PRE-REHABILITATION PLAN
Burke Lake, Grant County

I. PROPOSAL

A. Justification for Proposed Rehabilitation

1 & 2.) Burke Lake is located on the Quincy Wildlife Management Area and is managed as an opening day trout fishery. The fishing season is from March 1st through July 31st and has statewide regulations for daily bag and minimum size limits. Burke Lake is planted with rainbow trout fingerlings during the spring. When competing and/or predatory fish species are controlled, Burke Lake is capable a producing an excellent trout fishery during the late winter through early spring for yearling trout averaging 12 inches and carryovers up to and exceeding 20 inches.

Periodic lake rehabilitations are required to control populations of nuisance fish species (e.g., sunfish, perch, bass, bullheads, common carp, etc.). Rehabilitation and total fish eradication is not a difficult endeavor at Burke Lake, however, the re-introduction of nuisance fish species will always be a problem because Burke Lake is easily accessible and lies in close proximity to several other waters managed for warmwater fish. Angler participation in the trout fisheries make this project worthwhile relative to the amount of effort and cost involved in treatment even on a five year cycle.

Burke Lake is a statewide public resource. WDFW surveys since the early 1980's indicate less than 20% of the anglers fishing Burke Lake were from Grant County. Over 45% were from western Washington counties. At least 9,000 angler trips per season were conservatively estimated on Burke Lake in 1983. Even on "off" years, when ice and/or cold prevail, this water attracts 1-2,000 anglers on the opener.

3.) Even though the primary management of this water is not for waterfowl production, rehabilitations tend to promote waterfowl use.

4.) Burke Lake has been rehabilitated in 1966, 1970, 1975, 1977, 1983, 1987, 1993, 1999, and 2005. WDFW policy states that lake rehabilitation is an option for eliminating illegally planted fish.

B. Physical Description of Waters Proposed for Rehabilitation

1.) WATER: Burke Lake
2.) LOCATION: Sec 14 & 15, T19N R23E Grant Co.
3.) SURFACE ACRES: 70.0
4.) AVERAGE DEPTH: 15 feet
5.) MAX. DEPTH: 28 feet
6.) WATER VOLUME: 1,050.0 acre feet (2,854,051,200.0 lbs)
7.) INLET: seepage from West Canal; OUTLET: sub-surface

8.) STREAM: MILES - NA (Flow (cfs): NA)
9.) PUBLIC ACCESS: Entire lake via shoreline and public boat ramp
10.) LAND OWNERSHIP: Public 100%; Private 0 %
11.) ESTABLISHED RESORTS: None

C. Proposed Management Actions

1.) WATER: Burke Lake
2.) TARGET SPECIES: Brown bullhead catfish and black crappie
3.) DATE LAST REHABED: October 2005
4.) PROPOSED TREATMENT DATE: October 2012
5.) REPLANTING DATE: February-May 2013
6.) SPECIES: Rainbow Trout
7.) STOCKING PLAN: 12,000 catchables and 20,000 fingerlings
8.) PROPOSED TOXICANT: Rotenone, powder and liquid at a concentration of ≤4.0 ppm
9.) AMOUNT TO BE USED: (ROTENONE AT 5% ACT. INGRED): ≤10,710.0 lbs powder and ≤80 gal liquid
10.) METHOD OF APPLICATION: pumper boat slurry and airboat/ATV spray
11.) CREW DESCRIPTION: Leader Chad Jackson plus ~ 3-5 other personnel

II. PURPOSE:

Burke Lake is one of the middle two of four adjacent waters. It has been managed as a trout fishery since the mid-fifties and continues to be a popular opening-day fishery. The two lakes north and south (Stan Coffin and Evergreen Reservoir) are managed as warmwater fisheries. The greatest complicating factor in the management of Burke Lake is the recurring illegal introductions of nuisance fish species (e.g., sunfish, perch, bass, bullheads, common carp, etc.). Burke Lake has a long and colorful history of public involvement in management. The Department was actually brought to court in 1983 by several Quincy area sportsmen over the planned rehabilitation of Burke Lake. WDW prevailed, and the following excerpt from testimony still applies to Burke Lake today:

> "There are 20 waters around the Quincy area. Thirteen are trout fisheries (190.2 surface acres) and seven are warm water fisheries (341.6 surface acres). Four lakes of 61 acres in surface area are located within one mile of Burke Lake. These four lakes, Coffin, "H", Judith Pool and Ancient, are managed for warmwater fishing. Burke Lake is 57 surface acres in size and is an acceptable candidate for lake rehabilitation. Burke Lake's inlet flows are intermittent and seepage in origin, isolating the lake from any recurring contamination of unwanted fish species. The outlet is short and flows spill over a natural impassable barrier to upstream movement of any unwanted fish species. Very little marsh exists and submergent weedy areas are minimal in the spring months....
>
> "Burke Lake has been managed for trout since 1955. Yellow perch suddenly appeared for the first time in 1964. The 1966 treatment removed the perch successfully, since none were present in the 1970 treatment. Nevertheless in 1967, after the complete kill in 1966,

different species, largemouth bass and pumpkinseed sunfish, suddenly appeared for the first time. After the 1970 treatment, the perch, bass and sunfish suddenly reappeared. The 1975 treatment removed the perch successfully since none were present in the 1977 treatment. Nevertheless, the bass and sunfish suddenly reappeared after the 1975 treatment and had to be removed by the next treatment in 1977. Once again all these species are now present. And, for the first time, black crappie have appeared. All of these species are rather readily eliminated with low concentrations of rotenone.

"Furthermore, Columbia Basin lakes do not naturally repopulate with perch, bass, sunfish and crappie without a trace of other fish species which are more likely to occur, such as carp, bullheads, tui chub, suckers, and cottids. Yet this lake has repopulated without these other species which also are not desirable for warm water fishermen.

"It is unlawful to plant any fish species without authorization from the Game Department. See RCW 77.16.150. The Department has never authorized the planting of the above mentioned warm water species in Burke Lake. This rehabilitation history makes it clear that unknown and unauthorized parties have continued to illegally plant the lake...."

Jackson Affidavit
Office of the Attorney General
Temple of Justice
Olympia, WA 98504

The impact of nuisance fish species on trout fisheries is unquestionable. Dr. Walton and students from Peninsula State College investigated the fish populations of Burke Lake in 1991, previous to the planned rehabilitation in 1993. The bulk of fish biomass was found to be yellow perch and pumpkinseed sunfish. Of over 9,000 fish captured by a variety of methods, only three trout and one bass were taken. The study concluded that perch and sunfish were over abundant and too small to provide a fishery.

The effectiveness of rehabilitation in removing nuisance fish species from these waters was further demonstrated when the same class from Peninsula State College conducted post-rehabilitation surveys on Burke Lake in the spring of 1993. Attempts to collect fish during a week's time by electrofishing, various types of nets, and even plankton tows failed to turn up a single species or individual fish in Burke Lake two weeks after rehabilitation. Three-inch fingerling rainbow trout were stocked later that spring, and the growth of these fish was checked the following fall. In the three gill nets set for a single night we found numerous robust nine-inch rainbow. As testimony to the illegal activities encountered in previous years, there were also three adult sunfish captured in the same nets.

III. INTENDED OUTCOME/MEASURE OF SUCCESS:

Success of this measure will be apparent as angler participation increases. Given a reasonable chance of eliminating nuisance fish species, and provided illegal plants are curtailed, the

beneficial effects could be everlasting. If the nuisance fish species are not eliminated, or illegal plants continue, the trout fishery will still benefit for 4-6 years (also see reasons listed under Resource, Recreational and Economic Impacts). To abandon these lakes as trout fisheries is to invite other illegal incursions across the state.

IV. RESOURCE IMPACTS:

1. The populations of the target species will be severely and negatively impacted with the goal of total elimination.

2. District and Regional Habitat, Wildlife and Non-Game biologists have been consulted in regard to our rehabilitation plans. No substantial objections were raised, and only cautionary concerns were expressed on the potential impacts to non-targeted species.

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.

Surveys conducted two months after the rehabilitation of Burke Lake in 1993 revealed that bosminids and Daphnia were already flourishing in the lake. The excellent survival and growth of the rainbow trout stock at that time implied the recovery of the zooplankton and benthic communities so important to the production of trout in these lakes.

Burke Lake was home to heavy concentrations of bullfrogs, an exotic amphibian. While many thousands were eradicated, the species has reappeared either due to the survival of a few of the original population or through re-colonization from near-by waters. It is likely that any native amphibians present were also not completely eradicated, and these species would benefit from the removal of bullfrogs from these waters.

3. Loss of the year 2012 fishery may ensue if catchable-sized trout are unavailable for stocking. The meager warmwater fishery will be eliminated. The lakes will be closed to angling, and other recreational uses such as hunting, boating, and swimming will be curtailed during the planned period of treatment. These waters are not a source of irrigation or drinking water for either human or livestock use.

4. Professional biologists and other naturalists have visited this site frequently over the past 40 years. To our knowledge, no endemic, rare, threatened or otherwise listed species will be significantly impacted by the rehabilitation.

V. MITIGATING FOR ADVERSE IMPACTS:

1. Catchable-size (2.5 fpp) rainbow trout are available for stocking in late February, so no loss of recreational fishing time will occur in 2013. The fingerling-based fishery will again be available for harvest by the spring of 2014. Trout survival and growth will be greatly enhanced. Participation in the trout fisheries will exceed that currently found for existing fisheries. .

No removal of dead fish is planned as the nutrient base contained therein is best returned to the lake. Disturbance of waterfowl during treatment or by the anticipated fishery will be offset by increased food availability as the uncontrollable number of nuisance fish species are eliminated in favor of easily balanced populations of trout. It is in the interest of all species, managed or otherwise, to refrain from over-taxing the food-base.

2. Downstream resources will also be treated as they may harbor remnants of the target populations. Those waters downstream not to be treated are protected by subterranean flows.

3. No endemic, rare, threatened or otherwise listed species are known to inhabit this area.

4. Protective wear for the eyes, face and hands will be supplied on-site for all purveyors of rotenone. Superior techniques and equipment not available during previous rehabilitation attempts will be employed during this rehabilitation, further increasing the chances for success.

5. All landowners will be notified of the treatment, and access to the lakes will be posted during treatment according to Department of Ecology NPDES guidelines. Water withdrawals, swimming, possessing or consuming dead fish will cease during the period of toxicity.

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

Recreational angling opportunity will be increased if nuisance fish species are removed from these waters and fingerling trout stocking programs are reinstated. Angler success should reach ≥ 3.0 trout harvested per angler on opening day. Yearling trout should average about 12 inches. Carryovers should be expected to be about five percent or more of the catch, and average 14+ inches for 2-year-old fish.

If Burke Lake produced a good warmwater fishery (Burke has already overpopulated and produces no appreciable warmwater fishery), probably 1,000 to as many as 2,000 trips per season are estimated. This would be 6-12 % of the 15,000 trips per season produced by a good trout-only fishery on these waters. The results of stocking catchable-size trout in warmwater fish waters are so variable that angler interest generally wanes. Catchables stocked previous to rehabilitation to provide fisheries for the 2010, 2011, and 2012 openers produced good opening days, but quickly became fished out and they cost much more money to stock than a fry stocking strategy that produces the same size yearling fish.

VII. ECONOMIC IMPACTS:

Rehabilitation and fingerling stocking would bring back the fishery and associated economic activity. An estimated 15,000 trips per season made to these lakes as a result of the proposed management action would result in an economic impact totaling $568,500 per year (1991 dollars; based WDW estimate of $37.90 per trip). The fishery as it now exists, generously estimated at 2,000 trips, generates only $75,800 in economic benefit.

The total annual hatchery cost to plant Burke Lake with 20,000 fingerlings is roughly $2,610. The cost of stocking with 20,000 catchable-size trout for the first season after the rehabilitation is $13,000+. The rehabilitation will cost the Department about $17,000 (including costs of rotenone, staff time, travel expenses). If the lake is treated every five years on average (Burke averages 4.5 years), the total five-year program would cost approximately $33,000.

The cost of stocking with catchable-size trout, necessary to compete in a mixed-species water, for the entire five year program is $65,000+. Raising catchable-size fish in the hatchery requires more space and water than raising fingerlings resulting in fewer fish raised overall at the hatchery, thus a catchable trout program would be at the expense of other fisheries. In addition, stocking catchable-size trout does not produce as desirable a fishery in the angler's eye as fingerling stocking programs.

Estimates for the cost of the enforcement action necessary to curtail the activity of the individuals responsible for illegal stocking are not available. However, this cost might be looked upon as a statewide expenditure since some preventive benefit would certainly occur as perpetrators find out the Department takes illegal transport and planting of fish very seriously.

VIII. RELATED MANAGEMENT ACTION:

Burke Lake will be stocked with ≤20,000 rainbow trout fingerlings at 100 fish per lb. Catchable rainbow trout (≤2.5 fpp) will be available for stocking prior to the March 1st opener so that there will be no break in fishing opportunity. Burke Lake will receive approximately 12,000 catchable rainbow trout in late February. Creel checks will be done annually on opening day, and population surveys will occur as time is available.

IX. PUBLIC CONTACT:

A public meeting to discuss the proposed rehabilitation of Burke Lake will be held in Ephrata at the WDFW Region 2 office at 7 p.m. on July 26th, 2012 and in Olympia at the Natural Resource Building at 7:00 p.m. on July 31st. The purpose of the public meetings is to inform the general public about this project, assess public opinion, and address any concerns. The meeting announcement was provided statewide and to local newspapers and radio stations. All opinions and comments will be thoroughly reviewed and taken into consideration of the final decision to

rehabilitate Burke Lake.

Initiated by: Chad Jackson
District 5 Fish Biologist
Grant and Adams Counties
Region 2 Fish Program