Appendix 4. Simulated Route-Specific Survival by Year, No Action Alternative Compared to PA Scenarios, 1922–2003
1923 (WY type = BN)

Bypass discharge ($\text{ft}^3/\text{s}$)

Mean survival through Delta

Difference in survival ($PA - NAA$)

Date:
- Oct
- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul
1924 (WY type = C)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul

DCC Open
DCC Closed

NAA
PA

Georgiana S. Sutter & Steamboat S.
Sacramento R.

1924 (WY type = C)
1925 (WY type = D)

**Bypass discharge (ft³/s)**
- **NAA**
- **PA**

**Mean survival through Delta**
- **NAA**
- **PA**

**Difference in survival (PA − NAA)**
- **DCC**
- **Georgiana S.**
- **Sutter & Steamboat S.**
- **Sacramento R.**

**Dates:**
- Oct
- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul
1929 (WY type = C)

Bypass discharge (ft³/s)

- NAA
- PA

Mean survival through Delta

- NAA
- PA

Difference in survival (PA - NAA)

- DCC
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.

Date

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
1930 (WY type = D)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

- DCC Open
- DCC Closed

Date seq

p50.NAA[, 13]

Mean survival through Delta

- NAA
- PA

- DCC
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.

1930 (WY type = D)
1931 (WY type = C)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA − NAA)

Month:
- Oct
- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul

Streams:
- NAA
- PA
- DCC
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.
1935 (WY type = BN)

Bypass discharge (ft³/s)

DCC Open
DCC Closed

Mean survival through Delta

DCC
Georgiana S.
Sutter & Steamboat S.
Sacramento R.

Difference in survival (PA - NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
1937 (WY type = BN)

Bypass discharge (ft³/s)

Mean survival through Delta

Mean survival

Difference in survival (PA - NAA)

- DCC Closed
- DCC Open

Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, Jul

NAA
PA

Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, Jul

- DCC
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.
1940 (WY type = AN)

- **Bypass discharge (ft³/s)**
- **Mean survival through Delta**
- **Difference in survival (PA − NAA)**

**Legend:**
- NAA
- PA
- DCC Open
- DCC Closed

**Axes:**
- X-axis: Months (Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, Jul)
- Y-axis: Dimensions vary for each chart (e.g., Bypass discharge: 0 to 40,000 ft³/s; Mean survival: 0 to 1.0; Difference: -0.2 to 0.2)

**Data Key:**
- DCC: Georgiana S. and Steamboat S.
- Sacramento R.

**Notes:**
- The charts illustrate the comparison of bypass discharge and survival through Delta for different conditions and periods.
1941 (WY type = W)

- Bypass discharge (ft³/s)
  - NAA
  - PA

- Mean survival through Delta
  - NAA
  - PA
  - Sutter & Steamboat S.
  - Sacramento R.

- Difference in survival (PA − NAA)
1942 (WY type = W)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA − NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul

NAA

PA

DCC

Sacramento R.

Georgiana S.

P A

0.0

0.2

0.4

0.6

0.8

1.0

DCC Open

DCC Closed

date.seq

p50.NAA[, 13]

0.0

0.2

0.4

0.6

0.8

1.0

1942 (WY type = W)
1945 (WY type = BN)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

- NAA
- PA

DCC Open
DCC Closed
1946 (WY type = BN)

DCC Closed
DCC Open

Date seq

Mean survival through Delta

Difference in survival (PA - NAA)
1947 (WY type = D)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
1948 (WY type = BN)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA – NAA)

- DCC Closed
- DCC Open

- NAA
- PA

- DCC
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.

Mean survival through Delta for different discharge scenarios and months.
1950 (WY type = BN)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul

NAA PA

DCC Open DCC Closed

NAA PA

Georgiana S. Sutter & Steamboat S. Sacramento R.

1950 (WY type = BN)
1951 (WY type = AN)

**Bypass discharge (ft³/s)**
- **NAA** (black line)
- **PA** (red line)

**Mean survival through Delta**
- **NAA** (black line)
- **PA** (dashed line)

**Difference in survival (PA - NAA)**
- **DCC** (pink line)
- **Georgiana S.** (purple line)
- **Sutter & Steamboat S.** (green line)
- **Sacramento R.** (orange line)

Dates:
1952 (WY type = W)

Bypass discharge (ft³/s)

DCC Closed
DCC Open

Mean survival through Delta

NAA
PA

Difference in survival (PA − NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul

DCC
Georgiana S.
Sutter & Steamboat S.
Sacramento R.

p50.NAA[, 13]
1953 (WY type = W)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

DCC Open

DCC Closed

NAA

PA

p50.NAA[, 13]

date.seq

Difference in survival (PA − NAA)

DCC

Georgiana S.

Sutter & Steamboat S.

Sacramento R.

1953 (WY type = W)
1954 (WY type = AN)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

Legend:
- NAA
- PA
- DCC Open
- DCC Closed

Date:
- Oct
- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul

Mean survival through Delta:
- Sacramento R.
- Sutter & Steamboat S.
- Georgiana S.
- DCC
1955 (WY type = D)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

DCC

DCC Open

DCC Closed

Oct Nov Dec Jan Feb Mar Apr May Jun Jul

NAA

PA

0.0

0.2

0.4

0.6

0.8

1.0

1955 (WY type = D)
1956 (WY type = W)

Bypass discharge ($\text{ft}^3/\text{s}$)

Mean survival through Delta

Difference in survival (PA - NAA)

DCC

Georgiana S. & Steamboat S.

Sacramento R.

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
1958 (WY type = W)

Bypass discharge (ft³/s)

DCC Closed
DCC Open

Mean survival through Delta

Difference in survival (PA − NAA)

Date (months): Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, Jul

BYPASS discharge: NAA, PA

DCC: Georgiana S., Sutter & Steamboat S., Sacramento R.
1959 (WY type = BN)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA − NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
1961 (WY type = D)
1962 (WY type = BN)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA − NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul

NAA
PA

DCC Open
DCC Closed

1962 (WY type = BN)
1969 (WY type = W)

Bypass discharge (ft³/s)

Mean survival through Delta (NAA, PA)

Difference in survival (PA - NAA)

DCC Open

DCC Closed

NAA
PA

Date
Oct Nov Dec Jan Feb Mar Apr May Jun Jul

0.0 0.2 0.4 0.6 0.8 1.0

0.0 0.1 0.2

Sacramento R.

Georgiana S.

Sutter & Steamboat S.
1970 (WY type = W)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul

DCC Closed

DCC Open

NAA
PA

0.0 0.2 0.4 0.6 0.8 1.0

date.seq

p50.NAA[, 13]

Mean survival through Delta

DCC
Georgiana S.
Sutter & Steamboat S.
Sacramento R.

1970 (WY type = W)
1971 (WY type = W)

DCC Closed
DCC Open

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA − NAA)

Months:
- Oct
- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul

River sites:
- Pacific Area
- Sutter & Steamboat Area
- Sacramento River

Date range:
- 1971 (WY type = W)

Analysis:
1973 (WY type = AN)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

DCC Closed

DCC Open

Date.seq

p50.NAA[, 13]

Mean survival through Delta

DCC

Georgiana S.

Sutter & Steamboat S.

Sacramento R.

1973 (WY type = AN)
1974 (WY type = W)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA − NAA)
1975 (WY type = W)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA − NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
1977 (WY type = C)

Bypass discharge (ft³/s)

DCC Open
DCC Closed

Mean survival through Delta

Difference in survival (PA − NAA)

Date sequence
p50.NAA[, 13]

Oct Nov Dec Jan Feb Mar Apr May Jun Jul

NAA PA

Georgiana S.
Sacramento R.
1978 (WY type = AN)

Bypass discharge (ft³/s)

DCC Closed
DCC Open

Mean survival through Delta

Difference in survival (PA - NAA)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
1980 (WY type = AN)

- Bypass discharge (ft³/s)
- Mean survival through Delta
- Difference in survival (PA - NAA)

- NAA
- PA

- DCC Open
- DCC Closed

- DCC
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.

Date:
- Oct
- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul
1981 (WY type = D)

Bypass discharge (ft³/s)

By-pass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

Month

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
1982 (WY type = W)

![Graph showing bypass discharge (ft³/s) and mean survival through Delta NAA and PA over time from October to July.](image)

**Bypass discharge (ft³/s)**
- **NAA**
- **PA**

**Mean survival through Delta**
- **NAA**
- **PA**

**Difference in survival (PA - NAA)**
- **DCC**
- **Georgiana S.**
- **Sutter & Steamboat S.**
- **Sacramento R.**

**Legend:**
- **DCC Open**
- **DCC Closed**

**Dates:**
- Oct
- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul
1983 (WY type = W)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

DCC Closed

DCC Open

NAA

PA

Oct

Nov

Dec

Jan

Feb

Mar

Apr

May

Jun

Jul
1985 (WY type = D)

Bypass discharge (ft³/s)

- DCC Open
- DCC Closed

Mean survival through Delta

- NAA
- PA

Difference in survival (PA - NAA)

- DCC
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.

Date:
- Oct
- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- Jun
- Jul
1986 (WY type = W)

DCC Closed

DCC Open

Mean survival through Delta

100
80
60
40
20
0
Difference in survival (PA − NAA)

DCC
Georgiana S.
Sutter & Steamboat S.
Sacramento R.

2
1
0.8
0.6
0.4
0.2
0
0.2
0.4
0.6
0.8
1.0

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
1987 (WY type = D)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)
1989 (WY type = D)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

- DCC Open
- DCC Closed

- NAA
- PA

- DCC
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.

Date: Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, Jul
1990 (WY type = C)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA − NAA)

Date seq

NAA, PA

DCC

Georgiana S.

Sutter & Steamboat S.

Sacramento R.

1990 (WY type = C)
Mean survival through Delta

Difference in survival (PA − NAA)

1991 (WY type = C)
1993 (WY type = AN)

- Bypass discharge (ft³/s)
- Mean survival through Delta
- Difference in survival (PA - NAA)

**Graph Details:**
- **NAA** and **PA** lines for bypass discharge.
- Mean survival lines with various colors and styles for different areas.
- Difference in survival lines with various colors and styles.

**Legend:**
- DCC Open
- DCC Closed
- DCC
- NAA
- PA
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.
1994 (WY type = C)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

DCC

NAA

PA

Oct Nov Dec Jan Feb Mar Apr May Jun Jul

Sacramento R.

Georgiana S.

DCC Open

DCC Closed

5,000
10,000
20,000
40,000

0.0
0.2
0.4
0.6
0.8
1.0

-0.2
-0.1
0.0
0.1
0.2

0.0
0.1
0.2

p50.NAA[, 13]

date.seq
1995 (WY type = W)

**Bypass discharge (ft³/s)**

- NAA
- PA

**Mean survival through Delta**

- NAA
- PA

**Difference in survival (PA - NAA)**

- DCC
- Georgiana S.
- Sutter & Steamboat S.
- Sacramento R.

Graphs showing variations in bypass discharge, mean survival, and difference in survival over the months of October to July for the years 1995.
1998 (WY type = W)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA − NAA)

DCC Closed
DCC Open

5,000
10,000
20,000
40,000
0.0
0.2
0.4
0.6
0.8
1.0

Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
2000 (WY type = AN)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

- NAA
- PA

Date: Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, Jul

Location: DCC, Georgiana S., Sutter & Steamboat S., Sacramento R.

NAA: North American Aquatic
PA: Pacific Aquatic

Difference in survival (PA - NAA)
2001 (WY type = D)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA - NAA)

- NAA
- PA

Δp

DCC

Georgiana S.
Sutter & Steamboat S.
Sacramento R.

Oct Nov Dec Jan Feb Mar Apr May Jun Jul
2002 (WY type = D)

Bypass discharge (ft³/s)

Mean survival through Delta

Difference in survival (PA – NAA)