.6	0	27	15	8		Yes
478	6.0	38.3	82.2	6.3	0	19.2	14	0		Yes
495-a	12.4	155	0.0	3.1	1	45.3	25	3		Yes
495-c	2.9	15.1	0.0	1.8	0	6.8	19	0		No
503	1.8	16.6	0.0	1.4	0	6.1	26	0		No
513	1.4	19.8	0.0	2.8	6	13.2	58	0		No
515	6.9	167	0.0	2.3	7	46.5	34	17		Yes
519-a	4.5	141	13.3	3.3	6	23.4	44	17		Yes
519-b	4.1	18.5	43.1	4.0	6	14.4	36	0		No
521	2.1	7.7	0.0	4.9	14	25.4	63	0		Yes
525-a	3.9	72.5	0.0	4.4	15	27.6	9	6		Yes
525-b	2.0	4.6	0.0	0.8	0	1.4	71	0		No
528	1.5	10.5	32.2	2.7	0	9.1	0	0		No
53	1.4	13.7	70.8	8.2	0	38.6	9	5		No
530	3.8	24.3	23.1	4.4	2	15.6	25	0		No
57-a	3.0	38.2	15.6	5.5	8	39.7	8	6		No
57-b	1.9	14.2	33.7	6.6	2	34.4	1	1		No
63	1.5	7.1	0.0	4.1	1	15.5	100	0		No
66-a	2.2	9.8	60.8	6.8	0	16.7	0	1		No
74a/b	1.3	335.0	56.8	13.5	0	200.8	2	9	45	Yes
81	1.2	22.4	100.0	7.7	0	34.2	0	4		No
94	2.5	68.2	97.5	13.8	0	131.8	0	1		Yes
95	1.4	13.7	51.9	14.3	0	31.3	0	3	15	Yes

Table 3-2. Scaled scores for pathways for potential contaminant delivery.

[Wetland locations shown on plate 1; derivation of scores described in text]

Wetland identifier	Hydrogeomorphic class	Scaled integer score for precipitation as a potential pathway (wetland area divided by catchment area)	Scaled integer scores for surface water runoff as a potential pathway					Sum of the scaled scores for surface water	Scaled integer scores for ground water as a potential pathway				Sum of the scaled scores for ground water
			Catchment area	Bare bedrock	Slope	Stream, lake, or tidal inflow	Impervious area		Elevation range	Catchment area	Clay soil in catchment	Lack of stream, lake, or tidal inflow	
100-a	Lacustrine Fringe	**2**	7	3	2	5	0	**17**	2	7	8	0	**17**
102	Slope	**2**	4	3	2	0	0	**9**	1	4	10	5	**20**
103-b	Slope	**3**	3	0	2	0	0	**5**	1	3	9	5	**18**
108	Slope	**1**	5	10	2	0	0	**17**	3	5	10	5	**23**
122-b	Lacustrine Fringe	**1**	5	6	4	5	0	**20**	4	5	9	0	**18**
122-c	Depressional-Open	**1**	6	5	4	5	0	**20**	4	6	9	0	**19**
123-a	Lacustrine Fringe	**3**	5	2	2	5	0	**14**	2	5	8	0	**15**
123-d	Lacustrine Fringe	**1**	10	5	4	5	2	**26**	10	10	9	0	**29**
123-f	Depressional-Open	**1**	10	5	5	5	2	**27**	10	10	9	0	**29**
123-g	Depressional-Open	**2**	5	4	2	0	0	**11**	2	5	9	5	**21**
123-i	Riverine-Upper Perennial	**1**	9	5	5	5	2	**26**	10	9	9	0	**28**
125	Slope	**2**	5	7	4	0	10	**26**	3	5	10	5	**23**
127	Depressional-Semiclosed	**2**	5	7	2	0	1	**15**	1	5	9	5	**20**
129	Slope	**3**	3	7	5	0	9	**24**	3	3	10	5	**21**
135	Slope	**1**	5	8	4	0	0	**17**	4	5	10	5	**24**
143	Slope	**3**	3	7	4	0	1	**15**	3	3	10	5	**21**
144	Open Water	**1**	8	1	1	0	2	**12**	2	8	8	5	**23**
148-a	Depressional-Semiclosed	**6**	5	6	1	0	1	**13**	1	5	6	5	**17**
151-c	Depressional-Open	**1**	7	5	3	5	4	**24**	5	7	9	0	**21**
151-d	Depressional-Open	**2**	7	5	3	0	4	**19**	5	7	9	5	**26**
151-j	Riverine-Upper Perennial	**1**	7	5	3	5	4	**24**	5	7	9	0	**21**
155	Depressional-Closed	**4**	4	10	2	0	7	**23**	1	4	7	5	**17**
157	Hilltop/Upper Hillslope	**7**	1	10	2	0	0	**13**	1	1	10	5	**17**
174	Slope	**2**	6	5	3	0	3	**17**	2	6	9	5	**22**
176	Slope	**5**	4	10	3	0	0	**17**	1	4	5	5	**15**
179	Depressional-Open	**1**	6	5	4	0	4	**19**	5	6	9	5	**25**
17-b	Depressional-Open	**1**	6	0	2	5	1	**14**	2	6	6	0	**14**
186-a	Depressional-Semiclosed	**2**	4	7	3	0	0	**14**	2	4	8	5	**19**
186-c	Depressional-Semiclosed	**2**	5	6	3	0	1	**15**	4	5	8	5	**22**
186-f	Lacustrine Fringe	**1**	6	7	3	5	2	**23**	4	6	8	0	**18**

Table 3-2. Scaled scores for pathways for potential contaminant delivery.—Continued

[Wetland locations shown on plate 1; derivation of scores described in text]

Wetland identifier	Hydrogeomorphic class	Scaled integer score for precipitation as a potential pathway (wetland area divided by catchment area)	Scaled integer scores for surface water runoff as a potential pathway					Sum of the scaled scores for surface water	Scaled integer scores for ground water as a potential pathway				Sum of the scaled scores for ground water
			Catchment area	Bare bedrock	Slope	Stream, lake, or tidal inflow	Impervious area		Elevation range	Catchment area	Clay soil in catchment	Lack of stream, lake, or tidal inflow	
187	Slope	**4**	3	10	2	0	0	**15**	1	3	10	5	**19**
189-a	Soil Flat-Organic	**3**	5	0	1	0	5	**11**	1	5	5	5	**16**
189-d	Depressional-Semiclosed	**4**	5	5	2	0	0	**12**	1	5	7	5	**18**
191-a	Lacustrine Fringe	**1**	5	5	4	5	3	**22**	5	5	10	0	**20**
206-c	Lacustrine Fringe	**4**	3	0	1	5	0	**9**	1	3	5	0	**9**
206-f	Riverine-Upper Perennial	**1**	9	4	3	5	1	**22**	9	9	8	0	**26**
206-k	Riverine-Upper Perennial	**1**	8	5	3	5	0	**21**	9	8	9	0	**26**
207-b	Depressional-Open	**1**	5	3	5	5	3	**21**	3	5	5	0	**13**
207-f	Riverine-Upper Perennial	**1**	8	5	6	5	3	**27**	9	8	6	0	**23**
207-h	Slope	**2**	6	3	5	0	2	**16**	3	6	5	5	**19**
207-i	Depressional-Open	**3**	5	3	3	5	4	**20**	2	5	5	0	**12**
207-k	Depressional-Open	**3**	7	5	6	5	1	**24**	8	7	6	0	**21**
212-b	Depressional-Open	**2**	7	2	3	5	1	**18**	4	7	7	0	**18**
217	Slope	**2**	4	10	2	0	1	**17**	1	4	10	5	**20**
227-b	Depressional-Open	**1**	8	5	3	5	0	**21**	9	8	9	0	**26**
228	Riverine-Upper Perennial	**1**	9	4	3	5	1	**22**	9	9	8	0	**26**
234-a	Depressional-Semiclosed	**5**	3	2	1	0	0	**6**	1	3	5	5	**14**
237-b	Slope	**2**	4	5	4	0	7	**20**	4	4	8	5	**21**
237-d	Open Water	**1**	6	8	7	0	2	**23**	7	6	9	5	**27**
23-a	Soil Flat-Organic	**3**	7	0	1	0	1	**9**	2	7	5	5	**19**
23-b	Riverine-Upper Perennial	**1**	9	3	2	5	2	**21**	5	9	4	0	**18**
23-bb	Tidal Fringe	**1**	10	3	2	5	2	**22**	6	10	6	0	**22**
23-cc	Soil Flat-Organic	**3**	9	2	1	0	2	**14**	2	9	5	5	**21**
23-d	Soil Flat-Organic	**3**	4	0	1	0	0	**5**	1	4	0	5	**10**
23-dd	Riverine-Upper Perennial	**1**	9	6	3	5	2	**25**	6	9	8	0	**23**
23-ee	Tidal Fringe	**1**	10	3	2	5	2	**22**	6	10	6	0	**22**
23-hh	Soil Flat-Organic	**4**	6	1	2	0	2	**11**	2	6	6	5	**19**
23-i	Soil Flat-Organic	**1**	9	5	2	0	2	**18**	6	9	7	5	**27**
23-m	Tidal Fringe	**1**	10	3	2	5	2	**22**	6	10	6	0	**22**
23-mm	Slope	**2**	4	0	2	0	0	**6**	1	4	0	5	**10**

Table 3-2. Scaled scores for pathways for potential contaminant delivery.—Continued

[Wetland locations shown on plate 1; derivation of scores described in text]

Wetland identifier	Hydrogeomorphic class	Scaled integer score for precipitation as a potential pathway (wetland area divided by catchment area)	Scaled integer scores for surface water runoff as a potential pathway					Sum of the scaled scores for surface water	Scaled integer scores for ground water as a potential pathway				Sum of the scaled scores for ground water
			Catchment area	Bare bedrock	Slope	Stream, lake, or tidal inflow	Impervious area		Elevation range	Catchment area	Clay soil in catchment	Lack of stream, lake, or tidal inflow	
23-o	Soil Flat-Mineral	**4**	4	0	3	0	0	**7**	1	4	7	5	**17**
248	Depressional-Semiclosed	**3**	4	4	3	0	0	**11**	2	4	7	5	**18**
249	Depressional-Open	**1**	6	1	2	5	0	**14**	4	6	10	0	**20**
254	Slope	**2**	4	8	6	0	5	**23**	4	4	10	5	**23**
261	Riverine-Upper Perennial	**1**	6	10	4	5	0	**25**	8	6	10	0	**24**
26-a	Tidal Fringe	**2**	4	0	1	0	9	**14**	1	4	0	5	**10**
26-c	Slope	**2**	4	0	1	5	9	**19**	1	4	0	0	**5**
270	Slope	**2**	4	3	3	0	0	**10**	3	4	10	5	**22**
271	Depressional-Open	**1**	8	8	8	5	1	**30**	9	8	10	0	**27**
273-a	Lacustrine Fringe	**1**	10	2	3	0	1	**16**	7	10	9	5	**31**
273-b	Open Water	**1**	10	2	3	5	1	**21**	7	10	9	0	**26**
274-a	Depressional-Semiclosed	**3**	5	6	8	0	3	**22**	8	5	6	5	**24**
274-b	Slope	**2**	5	8	10	0	3	**26**	8	5	8	5	**26**
284-a	Depressional-Semiclosed	**1**	5	7	8	0	2	**22**	8	5	9	5	**27**
284-d	Riverine-Upper Perennial	**1**	7	7	8	5	1	**28**	8	7	9	0	**24**
290	Depressional-Semiclosed	**2**	4	0	2	0	1	**7**	1	4	9	5	**19**
292-a	Slope	**2**	4	1	3	0	4	**12**	3	4	2	5	**14**
292-b	Slope	**2**	4	1	3	0	4	**12**	3	4	2	5	**14**
295	Slope	**1**	6	8	7	0	0	**21**	8	6	10	5	**29**
296	Slope	**1**	5	9	10	0	2	**26**	7	5	8	5	**25**
303	Depressional-Open	**1**	7	5	6	5	3	**26**	7	7	6	0	**20**
309	Riverine-Upper Perennial	**1**	7	6	6	5	2	**26**	9	7	8	0	**24**
312	Depressional-Semiclosed	**2**	4	2	4	0	5	**15**	3	4	7	5	**19**
315	Depressional-Semiclosed	**3**	6	2	1	0	2	**11**	1	6	7	5	**19**
317	Slope	**4**	3	0	1	0	0	**4**	1	3	10	5	**19**
320	Depressional-Semiclosed	**1**	4	6	6	0	0	**16**	5	4	10	5	**24**
326	Depressional-Closed	**4**	3	2	2	0	6	**13**	1	3	5	5	**14**
331	Depressional-Open	**1**	8	8	7	0	1	**24**	10	8	10	5	**33**
334-a	Slope	**2**	4	10	8	0	0	**22**	3	4	10	5	**22**
334-b	Depressional-Semiclosed	**1**	4	10	8	0	0	**22**	3	4	10	5	**22**

Table 3-2. Scaled scores for pathways for potential contaminant delivery.—Continued

[Wetland locations shown on plate 1; derivation of scores described in text]

Wetland identifier	Hydrogeomorphic class	Scaled integer score for precipitation as a potential pathway (wetland area divided by catchment area)	Scaled integer scores for surface water runoff as a potential pathway					Sum of the scaled scores for surface water	Scaled integer scores for ground water as a potential pathway				Sum of the scaled scores for ground water
			Catchment area	Bare bedrock	Slope	Stream, lake, or tidal inflow	Impervious area		Elevation range	Catchment area	Clay soil in catchment	Lack of stream, lake, or tidal inflow	
336-a	Depressional-Semiclosed	**3**	5	2	2	0	5	**14**	1	5	3	5	**14**
336-b	Soil Flat-Organic	**3**	5	2	2	0	5	**14**	1	5	3	5	**14**
345	Slope	**1**	8	3	4	0	4	**19**	6	8	9	5	**28**
353	Depressional-Semiclosed	**2**	4	10	5	0	0	**19**	2	4	10	5	**21**
357	Slope	**4**	3	6	2	0	0	**11**	1	3	9	5	**18**
360	Slope	**1**	5	8	2	0	0	**15**	1	5	8	5	**19**
361	Depressional-Semiclosed	**3**	4	4	4	0	0	**12**	4	4	10	5	**23**
364-b	Depressional-Semiclosed	**2**	5	9	2	0	0	**16**	1	5	8	5	**19**
366	Slope	**3**	3	10	1	0	0	**14**	1	3	10	5	**19**
367	Lacustrine Fringe	**1**	6	7	6	5	2	**26**	6	6	9	0	**21**
368	Slope	**1**	7	6	6	0	0	**19**	8	7	9	5	**29**
369-a	Slope	**1**	6	6	5	0	0	**17**	5	6	10	5	**26**
369-c	Riverine-Nonperennial	**1**	6	6	2	5	0	**19**	1	6	7	0	**14**
371	Lacustrine Fringe	**1**	5	6	5	5	3	**24**	6	5	10	0	**21**
377	Slope	**4**	4	7	9	0	0	**20**	4	4	10	5	**23**
379	Depressional-Semiclosed	**1**	6	4	3	0	0	**13**	6	6	9	5	**26**
380	Riverine-Nonperennial	**1**	6	5	4	0	2	**17**	5	6	9	5	**25**
381-a	Riverine-Upper Perennial	**1**	7	6	2	5	0	**20**	2	7	9	0	**18**
381-b	Depressional-Semiclosed	**1**	6	5	2	0	0	**13**	2	6	8	5	**21**
382	Slope	**2**	4	8	6	0	0	**18**	5	4	10	5	**24**
383-a	Slope	**3**	4	6	4	0	3	**17**	4	4	8	5	**21**
384	Lacustrine Fringe	**1**	8	4	2	5	1	**20**	3	8	7	0	**18**
39	Hilltop/Upper Hillslope	**5**	3	0	1	0	0	**4**	1	3	7	5	**16**
393	Riverine-Upper Perennial	**1**	7	5	5	5	2	**24**	6	7	8	0	**21**
395	Depressional-Semiclosed	**2**	3	3	5	0	0	**11**	3	3	10	5	**21**
396	Depressional-Open	**3**	4	7	2	5	0	**18**	1	4	7	0	**12**
401	Slope	**4**	3	5	3	0	0	**11**	2	3	10	5	**20**
402	Depressional-Open	**1**	6	3	4	5	0	**18**	7	6	10	0	**23**
403	Riverine-Upper Perennial	**1**	8	8	6	5	1	**28**	8	8	9	0	**25**
405	Riverine-Nonperennial	**1**	7	4	4	5	2	**22**	6	7	8	0	**21**

Table 3-2. Scaled scores for pathways for potential contaminant delivery.—Continued

[Wetland locations shown on plate 1; derivation of scores described in text]

Wetland identifier	Hydrogeomorphic class	Scaled integer score for precipitation as a potential pathway (wetland area divided by catchment area)	Scaled integer scores for surface water runoff as a potential pathway					Sum of the scaled scores for surface water	Scaled integer scores for ground water as a potential pathway				Sum of the scaled scores for ground water
			Catchment area	Bare bedrock	Slope	Stream, lake, or tidal inflow	Impervious area		Elevation range	Catchment area	Clay soil in catchment	Lack of stream, lake, or tidal inflow	
417	Riverine-Upper Perennial	**1**	6	0	2	5	1	**14**	2	6	7	0	**15**
419	Riverine-Nonperennial	**1**	6	5	4	5	2	**22**	4	6	8	0	**18**
426	Riverine-Upper Perennial	**1**	8	3	5	5	4	**25**	5	8	10	0	**23**
435-a/c/d	Lacustrine Fringe	**2**	6	0	2	5	2	**15**	2	6	4	0	**12**
435-e	Riverine-Nonperennial	**1**	5	0	2	5	3	**15**	2	5	6	0	**13**
442-a	Riverine-Upper Perennial	**1**	7	6	6	5	0	**24**	8	7	9	0	**24**
442-b	Slope	**5**	4	4	2	0	0	**10**	2	4	3	5	**14**
442-b2	Slope	**3**	5	3	2	0	0	**10**	2	5	3	5	**15**
445	Slope	**2**	5	6	4	0	0	**15**	4	5	10	5	**24**
446-a	Depressional-Semiclosed	**2**	6	2	3	0	1	**12**	4	6	8	5	**23**
446-g	Riverine-Upper Perennial	**1**	7	2	2	5	2	**18**	4	7	8	0	**19**
447-a	Riverine-Upper Perennial	**1**	8	3	4	5	1	**21**	8	8	7	0	**23**
447-d	Soil Flat-Organic	**1**	8	5	5	0	1	**19**	8	8	7	5	**28**
450	Slope	**1**	6	4	3	0	0	**13**	4	6	10	5	**25**
452	Slope	**5**	3	0	1	0	0	**4**	1	3	6	5	**15**
457-a	Riverine-Upper Perennial	**1**	4	0	1	5	0	**10**	1	4	8	0	**13**
457-b	Depressional-Semiclosed	**2**	4	0	2	0	0	**6**	1	4	9	5	**19**
458	Riverine-Upper Perennial	**1**	8	2	3	5	1	**19**	4	8	8	0	**20**
461-a	Riverine-Upper Perennial	**1**	8	2	2	5	1	**18**	5	8	6	0	**19**
461-e	Soil Flat-Organic	**4**	3	0	1	0	0	**4**	1	3	0	5	**9**
461-f	Riverine-Upper Perennial	**1**	10	3	3	5	1	**22**	8	10	6	0	**24**
468	Slope	**1**	5	0	2	0	0	**7**	1	5	8	5	**19**
470-a	Riverine-Upper Perennial	**1**	10	2	3	5	1	**21**	8	10	6	0	**24**
470-aa	Tidal Fringe	**1**	8	0	2	5	2	**17**	2	8	3	0	**13**
470-bf	Riverine-Upper Perennial	**1**	7	0	1	5	1	**14**	2	7	7	0	**16**
470-bj	Soil Flat-Organic	**5**	7	1	1	0	3	**12**	1	7	9	5	**22**
470-by	Riverine-Upper Perennial	**1**	6	1	1	5	1	**14**	1	6	5	0	**12**
470-ca	Soil Flat-Organic	**3**	4	5	1	0	5	**15**	1	4	6	5	**16**
470-dd	Tidal Fringe	**4**	5	0	1	5	6	**17**	1	5	0	0	**6**
470-e	Soil Flat-Organic	**3**	5	1	1	0	0	**7**	1	5	1	5	**12**

Table 3-2. Scaled scores for pathways for potential contaminant delivery.—Continued

[Wetland locations shown on plate 1; derivation of scores described in text]

Wetland identifier	Hydrogeomorphic class	Scaled integer score for precipitation as a potential pathway (wetland area divided by catchment area)	Scaled integer scores for surface water runoff as a potential pathway					Sum of the scaled scores for surface water	Scaled integer scores for ground water as a potential pathway				Sum of the scaled scores for ground water
			Catchment area	Bare bedrock	Slope	Stream, lake, or tidal inflow	Impervious area		Elevation range	Catchment area	Clay soil in catchment	Lack of stream, lake, or tidal inflow	
470-hh	Tidal Fringe	**5**	3	0	1	5	1	**10**	1	3	3	0	**7**
470-k	Soil Flat-Organic	**7**	3	0	1	0	0	**4**	1	3	0	5	**9**
470-l	Soil Flat-Organic	**3**	4	0	1	0	0	**5**	1	4	0	5	**10**
470-ll	Tidal Fringe	**1**	9	1	1	5	1	**17**	2	9	7	0	**18**
470-qq	Soil Flat-Organic	**10**	5	0	1	0	0	**6**	1	5	1	5	**12**
470-rr	Slope	**4**	2	0	2	0	0	**4**	1	2	6	5	**14**
470-t	Soil Flat-Organic	**3**	4	0	1	0	0	**5**	1	4	2	5	**12**
470-tt	Soil Flat-Organic	**6**	5	0	1	0	0	**6**	1	5	7	5	**18**
470-uu	Soil Flat-Organic	**4**	5	0	1	0	0	**6**	1	5	5	5	**16**
470-v	Slope	**4**	3	0	1	0	0	**4**	1	3	3	5	**12**
470-vv	Riverine-Upper Perennial	**1**	8	1	1	5	2	**17**	2	8	8	0	**18**
470-z	Tidal Fringe	**3**	6	0	1	5	0	**12**	1	6	1	0	**8**
473	Soil Flat-Organic	**1**	6	0	1	0	2	**9**	1	6	0	5	**12**
474	Riverine-Upper Perennial	**1**	6	5	2	5	0	**18**	1	6	8	0	**15**
478	Riverine-Upper Perennial	**3**	5	9	2	5	0	**21**	1	5	8	0	**14**
495-a	Riverine-Upper Perennial	**2**	7	0	1	5	1	**14**	2	7	7	0	**16**
495-c	Soil Flat-Organic	**3**	4	0	1	0	0	**5**	1	4	8	5	**18**
503	Soil Flat-Mineral	**2**	4	0	1	0	0	**5**	1	4	7	5	**17**
513	Depressional-Closed	**1**	4	0	1	0	3	**8**	1	4	4	5	**14**
515	Depressional-Open	**1**	7	0	1	5	3	**16**	2	7	6	0	**15**
519-a	Riverine-Upper Perennial	**1**	7	2	1	5	3	**18**	1	7	5	0	**13**
519-b	Slope	**4**	4	5	1	0	3	**13**	1	4	6	5	**16**
521	Tidal Fringe	**4**	3	0	1	5	5	**14**	1	3	3	0	**7**
525-a	Riverine-Nonperennial	**1**	6	0	1	5	6	**18**	1	6	9	0	**16**
525-b	Soil Flat-Organic	**7**	2	0	1	0	0	**3**	1	2	2	5	**10**
528	Soil Flat-Mineral	**2**	4	4	1	0	0	**9**	1	4	10	5	**20**
53	Slope	**2**	4	8	2	0	0	**14**	1	4	9	5	**19**
530	Depressional-Semiclosed	**3**	5	3	1	0	1	**10**	1	5	7	5	**18**
57-a	Depressional-Semiclosed	**2**	5	2	2	0	3	**12**	1	5	9	5	**20**
57-b	Slope	**2**	4	4	2	0	1	**11**	1	4	9	5	**19**

Table 3-2. Scaled scores for pathways for potential contaminant delivery.—Continued

[Wetland locations shown on plate 1; derivation of scores described in text]

Wetland identifier	Hydrogeomorphic class	Scaled integer score for precipitation as a potential pathway (wetland area divided by catchment area)	Scaled integer scores for surface water runoff as a potential pathway					Sum of the scaled scores for surface water	Scaled integer scores for ground water as a potential pathway				Sum of the scaled scores for ground water
			Catchment area	Bare bedrock	Slope	Stream, lake, or tidal inflow	Impervious area		Elevation range	Catchment area	Clay soil in catchment	Lack of stream, lake, or tidal inflow	
63	Slope	**3**	3	0	1	0	1	**5**	1	3	0	5	**9**
66-a	Depressional-Semiclosed	**4**	3	7	2	0	0	**12**	1	3	10	5	**19**
74-a/b	Lacustrine Fringe	**1**	8	6	3	5	1	**23**	5	8	9	0	**22**
81	Slope	**1**	4	10	2	0	0	**16**	1	4	10	5	**20**
94	Riverine-Nonperennial	**1**	6	10	3	5	0	**24**	4	6	10	0	**20**
95	Lacustrine Fringe	**2**	4	6	3	5	0	**18**	1	4	10	0	**15**
95	Lacustrine Fringe	**2**	4	6	3	5	0	**18**	1	4	10	0	**15**

Table 3-3. Scaled scores for susceptibility to disruptions in water supply from projected future changes in climate.

[Negative factors are associated with higher susceptibility to disruptions; positive factors are associated with lower susceptibility to disruptions in water supply; wetland locations shown on plate 1]

Wetland identifier	Hydrogeomorphic class	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
		Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive scores	
100-a	Lacustrine Fringe	-2	-2	-3	-4	-4	-3	**-0.38**	3	7	2	8	5	**0.63**	**0.24**
102	Slope	-2	-2	-3	-7	-9	-4.6	**-0.59**	0	4	1	10	3.75	**0.47**	**-0.12**
103-b	Slope	-3	-2	0	-8	-10	-4.6	**-0.59**	0	3	1	9	3.25	**0.41**	**-0.18**
108	Slope	-1	-2	-10	-6	-8	-5.4	**-0.69**	0	5	3	10	4.5	**0.56**	**-0.13**
122-b	Lacustrine Fringe	-1	-4	-6	-6	-8	-5	**-0.64**	7	5	4	9	6.25	**0.78**	**0.14**
122-c	Depressional-Open	-1	-4	-5	-5	-8	-4.6	**-0.59**	0	6	4	9	4.75	**0.59**	**0.00**
123-a	Lacustrine Fringe	-3	-2	-2	-6	-9	-4.4	**-0.56**	1	5	2	8	4	**0.50**	**-0.06**
123-d	Lacustrine Fringe	-1	-4	-5	-1	-1	-2.4	**-0.31**	2	10	10	9	7.75	**0.97**	**0.66**
123-f	Depressional-Open	-1	-5	-5	-1	-1	-2.6	**-0.33**	0	10	10	9	7.25	**0.91**	**0.57**
123-g	Depressional-Open	-2	-2	-4	-6	-9	-4.6	**-0.59**	0	5	2	9	4	**0.50**	**-0.09**
123-i	Riverine-Upper Perennial	-1	-5	-5	-2	-1	-2.8	**-0.36**	0	9	10	9	7	**0.88**	**0.52**
125	Slope	-2	-4	-7	-6	-7	-5.2	**-0.67**	0	5	3	10	4.5	**0.56**	**-0.10**
127	Depressional-Semiclosed	-2	-2	-7	-6	-9	-5.2	**-0.67**	0	5	1	9	3.75	**0.47**	**-0.20**
129	Slope	-3	-5	-7	-8	-8	-6.2	**-0.79**	0	3	3	10	4	**0.50**	**-0.29**
135	Slope	-1	-4	-8	-6	-10	-5.8	**-0.74**	0	5	4	10	4.75	**0.59**	**-0.15**
143	Slope	-3	-4	-7	-8	-10	-6.4	**-0.82**	0	3	3	10	4	**0.50**	**-0.32**
144	Open Water	-1	-1	-1	-3	-6	-2.4	**-0.31**	0	5	1	6	3	**0.38**	**-0.32**
148-a	Depressional-Semiclosed	-6	-1	-6	-6	-8	-5.4	**-0.69**	0	5	1	6	3	**0.38**	**-0.32**
151-c	Depressional-Open	-1	-3	-5	-4	-4	-3.4	**-0.44**	0	7	5	9	5.25	**0.66**	**0.22**
151-d	Depressional-Open	-2	-3	-5	-4	-9	-4.6	**-0.59**	0	7	5	9	5.25	**0.66**	**0.07**
151-j	Riverine-Upper Perennial	-1	-3	-5	-4	-5	-3.6	**-0.46**	0	7	5	9	5.25	**0.66**	**0.19**
155	Depressional-Closed	-4	-2	-10	-7	-6	-5.8	**-0.74**	0	4	1	7	3	**0.38**	**-0.37**
157	Hilltop/Upper Hillslope	-7	-2	-10	-10	-10	-7.8	**-1.00**	0	1	1	10	3	**0.38**	**-0.63**
174	Slope	-2	-3	-5	-5	-8	-4.6	**-0.59**	0	6	2	9	4.25	**0.53**	**-0.06**
176	Slope	-5	-3	-10	-7	-10	-7	**-0.90**	0	4	1	5	2.5	**0.31**	**-0.58**

Table 3-3. Scaled scores for susceptibility to disruptions in water supply from projected future changes in climate.—Continued

[Negative factors are associated with higher susceptibility to disruptions; positive factors are associated with lower susceptibility to disruptions in water supply; wetland locations shown on plate 1]

Wetland identifier	Hydrogeomorphic class	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
		Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive scores	
179	Depressional-Open	-1	-4	-5	-5	-9	-4.8	**-0.62**	0	6	5	9	5	**0.63**	**0.01**
17-b	Depressional-Open	-1	-2	0	-5	-6	-2.8	**-0.36**	0	6	2	6	3.5	**0.44**	**0.08**
186-a	Depressional-Semiclosed	-2	-3	-7	-7	-7	-5.2	**-0.67**	0	4	2	8	3.5	**0.44**	**-0.23**
186-c	Depressional-Semiclosed	-2	-3	-6	-6	-7	-4.8	**-0.62**	0	5	4	8	4.25	**0.53**	**-0.08**
186-f	Lacustrine Fringe	-1	-3	-7	-5	-6	-4.4	**-0.56**	8	6	4	8	6.5	**0.81**	**0.25**
187	Slope	-4	-2	-10	-8	-10	-6.8	**-0.87**	0	3	1	10	3.5	**0.44**	**-0.43**
189-a	Soil Flat-Organic	-3	-1	0	-6	-7	-3.4	**-0.44**	0	5	1	5	2.75	**0.34**	**-0.09**
189-d	Depressional-Semiclosed	-4	-2	-5	-6	-8	-5	**-0.64**	0	5	1	7	3.25	**0.41**	**-0.23**
191-a	Lacustrine Fringe	-1	-4	-5	-6	-9	-5	**-0.64**	10	5	5	10	7.5	**0.94**	**0.30**
206-c	Lacustrine Fringe	-4	-1	0	-8	-9	-4.4	**-0.56**	7	3	1	5	4	**0.50**	**-0.06**
206-f	Riverine-Upper Perennial	-1	-3	-4	-2	-5	-3	**-0.38**	0	9	9	8	6.5	**0.81**	**0.43**
206-k	Riverine-Upper Perennial	-1	-3	-5	-3	-7	-3.8	**-0.49**	0	8	9	9	6.5	**0.81**	**0.33**
207-b	Depressional-Open	-1	-5	-3	-6	-8	-4.6	**-0.59**	0	5	3	5	3.25	**0.41**	**-0.18**
207-f	Riverine-Upper Perennial	-1	-6	-5	-3	-3	-3.6	**-0.46**	0	8	9	6	5.75	**0.72**	**0.26**
207-h	Slope	-2	-5	-3	-5	-8	-4.6	**-0.59**	0	6	3	5	3.5	**0.44**	**-0.15**
207-i	Depressional-Open	-3	-3	-3	-6	-10	-5	**-0.64**	0	5	2	5	3	**0.38**	**-0.27**
207-k	Depressional-Open	-3	-6	-5	-4	-7	-5	**-0.64**	0	7	8	6	5.25	**0.66**	**0.02**
212-b	Depressional-Open	-2	-3	-2	-4	-9	-4	**-0.51**	0	7	4	7	4.5	**0.56**	**0.05**
217	Slope	-2	-2	-10	-7	-10	-6.2	**-0.79**	0	4	1	10	3.75	**0.47**	**-0.33**
227-b	Depressional-Open	-1	-3	-5	-3	-8	-4	**-0.51**	0	8	9	9	6.5	**0.81**	**0.30**
228	Riverine-Upper Perennial	-1	-3	-4	-2	-6	-3.2	**-0.41**	0	9	9	8	6.5	**0.81**	**0.40**
234-a	Depressional-Semiclosed	-5	-1	-2	-8	-7	-4.6	**-0.59**	0	3	1	5	2.25	**0.28**	**-0.31**
237-b	Slope	-2	-4	-5	-7	-10	-5.6	**-0.72**	0	4	4	8	4	**0.50**	**-0.22**
237-d	Open Water	-1	-7	-8	-5	-8	-5.8	**-0.74**		6	7	9	7.33	**0.92**	**0.17**
23-a	Soil Flat-Organic	-3	-1	0	-4	-7	-3	**-0.38**	0	7	2	5	3.5	**0.44**	**0.05**

Table 3-3. Scaled scores for susceptibility to disruptions in water supply from projected future changes in climate.—Continued

[Negative factors are associated with higher susceptibility to disruptions; positive factors are associated with lower susceptibility to disruptions in water supply; wetland locations shown on plate 1]

Wetland identifier	Hydrogeomorphic class	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
		Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive scores	
23-b	Riverine-Upper Perennial	-1	-2	-3	-2	-2	-2	**-0.26**	0	9	5	4	4.5	**0.56**	**0.31**
23-bb	Tidal Fringe	-1	-2	-3	-1	-3	-2	**-0.26**	10	10	6	6	8	**1.00**	**0.74**
23-cc	Soil Flat-Organic	-3	-1	-2	-2	-6	-2.8	**-0.36**	0	9	2	5	4	**0.50**	**0.14**
23-d	Soil Flat-Organic	-3	-1	0	-7	-9	-4	**-0.51**	0	4	1	0	1.25	**0.16**	**-0.36**
23-dd	Riverine-Upper Perennial	-1	-3	-6	-2	-7	-3.8	**-0.49**	0	9	6	8	5.75	**0.72**	**0.23**
23-ee	Tidal Fringe	-1	-2	-3	-1	-3	-2	**-0.26**	10	10	6	6	8	**1.00**	**0.74**
23-hh	Soil Flat-Organic	-4	-2	-1	-5	-8	-4	**-0.51**	0	6	2	6	3.5	**0.44**	**-0.08**
23-i	Soil Flat-Organic	-1	-2	-5	-2	-7	-3.4	**-0.44**	0	9	6	7	5.5	**0.69**	**0.25**
23-m	Tidal Fringe	-1	-2	-3	-1	-3	-2	**-0.26**	10	10	6	6	8	**1.00**	**0.74**
23-mm	Slope	-2	-2	0	-7	-9	-4	**-0.51**	0	4	1	0	1.25	**0.16**	**-0.36**
23-o	Soil Flat-Mineral	-4	-3	0	-7	-10	-4.8	**-0.62**	0	4	1	7	3	**0.38**	**-0.24**
248	Depressional-Semiclosed	-3	-3	-4	-7	-10	-5.4	**-0.69**	0	4	2	7	3.25	**0.41**	**-0.29**
249	Depressional-Open	-1	-2	-1	-5	-7	-3.2	**-0.41**	0	6	4	10	5	**0.63**	**0.21**
254	Slope	-2	-6	-8	-7	-9	-6.4	**-0.82**	0	4	4	10	4.5	**0.56**	**-0.26**
261	Riverine-Upper Perennial	-1	-4	-10	-5	-9	-5.8	**-0.74**	0	6	8	10	6	**0.75**	**0.01**
26-a	Tidal Fringe	-2	-1	0	-7	-8	-3.6	**-0.46**	10	4	1	0	3.75	**0.47**	**0.01**
26-c	Slope	-2	-1	0	-7	-3	-2.6	**-0.33**	0	4	1	0	1.25	**0.16**	**-0.18**
270	Slope	-2	-3	-3	-7	-10	-5	**-0.64**	0	4	3	10	4.25	**0.53**	**-0.11**
271	Depressional-Open	-1	-8	-8	-3	-7	-5.4	**-0.69**	0	8	9	10	6.75	**0.84**	**0.15**
273-a	Lacustrine Fringe	-1	-3	-2	-1	-1	-1.6	**-0.21**	3	10	7	9	7.25	**0.91**	**0.70**
273-b	Open Water	-1	-3	-2	-1	-1	-1.6	**-0.21**	0	10	7	9	6.5	**0.81**	**0.61**
274-a	Depressional-Semiclosed	-3	-8	-6	-6	-7	-6	**-0.77**	0	5	8	6	4.75	**0.59**	**-0.18**
274-b	Slope	-2	-10	-8	-6	-9	-7	**-0.90**	0	5	8	8	5.25	**0.66**	**-0.24**
284-a	Depressional-Semiclosed	-1	-8	-7	-6	-9	-6.2	**-0.79**	0	5	8	9	5.5	**0.69**	**-0.11**
284-d	Riverine-Upper Perennial	-1	-8	-7	-4	-9	-5.8	**-0.74**	0	7	8	9	6	**0.75**	**0.01**

Table 3-3. Scaled scores for susceptibility to disruptions in water supply from projected future changes in climate.—Continued

[Negative factors are associated with higher susceptibility to disruptions; positive factors are associated with lower susceptibility to disruptions in water supply; wetland locations shown on plate 1]

Wetland identifier	Hydrogeomorphic class	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
		Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive scores	
290	Depressional-Semiclosed	-2	-2	0	-7	-10	-4.2	**-0.54**	0	4	1	9	3.5	**0.44**	**-0.10**
292-a	Slope	-2	-3	-1	-7	-6	-3.8	**-0.49**	0	4	3	2	2.25	**0.28**	**-0.21**
292-b	Slope	-2	-3	-1	-7	-6	-3.8	**-0.49**	0	4	3	2	2.25	**0.28**	**-0.21**
295	Slope	-1	-7	-8	-5	-9	-6	**-0.77**	0	6	8	10	6	**0.75**	**-0.02**
296	Slope	-1	-10	-9	-6	-9	-7	**-0.90**	0	5	7	8	5	**0.63**	**-0.27**
303	Depressional-Open	-1	-6	-5	-4	-7	-4.6	**-0.59**	0	7	7	6	5	**0.63**	**0.04**
309	Riverine-Upper Perennial	-1	-6	-6	-4	-8	-5	**-0.64**	0	7	9	8	6	**0.75**	**0.11**
312	Depressional-Semiclosed	-2	-4	-2	-7	-8	-4.6	**-0.59**	0	4	3	7	3.5	**0.44**	**-0.15**
315	Depressional-Semiclosed	-3	-1	-2	-5	-5	-3.2	**-0.41**	0	6	1	7	3.5	**0.44**	**0.03**
317	Slope	-4	-1	0	-8	-10	-4.6	**-0.59**	0	3	1	10	3.5	**0.44**	**-0.15**
320	Depressional-Semiclosed	-1	-6	-6	-7	-9	-5.8	**-0.74**	0	4	5	10	4.75	**0.59**	**-0.15**
326	Depressional-Closed	-4	-2	-2	-8	-9	-5	**-0.64**	0	3	1	5	2.25	**0.28**	**-0.36**
331	Depressional-Open	-1	-7	-8	-3	-9	-5.6	**-0.72**	0	8	0	10	4.5	**0.56**	**-0.16**
334-a	Slope	-2	-8	-10	-7	-6	-6.6	**-0.85**	0	4	3	10	4.25	**0.53**	**-0.31**
334-b	Depressional-Semiclosed	-1	-8	-10	-7	-8	-6.8	**-0.87**	0	4	3	10	4.25	**0.53**	**-0.34**
336-a	Depressional-Semiclosed	-3	-2	-2	-6	-1	-2.8	**-0.36**	0	5	1	3	2.25	**0.28**	**-0.08**
336-b	Soil Flat-Organic	-3	-2	-2	-6	-1	-2.8	**-0.36**	0	5	1	3	2.25	**0.28**	**-0.08**
345	Slope	-1	-4	-3	-3	-9	-4	**-0.51**	0	8	6	9	5.75	**0.72**	**0.21**
353	Depressional-Semiclosed	-2	-5	-10	-7	-10	-6.8	**-0.87**	0	4	2	10	4	**0.50**	**-0.37**
357	Slope	-4	-2	-6	-8	-10	-6	**-0.77**	0	3	1	9	3.25	**0.41**	**-0.36**
360	Slope	-1	-2	-8	-6	-9	-5.2	**-0.67**	0	5	1	8	3.5	**0.44**	**-0.23**
361	Depressional-Semiclosed	-3	-4	-4	-7	-10	-5.6	**-0.72**	0	4	4	10	4.5	**0.56**	**-0.16**
364-b	Depressional-Semiclosed	-2	-2	-9	-6	-7	-5.2	**-0.67**	0	5	1	8	3.5	**0.44**	**-0.23**
366	Slope	-3	-1	-10	-8	-10	-6.4	**-0.82**	0	3	1	10	3.5	**0.44**	**-0.38**
367	Lacustrine Fringe	-1	-6	-7	-5	-9	-5.6	**-0.72**	6	6	6	9	6.75	**0.84**	**0.13**

Table 3-3. Scaled scores for susceptibility to disruptions in water supply from projected future changes in climate.—Continued

[Negative factors are associated with higher susceptibility to disruptions; positive factors are associated with lower susceptibility to disruptions in water supply; wetland locations shown on plate 1]

Wetland identifier	Hydrogeomorphic class	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
		Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive scores	
368	Slope	-1	-6	-6	-4	-9	-5.2	**-0.67**	0	7	8	9	6	**0.75**	**0.08**
369-a	Slope	-1	-5	-6	-5	-8	-5	**-0.64**	0	6	5	10	5.25	**0.66**	**0.02**
369-c	Riverine-Nonperennial	-1	-2	-6	-5	-6	-4	**-0.51**	0	6	1	7	3.5	**0.44**	**-0.08**
371	Lacustrine Fringe	-1	-5	-6	-6	-9	-5.4	**-0.69**	0	5	6	10	5.25	**0.66**	**-0.04**
377	Slope	-4	-9	-7	-7	-10	-7.4	**-0.95**	0	4	4	10	4.5	**0.56**	**-0.39**
379	Depressional-Semiclosed	-1	-3	-4	-5	-9	-4.4	**-0.56**	0	6	6	9	5.25	**0.66**	**0.09**
380	Riverine-Nonperennial	-1	-4	-5	-5	-9	-4.8	**-0.62**	0	6	5	9	5	**0.63**	**0.01**
381-a	Riverine-Upper Perennial	-1	-2	-6	-4	-8	-4.2	**-0.54**	0	7	2	9	4.5	**0.56**	**0.02**
381-b	Depressional-Semiclosed	-1	-2	-5	-5	-8	-4.2	**-0.54**	0	6	2	8	4	**0.50**	**-0.04**
382	Slope	-2	-6	-8	-7	-10	-6.6	**-0.85**	0	4	5	10	4.75	**0.59**	**-0.25**
383-a	Slope	-3	-4	-6	-7	-8	-5.6	**-0.72**	0	4	4	8	4	**0.50**	**-0.22**
384	Lacustrine Fringe	-1	-2	-4	-3	-5	-3	**-0.38**	6	8	3	7	6	**0.75**	**0.37**
39	Hilltop/Upper Hillslope	-5	-1	0	-8	-10	-4.8	**-0.62**	0	3	1	7	2.75	**0.34**	**-0.27**
393	Riverine-Upper Perennial	-1	-5	-5	-4	-9	-4.8	**-0.62**	0	7	6	8	5.25	**0.66**	**0.04**
395	Depressional-Semiclosed	-2	-5	-3	-8	-9	-5.4	**-0.69**	0	3	3	10	4	**0.50**	**-0.19**
396	Depressional-Open	-3	-2	-7	-7	-10	-5.8	**-0.74**	0	4	1	7	3	**0.38**	**-0.37**
401	Slope	-4	-3	-5	-8	-9	-5.8	**-0.74**	0	3	2	10	3.75	**0.47**	**-0.27**
402	Depressional-Open	-1	-4	-3	-5	-9	-4.4	**-0.56**	0	6	7	10	5.75	**0.72**	**0.15**
403	Riverine-Upper Perennial	-1	-6	-8	-3	-9	-5.4	**-0.69**	0	8	8	9	6.25	**0.78**	**0.09**
405	Riverine-Nonperennial	-1	-4	-4	-4	-9	-4.4	**-0.56**	0	7	6	8	5.25	**0.66**	**0.09**
417	Riverine-Upper Perennial	-1	-2	0	-5	-9	-3.4	**-0.44**	0	6	2	7	3.75	**0.47**	**0.03**
419	Riverine-Nonperennial	-1	-4	-5	-5	-10	-5	**-0.64**	0	6	4	8	4.5	**0.56**	**-0.08**
426	Riverine-Upper Perennial	-1	-5	-3	-3	-9	-4.2	**-0.54**	0	8	5	10	5.75	**0.72**	**0.18**
435-a/c/d	Lacustrine Fringe	-2	-2	0	-5	-8	-3.4	**-0.44**	8	6	2	4	5	**0.63**	**0.19**
435-e	Riverine-Nonperennial	-1	-2	0	-6	-9	-3.6	**-0.46**	0	5	2	6	3.25	**0.41**	**-0.06**

Table 3-3. Scaled scores for susceptibility to disruptions in water supply from projected future changes in climate.—Continued

[Negative factors are associated with higher susceptibility to disruptions; positive factors are associated with lower susceptibility to disruptions in water supply; wetland locations shown on plate 1]

Wetland identifier	Hydrogeomorphic class	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
		Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive scores	
442-a	Riverine-Upper Perennial	-1	-6	-6	-4	-9	-5.2	**-0.67**	0	7	8	9	6	**0.75**	**0.08**
442-b	Slope	-5	-2	-4	-7	-9	-5.4	**-0.69**	0	4	2	3	2.25	**0.28**	**-0.41**
442-b2	Slope	-3	-2	-3	-6	-10	-4.8	**-0.62**	0	5	2	3	2.5	**0.31**	**-0.30**
445	Slope	-2	-4	-6	-6	-10	-5.6	**-0.72**	0	5	4	10	4.75	**0.59**	**-0.12**
446-a	Depressional-Semiclosed	-2	-3	-2	-5	-8	-4	**-0.51**	0	6	4	8	4.5	**0.56**	**0.05**
446-g	Riverine-Upper Perennial	-1	-2	-2	-4	-5	-2.8	**-0.36**	0	7	4	8	4.75	**0.59**	**0.23**
447-a	Riverine-Upper Perennial	-1	-4	-3	-3	-8	-3.8	**-0.49**	0	8	8	7	5.75	**0.72**	**0.23**
447-d	Soil Flat-Organic	-1	-5	-5	-3	-8	-4.4	**-0.56**	0	8	8	7	5.75	**0.72**	**0.15**
450	Slope	-1	-3	-4	-5	-8	-4.2	**-0.54**	0	6	4	10	5	**0.63**	**0.09**
452	Slope	-5	-1	0	-8	-10	-4.8	**-0.62**	0	3	1	6	2.5	**0.31**	**-0.30**
457-a	Riverine-Upper Perennial	-1	-1	0	-7	-6	-3	**-0.38**	0	4	1	8	3.25	**0.41**	**0.02**
457-b	Depressional-Semiclosed	-2	-2	0	-7	-9	-4	**-0.51**	0	4	1	9	3.5	**0.44**	**-0.08**
458	Riverine-Upper Perennial	-1	-3	-2	-3	-6	-3	**-0.38**	0	8	4	8	5	**0.63**	**0.24**
461-a	Riverine-Upper Perennial	-1	-2	-2	-3	-6	-2.8	**-0.36**	0	8	5	6	4.75	**0.59**	**0.23**
461-e	Soil Flat-Organic	-4	-1	0	-8	-7	-4	**-0.51**	0	3	1	0	1	**0.13**	**-0.39**
461-f	Riverine-Upper Perennial	-1	-3	-3	-1	-6	-2.8	**-0.36**	0	10	8	6	6	**0.75**	**0.39**
468	Slope	-1	-2	0	-6	-10	-3.8	**-0.49**	0	5	1	8	3.5	**0.44**	**-0.05**
470-a	Riverine-Upper Perennial	-1	-3	-2	-1	-6	-2.6	**-0.33**	0	10	8	6	6	**0.75**	**0.42**
470-aa	Tidal Fringe	-1	-2	0	-3	-7	-2.6	**-0.33**	10	8	2	3	5.75	**0.72**	**0.39**
470-bf	Riverine-Upper Perennial	-1	-1	0	-4	-4	-2	**-0.26**	0	7	2	7	4	**0.50**	**0.24**
470-bj	Soil Flat-Organic	-5	-1	-1	-4	-7	-3.6	**-0.46**	0	7	1	9	4.25	**0.53**	**0.07**
470-by	Riverine-Upper Perennial	-1	-1	-1	-5	-4	-2.4	**-0.31**	0	6	1	5	3	**0.38**	**0.07**
470-ca	Soil Flat-Organic	-3	-1	-5	-7	-10	-5.2	**-0.67**	0	4	1	6	2.75	**0.34**	**-0.32**
470-dd	Tidal Fringe	-4	-1	0	-6	-9	-4	**-0.51**	10	5	1	0	4	**0.50**	**-0.01**
470-e	Soil Flat-Organic	-3	-1	-1	-6	-10	-4.2	**-0.54**	0	5	1	1	1.75	**0.22**	**-0.32**

Table 3-3. Scaled scores for susceptibility to disruptions in water supply from projected future changes in climate.—Continued

[Negative factors are associated with higher susceptibility to disruptions; positive factors are associated with lower susceptibility to disruptions in water supply; wetland locations shown on plate 1]

Wetland identifier	Hydrogeomorphic class	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
		Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive scores	
470-hh	Tidal Fringe	-5	-1	0	-8	-10	-4.8	**-0.62**	10	3	1	3	4.25	**0.53**	**-0.08**
470-k	Soil Flat-Organic	-7	-1	0	-8	-10	-5.2	**-0.67**	0	3	1	0	1	**0.13**	**-0.54**
470-l	Soil Flat-Organic	-3	-1	0	-7	-10	-4.2	**-0.54**	0	4	1	0	1.25	**0.16**	**-0.38**
470-ll	Tidal Fringe	-1	-1	-1	-2	-1	-1.2	**-0.15**	10	9	2	7	7	**0.88**	**0.72**
470-qq	Soil Flat-Organic	-10	-1	0	-6	-8	-5	**-0.64**	0	5	1	1	1.75	**0.22**	**-0.42**
470-rr	Slope	-4	-2	0	-9	-10	-5	**-0.64**	0	2	1	6	2.25	**0.28**	**-0.36**
470-t	Soil Flat-Organic	-3	-1	0	-7	-5	-3.2	**-0.41**	0	4	1	2	1.75	**0.22**	**-0.19**
470-tt	Soil Flat-Organic	-6	-1	0	-6	-10	-4.6	**-0.59**	0	5	1	7	3.25	**0.41**	**-0.18**
470-uu	Soil Flat-Organic	-4	-1	0	-6	-10	-4.2	**-0.54**	0	5	1	5	2.75	**0.34**	**-0.19**
470-v	Slope	-4	-1	0	-8	-9	-4.4	**-0.56**	0	3	1	3	1.75	**0.22**	**-0.35**
470-vv	Riverine-Upper Perennial	-1	-1	-1	-3	-1	-1.4	**-0.18**	0	8	2	8	4.5	**0.56**	**0.38**
470-z	Tidal Fringe	-3	-1	0	-5	-3	-2.4	**-0.31**	10	6	1	1	4.5	**0.56**	**0.25**
473	Soil Flat-Organic	-1	-1	0	-5	-6	-2.6	**-0.33**	0	6	1	0	1.75	**0.22**	**-0.11**
474	Riverine-Upper Perennial	-1	-2	-5	-5	-6	-3.8	**-0.49**	0	6	1	8	3.75	**0.47**	**-0.02**
478	Riverine-Upper Perennial	-3	-2	-9	-6	-10	-6	**-0.77**	0	5	1	8	3.5	**0.44**	**-0.33**
495-a	Riverine-Upper Perennial	-2	-1	0	-4	-8	-3	**-0.38**	0	7	2	7	4	**0.50**	**0.12**
495-c	Soil Flat-Organic	-3	-1	0	-7	-9	-4	**-0.51**	0	4	1	8	3.25	**0.41**	**-0.11**
503	Soil Flat-Mineral	-2	-1	0	-7	-10	-4	**-0.51**	0	4	1	7	3	**0.38**	**-0.14**
513	Depressional-Closed	-1	-1	0	-7	-10	-3.8	**-0.49**	0	4	1	4	2.25	**0.28**	**-0.21**
515	Depressional-Open	-1	-1	0	-4	-3	-1.8	**-0.23**	0	7	2	6	3.75	**0.47**	**0.24**
519-a	Riverine-Upper Perennial	-1	-1	-2	-4	-3	-2.2	**-0.28**	0	7	1	5	3.25	**0.41**	**0.12**
519-b	Slope	-4	-1	-5	-7	-9	-5.2	**-0.67**	0	4	1	6	2.75	**0.34**	**-0.32**
521	Tidal Fringe	-4	-1	0	-8	-10	-4.6	**-0.59**	10	3	1	3	4.25	**0.53**	**-0.06**
525-a	Riverine-Nonperennial	-1	-1	0	-5	-7	-2.8	**-0.36**	0	6	1	9	4	**0.50**	**0.14**
525-b	Soil Flat-Organic	-7	-1	0	-9	-9	-5.2	**-0.67**	0	2	1	2	1.25	**0.16**	**-0.51**

Table 3-3. Scaled scores for susceptibility to disruptions in water supply from projected future changes in climate.—Continued

[Negative factors are associated with higher susceptibility to disruptions; positive factors are associated with lower susceptibility to disruptions in water supply; wetland locations shown on plate 1]

Wetland identifier	Hydrogeomorphic class	Negative factors for disruptions in water supply, scaled catchment scores							Positive factors for disruptions in water supply, scaled scores						Final score
		Precipitation	Slope	Bare bedrock	Catchment size	Storage	Average of negative scores	Scaled average negative score	Lacustrine influence	Catchment size	Topographic relief	Percent clay soils	Average of positive scores	Scaled average positive scores	
528	Soil Flat-Mineral	-2	-1	-4	-7	-7	-4.2	**-0.54**	0	4	1	10	3.75	**0.47**	**-0.07**
53	Slope	-2	-2	-8	-7	-7	-5.2	**-0.67**	0	4	1	9	3.5	**0.44**	**-0.23**
530	Depressional-Semiclosed	-3	-1	-3	-6	-9	-4.4	**-0.56**	0	5	1	7	3.25	**0.41**	**-0.16**
57-a	Depressional-Semiclosed	-2	-2	-2	-6	-7	-3.8	**-0.49**	0	5	1	9	3.75	**0.47**	**-0.02**
57-b	Slope	-2	-2	-4	-7	-9	-4.8	**-0.62**	0	4	1	9	3.5	**0.44**	**-0.18**
63	Slope	-3	-1	0	-8	-10	-4.4	**-0.56**	0	3	1	0	1	**0.13**	**-0.44**
66-a	Depressional-Semiclosed	-4	-2	-7	-8	-9	-6	**-0.77**	0	3	1	10	3.5	**0.44**	**-0.33**
74-a/b	Lacustrine Fringe	-1	-3	-6	-3	-6	-3.8	**-0.49**	5	8	5	9	6.75	**0.84**	**0.36**
81	Slope	-1	-2	-10	-7	-8	-5.6	**-0.72**	0	4	1	10	3.75	**0.47**	**-0.25**
94	Riverine-Nonperennial	-1	-3	-10	-5	-9	-5.6	**-0.72**	0	6	4	10	5	**0.63**	**-0.09**
95	Lacustrine Fringe	-2	-3	-6	-7	-8	-5.2	**-0.67**	7	4	1	10	5.5	**0.69**	**0.02**

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