

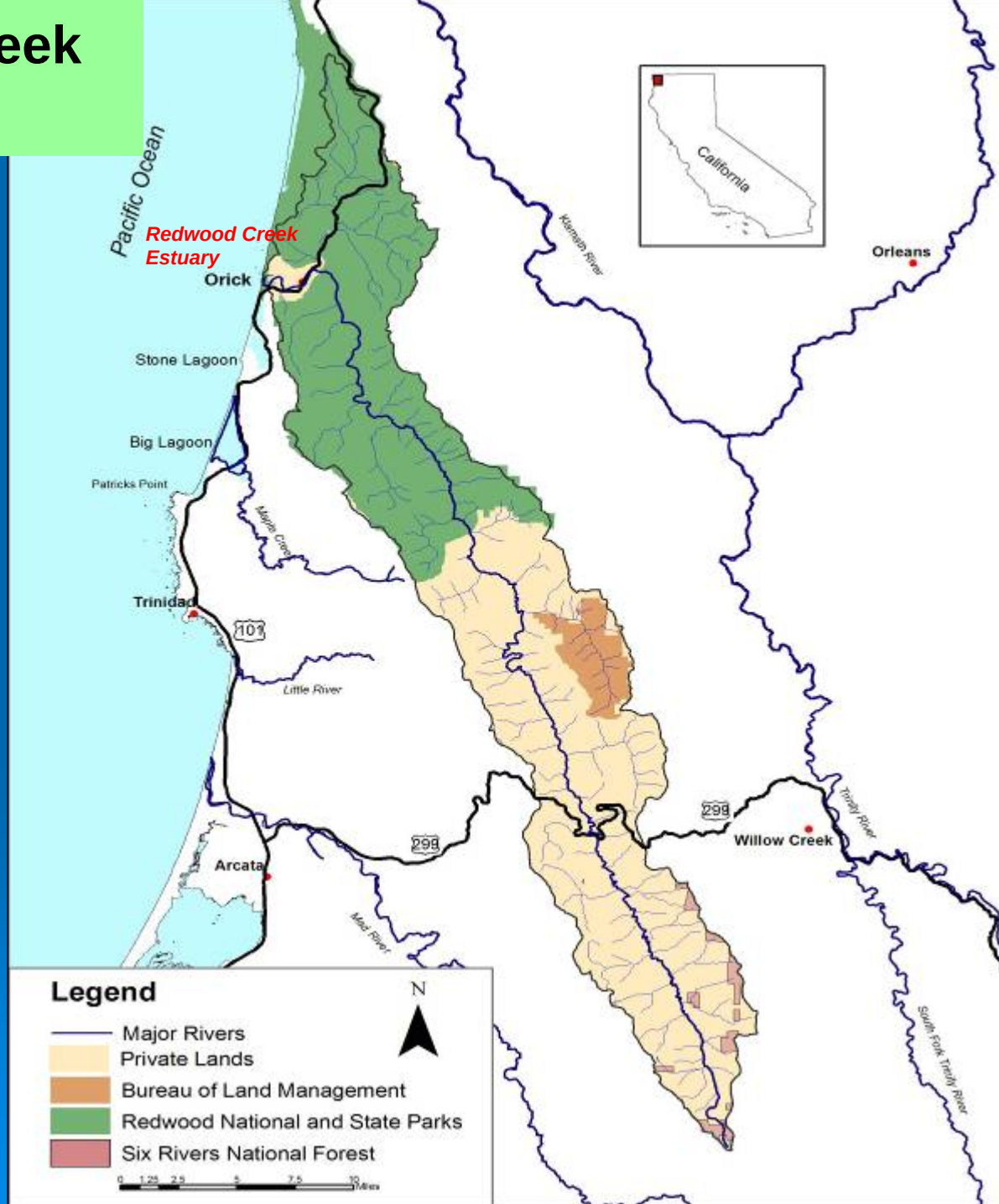
Redwood Creek Estuary and Mainstem Summer Steelhead Monitoring

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**Redwood Creek Fisheries Workshop
April 15, 2008**



Redwood Creek Watershed



RNSP Biological and Physical Estuary Monitoring

➤ Biological

- Species composition
- Population estimates
- Fish growth

➤ Physical

- Water elevations
- Cross section surveys
- Water temperature
- Flow (USGS-DWR gauge)

Redwood Creek Estuary

September
1948



Redwood Creek Estuary

1988

Levees

3.4 miles long

Cutoff last meander
of Redwood Cr



Present Conditions

- Levees
- Change in Circulation and Sedimentation Patterns
- Loss of Estuary Volume and Depth
- Loss of Riparian Vegetation



Redwood Creek Estuary

Bar-built estuary
Mouth closed in
summer and fall

May 2003



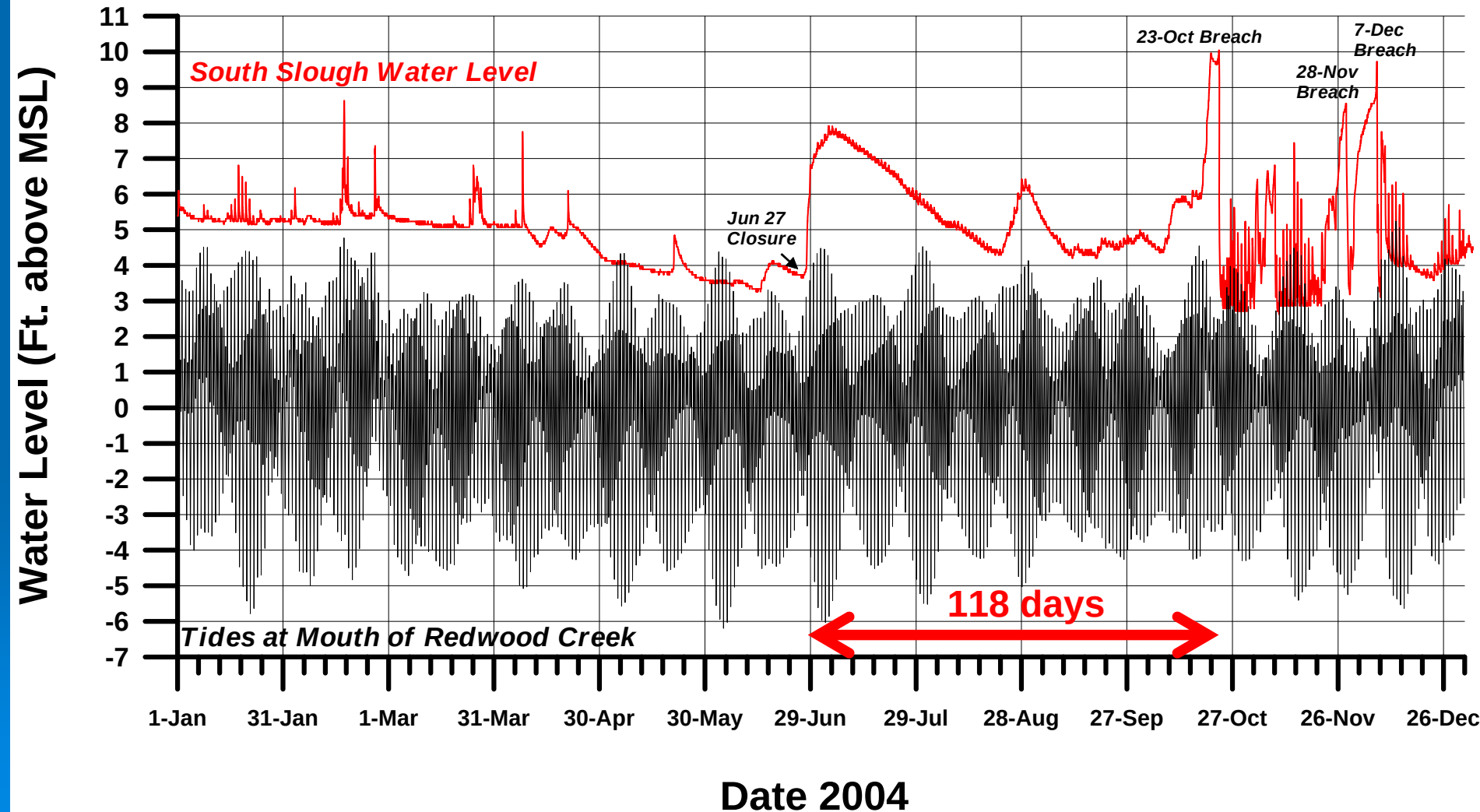
September 2003



2004

South Slough Water Levels and Tides at Mouth of Redwood Creek

1/01/04 - 12/31/04



Redwood Creek Estuary Fish Monitoring



Estuary Fish Sampling



Beach Seining



Measuring Fish



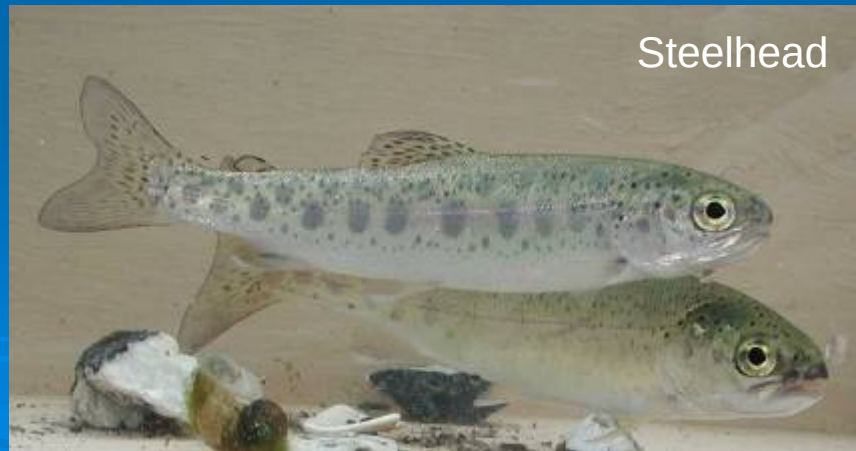
Redwood Creek Estuary Salmonid Fish Species

Chinook Salmon (Threatened)

Coho Salmon (Threatened)

Steelhead Trout (Threatened)

Coastal Cutthroat Trout (Not Warranted for Listing)



Chinook Salmon

- Rear in the Redwood Creek estuary
- Estuary dependent species



Steelhead Trout

- Extensive estuary use by older age juvenile steelhead
- Smoltification



Coastal Cutthroat Trout

- Largest fish in the estuary



Coho Salmon

- Limited summer use of estuary



Estuary Chinook Population Estimates

1997 – 2007

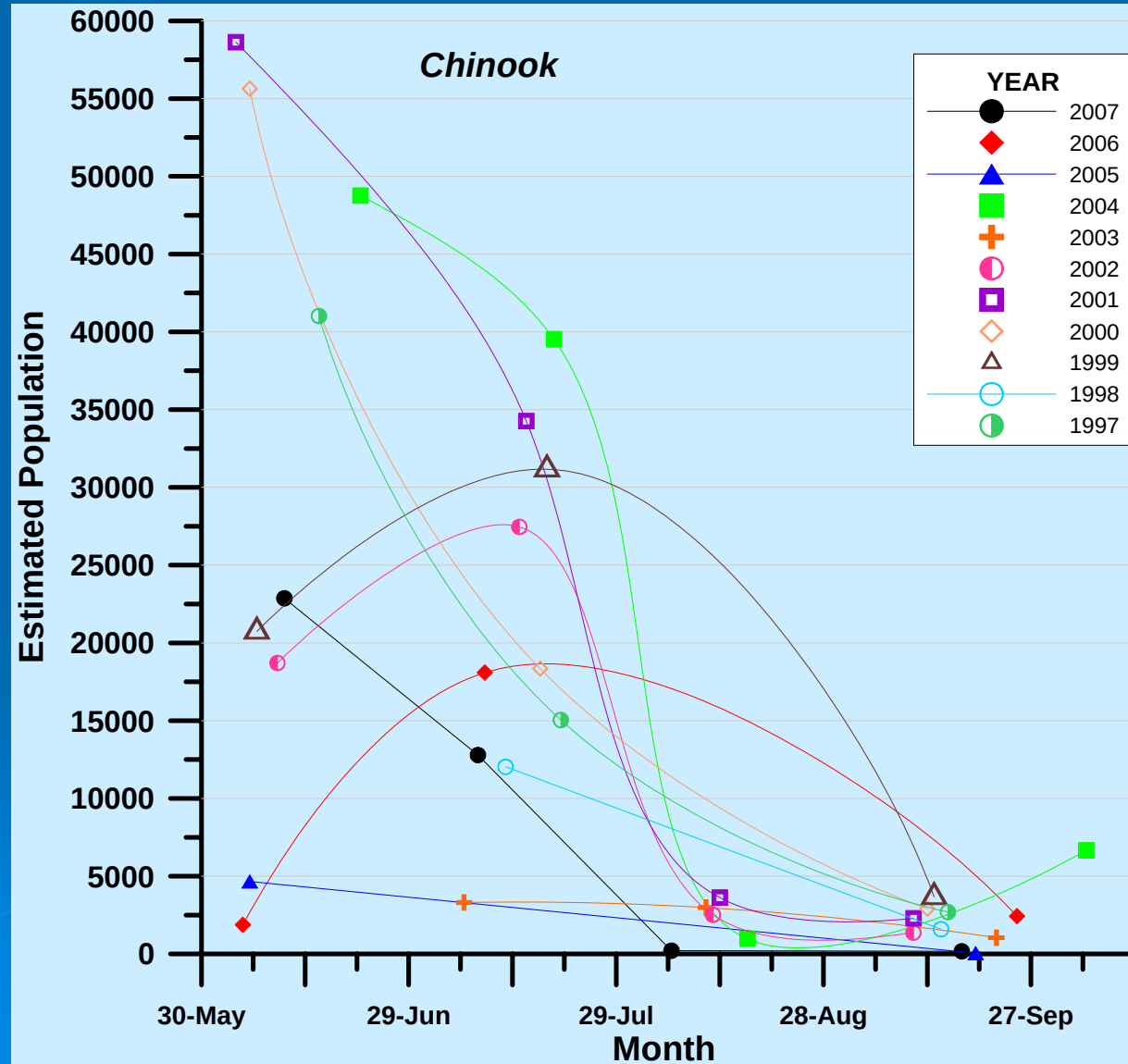
Last Estimate Mean
for 1997 to 2007

2,260 Chinook

Min – Max

50 to 6,660

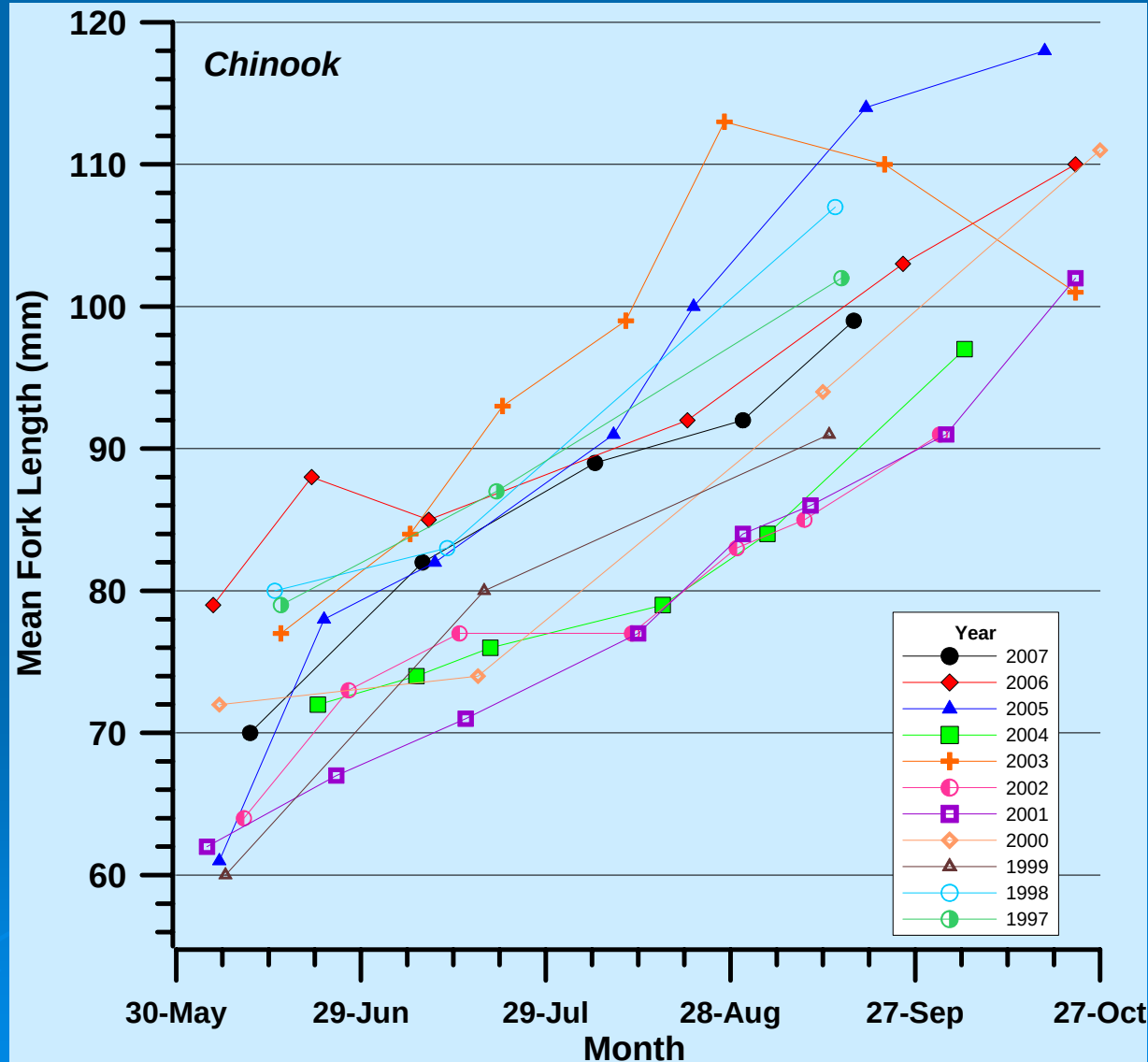
Limited Carrying
Capacity of Estuary



Estuary Chinook Mean Size

1997 to 2007

Extended estuary
rearing affords
size increase



Estuary Steelhead Population Estimates

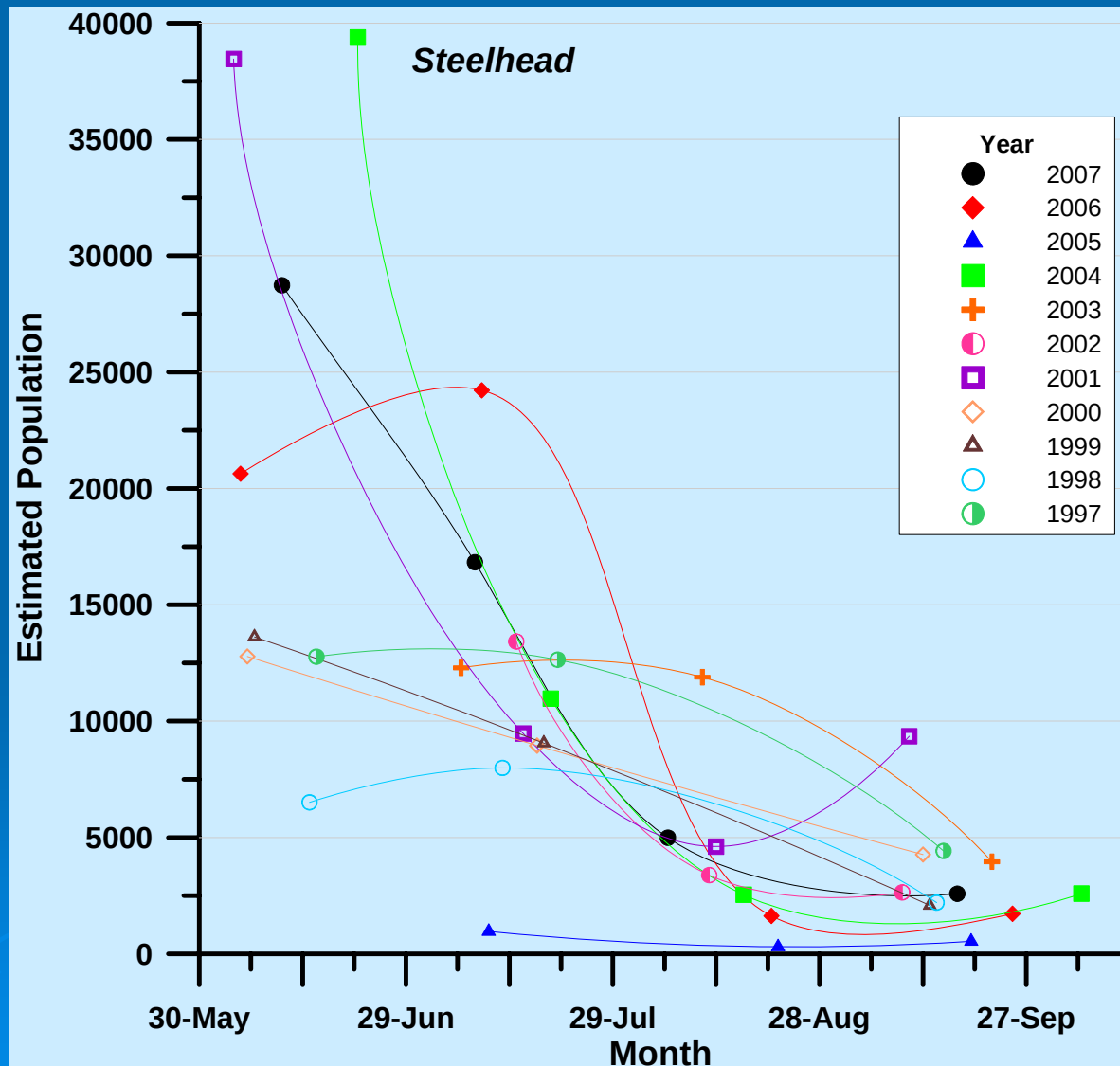
1997 – 2007
Seasonal Decline

Last Estimate Mean
for 1997 to 2007

3,300 Steelhead

Min – Max

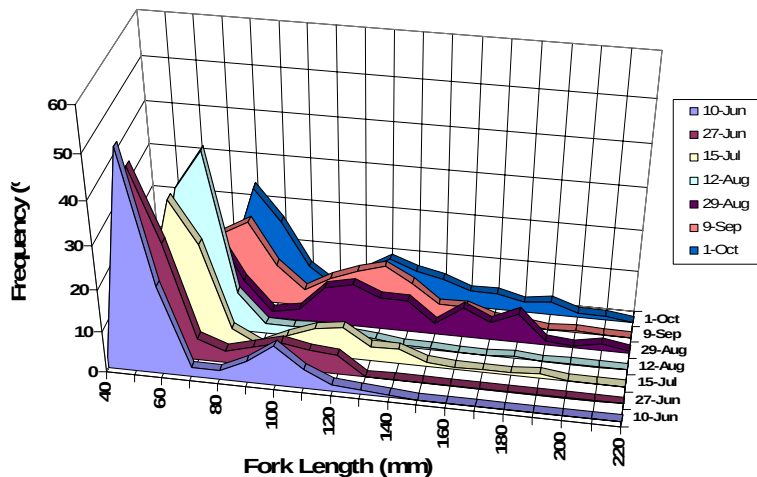
540 to 9,350



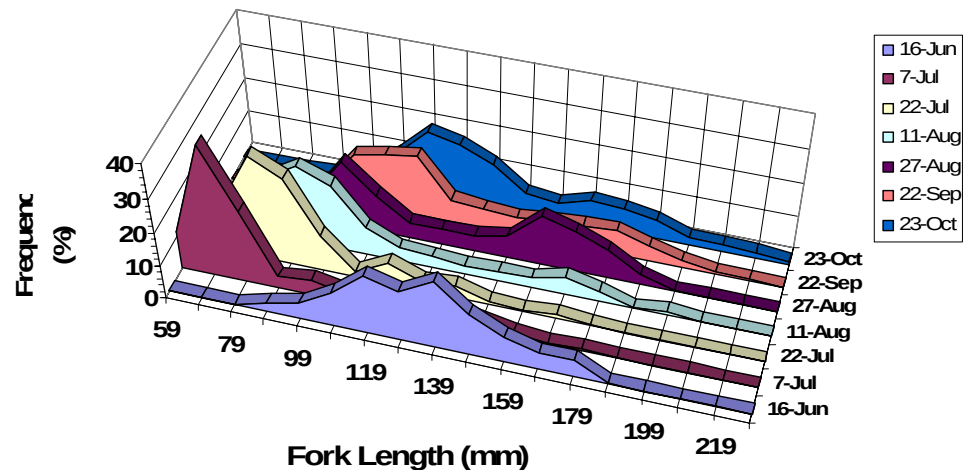
Estuary Steelhead Size/Age Classes

- Fork length (mm) versus frequency (%) histogram of Redwood Creek estuary juvenile steelhead trout sampled in 2002 and 2003
- The fork length classes are 10-mm increments.

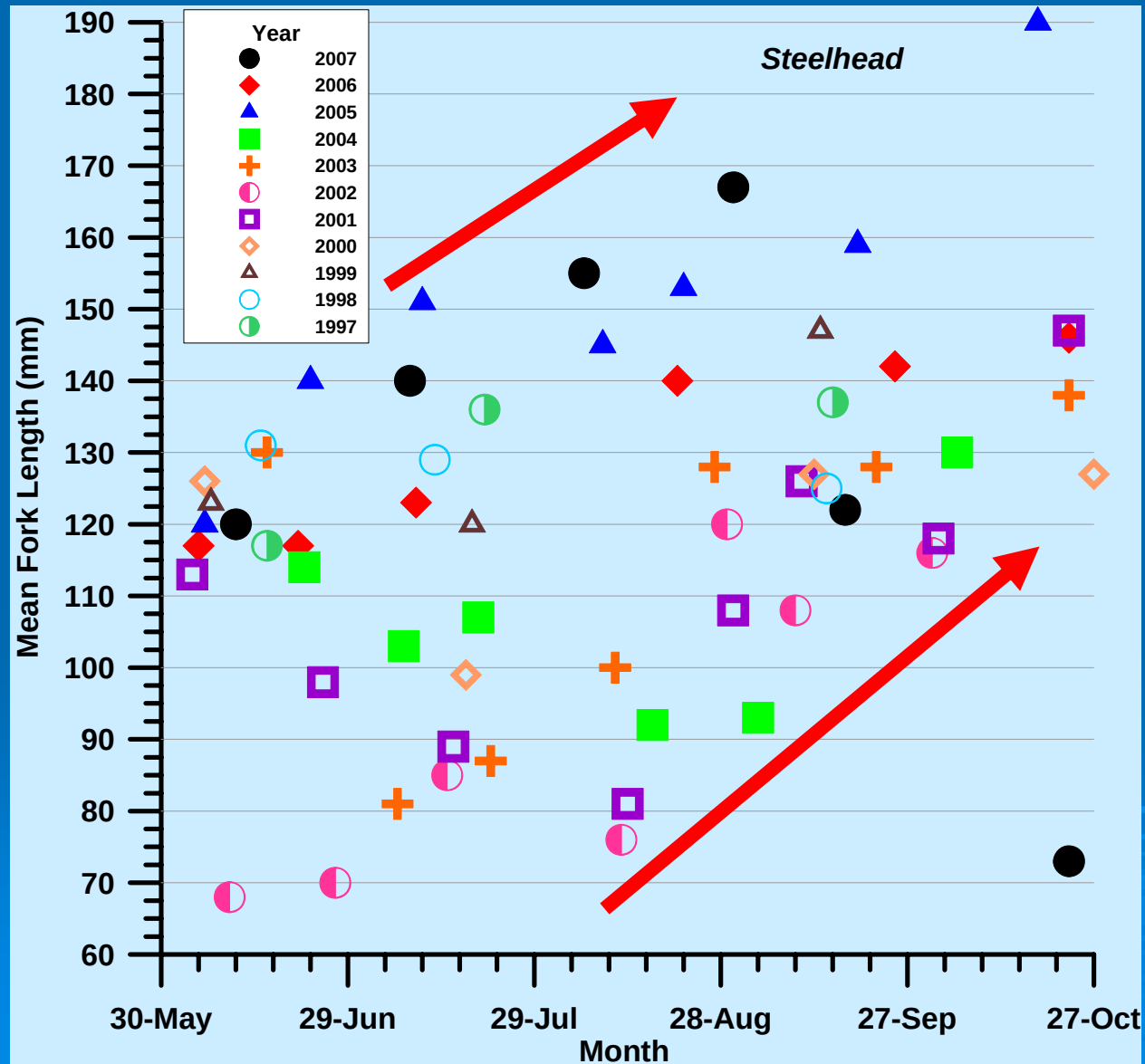
Estuary Steelhead 2002



Estuary Steelhead 2003



Estuary Steelhead Mean Size



Estuary Restoration

- Restore Historical Estuary Configuration
 - Partial levee removal
 - Levee setbacks
 - Dredging to historical depths
- Restore Estuarine Ecosystem
 - Revegetation of riparian
 - Restore wetlands
 - Restore Sand Cache and Strawberry Creeks

Redwood Creek Watershed Group

Congressional appropriation for the
Corps of Engineers to initiate a General Investigations Study

Redwood Creek Summer Steelhead



Summer Steelhead Monitoring

- Surveys started in 1981
 - Continuing to the present (2007)
 - 27 years
- Mainstem Redwood Creek
- Determined to be summer steelhead and not runbacks
 - based on summer ovary to total weight ratio



➤ Snorkel Survey Reach

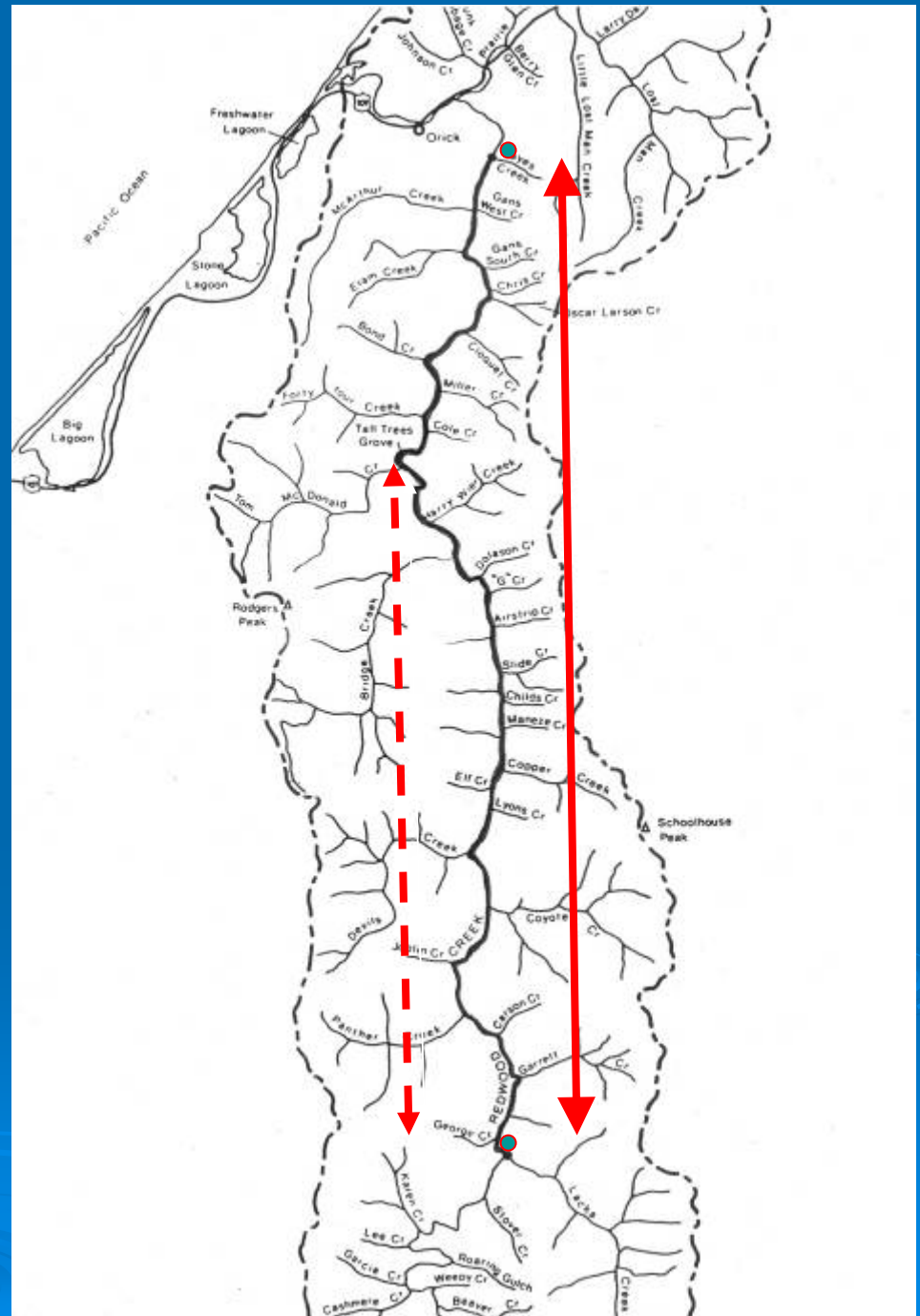
- Lacks Creek to Downstream of Hayes Creek
- RNSP and Green Diamond lands

➤ 24.1 miles (38.9 km)

- 36% of mainstem Redwood Creek

➤ 6 days

- Last week of July
- First week of August

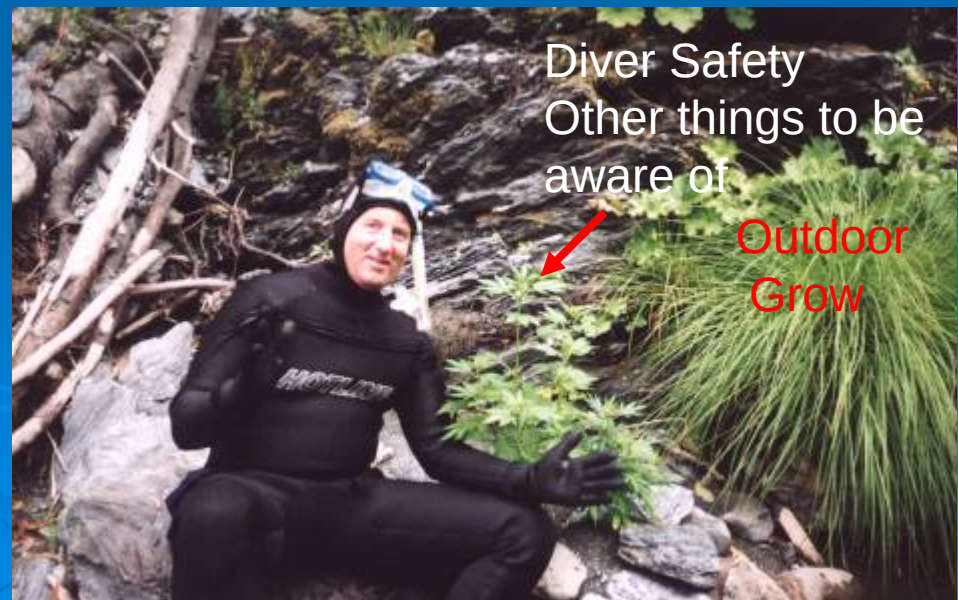


➤ Dive crews

- Mask and snorkel
- 5/4 surfsuits w/hood
- Gloves
- Wading boots
- Weights



1990s



➤ Mainstem

Redwood Creek

- 'Rocky Gorge' area
 - deeper pools
- Wider lower river



Summer Steelhead

- Found in pools and pools associated with cooler tributary inflow
- Pools with structure
 - Boulders
 - Woody Debris



Other Fish Observed

- Coastal Cutthroat Trout
- Juvenile Salmonids
 - Chinook
 - Steelhead
 - Coho
- Suckers & Sculpin & Threespine Stickleback
- Spring Chinook (1988)
- Sockeye (2005 & 2007)



Cutthroat Trout



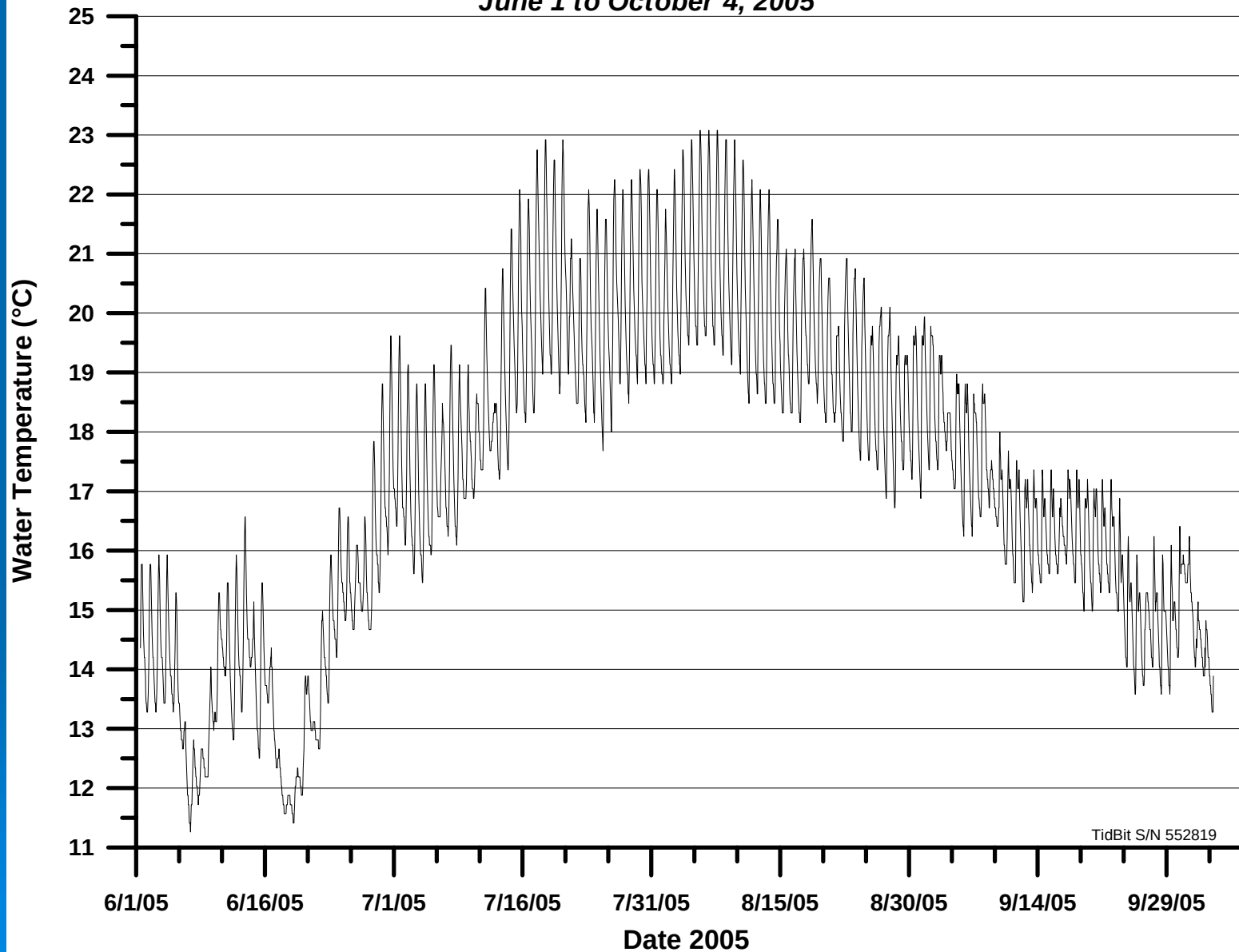
Sockeye Salmon



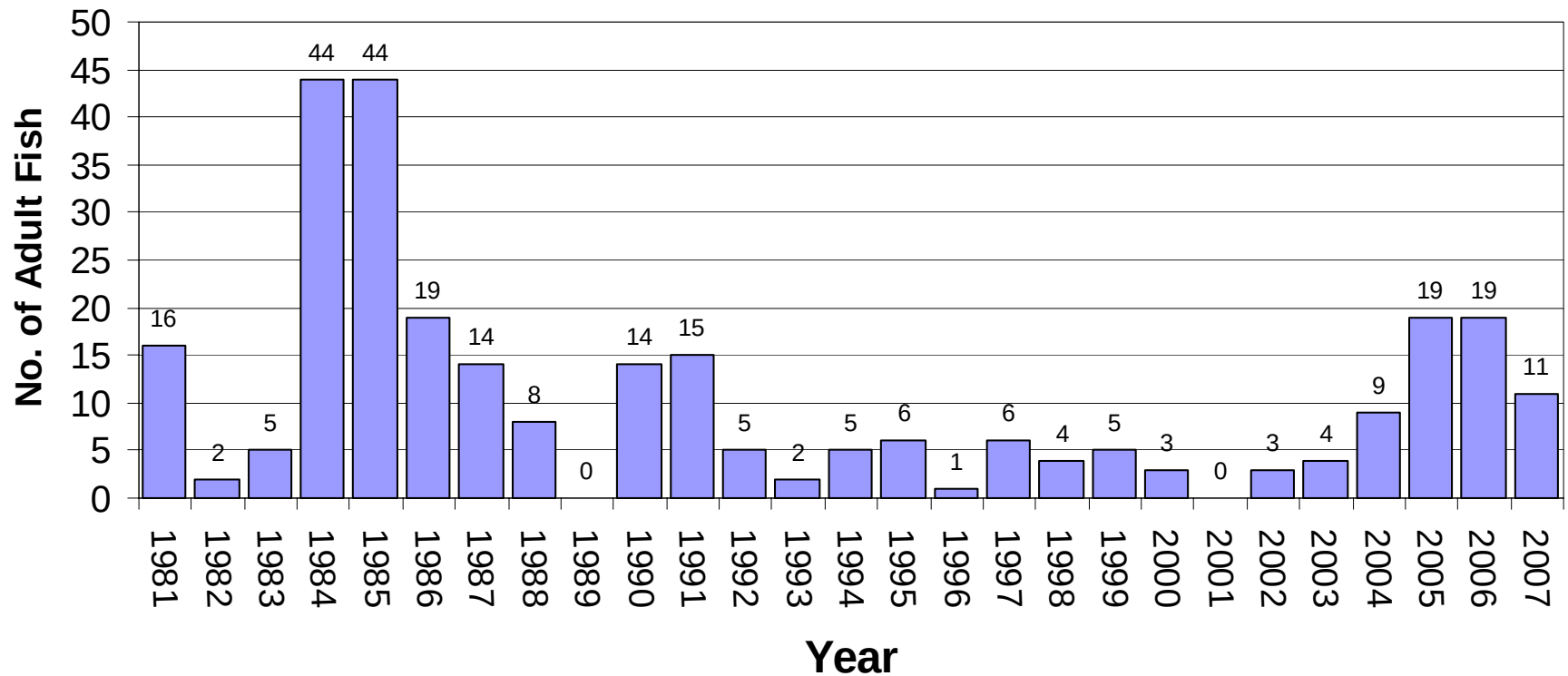
School of Suckers

Redwood Creek Above Tom McDonald Creek Water Temperature (°C)

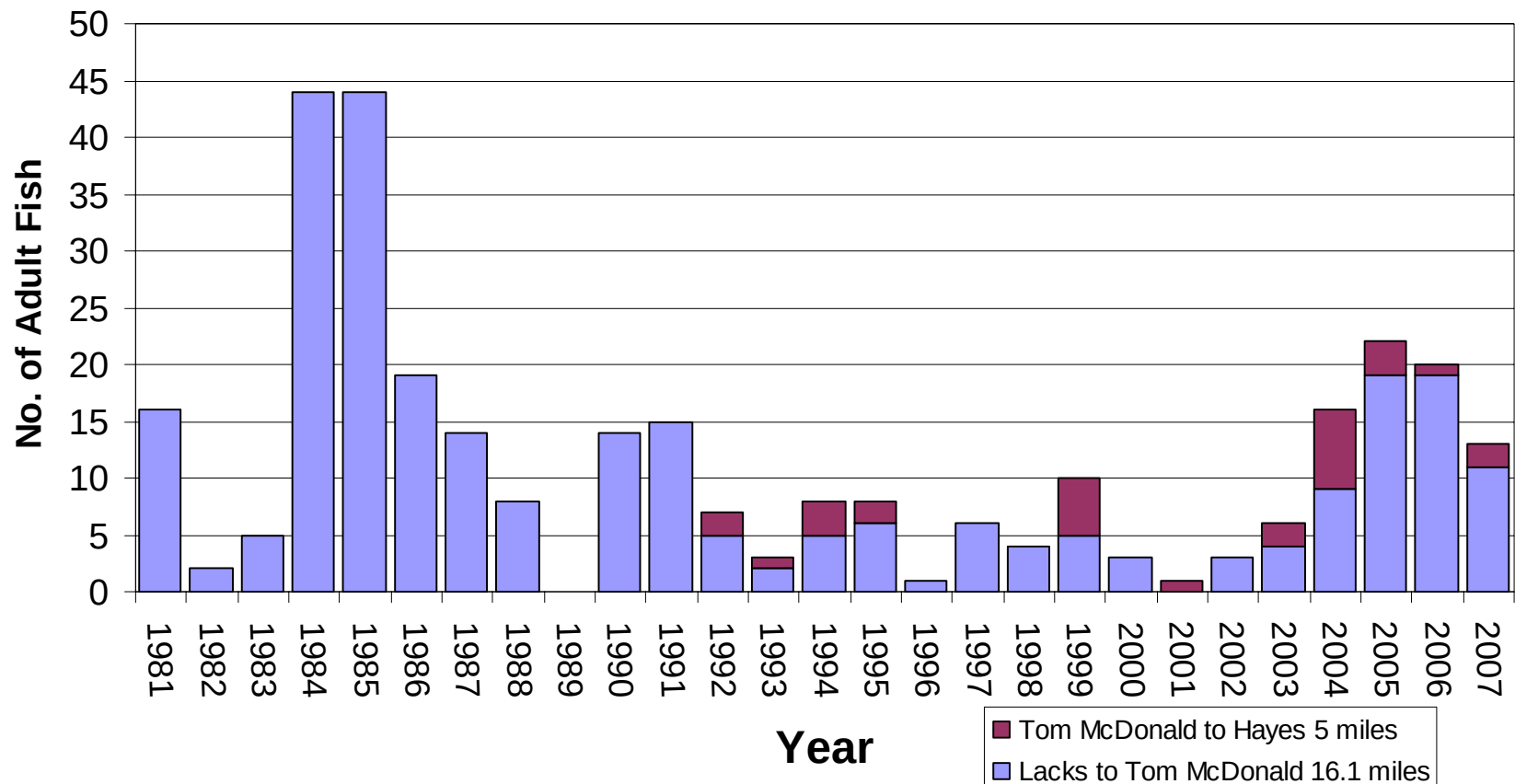
June 1 to October 4, 2005



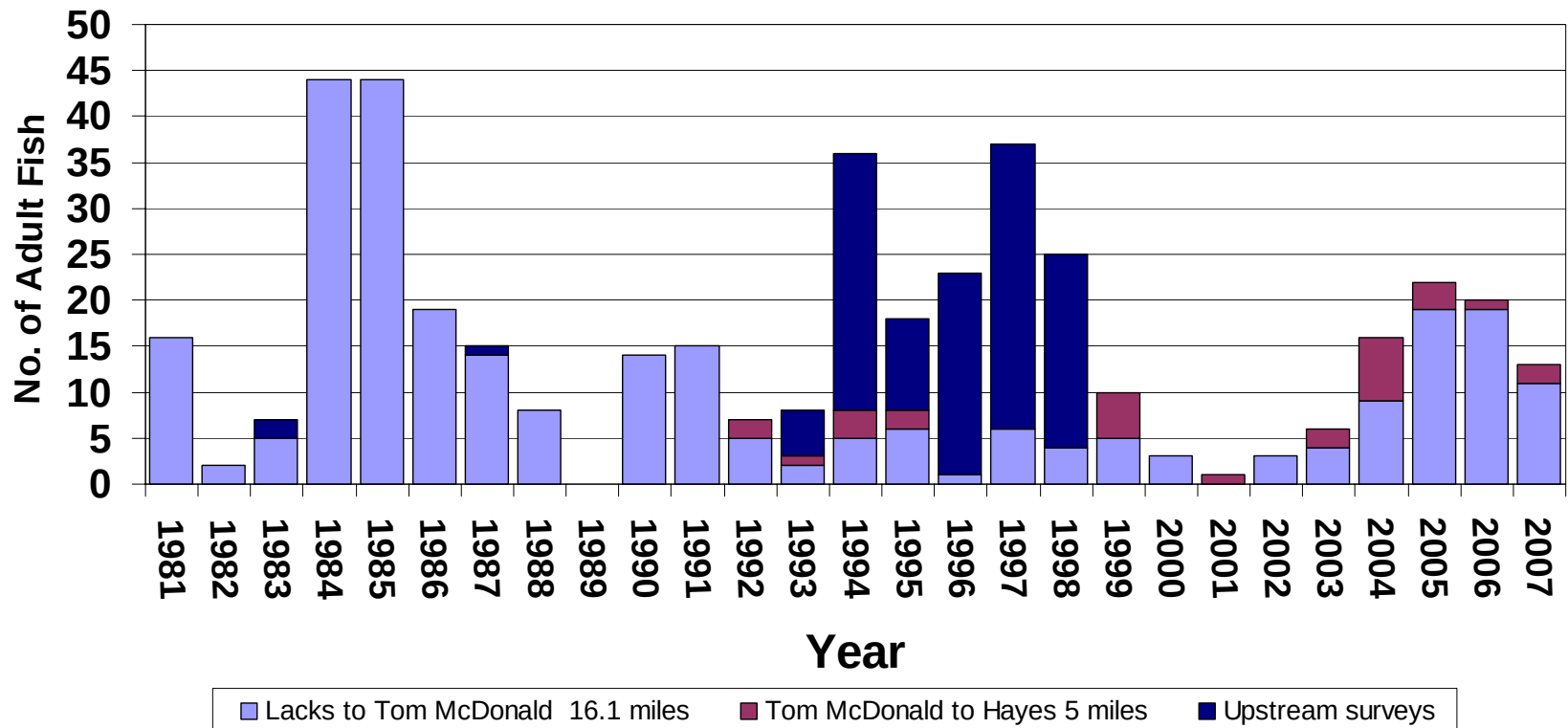
Redwood Creek Summer Steelhead 25.9 km (16.1miles) Index Reach 1981 - 2007



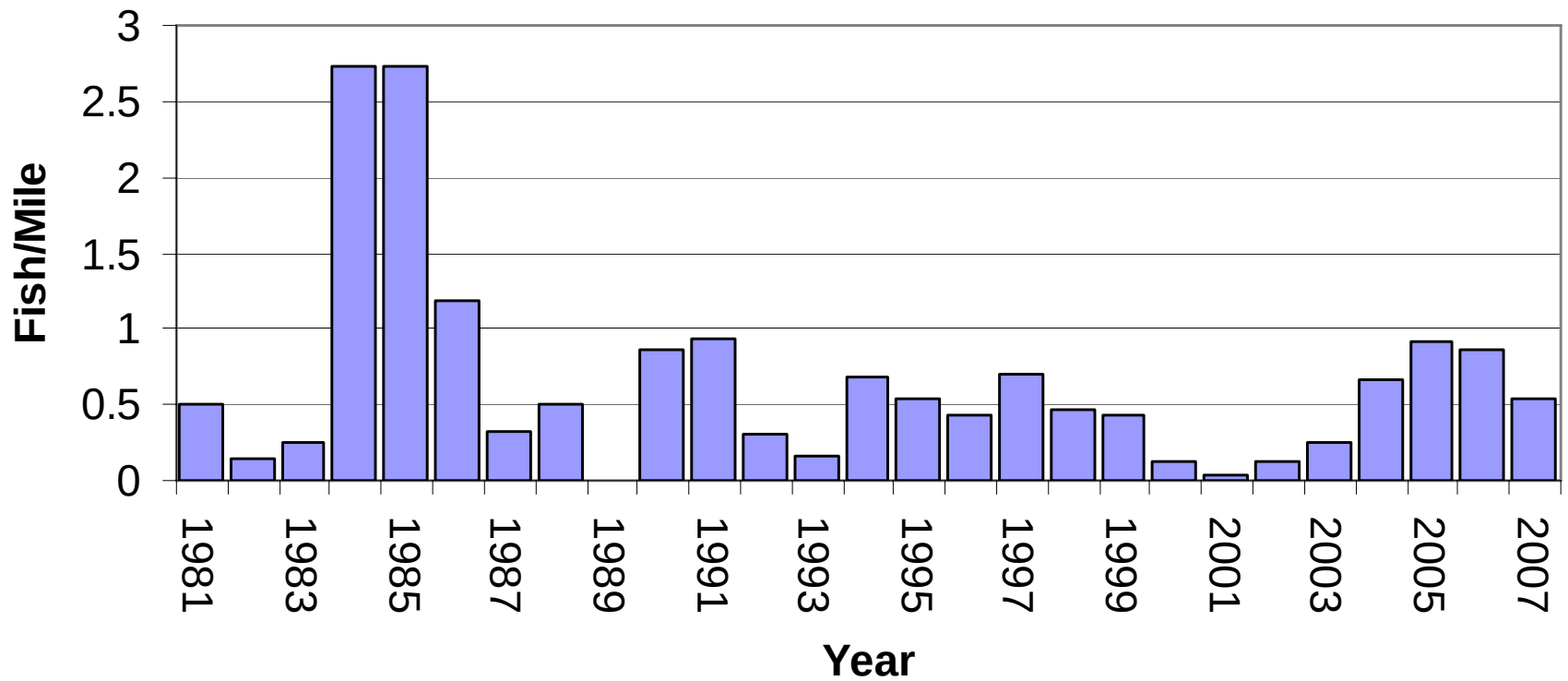
Redwood Creek Summer Steelhead Including 24.1 miles Expanded Reach 1992 - 2007



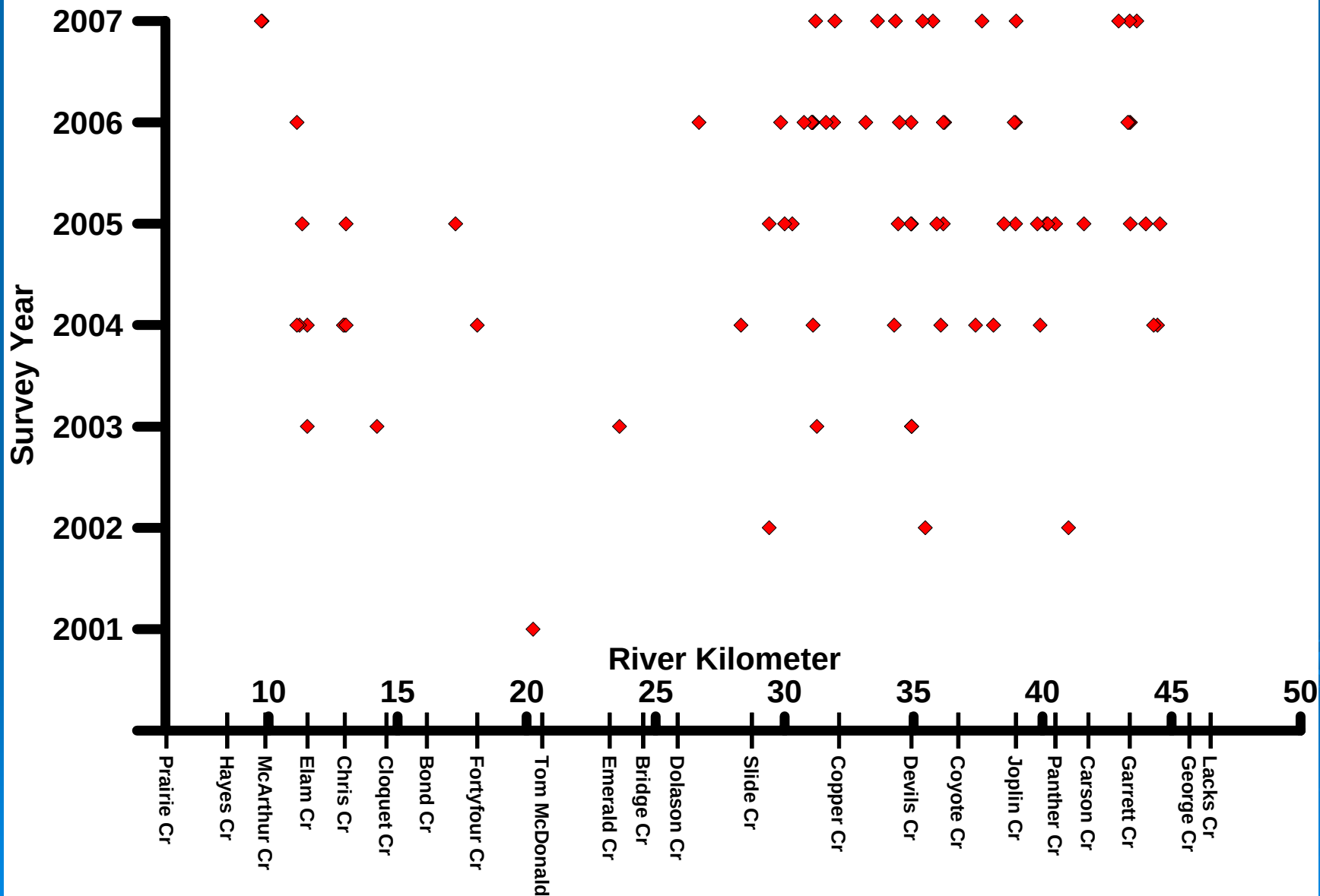
Redwood Creek Summer Steelhead All Surveys 1981- 2007



Redwood Creek Summer Steelhead Per Mile



Redwood Creek Summer Steelhead Distribution



A photograph of a person wearing a black wetsuit and a blue snorkel mask, floating in a calm river. The person is positioned in the lower center of the frame. The river is surrounded by a dense forest of tall evergreen trees. Large, light-colored rocks are visible in the background, partially submerged in the water. The water reflects the surrounding greenery and the sky. A teal oval with the word "Questions?" is overlaid on the right side of the image.

Questions?