This Presentation was part the

California Fish and Game Commission's Workshop on Strategic Improvement in California's Anadromous Hatcheries

Sacramento, February 4, 2014

CALIFORNIA HATCHERY SCIENTIFIC REVIEW GROUP
Steelhead Programs Major Recommendations

California Fish and Game Commission
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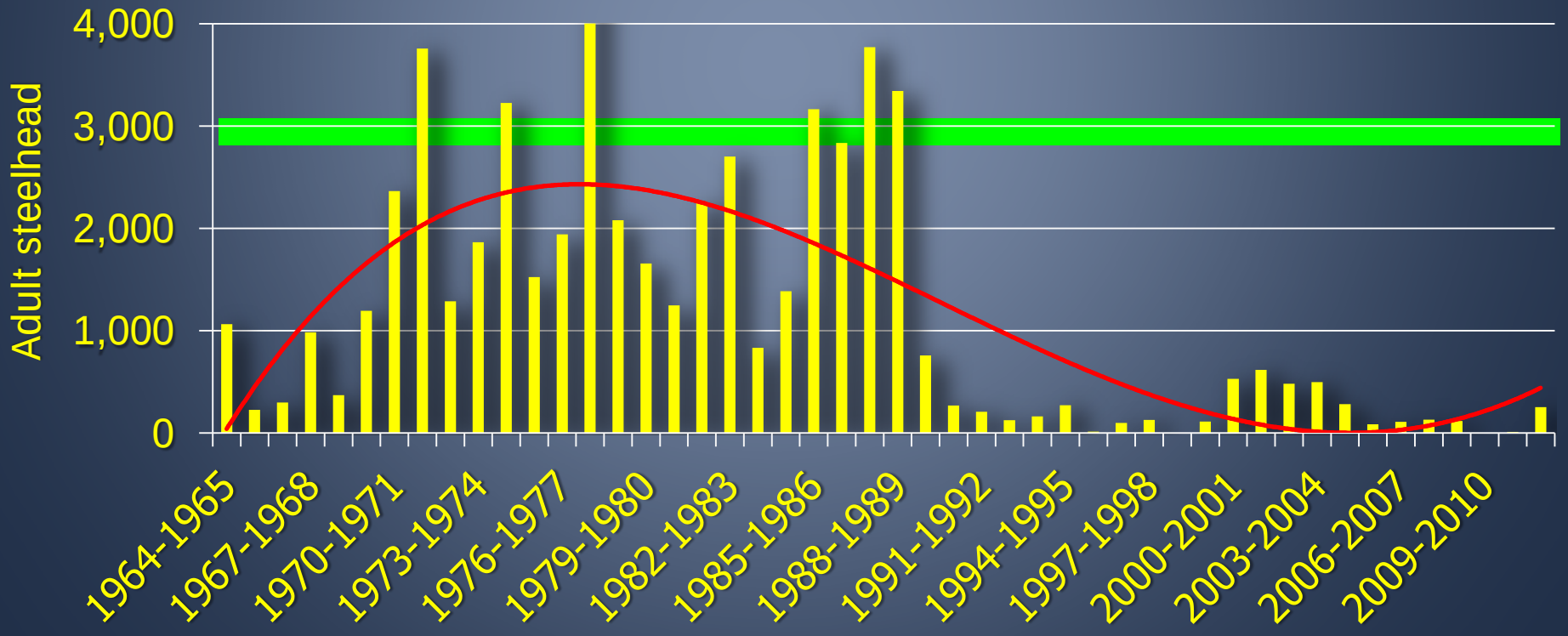
IRON GATE HATCHERY

- ✓ Update facilities (i.e. fish trap, holding ponds, predator control)
- ✓ Do not use non-anadromous rainbow trout for broodstock
- ✓ Develop new broodstock source (i.e. Shasta or Scott rivers)
- ✓ Release juvenile fish at minimum of 6 inches (IHOT 1995)



Iron Gate Hatchery

• During the early 1900's hundreds of thousands steelhead eggs were collected at egg taking stations in the upper Klamath River, transferred to the Mount Shasta Hatchery, and distributed throughout the state.

• In 1962, Iron Gate Hatchery was put into operation to mitigate for lost habitat resulting from the construction of Iron Gate Dam.

• During the late 1970's and 1980's, Iron Gate Hatchery produced steelhead comprised an average of about 11 percent of the fish returning to the lower river.

• During the same period, hatchery marked steelhead comprised from 30 to 65 percent of the fish trapped at the hatchery.

• The current production goal is to release 200,000 yearlings annually, this goal was met in most years prior to 1991; however, the goal has not been achieved since that time.

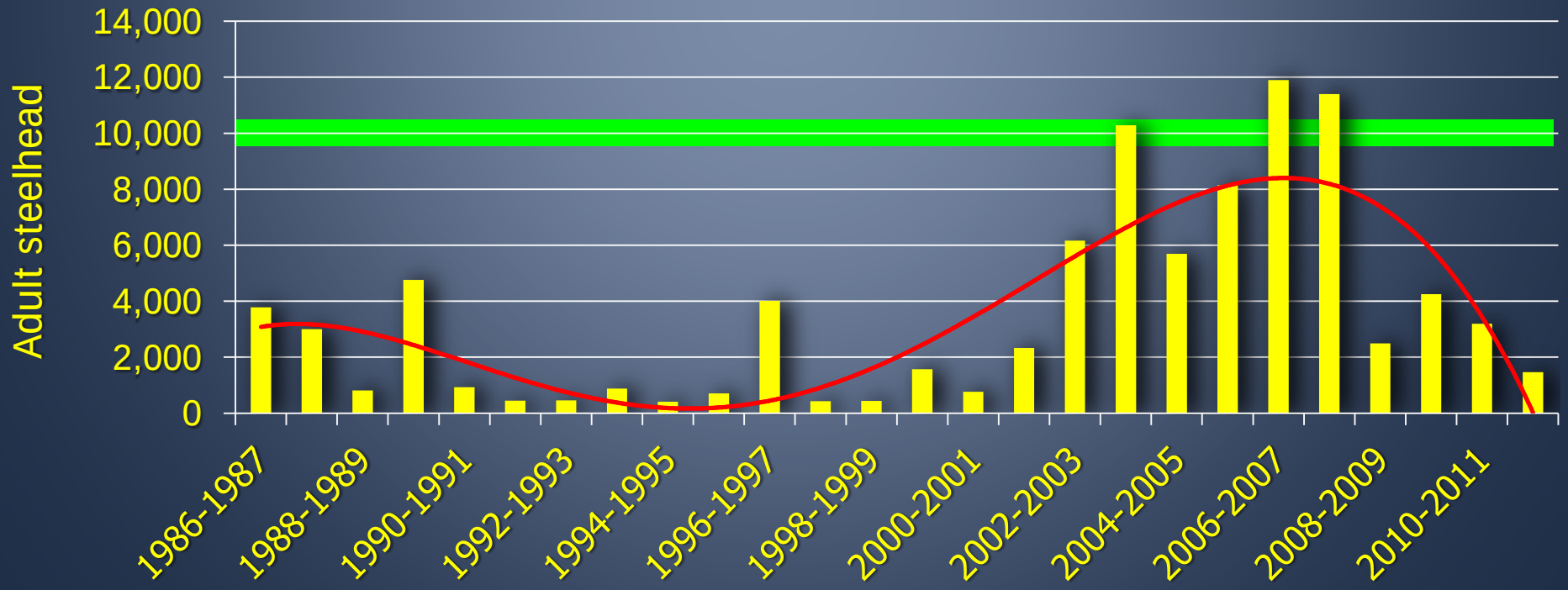
• From the 1963 through 1989, adult steelhead trapped at IGH averaged almost 2,000 fish and in some years exceeded 3,000 fish. After 1989-90, the number of steelhead trapped at the hatchery decline severely. Since then, less than 500 fish have been trapped annually and in some years only a few hundred fish.

• Given the decline in adult returns to the hatchery and few number of adipose fin marked fish observed in the fishery, it is evident that survival rates are low.

• Based on available information, it is likely that the few IGH yearling fish released residualize in the river and do not migrate to the ocean, and contribute to a popular trout fishery in the river downstream from Iron Gate Hatchery.

TRINITY RIVER HATCHERY

- ✓ **Measure program success by number of adults and half-pounders returning to freshwater**
- ✓ **Review smolt to adult return ratio to meet mitigation goal (10,000 adult steelhead USFWS and CDFG 1956)**
- ✓ **Recondition spawned adult steelhead prior to release**



Trinity River Hatchery

• The Trinity River Hatchery was constructed in the early 1960's to mitigate for the loss of anadromous fish habitat from construction of Trinity and Lewiston dams.

• The mitigation goal for the hatchery was defined as 10,000 steelhead based on pre-project studies of anadromous fish populations that estimated 10,000 steelhead passed above the Lewiston Dam.

• During the past several decades the number of adult steelhead trapped has not met the mitigation goal in most seasons although during the past ten seasons, the goal has been met in three seasons,

• To achieve the yearling steelhead production goal, the hatchery releases approximately 800,000 yearling steelhead annually

• Studies by the Department during the late 1970's and 1980's, indicated Trinity River Hatchery produced steelhead comprised an average of about 5 percent of the steelhead returning to the lower river.

• During the same period (late 1970's and early 1980's), hatchery marked steelhead comprised about 90 percent of the fish trapped at the hatchery.

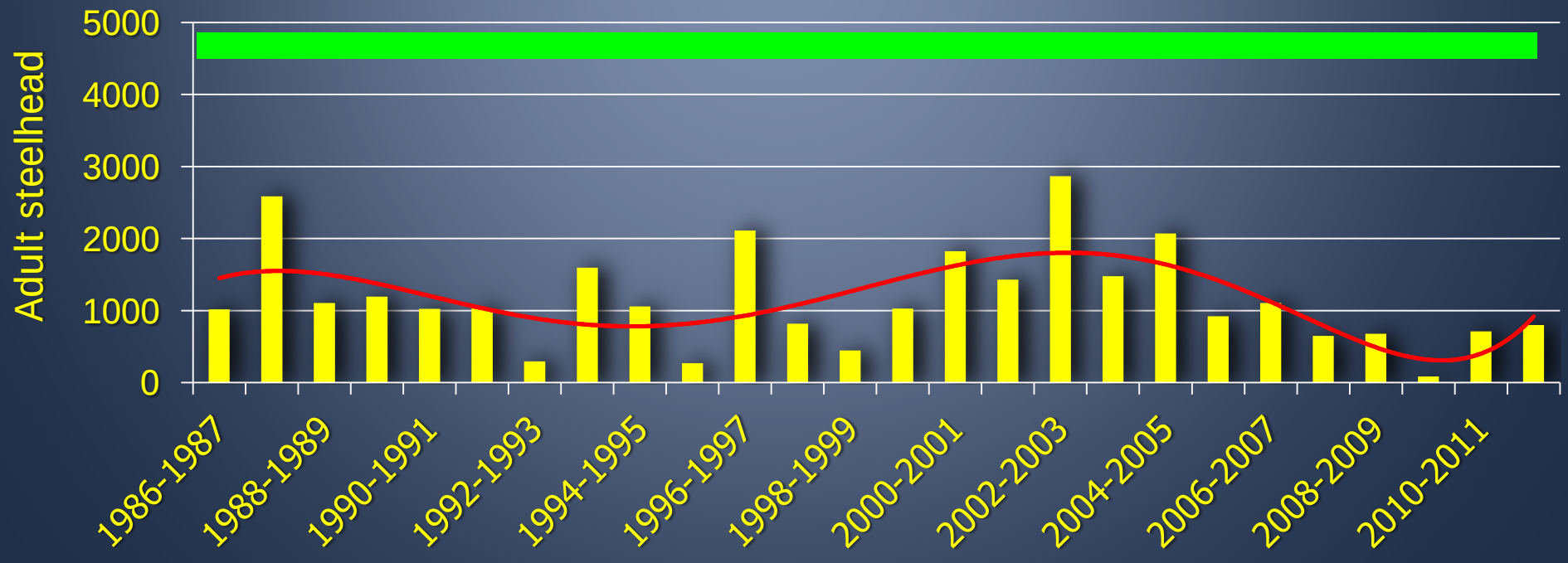
• More recent information suggests that hatchery produced steelhead comprise about 75 percent of the steelhead that migrate above Willow Creek, located about 70 miles downstream from the hatchery, and 99 percent of the steelhead trapped at the hatchery are hatchery-produced.

COLEMAN NATIONAL FISH HATCHERY
MAJOR RECOMMENDATIONS

- ✓ **Improve adult steelhead holding facilities**

- ✓ **Incorporate natural origin fish in the broodstock (recognized conflicts with Battle Creek restoration efforts)**

- ✓ **Determine the cause of low smolt to adult returns (i.e. residualize; high in-river, delta/estuary, and ocean mortality; straying as adults)**



Coleman National Fish Hatchery

• Coleman National Fish Hatchery was developed by the Bureau of Reclamation to partially mitigate for habitat and fish losses caused by construction of Shasta and Keswick dams.

• The steelhead program is operated as a segregated-harvest program intended to contribute to the sport fishery in the Sacramento River, provide escapement back to the hatchery for broodstock, and are balanced with a third goal of minimizing risks to the natural population.

• In the late 1950's and 60's, the Sacramento River steelhead run was estimated to be about 40,000 fish and supported up to 26,000 angler days of effort annually.

• During the past several decades, less than 2,000 adult steelhead have been trapped annually most seasons.

• Today, steelhead trapped at the hatchery are listed as threatened under the Endangered Species Act and are part of the Central Valley steelhead Evolutionarily Significant Unit.

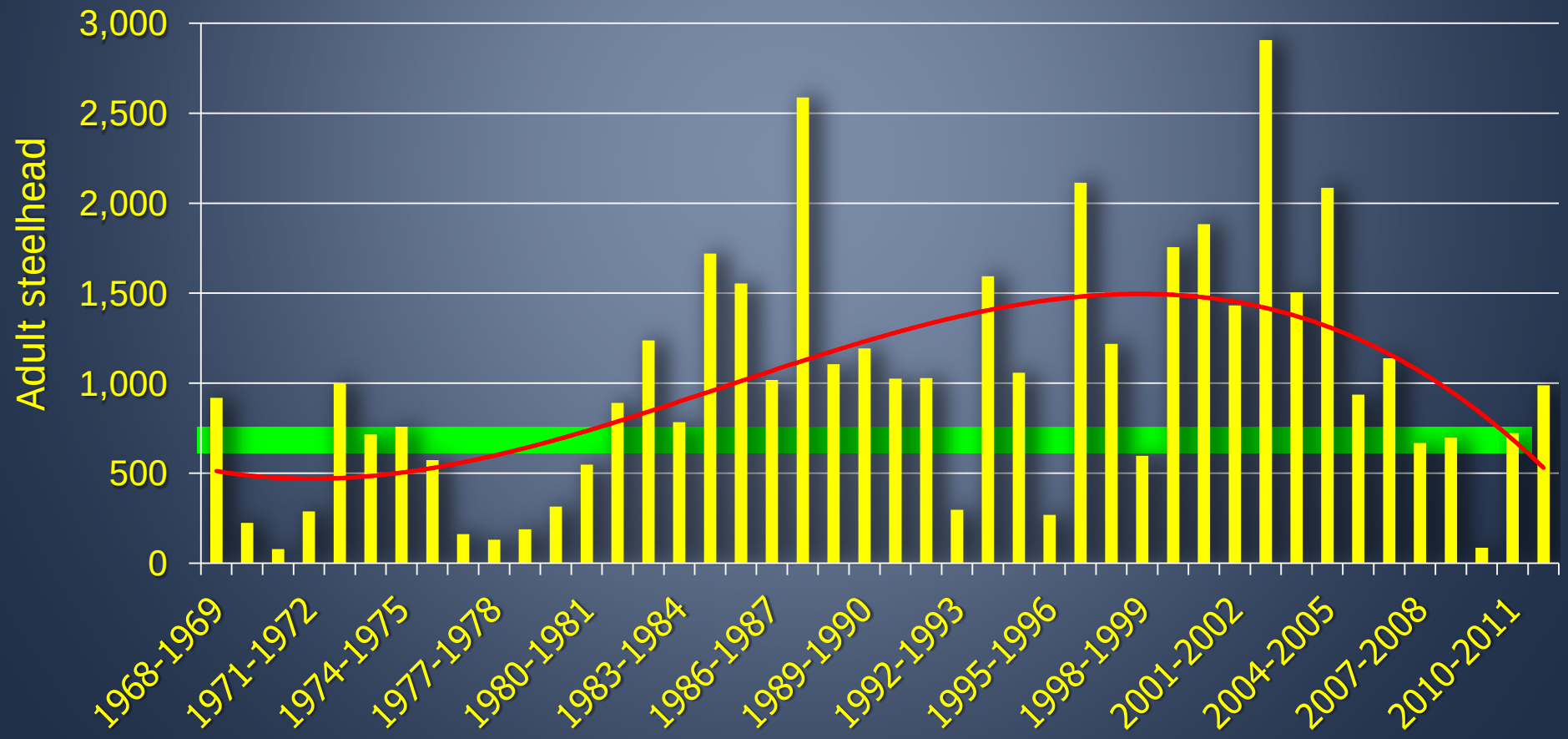
• While there is no adult production goal, the hatchery production goal is to release 600,000 steelhead at 4 fish per pound every January.

• Hatchery released yearling fish have been 100% marked since 1998 and since 2002, about 86 percent of the steelhead trapped have been of hatchery origin.

FEATHER RIVER HATCHERY

- ✓ **Do not use non-anadromous (resident) rainbow trout for broodstock**

- ✓ **Early release of juveniles does not meet standards (IHOT 1995) (early release results in residualization and increased mortality)**



Feather River Hatchery

• Feather River Hatchery is a component of the Oroville Project that was constructed in the mid-1960s downstream of Oroville Dam and about 66 miles upstream from the confluence of the Feather and Sacramento rivers.

• Feather River steelhead are listed as threatened under the Endangered Species Act and are part of the Central Valley steelhead Evolutionarily Significant Unit.

• The production goal for the program is to release 450,000 yearling steelhead annually at 3 fish per pound.

• During the initial 5 to 10 years of hatchery operation, experimentation occurred with stocks from Coleman, Mokelumne, Nimbus, Washougal, and Feather hatcheries using juvenile fish, eggs, and some broodstock.

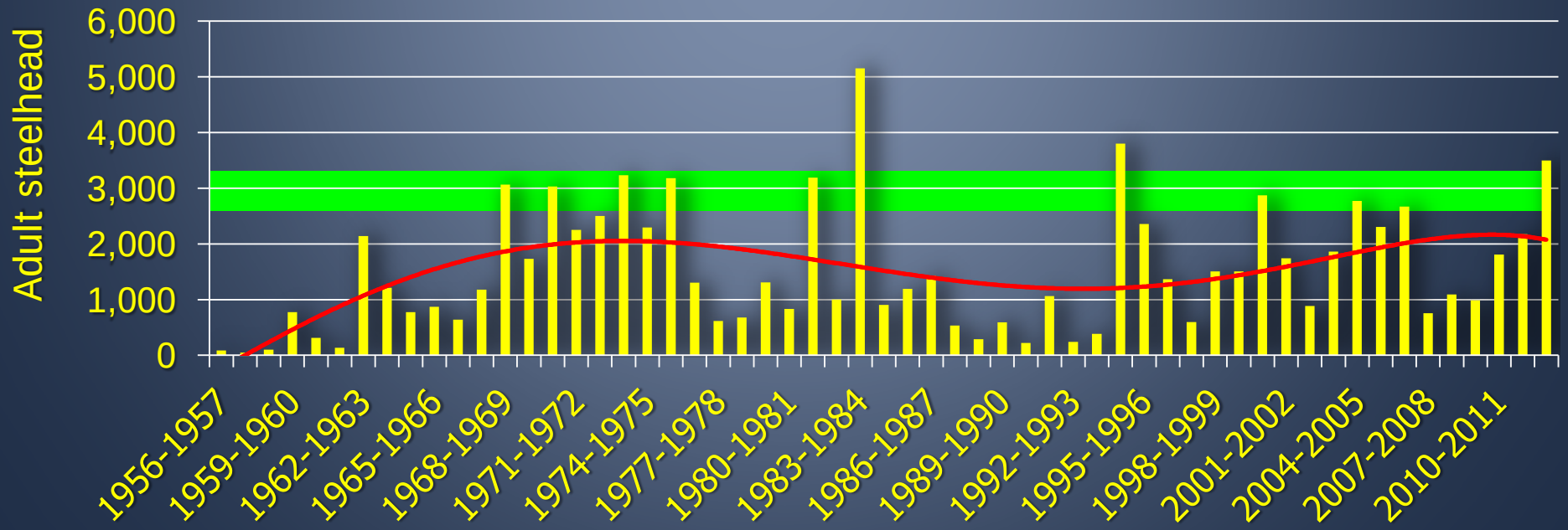
• For the last 20 years, only fish returning to the Feather River basin have been used for broodstock.

• The historical number of steelhead that migrated into the Feather River is unknown, but the number of adult steelhead trapped at the hatchery annually since operation has as averaged 972 fish, and ranged from a low of 78 to a high of 2,865 fish.

• During the eight years following construction, based on angler surveys and fish counts, the Department reported that the hatchery operations were maintaining pre-project steelhead abundance levels of 852 steelhead annually.

NIMBUS FISH HATCHERY

- ✓ **Replace non-indigenous broodstock with an alternative (appropriate) broodstock (BOR contract for study in place)**
- ✓ **Early release of juveniles does not meet standards (IHOT 1995) (results in residualization and increased mortality)**
- ✓ **Develop alternative cold water source to reduce summer water temperatures (major infrastructure improvement required)**



Nimbus Fish Hatchery

• Early managers concluded that construction of Nimbus and Folsom dams eliminated 100% of the steelhead habitat in the American River and the hatchery was constructed in 1955 to compensate for the lost habitat and fishery.

• During the first two seasons of operation, less than 200 adult steelhead were trapped and to help meet production goals, about 2 million steelhead eggs from Eel River egg taking stations were transferred to the hatchery in the early years of operation.

• Today, the hatchery broodstock is managed as distinct population and genetic analysis of juvenile fish sampled from the American River (naturally produce or wild) and at the hatchery indicate the two groups are similar and most closely resemble Eel River steelhead.

• All hatchery released yearling fish have been adipose fin marked since 1999 and since 2002, 97 percent or the steelhead trapped at the hatchery have been of hatchery origin.

• Nimbus Fish Hatchery steelhead are not listed or a candidate for listing, however, wild fish produced in the American River are included in the Distinct Population Segment for Central Valley steelhead.

• The hatchery annual production goal is to release 430,000 yearling steelhead that are released in the American River in early February.

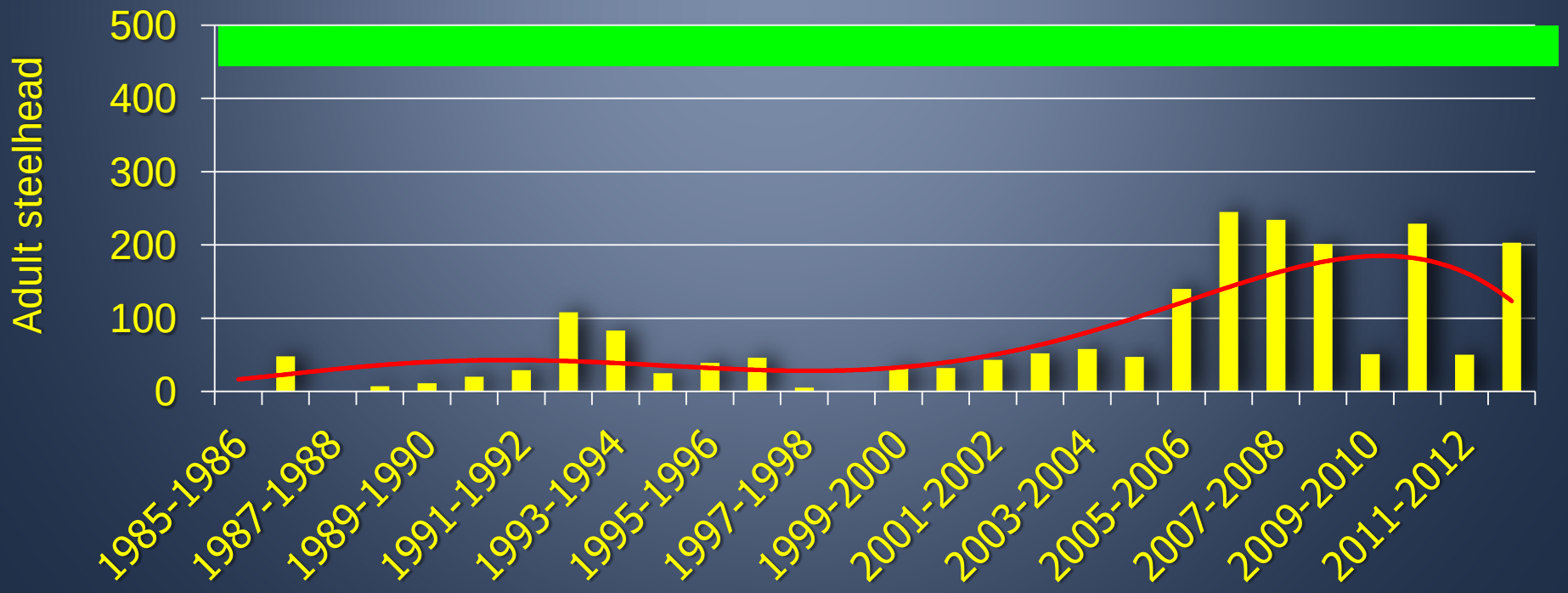
• Since the first year of operation, hatchery personnel have trapped an average of about 1,500 adult steelhead annually for an estimated yearling to age 3 adult survival rate of slightly less than 1 percent.

• The estimated in-river adult steelhead run including fish harvested by anglers, natural spawning escapement, and fish trapped at the hatchery has averaged slightly less than 3,400 fish annually.

MOKELUMNE RIVER HATCHERY

✓ Non-anadromous (resident) or unmarked fish typically should not be used as broodstock and the current 16-inch minimum length for broodstock should be continued

✓Natural-origin adult steelhead returns to the hatchery, whether spawned or unspawned, should be released. Fish may be reconditioned prior to release.



Mokelumne River Fish Hatchery

• The Mokelumne River Fish Hatchery is on the lower Mokelumne River just downstream of Camanche Dam and is funded and operated to meet the requirements of EBMUD's Lower Mokelumne River Project Federal Energy Regulatory Commission license.

• Prior to construction of Camanche Dam, the Department reported that the Mokelumne River supported an excellent steelhead fishery.

• In 1998, EBMUD, the Department and the U.S. Fish and Wildlife Service entered into an agreement to resolve various licensing and state water right issues. The hatchery was upgraded as an integral part of a strategy to supplement the natural production of and to meet the mitigation requirement for anadromous fish. Hatchery reconstruction and expansion was completed in 2002.

• Mokelumne River Hatchery steelhead are not listed or a candidate for listing.

•In past years, steelhead eggs from both Feather River and Nimbus Fish Hatcheries have been transferred to the hatchery.

• Presently, the Mokelumne River steelhead program goal is to release 250,000 yearling steelhead at 4 fish per pound.

• All yearling fish released from the hatchery are adipose fin marked and in recent years, about 75% of the fish trapped are of hatchery origin.

• The number of steelhead trapped at the hatchery remain low and studies suggest that a portion of the fish trapped are resident rainbow trout, not steelhead