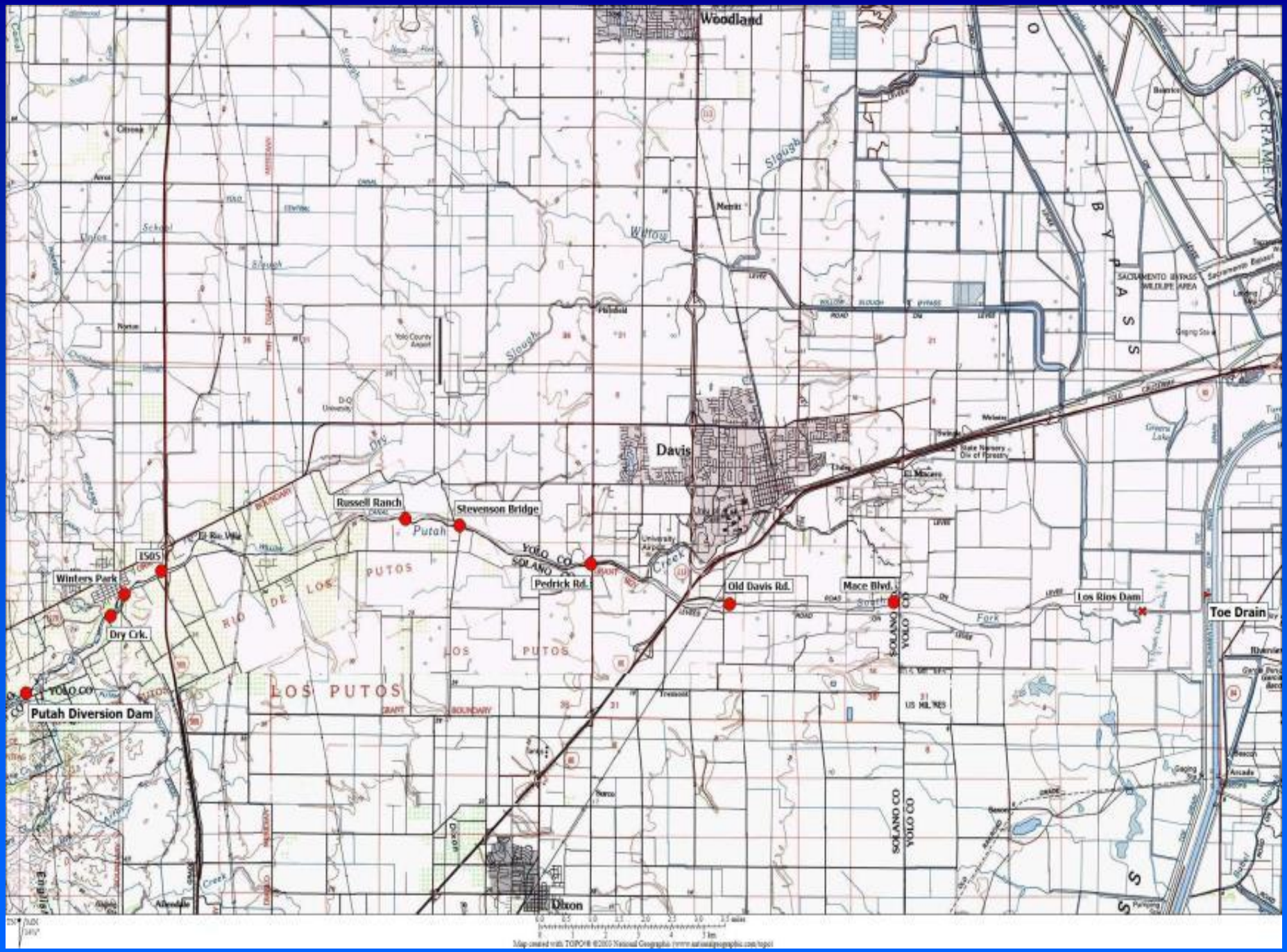
Putah Creek Fish Monitoring

TRPA Fish Biologists

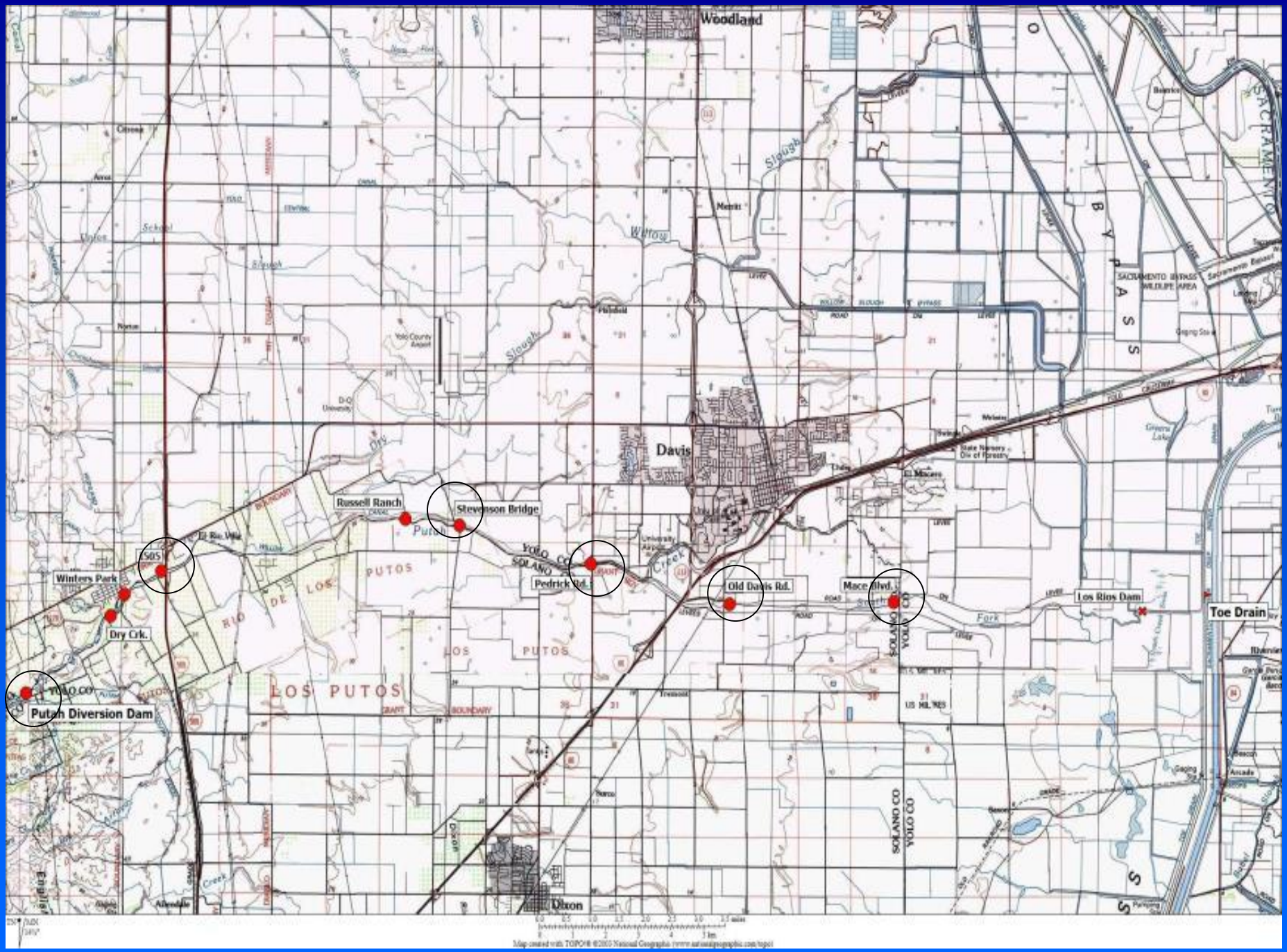
TRPA Fish Biologists staff have been conducting fish and water quality monitoring surveys on Putah Creek since 1991

The October 2018 fish survey represents the latest in a long-term monitoring effort that have documented the benefits of of the Putah Creek Accord and other restoration efforts

We currently survey nine sites along the 25.4 miles of creek between the PDD and the Toe Drain.


Woodland
Davis
Dixon
Russell Ranch
Stevenson Bridge
Pedrick Rd.
Old Davis Rd.
Mace Blvd.
Los Rios Dam
Toe Drain
Winters Park
Dry Crk.
Putah Diversion Dam
LOS PUTOS
RIO DE LOS PUTOS
Putah
Dry
Willow
Slough
Creek
BYPASS
SACRAMENTO
YOLO CO
SOLANO CO

Six of the nine sites currently surveyed have been surveyed since 1991


Woodland
Davis
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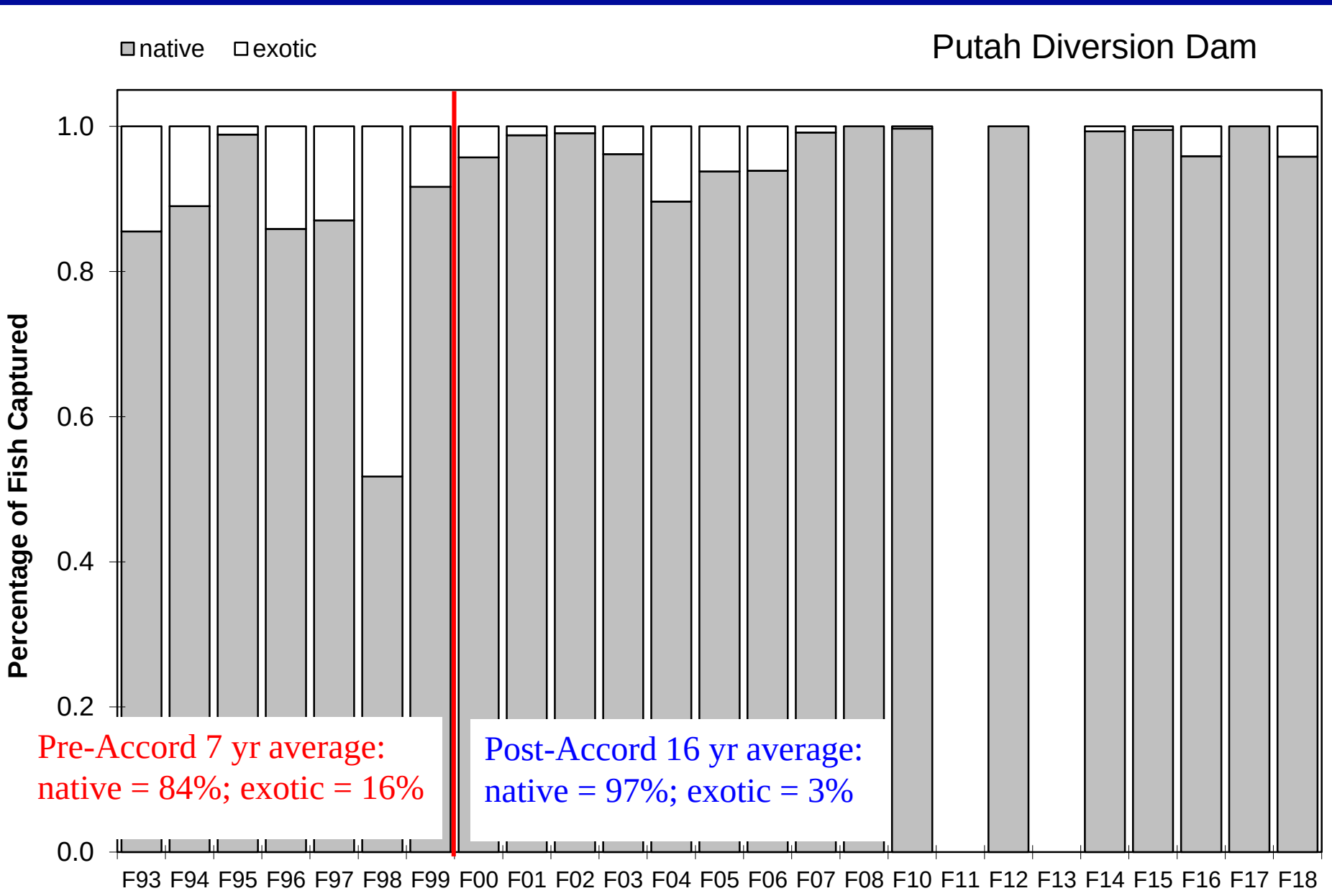
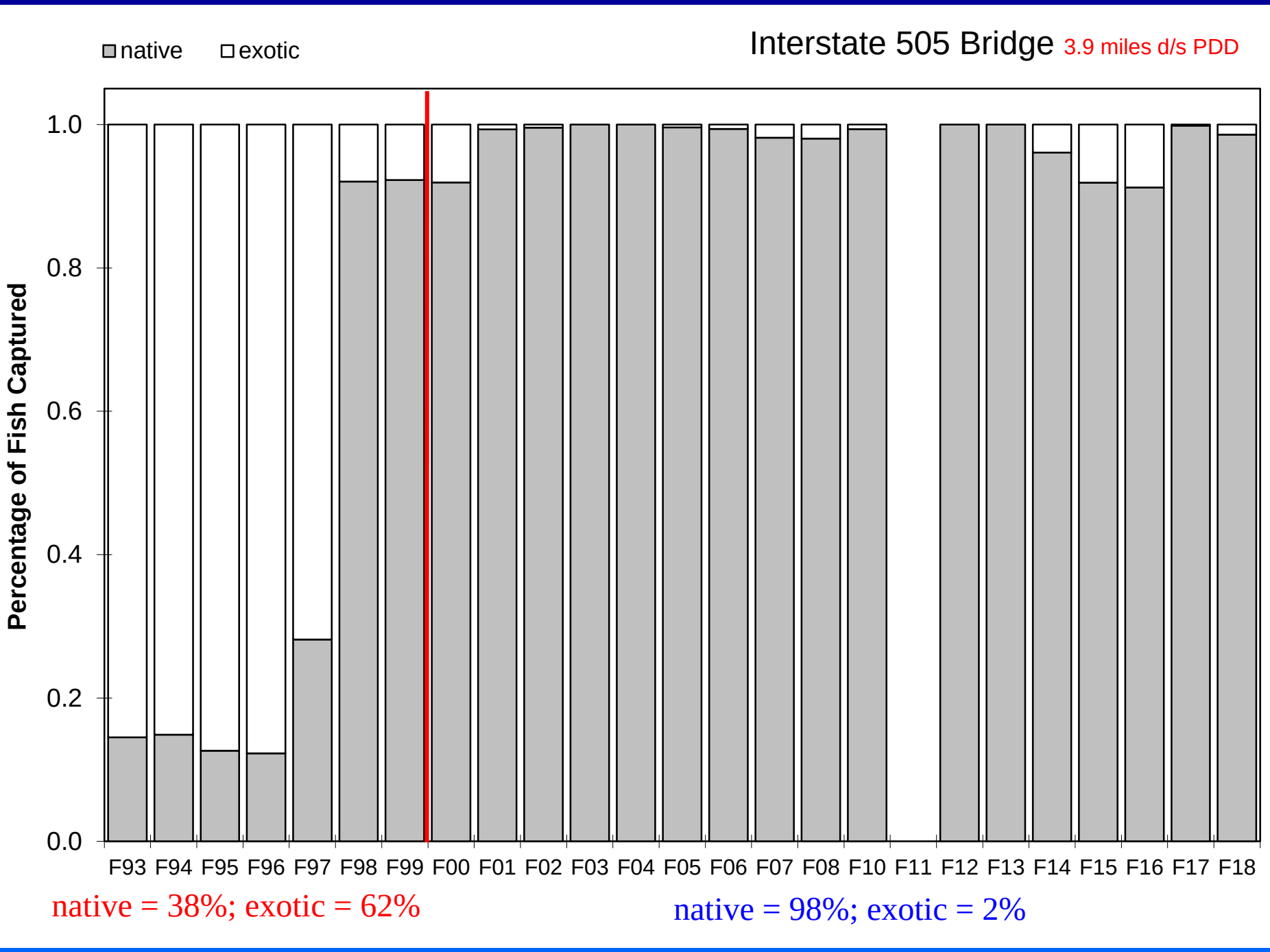
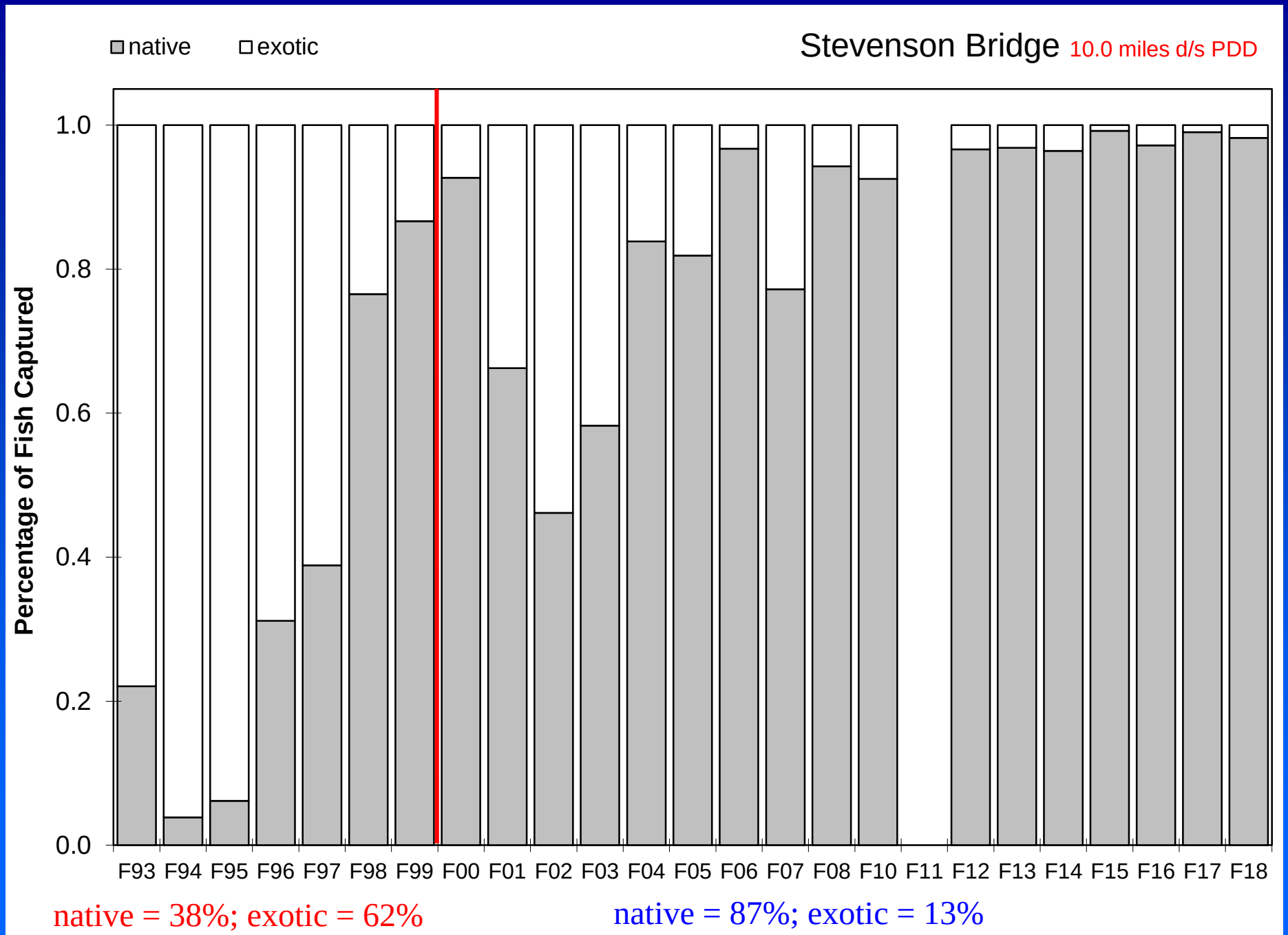
Los Rios Dam
Toe Drain
LOS PUTOS
RIO DE LOS PUTOS
YOLO CO
SOLANO CO
Putah
Dry
Willow
Slough
Creek
BYPASS

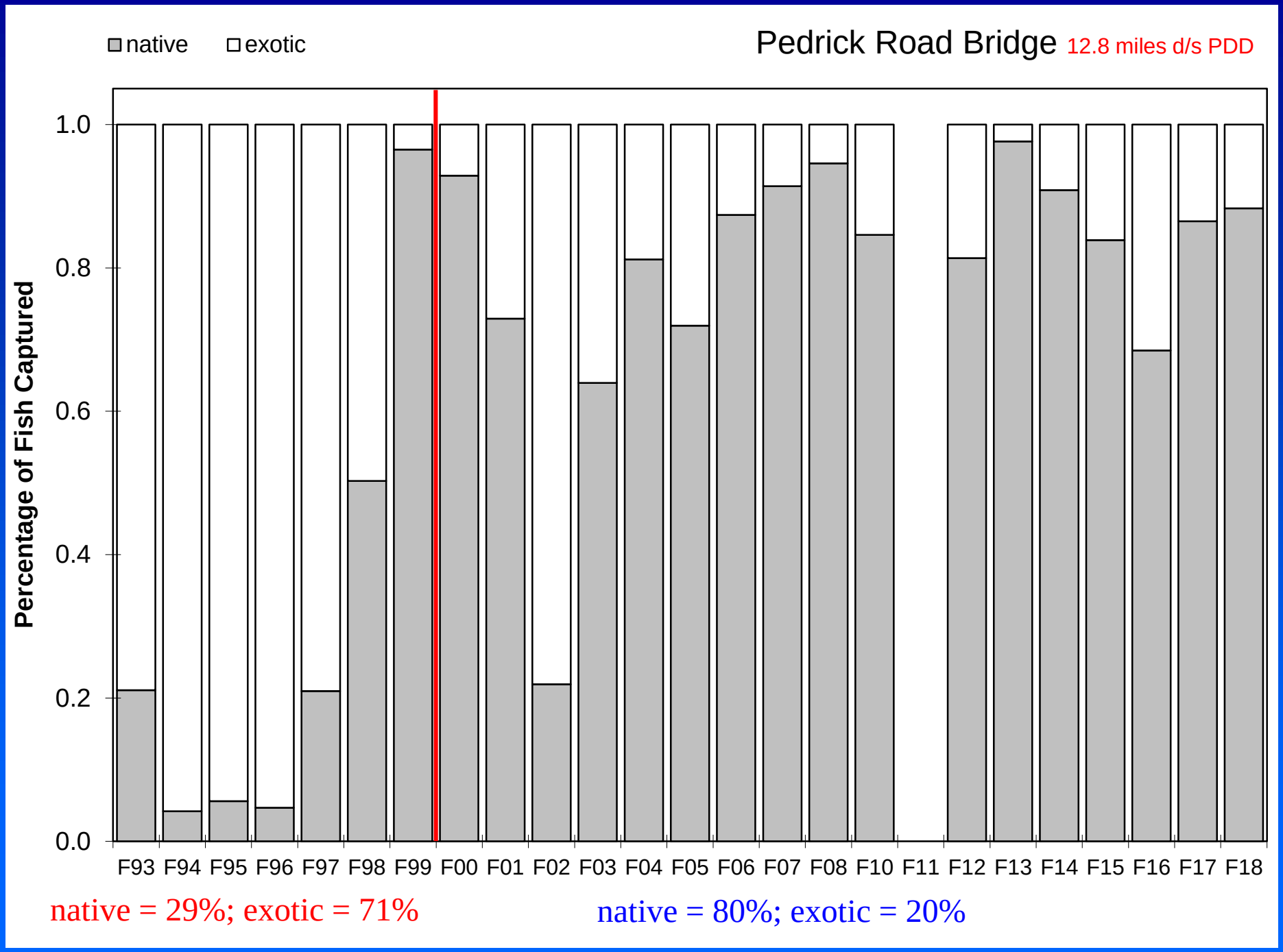
These sites were first surveyed in the summer of 1991, then in both the summer and fall (1993-2000) then only the fall (2001-2018)

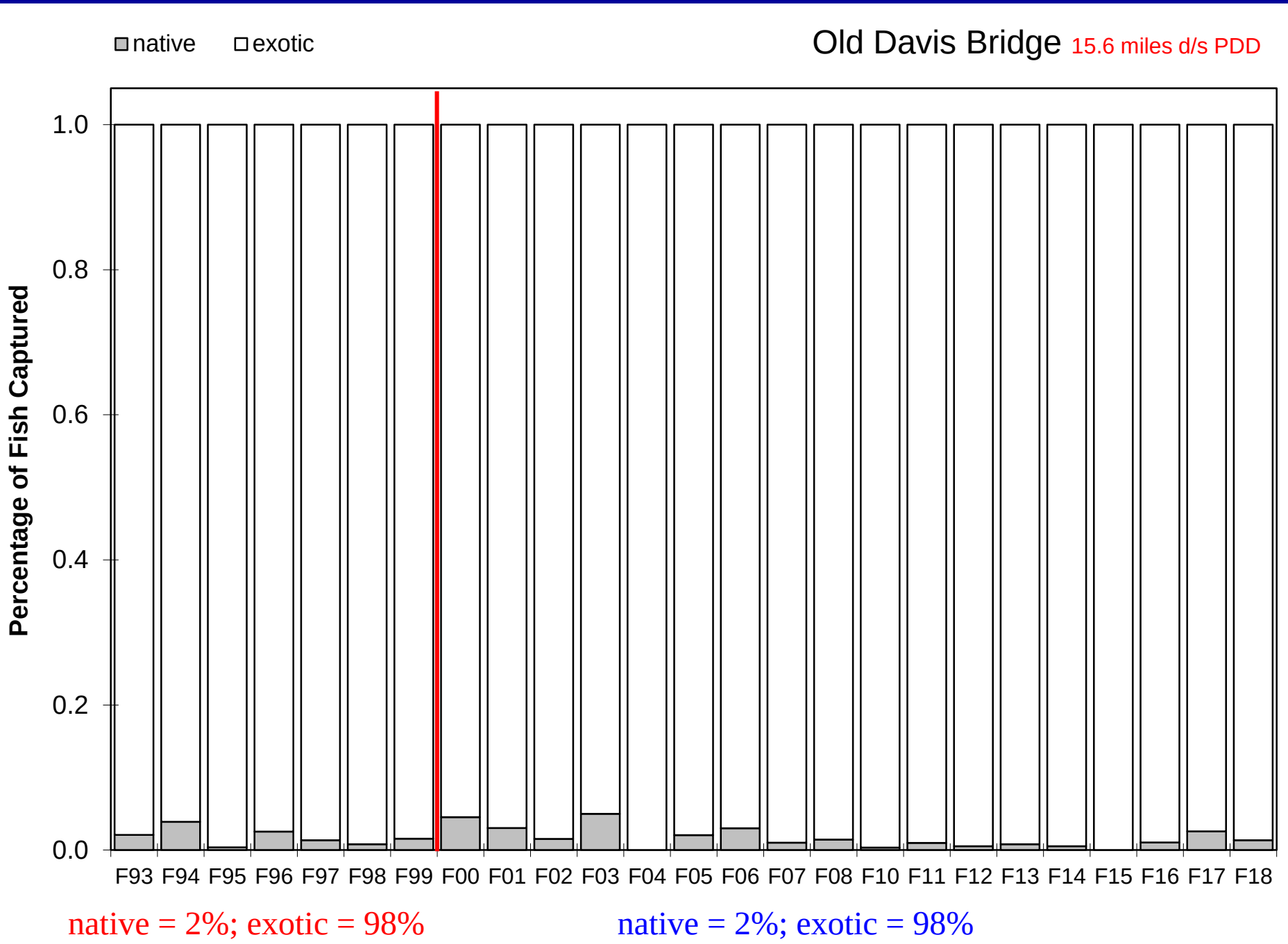
I am going to limit my remarks to the longest sequence of 24 fall surveys (1993-2018)

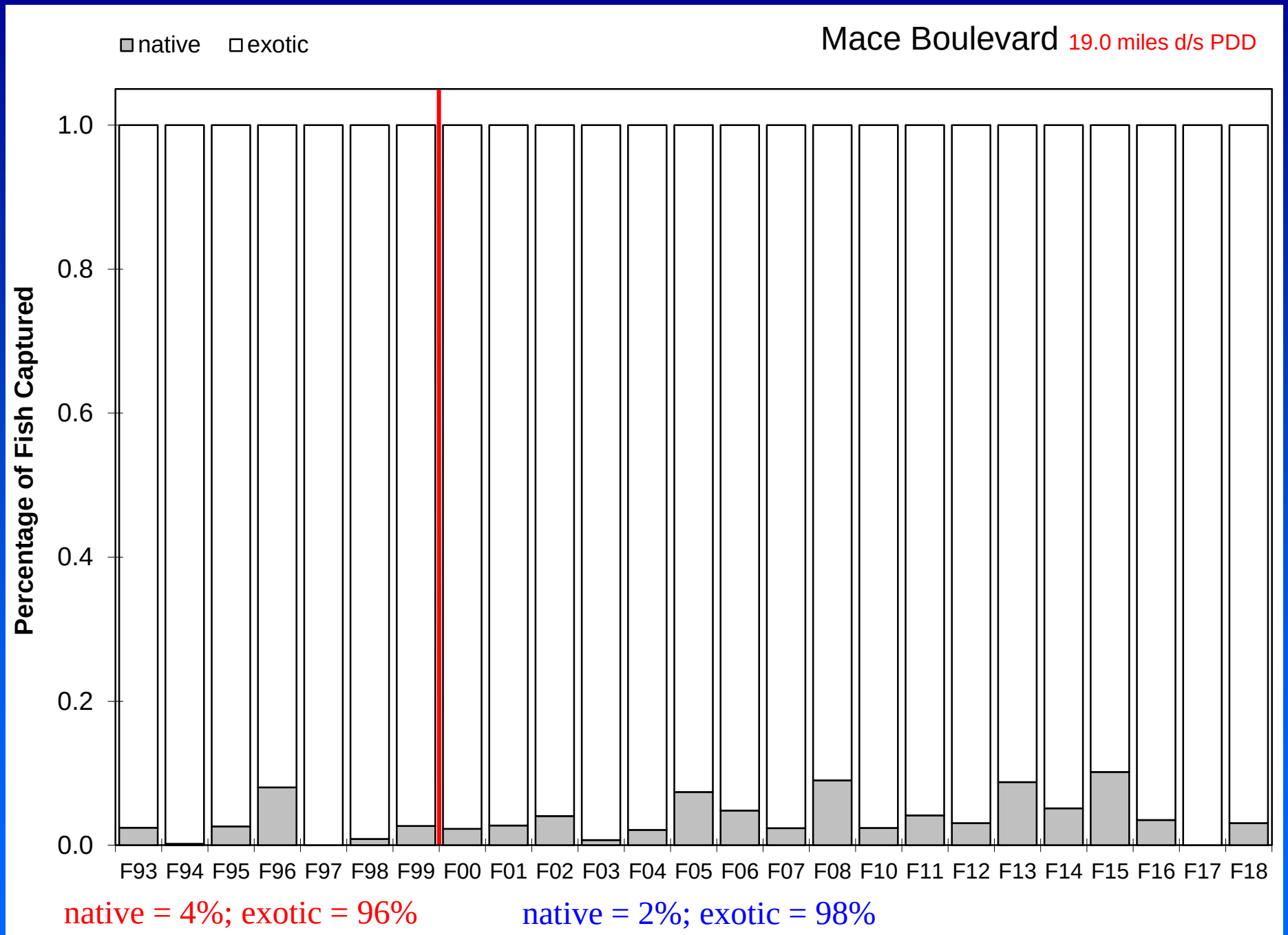

native
exotic
Putah Diversion Dam
Percentage of Fish Captured
1.0
0.8
0.6
0.4
0.2
0.0
F93 F94 F95 F96 F97 F98 F99 F00 F01 F02 F03 F04 F05 F06 F07 F08 F10 F11 F12 F13 F14 F15 F16 F17 F18
Pre-Accord 7 yr average:
native = 84%; exotic = 16%
Post-Accord 16 yr average:
native = 97%; exotic = 3%


native
exotic
Interstate 505 Bridge
3.9 miles d/s PDD
Percentage of Fish Captured
1.0
0.8
0.6
0.4
0.2
0.0
F93 F94 F95 F96 F97 F98 F99 F00 F01 F02 F03 F04 F05 F06 F07 F08 F10 F11 F12 F13 F14 F15 F16 F17 F18
native = 38%; exotic = 62%
native = 98%; exotic = 2%


native
exotic
Stevenson Bridge 10.0 miles d/s PDD
Percentage of Fish Captured
1.0
0.8
0.6
0.4
0.2
0.0
F93 F94 F95 F96 F97 F98 F99 F00 F01 F02 F03 F04 F05 F06 F07 F08 F10 F11 F12 F13 F14 F15 F16 F17 F18
native = 38%; exotic = 62%
native = 87%; exotic = 13%

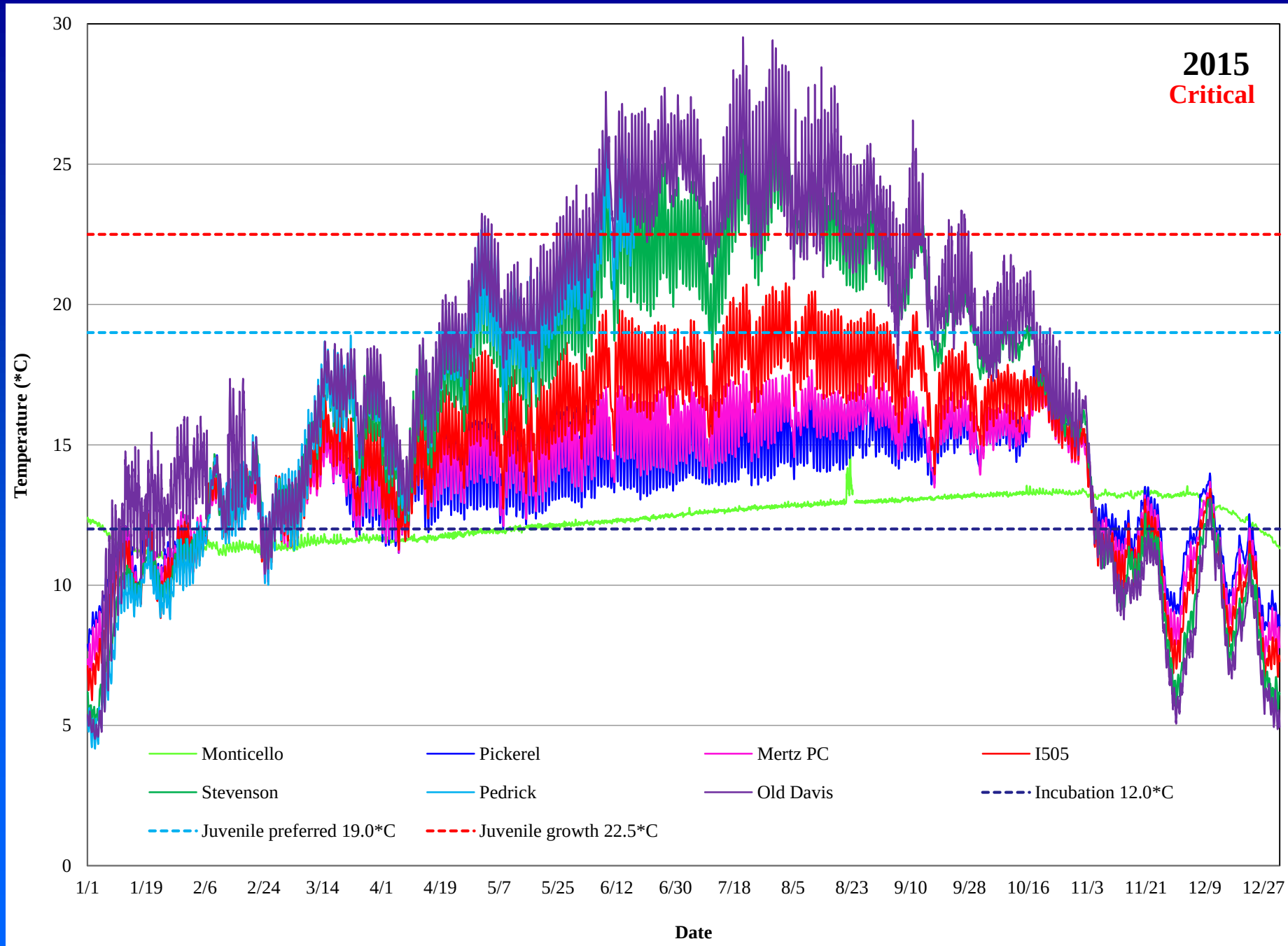

native
exotic
Pedrick Road Bridge 12.8 miles d/s PDD
Percentage of Fish Captured
1.0
0.8
0.6
0.4
0.2
0.0
F93 F94 F95 F96 F97 F98 F99 F00 F01 F02 F03 F04 F05 F06 F07 F08 F10 F11 F12 F13 F14 F15 F16 F17 F18
native = 29%; exotic = 71%
native = 80%; exotic = 20%

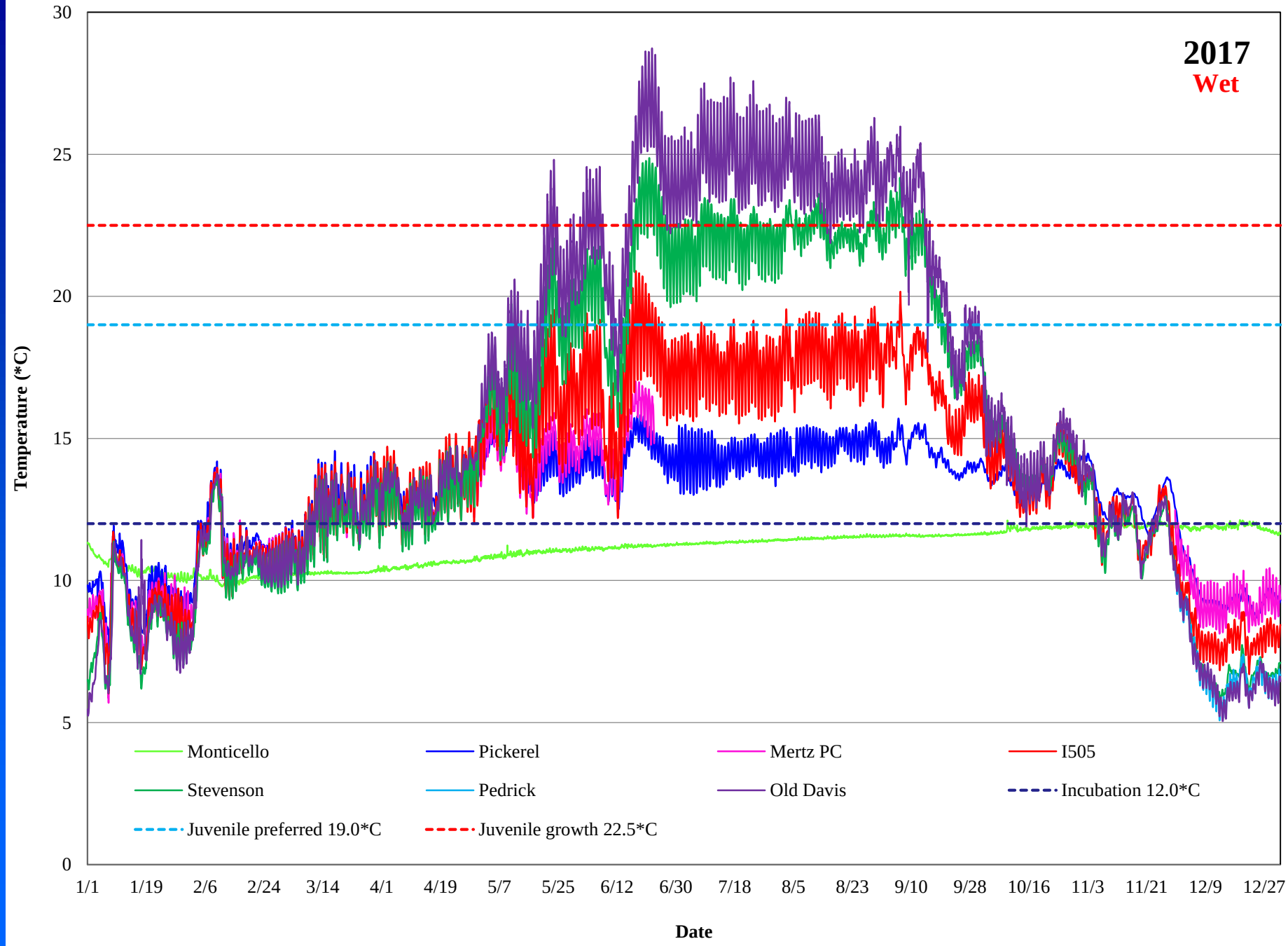

native
exotic
Old Davis Bridge 15.6 miles d/s PDD
Percentage of Fish Captured
1.0
0.8
0.6
0.4
0.2
0.0
F93 F94 F95 F96 F97 F98 F99 F00 F01 F02 F03 F04 F05 F06 F07 F08 F10 F11 F12 F13 F14 F15 F16 F17 F18
native = 2%; exotic = 98%
native = 2%; exotic = 98%

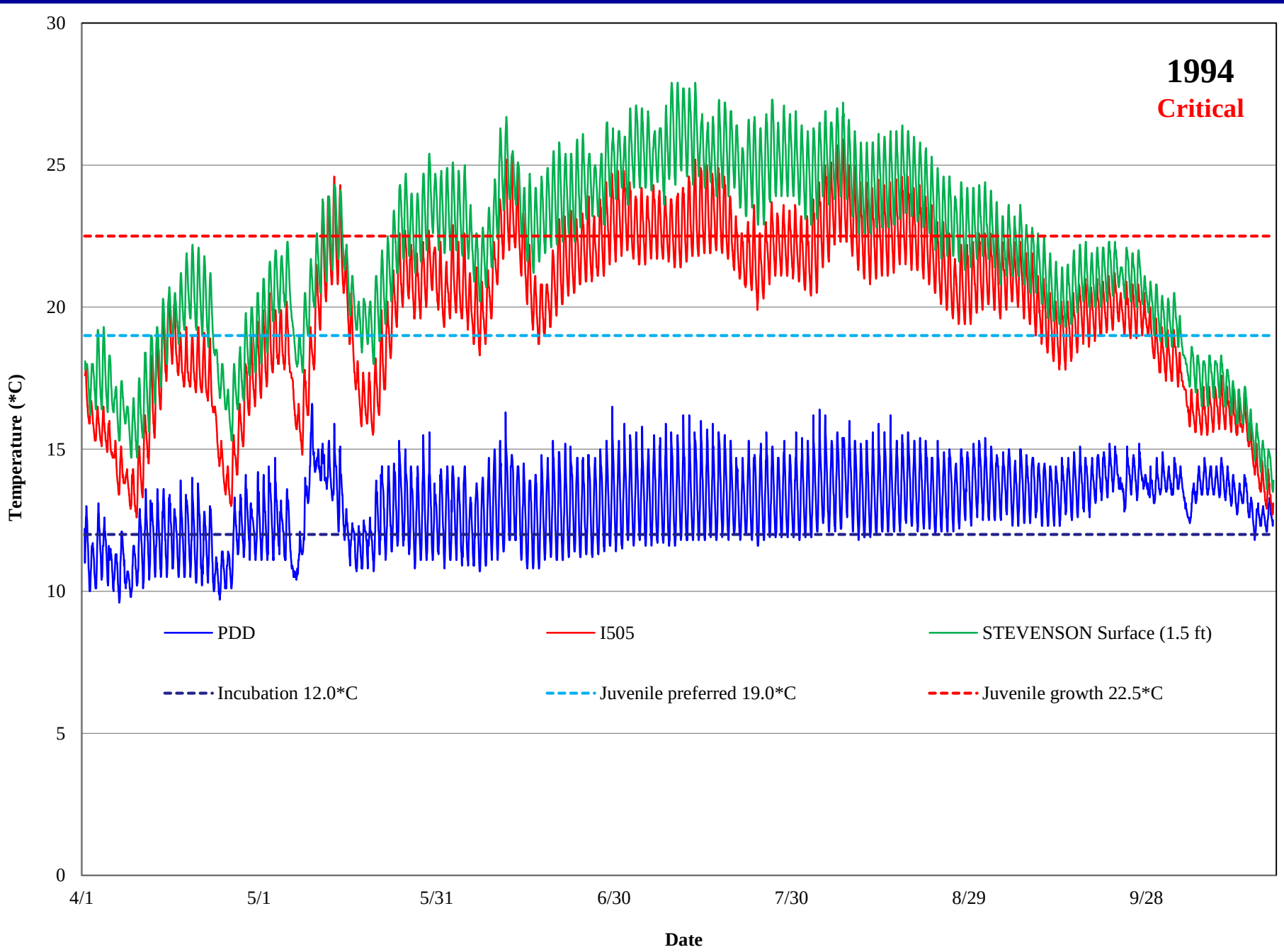

native
exotic
Mace Boulevard 19.0 miles d/s PDD
Percentage of Fish Captured
1.0
0.8
0.6
0.4
0.2
0.0
F93 F94 F95 F96 F97 F98 F99 F00 F01 F02 F03 F04 F05 F06 F07 F08 F10 F11 F12 F13 F14 F15 F16 F17 F18
native = 4%; exotic = 96%
native = 2%; exotic = 98%

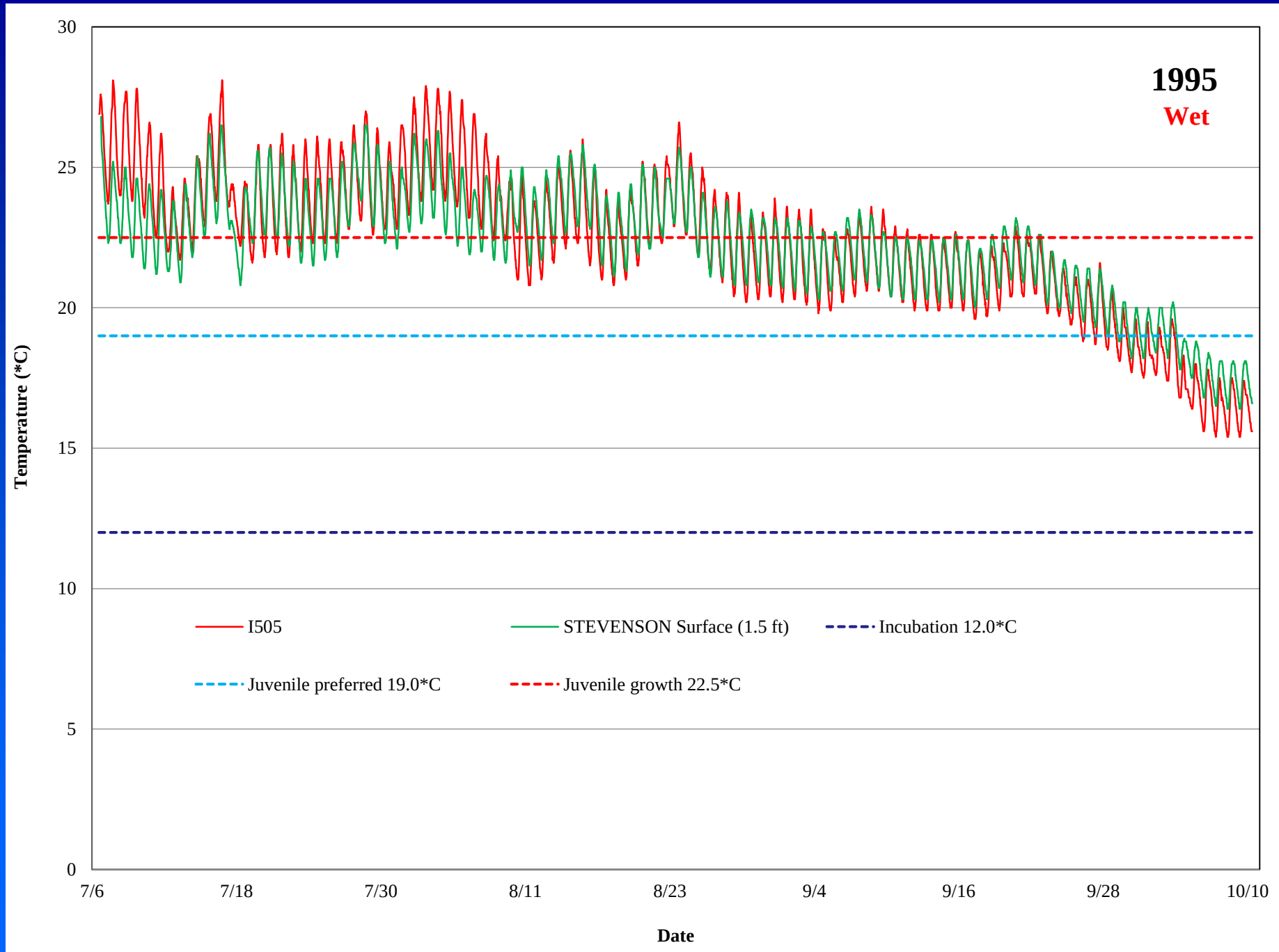
24 years of surveys (1993-2018) Conditions for native fish in 13 miles of Putah Creek between PDD and Pedrick Road have improved since the May 2000 Accord and the ‘live stream” flows as measured at I-80, with highest reductions in exotics occurring between miles 4 and 13 (I505 to Pedrick).

Temperature monitoring indicates suitable temperatures for year-round rearing of steelhead (and resident trout) extend to I-505 (3.9 miles below PDD) and probably beyond toward Stevenson area (10 miles below PDD). We now catch juvenile trout as far downstream as Russell Ranch area (9.2 miles below PDD).

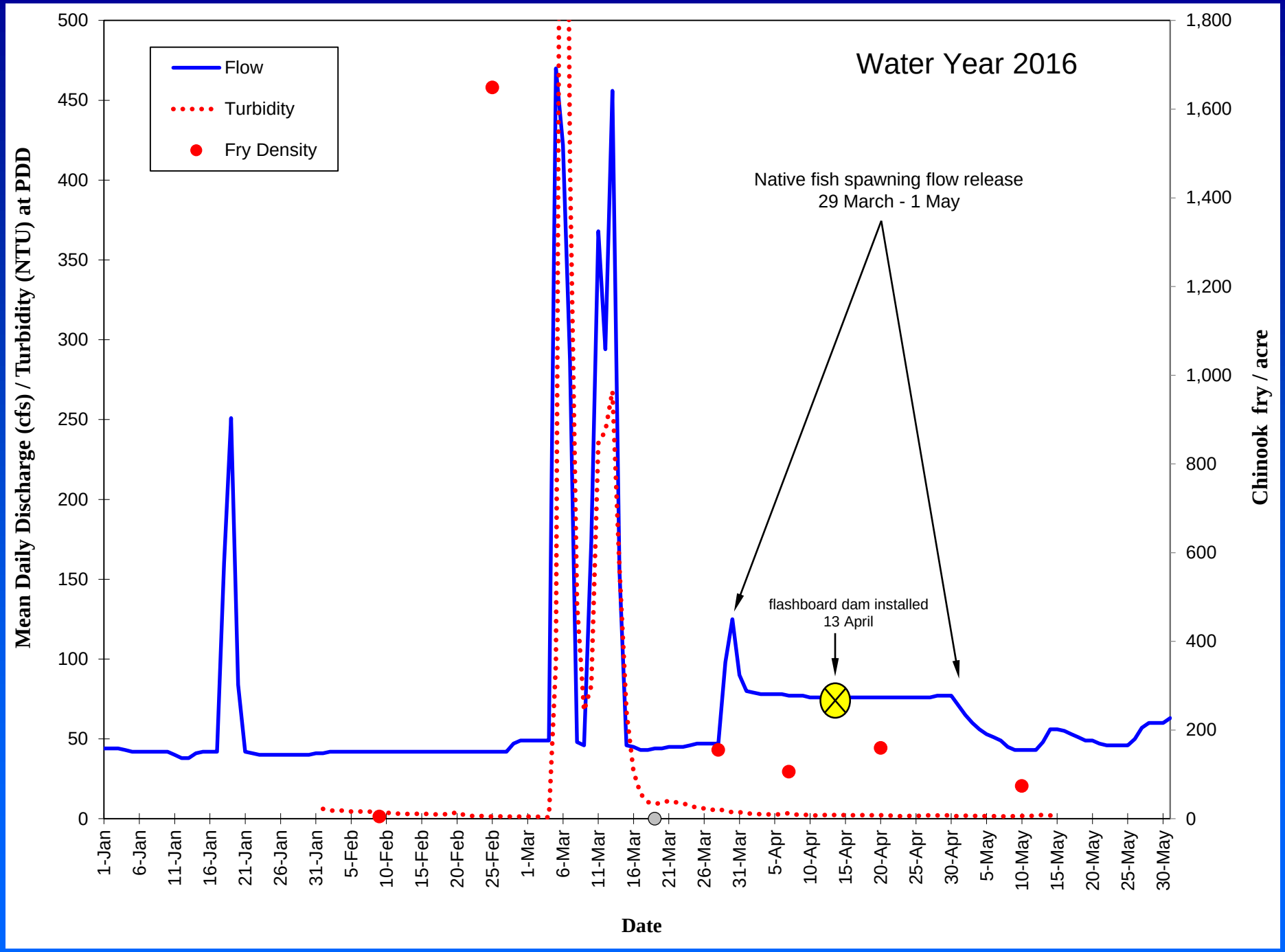

2015
Critical
Temperature (*C)
Date
30
25
20
15
10
5
0
1/1
1/19
2/6
2/24
3/14
4/1
4/19
5/7
5/25
6/12
6/30
7/18
8/5
8/23
9/10
9/28
10/16
11/3
11/21
12/9
12/27
Monticello
Pickerel
Mertz PC
I505
Stevenson
Pedrick
Old Davis
Incubation 12.0*C
Juvenile preferred 19.0*C
Juvenile growth 22.5*C

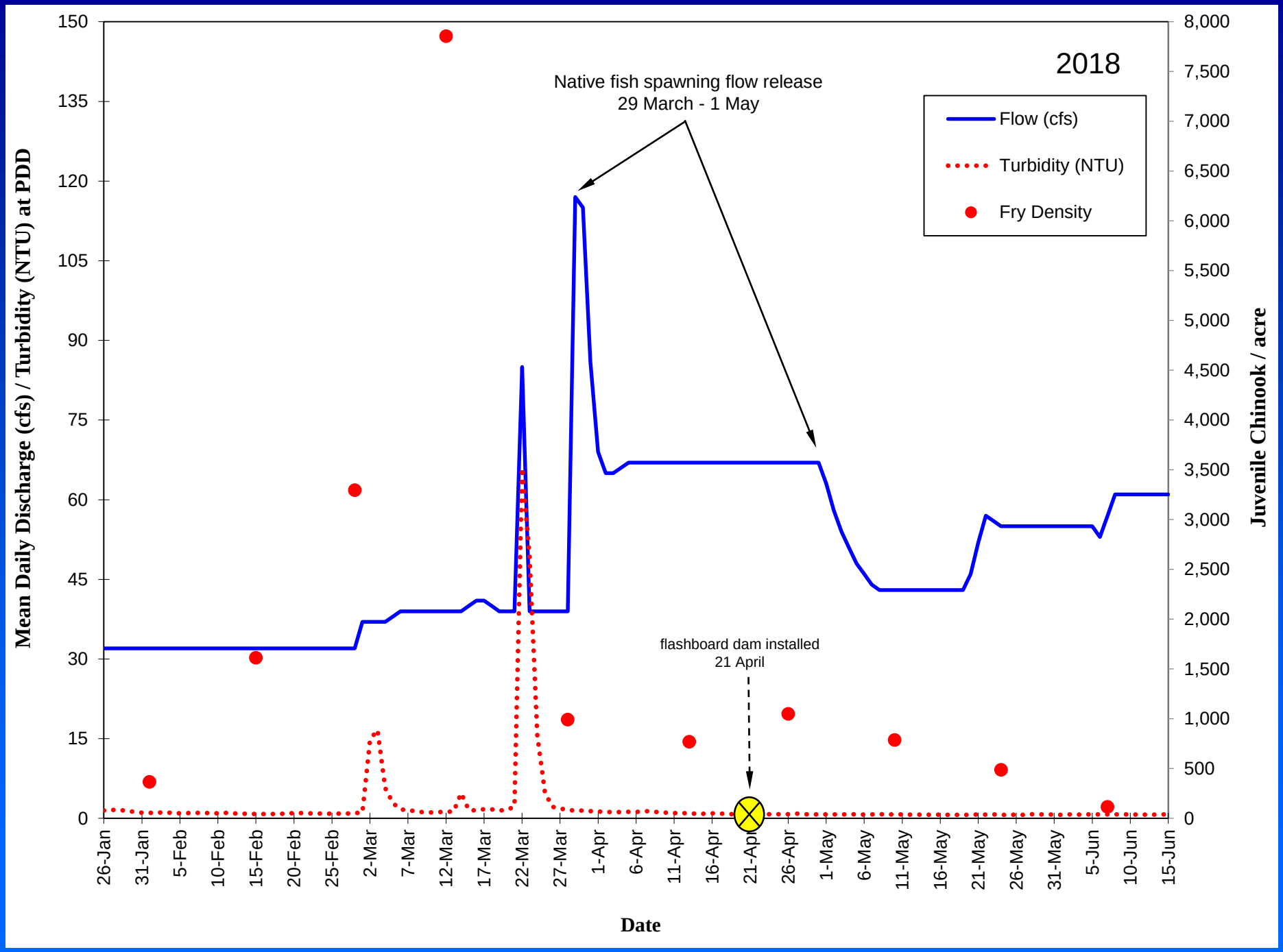

2017
Wet
Temperature (*C)
Date
30
25
20
15
10
5
0
1/1
1/19
2/6
2/24
3/14
4/1
4/19
5/7
5/25
6/12
6/30
7/18
8/5
8/23
9/10
9/28
10/16
11/3
11/21
12/9
12/27
Monticello
Pickerel
Mertz PC
I505
Stevenson
Pedrick
Old Davis
Incubation 12.0*C
Juvenile preferred 19.0*C
Juvenile growth 22.5*C


1994
Critical
Temperature (*C)
30
25
20
15
10
5
0
4/1
5/1
5/31
6/30
7/30
8/29
9/28
Date
PDD
I505
STEVENSON Surface (1.5 ft)
Incubation 12.0*C
Juvenile preferred 19.0*C
Juvenile growth 22.5*C


1995
Wet
Temperature (*C)
30
25
20
15
10
5
0
7/6
7/18
7/30
8/11
8/23
9/4
9/16
9/28
10/10
Date
I505
STEVENSON Surface (1.5 ft)
Incubation 12.0*C
Juvenile preferred 19.0*C
Juvenile growth 22.5*C

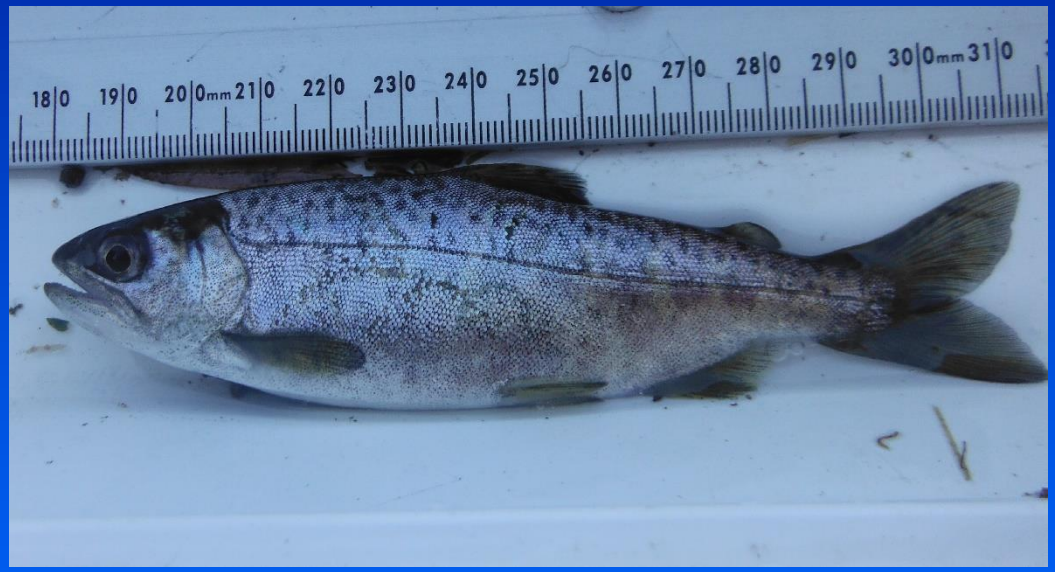
Juvenile Chinook salmon surveys conducted in 2016 and 2018 to determine emergence, distribution and abundance patterns and emigration/over-summering


Water Year 2016
Flow
Turbidity
Fry Density
Native fish spawning flow release
29 March - 1 May
flashboard dam installed
13 April
Mean Daily Discharge (cfs) / Turbidity (NTU) at PDD
Chinook fry / acre
Date
500
450
400
350
300
250
200
150
100
50
0
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1-Jan
6-Jan
11-Jan
16-Jan
21-Jan
26-Jan
31-Jan
5-Feb
10-Feb
15-Feb
20-Feb
25-Feb
1-Mar
6-Mar
11-Mar
16-Mar
21-Mar
26-Mar
31-Mar
5-Apr
10-Apr
15-Apr
20-Apr
25-Apr
30-Apr
5-May
10-May
15-May
20-May
25-May
30-May


2018
Native fish spawning flow release
29 March - 1 May
flashboard dam installed
21 April
Flow (cfs)
Turbidity (NTU)
Fry Density
Mean Daily Discharge (cfs) / Turbidity (NTU) at PDD
Juvenile Chinook / acre
Date
150
135
120
105
90
75
60
45
30
15
0
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
26-Jan
31-Jan
5-Feb
10-Feb
15-Feb
20-Feb
25-Feb
2-Mar
7-Mar
12-Mar
17-Mar
22-Mar
27-Mar
1-Apr
6-Apr
11-Apr
16-Apr
21-Apr
26-Apr
1-May
6-May
11-May
16-May
21-May
26-May
31-May
5-Jun
10-Jun
15-Jun

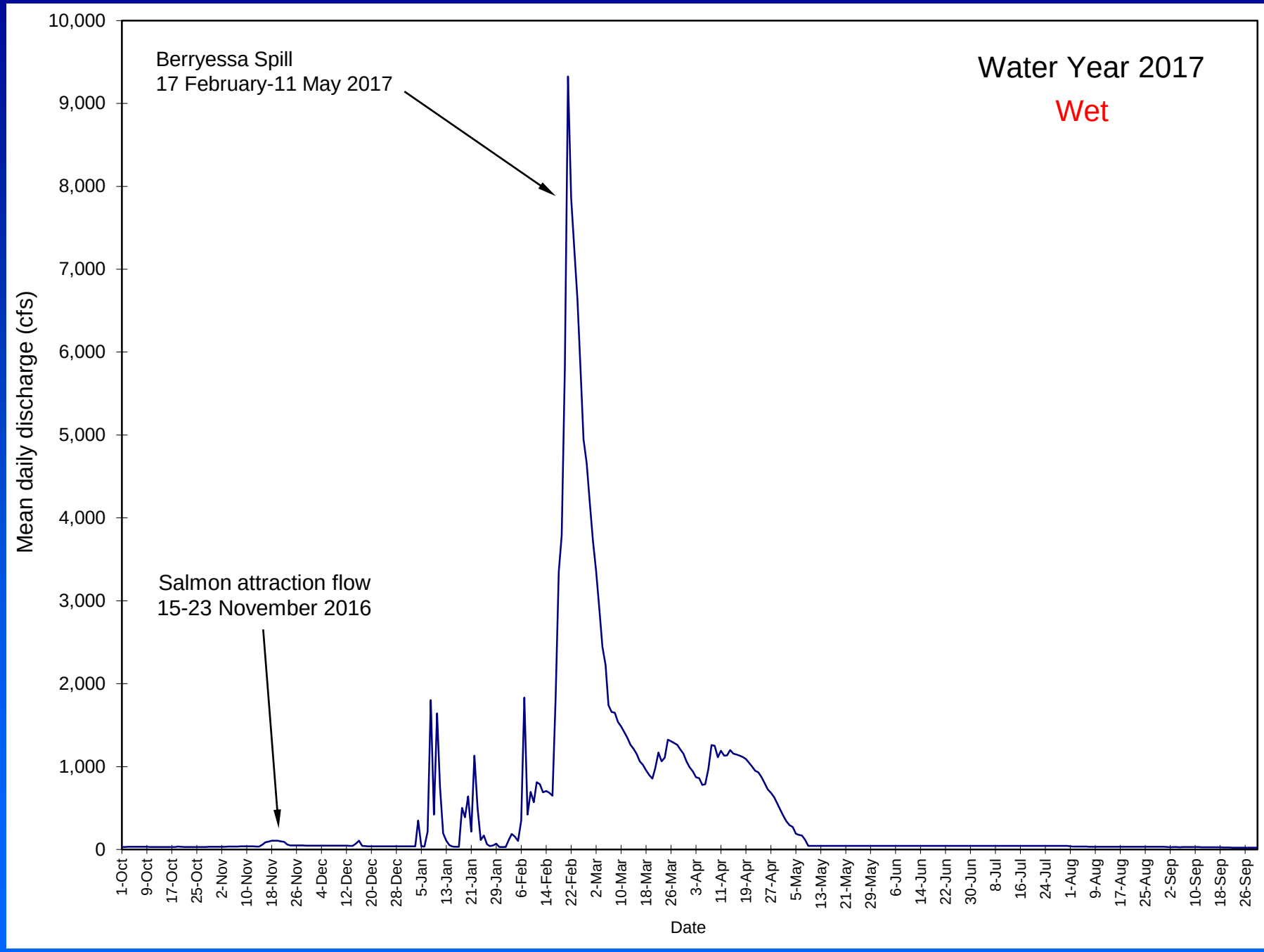
October 2016 and 2018 found juvenile Chinook that over-summered in Putah Creek near PDD

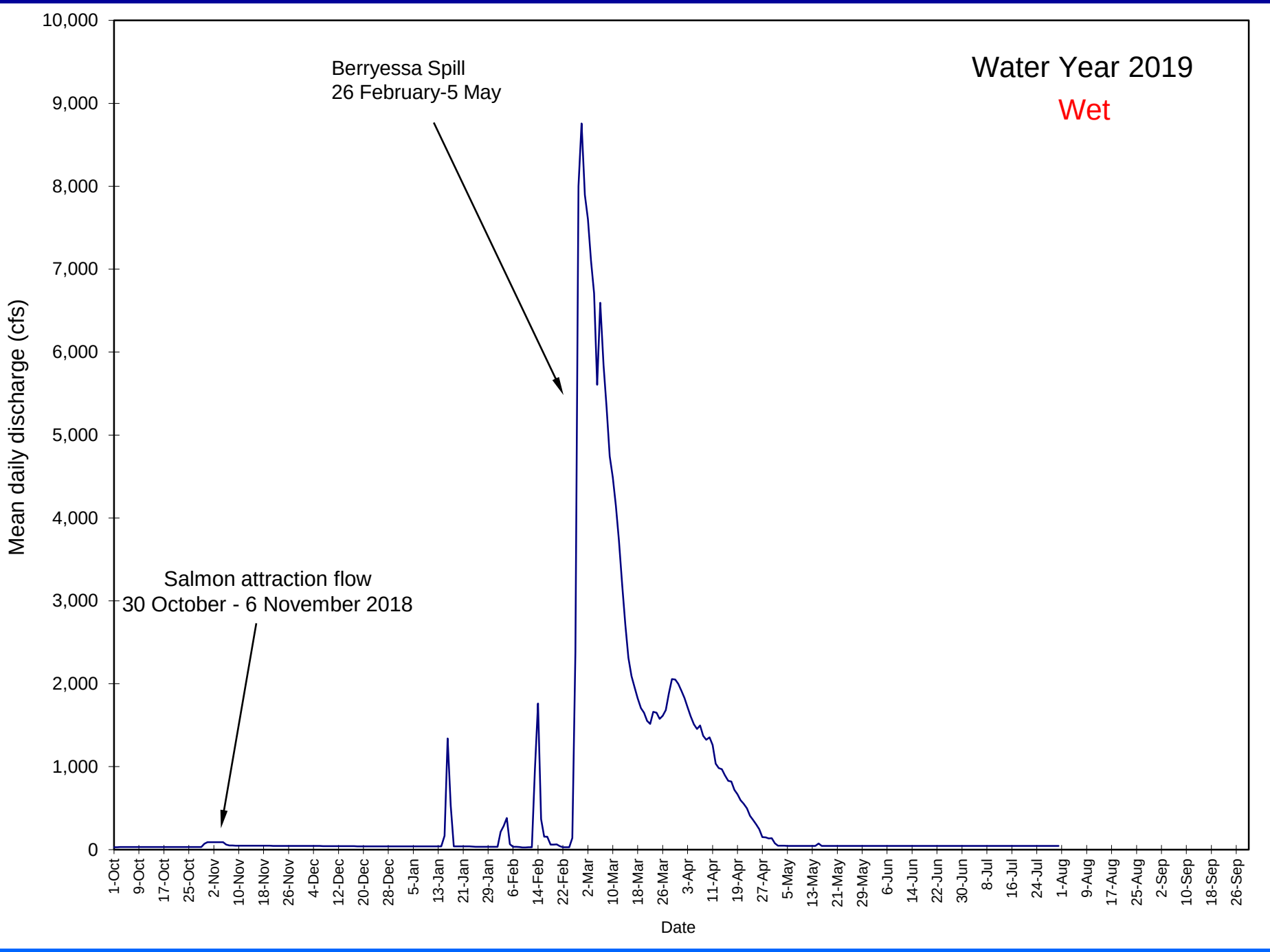
October 2016



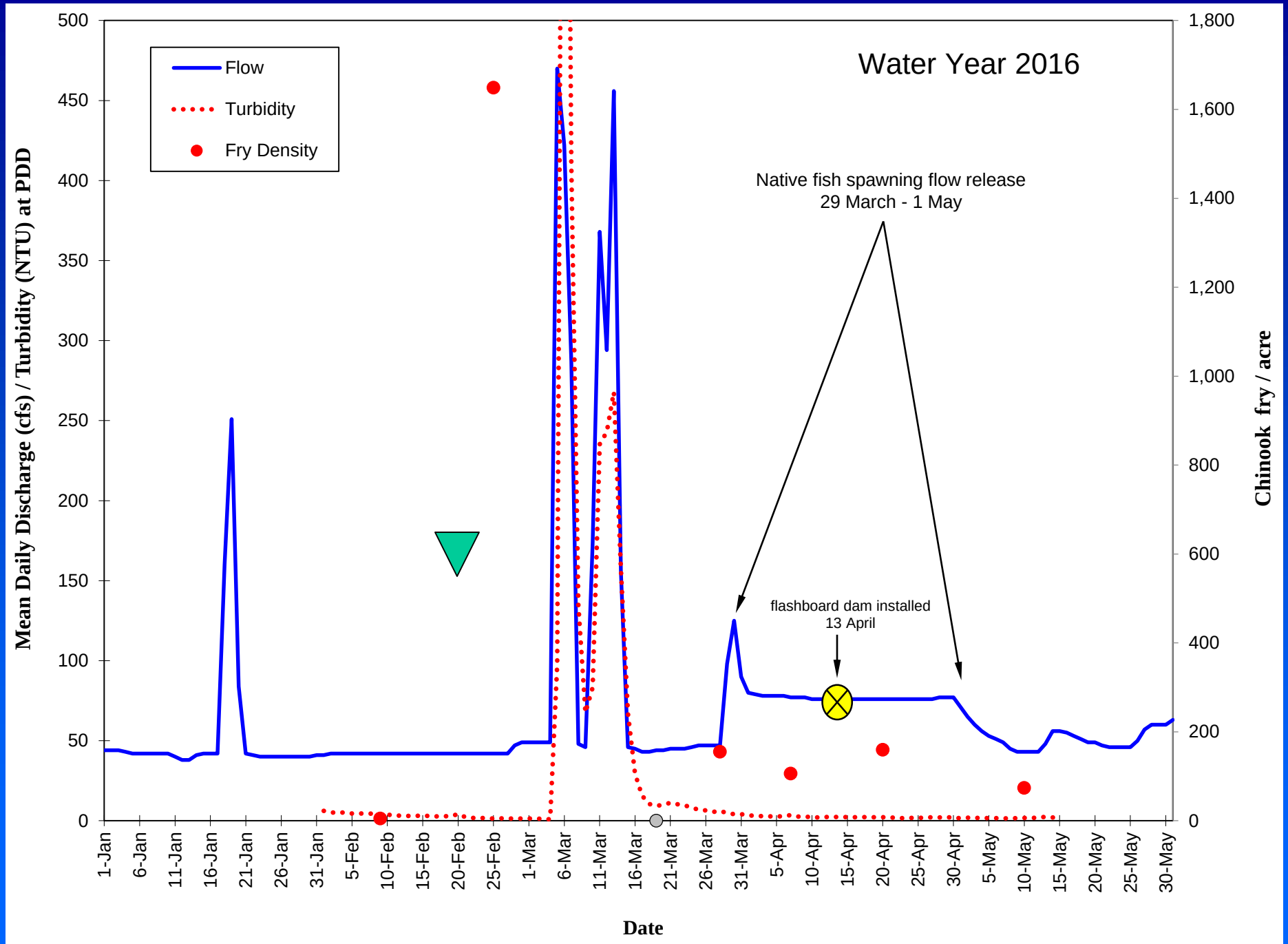
October 2018

No surveys in 2017 or 2019 as these were wet years when Lake Berryessa spilled


Berryessa Spill
17 February-11 May 2017
Water Year 2017
Wet
Salmon attraction flow
15-23 November 2016
Mean daily discharge (cfs)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1-Oct
9-Oct
17-Oct
25-Oct
2-Nov
10-Nov
18-Nov
26-Nov
4-Dec
12-Dec
20-Dec
28-Dec
5-Jan
13-Jan
21-Jan
29-Jan
6-Feb
14-Feb
22-Feb
2-Mar
10-Mar
18-Mar
26-Mar
3-Apr
11-Apr
19-Apr
27-Apr
5-May
13-May
21-May
29-May
6-Jun
14-Jun
22-Jun
30-Jun
8-Jul
16-Jul
24-Jul
1-Aug
9-Aug
17-Aug
25-Aug
2-Sep
10-Sep
18-Sep
26-Sep
Date


Water Year 2019
Wet
Berryessa Spill
26 February-5 May
Salmon attraction flow
30 October - 6 November 2018
Mean daily discharge (cfs)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1-Oct
9-Oct
17-Oct
25-Oct
2-Nov
10-Nov
18-Nov
26-Nov
4-Dec
12-Dec
20-Dec
28-Dec
5-Jan
13-Jan
21-Jan
29-Jan
6-Feb
14-Feb
22-Feb
2-Mar
10-Mar
18-Mar
26-Mar
3-Apr
11-Apr
19-Apr
27-Apr
5-May
13-May
21-May
29-May
6-Jun
14-Jun
22-Jun
30-Jun
8-Jul
16-Jul
24-Jul
1-Aug
9-Aug
17-Aug
25-Aug
2-Sep
10-Sep
18-Sep
26-Sep
Date

The 2017 and 2019 spills and extended high flows probably destroyed most of the fry production by burying/scouring redds prior to emergence or washing small and vulnerable newly emergent fry downstream into less suitable habitat or out of basin


Water Year 2016
Flow
Turbidity
Fry Density
Native fish spawning flow release
29 March - 1 May
flashboard dam installed
13 April
Mean Daily Discharge (cfs) / Turbidity (NTU) at PDD
Chinook fry / acre
Date
500
450
400
350
300
250
200
150
100
50
0
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
1-Jan
6-Jan
11-Jan
16-Jan
21-Jan
26-Jan
31-Jan
5-Feb
10-Feb
15-Feb
20-Feb
25-Feb
1-Mar
6-Mar
11-Mar
16-Mar
21-Mar
26-Mar
31-Mar
5-Apr
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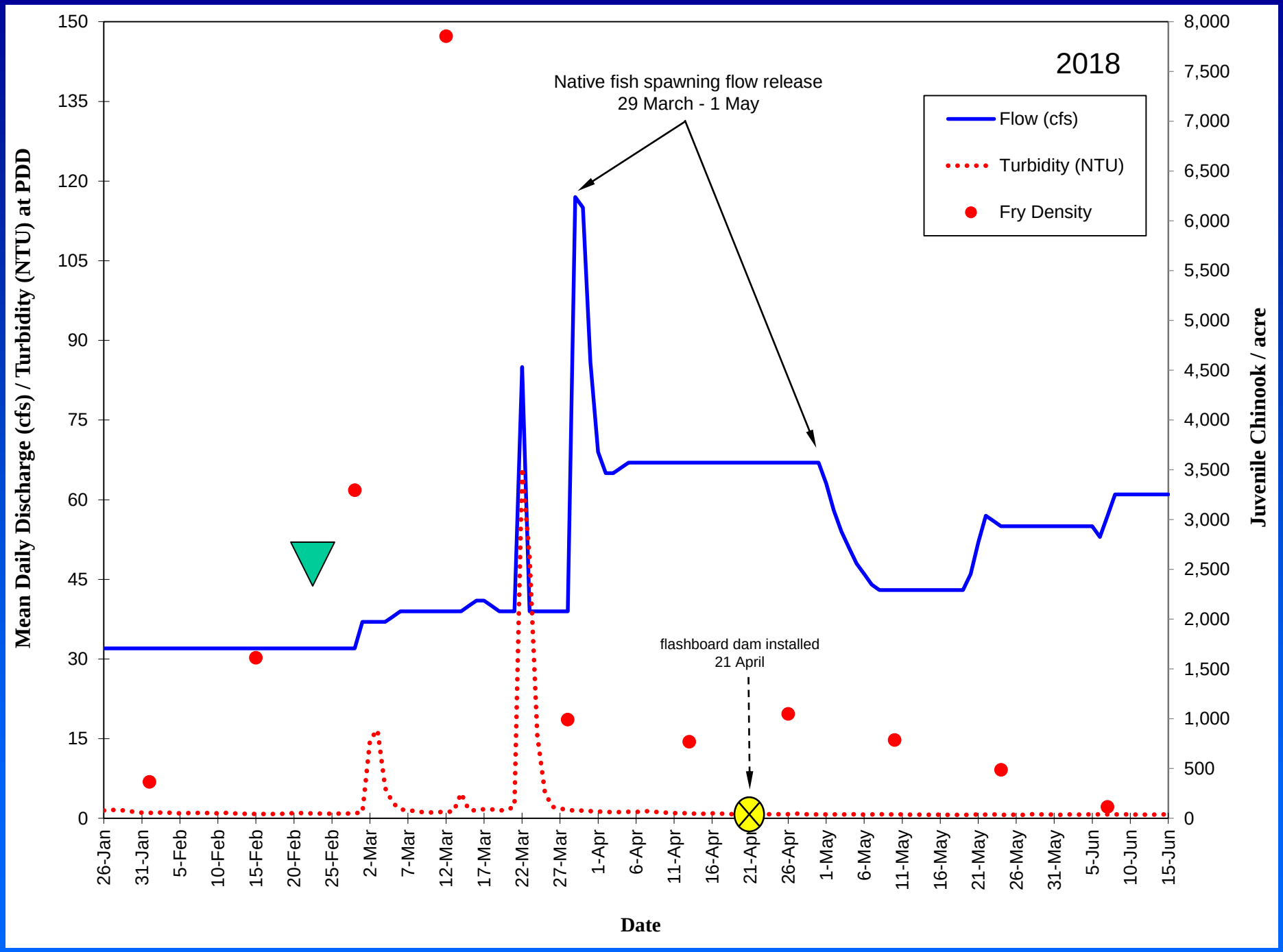
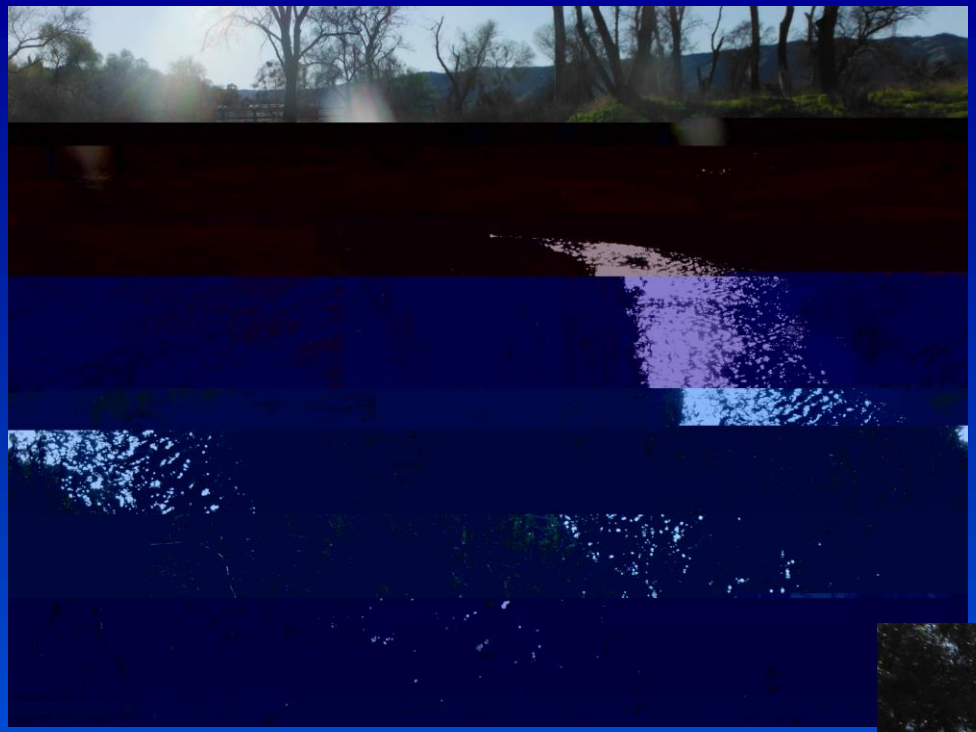
5-May
10-May
15-May
20-May
25-May
30-May


2018
Native fish spawning flow release
29 March - 1 May
flashboard dam installed
21 April
Flow (cfs)
Turbidity (NTU)
Fry Density
Mean Daily Discharge (cfs) / Turbidity (NTU) at PDD
Juvenile Chinook / acre
Date
150
135
120
105
90
75
60
45
30
15
0
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
26-Jan
31-Jan
5-Feb
10-Feb
15-Feb
20-Feb
25-Feb
2-Mar
7-Mar
12-Mar
17-Mar
22-Mar
27-Mar
1-Apr
6-Apr
11-Apr
16-Apr
21-Apr
26-Apr
1-May
6-May
11-May
16-May
21-May
26-May
31-May
5-Jun
10-Jun
15-Jun

Noted channel and substrate changes during our January and late May 2019 snorkel surveys

Largest and most sever changes occurred just below PDD, but some at Dry Creek confluence and at Winters Bridge



Next fish monitoring scheduled for mid-October 2019 and hope to continue winter/spring juvenile chinook snorkel surveys in late January 2020