

# **PRE-REHABILITATION PLAN**

## **Kings Lake (Pend Oreille County)**

### **I. PROPOSAL**

#### **A. Justification for Proposed Rehabilitation**

Kings Lake (Pend Oreille County, Washington) is managed as a broodstock lake for westslope cutthroat by the Washington Department of Fish and Wildlife (WDFW). The annual egg take goal from Kings Lake is 325,000, and fish reared from this egg take are used throughout Region 1 for planting of lowland lake fisheries. In the early 2000's, Kings Lake stock cutthroat were accidentally mixed with rainbow trout in the hatchery, and these fish were subsequently stocked into Kings Lake. Despite maintaining adult traps on two main tributaries of Kings Lake, both cutthroat and rainbow trout have been successful at reproducing naturally in the system. Due to overlap in spawn-timing and a lack of reproductive isolating mechanisms between the two species, genetic introgression has occurred, resulting in corruption of the formerly genetically pure westslope cutthroat population. In addition, it appears that an annually increasing amount of biomass is being tied up in rainbow trout and/or introgressed individuals. Visual inspections of all fish captured during adult trapping in the two main tributaries (conducted during the spring spawning season) allow WDFW staff to "pick out" individuals with phenotypic characteristics of rainbow trout. However, despite having done this for multiple years, the rate of genetic introgression has increased over time.

Idaho Department of Fish and Game (IDFG) requested Kings Lake stock cutthroat in 2007 to start their own westslope cutthroat brood at Cabinet Gorge Hatchery. From 2007 through 2010, IDFG collected and spawned 30 pairs of fish from Kings Lake per year. They conducted genetic testing (using 6-7 of Ostberg's nDNA markers) of each parent fish to determine whether rainbow trout alleles were present. All offspring resulting from crosses of parent fish with evidence of rainbow trout alleles were culled from the broodstock population. IDFG is amenable to supply WDFW with broodstock replacement for Kings Lake following lake rehabilitation.

Treatment will be attempted in late September when the water level is near its lowest annual point. In-flow from tributary streams should also be near its lowest annual point, as well. By September, there will be no outflow from Kings Lake (i.e. no surface water connection downstream).

There are no acceptable alternatives to lake rehabilitation. Kings Lake supplies westslope cutthroat for stocking of numerous Region 1 lowland lakes. The original source for Kings Lake stock cutthroat was Granite and Kalispell creeks (Priest Lake, ID drainage), so this cutthroat stock is native to the larger Pend Oreille River drainage. Introgression with non-native rainbow trout is unacceptable, as Kings Lake stock cutthroat are planted into lowland lakes in Pend Oreille County, some of which ultimately have surface water connections to the Pend Oreille River and tributaries. Lake rehabilitation will assure maintenance of the genetic integrity of the Kings Lake cutthroat stock.

## **B. Physical Description of Water Proposed for Rehabilitation**

1. WATER: **Kings Lake**
2. LOCATION: Sec's 1 and 2, T33N, R44E, Pend Oreille Co.
3. SURFACE ACRES: 65    MAX. DEPTH: 55
4. VOLUME: 1950 acre-feet; 5,299,396,128 lbs H<sub>2</sub>O
5. INLET STREAM: 2 major inlets (both un-named) and one intermittent tributary. Also, some groundwater seeps.
6. OUTLET STREAM: none
7. PUBLIC ACCESS: None.
8. LAND OWNERSHIP: Private 80%; WDFW 20%.
9. ESTABLISHED RESORTS: None

## **C. Proposed Management Actions**

1. WATER: **Kings Lake**
2. TARGET SPECIES: rainbow trout
3. DATE LAST REHABED: Fall 1940
4. PROPOSED TREATMENT DATE: September - October 2011
5. REPLANTING DATE: spring 2012
6. SPECIES: Westslope cutthroat trout
7. FINGERLINGS: 7,500
8. PROPOSED TOXICANT: Powdered and/or Liquid Rotenone
9. CONCENTRATION:  $\leq 1$  ppm
10. AMOUNT (ROTENONE AT 5% ACT. INGRED): 5265 lbs. and 30 gallons
11. METHOD OF APPLICATION: Option 1 (boat/ATV))
12. CREW DESCRIPTION: Leader(s) Bill Baker + 5-7 crew

**Total Toxicant** (ROTENONE AT 5% ACT. INGRED) = 5265 lbs. and 30 gallons

## **II. PURPOSE:**

The Washington Department of Fish and Wildlife (WDFW) provides many types of fisheries in response to public desires. WDFW manages both trout and warmwater recreational fisheries based on many different species of fish and levels of difficulty. Public demand for and participation in trout fisheries is very high. Kings Lake provides a brood source for westslope cutthroat trout that are planted throughout northeast Washington. Increasing rates of genetic introgression between Kings Lake westslope cutthroat and accidentally introduced rainbow trout are problematic, both in terms of procurement of sufficient numbers of cutthroat eggs and genetic integrity of the hatchery cutthroat stock used for planting lakes in proximity to wild cutthroat stocks in Pend Oreille County. Complete rehabilitation is the only feasible method of restoring Kings Lake to its intended use.

### **III. INTENDED OUTCOME/MEASURE OF SUCCESS:**

WDFW intends to restore the Kings Lake cutthroat population to a pure westslope cutthroat stock. Annual egg take is projected to return to 325,000. The annual egg take will be used to supply the Regional need for planting of westslope cutthroat in lowland lakes throughout northeast Washington. The rehabilitation is projected to last indefinitely.

### **IV. RESOURCE IMPACTS:**

1. Target species: Rainbow trout
2. District and Regional Habitat, Wildlife and Non-Game biologists have been appraised of current rehabilitation plans. No substantial objections were raised, and only cautionary concerns were expressed on the potential impacts to non-targeted species.
3. According to Bradbury (1986), the effects of rotenone on benthos are variable, depending on the concentrations and species. Crustaceans are most tolerant while the smaller insects are most affected. Immediate reduction of populations averages 25%, and survival doubles when access to bottom sediments exists. Benthic communities generally recover to at least pretreatment levels within two months. Zooplankton is more severely impacted, and communities generally take two to twelve months to fully recover. While relatively tolerant of even heavy doses of rotenone, amphibians (especially larval) are at risk, and herptiles are affected somewhat less so. Almost no chance of eliminating an entire population exists.
4. The lake will be closed to angling, and other recreational uses such as boating, and swimming will be curtailed during the planned period of treatment. This water is not a source of potable water for humans.
5. Professional biologists and other naturalists have visited this site frequently over the past 50 years. To our knowledge, no endemic, rare, threatened or otherwise listed species have been documented nor will any be impacted by the rehabilitation.

### **V. MITIGATING FOR ADVERSE IMPACTS:**

1. Cutthroat trout fry survival and growth will be greatly enhanced, and Kings Lake will again reach its full egg-take potential. No removal of dead fish is planned as the nutrient base contained therein is best returned to the lake.
2. No downstream resources exist.
3. No endemic, rare, threatened or otherwise listed species are known from this area.
4. Protective wear for the eyes, face and hands will be available for all purveyors of rotenone.

5. The lake will be posted according to Department of Ecology guidelines to notify the public of the treatment and discourage the public from possessing or consuming dead fish.

#### **VI. RECREATIONAL IMPACT: also see I.A., II and III**

Recreational angling opportunity will be increased, as the rehabilitation will result in restoration of the historical cutthroat egg-take (325,000/year) from Kings Lake. These eggs will be used to supply cutthroat for stocking of lowland lakes throughout northeast Washington (WDFW Region 1).

#### **VII. ECONOMIC IMPACTS:**

WDFW stocks approximately 18 lowland lakes with Kings Lake stock westslope cutthroat. A conservative estimate of 300 trips made to each of these lakes as a result of the proposed management action results in an economic impact totaling \$204,660 per year (1991 dollars; based on WDFW estimate of \$37.90 per trip). The rehabilitation will cost the Department about \$17,000 (including costs of rotenone, time, and travel).

#### **VIII. RELATED MANAGEMENT ACTION:**

Increased penalties and enforcement activities are desirable if WDFW is ever going to dissuade illegal stocking of state managed waters. Educating the public about the costs in Department dollars and time with emphasis on what WDFW might be able to accomplish with those resources would be a very worthwhile activity for O & E. This may result in stemming recruitment to this ill-advised group and turning local opinion against the offenders.

#### **IX. PUBLIC CONTACT:**

A public meeting will be held on July 13<sup>th</sup>, 2011 to explain Region 1's 2011 rehabilitation proposals, assess public opinion, and address local concerns. The announcement will be provided to area papers and radio stations at least a week in advance of the meeting.

Initiated by: WDFW Region 1 Fisheries Management