

**LOWLAND LAKE REHABILITATION PROPOSALS  
AUTUMN 2005**



**WASHINGTON DEPARTMENT  
OF FISH AND WILDLIFE  
FINAL DETERMINATION OF  
NON-SIGNIFICANCE  
August 31, 2005**

State of Washington

**DEPARTMENT OF FISH AND WILDLIFE**

Mailing Address: 600 Capitol Way N - Olympia, Washington 98501-1091 - (360) 902-2200, TDD (360) 902-2207  
Main Office location: Natural Resources Building - 1111 Washington Street SE - Olympia, WA

**ADDENDUM TO FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENTS  
Dated: August, 1992 and January, 2002**

**Name of FSEIS:**

1. Lake and Stream Rehabilitation Final Supplemental Impact Statement (FEIS), 1992-1993 and
2. Lake and Stream Rehabilitation: Rotenone Use and Health Risks FSEIS, 2002

**The document (FSEIS and FEIS) is available to be read at:**

Washington Department of Fish and Wildlife-Natural Resources Building,  
1111 Washington Street SE, Olympia, WA.  
Monday-Friday 8:00am – 5:00pm

**Description of Proposal:** Rehabilitation of lakes and streams in eastern Washington (Okanogan and Grant Counties), by the use of Rotenone, to improve fishing for game fish via the elimination of other non-game or competitor species of fish. The FSEIS applied to statewide coverage.

**Proponent:** Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, Washington 98501-1091. Contact Person Jim Uehara Ph: 360-902-2738.

**Lead Agency:** Washington Department of Fish and Wildlife

**The lead agency is providing updated information on this project which may be of interest to other agencies or the public. The updated information provided below does not substantially change the analysis of significant impacts in the existing environmental checklist.**

The original Final Supplemental Environmental Impact Statement, dated August, 1992, was reviewed as a statewide proposal. Implementation of the FSEIS includes the following lakes for the 2005-2006 season.

**Location of Current Proposals:**

**Okanogan County**

Spectacle Lake - Section 02, 04, 09, 10, 11, Township 38 North, Range 26 East WM

Big Green /Little Green Lakes – Section 12, 13, 24, Township 34 North, Range 25 East WM

**Grant County**

Warden Lake – Section 10, 15, 16, Township 17 North, Range 29 East WM

South Warden Lake - Section 15, Township 17 North, Range 29 East WM

Annex (Index) Lakes – Section 10, 11, Township 17 North, Range 29 East, WM

**Based on the original Final Supplemental Environmental Impact Statement (dated, 8/92), the additional Supplemental Environmental Impact Statement (dated, 1/02 and the updated information provided in this addendum, the lead agency has determined that a new threshold**

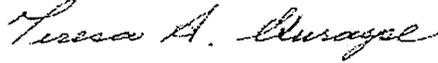
**determination is not warranted.**

The lead agency will not act on this proposal for 30 days from the date of issue below.  
**Comments must be submitted by: August 31, 2005.**

**Responsible Official:** Teresa A. Eturaspe  
**Position/Title:** SEPA/NEPA Coordinator, Regulatory Services Section

**Address:** 600 Capitol Way North, Olympia, WA 98501

**Please contact:** Teresa A. Eturaspe **Phone:** (360) 902-2575 **Fax:** (360) 902-2946 or  
**e-mail:** [eturatae@dfw.wa.gov](mailto:eturatae@dfw.wa.gov) if you have questions or comments about this determination.

**DATE OF ISSUE:** August 1, 2005 **SIGNATURE:** 

SEPA Log Number: 05-071add (Addendum to Lake and Stream Rehabilitation, FSEIS, 1992 and Lake and Stream Rehabilitation: Rotenone Use and Health Risks, FSEIS, 2002)

**Distribution of Environmental Document:**

Department of Ecology, Environmental Review Section, Olympia  
Department of Natural Resources, SEPA Center, Olympia  
U.S. Fish and Wildlife Service, Upper Columbia River Basin Field Office, Spokane  
U.S. Army Corps of Engineers, Seattle  
NOAA-Fisheries, Seattle  
Grant County Planning Department, Ephrata  
Columbia River Inter-Tribal Fisheries Commission, Portland, OR  
Colville Confederated Tribes, Nespelem  
WDFW, Habitat Program, Region 2, Ephrata  
WDFW, Fish Program, Region 2, Ephrata  
WDFW, Wildlife Program, Region 2, Ephrata

**Distribution of Environmental Document:**

Okanogan County Planning Department, Okanogan  
Okanogan Board of Commissioners, Okanogan  
Yakima Nation, Toppenish



**WASHINGTON DEPARTMENT  
OF FISH AND WILDLIFE  
FINAL DETERMINATION OF  
NON-SIGNIFICANCE  
September 19, 2005**

State of Washington

**DEPARTMENT OF FISH AND WILDLIFE**

Mailing Address: 600 Capitol Way N - Olympia, Washington 98501-1091 - (360) 902-2200, TDD (360) 902-2207  
Main Office location: Natural Resources Building - 1111 Washington Street SE - Olympia, WA

**ADDENDUM TO FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENTS**

**Dated: August, 1992 and January, 2002**

**Name of FSEIS:**

1. Lake and Stream Rehabilitation Final Supplemental Impact Statement (FEIS), 1992-1993 and
2. Lake and Stream Rehabilitation: Rotenone Use and Health Risks FSEIS, 2002

**The document (FSEIS and FEIS) is available to be read at:**

Washington Department of Fish and Wildlife-Natural Resources Building,  
1111 Washington Street SE, Olympia, WA.  
Monday-Friday 8:00am – 5:00pm

**Description of Proposal:** Rehabilitation of lakes and streams in eastern Washington (Okanogan and Grant Counties), by the use of Rotenone, to improve fishing for game fish via the elimination of other non-game or competitor species of fish. The FSEIS applied to statewide coverage.

**Proponent:** Washington Department of Fish and Wildlife, 600 Capitol Way North, Olympia, Washington 98501-1091. Contact Person Jim Uehara Ph: 360-902-2738.

**Lead Agency:** Washington Department of Fish and Wildlife

**The lead agency is providing updated information on this project which may be of interest to other agencies or the public. The updated information provided below does not substantially change the analysis of significant impacts in the existing environmental checklist.**

The original Final Supplemental Environmental Impact Statement, dated August, 1992, was reviewed as a statewide proposal. Implementation of the FSEIS includes the following lakes for the 2005-2006 season.

**The August 1, 2005 Addendum to FSEIS, should be modified to reflect the following corrections:**

**Addition of Quincy and Burke Lakes to the Addendum cover page "Location of Current Proposals". (The Lake Management Plans for Quincy and Burke Lakes were included in the package for 30 day review but were left off of the "Location of Current Proposals" list on the cover page.**

**Location of Current Proposals:**

**Okanogan County**

Spectacle Lake - Section 02, 04, 09, 10, 11, Township 38 North, Range 26 East WM  
Big Green /Little Green Lakes – Section 12, 13, 24, Township 34 North, Range 25 East WM

**Grant County**

Warden Lake – Section 10, 15, 16, Township 17 North, Range 29 East WM

South Warden Lake - Section 15, Township 17 North, Range 29 East WM  
Annex (Index) Lakes – Section 10, 11, Township 17 North, Range 29 East, WM  
**Quincy and Burke Lakes - Section 14, 15, 23, Township 19 North, Range 23 East, WM**

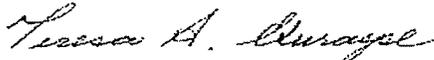
**Based on the original Final Supplemental Environmental Impact Statement (dated, 8/92), the additional Supplemental Environmental Impact Statement (dated, 1/02 and the updated information provided in this addendum, the lead agency has determined that a new threshold determination is not warranted.**

The lead agency will not act on this proposal for 14 days from the date of issue below.  
**Comments must be submitted by: September 16, 2005.**

**Responsible Official:** Teresa A. Eturaspe  
**Position/Title:** SEPA/NEPA Coordinator, Regulatory Services Section

**Address:** 600 Capitol Way North, Olympia, WA 98501

**Please contact:** Teresa A. Eturaspe **Phone:** (360) 902-2575 **Fax:** (360) 902-2946 or  
**e-mail:** [eturatae@dfw.wa.gov](mailto:eturatae@dfw.wa.gov) if you have questions or comments about this determination.

**DATE OF ISSUE: September 2, 2005 SIGNATURE** 

SEPA Log Number: 05-091addendum to 05-071add (Addendum to Lake and Stream Rehabilitation, FSEIS, 1992 and Lake and Stream Rehabilitation: Rotenone Use and Health Risks, FSEIS, 2002)

**Distribution of Environmental Document:**

Department of Ecology, Environmental Review Section, Olympia  
Department of Natural Resources, SEPA Center, Olympia  
U.S. Fish and Wildlife Service, Upper Columbia River Basin Field Office, Spokane  
U.S. Army Corps of Engineers, Seattle  
NOAA-Fisheries, Seattle  
Grant County Planning Department, Ephrata  
Columbia River Inter-Tribal Fisheries Commission, Portland, OR  
Colville Confederated Tribes, Nespelam  
WDFW, Habitat Program, Region 2, Ephrata  
WDFW, Fish Program, Region 2, Ephrata  
WDFW, Wildlife Program, Region 2, Ephrata  
Yakima Nation, Toppenish



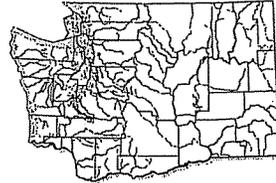
RECEIVED

AUG 29 2005

STATE OF WASHINGTON HABITAT PROGRAM  
DEPARTMENT OF ECOLOGY

15 West Yakima Avenue, Suite 200 • Yakima, Washington 98902-3452 • (509) 575-2490

August 26, 2005



Your address  
is in the  
**Deschutes**  
watershed

Teresa Eturaspe, SEPA Coordinator  
Dept. of Fish & Wildlife  
600 Capital Way North  
Olympia, WA 98501

Dear Ms. Eturaspe:

Thank you for the opportunity to comment on the addendum to the Lake and Stream Rehabilitation Final Supplemental EIS and Rotenone Use. We have reviewed the documents and have the following comments.

**Water Quality**

An NPDES permit from Ecology is required prior to implementing a rotenone program. The permit has numerous stipulations and conditions that will need to be followed. Contact Ray Latham at (509) 575-2807 for further information.

Sincerely,

Gwen Clear  
Environmental Review Coordinator  
Central Regional Office  
(509) 575-2012

963





STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

4601 N. Monroe Street • Spokane, Washington 99205-1295 • (509) 329-3400

August 30, 2005

Ms. Teresa A. Eturaspe  
SEPA/NEPA Coordinator  
Regulatory Services Section  
Department of Fish and Wildlife  
600 Capitol Way North  
Olympia, WA 98501

Dear Ms. Eturaspe,

Thank you for the opportunity to comment on the Addendum to Final Supplemental Environmental Impact Statements Dated August, 1992 and January, 2002 regarding the rehabilitation of lakes and streams in Eastern Washington by the use of Rotenone, to improve fishing for game fish via the elimination of other non-game or competitor species of fish (Proponent – Washington Department of Fish and Wildlife). The Department of Ecology has reviewed the documents and has the following comments;

Water Quality Program

A water quality certification may be required from the Department of Ecology in conjunction with the U.S. Army Corps of Engineers' permit for this project.

Any discharge of sediment-laden runoff or other pollutants to waters of the state is in violation of Chapter 90.48, Water Pollution Control, and WAC 173-201A, Water Quality Standards for Surface Waters of the State of Washington, and is subject to enforcement action.

Proper disposal of construction debris must be on land in such a manner that debris cannot enter the natural stormwater drainage system or cause water quality degradation of state waters.

Proper erosion and sediment control practices must be used on the construction site and adjacent areas to prevent upland sediments from entering the natural stormwater drainage system. All areas disturbed or newly created by construction activities must be revegetated; use bioengineering techniques, use clean durable riprap, or some other equivalent type of protection against erosion when other measures are not practical.

Any operation which would generate a waste discharge or have the potential to impact the quality of state waters, must receive specific prior authorization from Department of Ecology as provided under Chapter 90.48 RCW, Chapter 173-216 WAC, Chapter 173-220 WAC, Chapter 173-200 WAC and Chapter 173-201A WAC.

All dry wells and other injection wells must be registered with the Underground Injection Control program (UIC) at Department of Ecology. Contact the UIC staff at UIC Program, Department of Ecology, P.O. Box 47600, Olympia, WA 98504-7600 or (360) 407-6616 for registration forms and further information.

Dry wells can not be used for disposal of stormwater unless a treatment device or all known available and reasonable methods of prevention, control and treatment (AKART) is provided prior to injection and the discharge can meet the Ground Water Standards, Chapter 173-200 WAC. Examples of AKART are grassy swales, sand filters, catch basins, and wet and dry ponds. A coalescing plate oil/water separator or equivalent treatment must be used in high traffic areas where gasoline or oil contamination or storm water is likely to be present. Disposal of antifreeze, oil and other pollutants into drywells is not allowed.



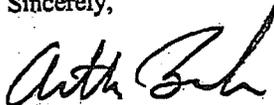
Routine inspection and maintenance of all sediment and erosion control devices is recommended both during and after development of the site.

Dumpsters and refuse collection containers must be leak free with close fitting covers. The drainage for refuse containers and dumpster areas adjacent to or over the water must be connected to the sanitary sewer or otherwise designed to prevent leachate from being discharged to surface waters.

Office of Regulatory Assistance

For information regarding assistance with the regulatory permitting process, please contact Arthur Buchan with the Department of Ecology. Arthur can be reached in Spokane at (509) 329-3550, Email: [abuc461@ecy.wa.gov](mailto:abuc461@ecy.wa.gov). Office of Regulatory Assistance staff serves as a primary resource for agency contacts, applications, and key information concerning local, state, and federal environmental permits and regulatory requirements.

Sincerely,



Arthur Buchan, M.S.  
SEPA Coordinator  
Department of Ecology  
Eastern Regional Office  
4601 N. Monroe Street  
Spokane, WA 99205-1295  
Phone: (509) 329-3550  
Email: [abuc461@ecy.wa.gov](mailto:abuc461@ecy.wa.gov)

2005-5917

## Jim Uehara - Public Meeting for proposed lake rehabilitation projects 2005

---

**From:** Jim Uehara  
**To:** Eturaspe, Teresa; Gibbons, Bob; Jateff, Robert; Jon Anderson; Korth, Jeff; Miller, Joseph; Whalen, John  
**Date:** 07/29/2005 8:19 AM  
**Subject:** Public Meeting for proposed lake rehabilitation projects 2005  
**CC:** Uehara, Jim

---

Washington Department of Fish and Wildlife held the third of three public meetings at the Natural Resource Building last night July 28, 2005. The meeting was to begin at 7:00 PM. Bob Gibbons, Teresa Eturaspe (Habitat Program) and Jim Uehara were present. Bob and Jim posted signs at 6:45 PM and waited by the public entrances until 7:25pm. No one from the public showed up for the meeting. We closed down at 7:35pm.

Jim Uehara  
Resident/Native Fish Program Manager  
Washington Dept. of Fish and Wildlife  
Olympia WA 98501-1091  
(360) 902-2738  
[uehariku@dfw.wa.gov](mailto:uehariku@dfw.wa.gov)

**From:** Jim Uehara  
**To:** Eturaspe, Teresa; Gibbons, Bob; Jateff, Robert; Jon Anderson; Korth, Jeff; Miller, Joseph; Whalen, John  
**Date:** 07/29/2005 8:20:32 AM  
**Subject:** Public Meeting for proposed lake rehabilitation projects 2005

Washington Department of Fish and Wildlife held the third of three public meetings at the Natural Resource Building last night July 28, 2005. The meeting was to begin at 7:00 PM. Bob Gibbons, Teresa Eturaspe (Habitat Program) and Jim Uehara were present. Bob and Jim posted signs at 6:45 PM and waited by the public entrances until 7:25pm. No one from the public showed up for the meeting. We closed down at 7:35pm.

Jim Uehara  
Resident/Native Fish Program Manager  
Washington Dept. of Fish and Wildlife  
Olympia WA 98501-1091  
(360) 902-2738  
ueharjku@dfw.wa.gov

**CC:** Uehara, Jim

# Tri-City Herald

P.O. Box 2608  
Tri-Cities, WA 99302-2608  
Phone (509) 582-1500

## AFFIDAVIT OF PUBLICATION

DATE: September 24, 2005 LEGAL NO. 4408

ACCOUNT NO: 94227

DESCRIPTION: NOTICETHEWASINGTOND

TIMES: 1 INCHES:

RECEIVED  
OCT 28 2005

Sold To: WASH DEPT OF FISH & WILDL  
1550 ATLER ST NW  
EPHRATA WA.98823

WDFW REGION TWO TOTAL \$ 139.70

## AFFIDAVIT OF PUBLICATION

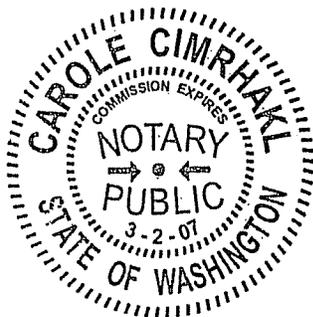
COUNTY OF BENTON  
STATE OF WASHINGTON <sup>ss.</sup>

KENNEN HAWKES, being duly sworn,  
deposes and says, I am a clerk of the Tri-City Herald, a daily newspaper. That said newspaper is a legal newspaper and has been approved as a legal newspaper by order of the superior court in the county in which it is published and it is now and has been for more than six months prior to the date of the publication hereinafter referred to, published continually as a daily newspaper in Benton County, Washington. That the attached is a true copy of a NOTICETHEWASHINGTOND as it was printed in the regular and entire issue of the Tri-City Herald itself and not in a supplement thereof, ran 1 time(s), commencing on Saturday, September 24, 2005, and ending on Saturday, September 24, 2005, and that said newspaper was regularly distributed to its subscribers during all of this period.



SUBSCRIBED AND SWORN BEFORE ME THIS 20TH DAY OF OCTOBER, 2005.

Carole Cimrhakl  
Notary Public in and for the State of Washington, residing at Kennewick.  
COMMISSION EXPIRES 3/2/07





**AFFIDAVIT OF PUBLICATION**

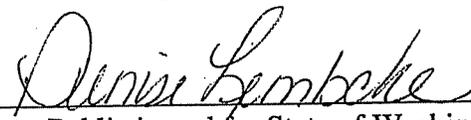
((STATE OF WASHINGTON: COUNTY OF GRANT))

I, Jaye Newberg, do solemnly swear that I am the Principle Agent of the Columbia Basin Herald, a newspaper established and regularly published five days a week in the English language, in and of general circulation continuously for more than six (6) months prior to the 31<sup>st</sup> day of March, 1944; that said newspaper is printed in an office maintained at its place of publication in the City of Moses Lake, Washington; that said newspaper was approved and designated as a legal newspaper by order of the Superior Court of the State of Washington for Grant County on the 31<sup>st</sup> day of March, 1944; and that said order has not been revoked and is in full force and effect.

That the annexed is a true copy of Legal Notice # 09047/Rehab Quincy & Burke Lakes as it was published in regular issues (and not in supplement form) of said newspaper once each day for a period of one consecutive day commencing on the 30th day of September 2005 and ending on the 30th day of September 2005 both dates inclusive and that such newspaper was regularly distributed to its subscribers during all of said period, that the full amount of fee charged for the foregoing publication is the sum of \$112.61 and has been paid in full.

  
\_\_\_\_\_

Subscribed and sworn to before me this 30<sup>st</sup> day of September, 2005.

  
\_\_\_\_\_  
Notary Public in and for State of Washington  
Residing at Moses Lake, Washington



From: Bob Jateff  
To: Stephen Germaine  
Date: 07/25/2005 3:49:20 PM  
Subject: Re: rotenone for Spectacle Lake

Stephen,

There was a survey done earlier this spring by Carolyn Pearson to see if any spotted leopard frogs were in the lake. I don't think that she found any, but you can call her if interested. Her number is 509-923-2166. Thanks.

Bob

CC: Jeff Korth; Jim Uehara; Jon Anderson

**LAKE MANAGEMENT PLANS**

**Water:** Spectacle Lake

**Management Type:** Trout Only

**Location:** Near the town of Loomis, WA, Sections 2-4-9-10-11, T38N, R26E in Okanogan County.

**Size:** 307 acres, 61 feet maximum depth, 9,574 acre feet

**Water Source:** subsurface flow, irrigation water from Toats Coulee Creek via pipeline

**Outflow:** intermittent during irrigation season only into Whitestone Lake

**Management History:** Since its inception, this fishery has been managed as a production fishery, owing to its large size, excellent productivity, and operation of three resorts. Historically, the lake opened on the traditional April opener and closed on July 31<sup>st</sup>. In 1994, opening day was changed to March 1<sup>st</sup> at the request of the resort owners.

Due to the illegal planting of spiny ray fishes (bass, sunfish, and brown bullheads), plants of catchable rainbows have been the norm to try and counteract the competition and predation issues brought on by the illegal introductions. As can be seen in the following table, the size as well as the number of fish caught has declined in recent years:

Year	#Fish/Angler	Average Length/Yearling
2004	2.8	10.5"
2005	1.8	10"

Even though these fish are products of a catchable sized plant, they still represent a much smaller size and number per angler that was experienced historically in Spectacle when the number of fish per angler was 4-5 and the average size of the yearlings was 12".

**Current Management Objectives:**

Continue to manage this lake for a trout only fishery. Change the season to an April 1<sup>st</sup> opener and extend the close date to September 30<sup>th</sup>. Provide at least four yearling and one carryover rainbow trout per angler trip for up to 10,000 angler trips per season.

**(1) Fishery Objectives:**

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg.Size</u>	<u>Exploit.</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Standard	2-3	4+	12 inches	80% 1-yr-olds
		Fishery		1+	16+ inches	20% 2+-yr-olds

(2) Angler use objective (# angler days): Season - 10,000 +

(3) Stocking Objectives:

<u>Lake</u>	<u>Species</u>	<u>Number of Trout Stocked</u>			<u>Planting Month</u>
		<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	
Spectacle	Rainbow	125,000	407	100	April/May

(4) Management Strategy:

- Check yearling growth; should be about 12 inches, adjust stocking rate as necessary.
- Expect 80% loss of yearling fish by end of season due to harvest and hooking mortality.
- Maintain about 15-20 percent of the catch at age 2+ years old, 15+ inch fish.
- Monitor angling activity and catch rates annually at opening day surveys.
- Monitor all fish species periodically by electrofishing or netting.
- Control spiny-ray species with rotenone when trout survival is inadequate to produce an acceptable fishery.
- Consider the use of sterile, triploid rainbow trout

## PRE-REHABILITATION PLAN Spectacle Lake

### I. PROPOSAL

#### A. Justification for Proposed Rehabilitation

(1-2) Spectacle Lake is considered one of the most productive large lakes in Okanogan County and supports three resorts. It is a lake of statewide significance, with maximum opening day crowds approaching 1,000 anglers. The lake is also a storage reservoir for the Whitestone Reclamation District and supplies water for surrounding croplands. Historically, the lake was planted with 125,000 – 150,000 fingerling rainbow, which produced an excellent fishery for 10” – 12” trout the following year. Illegal introductions of spiny ray fishes in recent years, has seriously compromised this once great fishing lake. Fingerling plants of rainbow can no longer survive to yearling size due to competition and predation with warmwater species (sunfish, largemouth bass, brown bullheads). Legal plants of rainbow trout (up to 30,000 8”-10” fish yearly) are now needed to sustain the fishing, but are much more expensive to produce at the hatcheries and could be used at other less productive waters instead. In addition, angler surveys indicate a preference for fingerling fish that have experienced an entire growing season in the lake versus catchable trout that are planted just prior to the opener. Treatment is needed at this time to restore Spectacle Lake back to a trout only water.

(3) Primary management of these waters is for trout only.

(4) Lake rehabilitation with rotenone was not an entirely successful management tool for Spectacle Lake in 1993, which was the last time rehabilitation of this water took place. Treatment strength needed to be stronger to eliminate undesirable species.

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

1. WATER: Spectacle Lake
2. LOCATION: Sec 2-4-9-10-11, T38N R26E, Okanogan Co.
3. SURFACE ACRES: 307
4. MAX. DEPTH: 61
5. VOLUME: 9,754 acre feet 26,525,000,000 lbs water
6. OUTLET: None
7. STREAM: MILES N/A FLOW (cfs)
8. PUBLIC ACCESS: Two day use sites (WDFW) with launch facilities
9. LAND OWNERSHIP: Public 40% Private 60%;
10. ESTABLISHED RESORTS: Three (Rainbow Resort, Spectacle Lake, and Spectacle Falls)

#### C. Proposed Management Actions

1. WATER: Spectacle Lake
2. TARGET SPECIES: sunfish, brown bullhead, largemouth bass
3. DATE LAST REHABED: Oct 5, 1993
4. PROPOSED TREATMENT DATE: Oct/Nov 2005
5. REPLANTING DATE: Late-spring 2006
6. SPECIES: Rainbow trout
7. STOCKING: 30,000+ rainbow catchables (8”-10”) and 125,000 fingerling rainbow
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 3 ppm AMOUNT (ROTENONE AT 5% ACT. INGRED): 79,572 lbs., 50 gal.
9. METHOD OF APPLICATION: pumper boats - slurry and spray; ATV with sprayer; small boat with small sprayer, backpack sprayers.
10. CREW DESCRIPTION: Leader(s) Robert Jateff, Personnel 10-12

## II. PURPOSE:

Spectacle Lake has been managed as a lowland lake trout water since the 1950's. Complete rehabilitation is the only feasible method of restoring these waters to the trout type of management scheme. Complete removal of all competing species is the goal of the rehabilitation.

## III. INTENDED OUTCOME/MEASURE OF SUCCESS:

We intend to restore Spectacle Lake to its popular harvestable trout fishery, and improve its popularity by maintaining quality trout throughout the duration of the season. Success of this measure will be apparent during annual creel surveys. Given a reasonable chance of eliminating the populations of undesirable species, the beneficial effects should be noticeable one-two years post treatment.

## IV. RESOURCE IMPACTS:

1. Target species: sunfish, largemouth bass, brown bullheads
2. District and Regional Habitat, Wildlife and Non-Game biologists have been apprised of our rehabilitation plans. No 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 the population average 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.

3. Participation in the trout fisheries should exceed that currently found for existing fisheries. The water in the lake is used solely for recreation and irrigation, which during October and November does not occur. Dead fish along the shoreline may be offensive to the property owners for a short time after treatment.

4. Professional biologists and other naturalists have visited this site frequently over the past 50 years. Common loons have recently been listed as a Washington State sensitive species. Loons have been known to use Spectacle Lake as a foraging area. Fingerling and larger rainbow trout will be planted in the lake in the early spring for the fishery as well as providing forage fish for any loon population using the lake at that time.

## V. MITIGATING FOR ADVERSE IMPACTS:

1. Trout survival and growth will be greatly enhanced. 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 numbers of spiny-rayed fishes are eliminated in favor of easily balanced populations of trout. It is in the interest of all species being managed to refrain from over-taxing the food-base.

2. Water will be confined to the lake proper, since there is no outfall at this time of the year.
3. Common loons use the lake for foraging during the spring and summer. Fingerling and larger fish plants during this time will provide the needed forage species for the loon.
4. Protective gear for the eyes, face, hands and clothes will be supplied on-site 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. The landowners will be notified of the rehabilitation and consequent exposure of livestock to rotenone.

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

Recreational angling opportunity will be increased if the undesirable species are removed from Spectacle Lake. The level of participation will dwindle to almost nothing if no action is taken immediately. Given the success of the planned management action, as many as 10,000 fishing days are estimated for the season. Anglers should average about four-five fish per trip if the treatment is successful. Yearling trout should average about 11 inches. Carryovers should be expected to be about 20 percent of the catch, and average 15 inches for 2-year-old fish.

#### VII. ECONOMIC IMPACTS:

Rehabilitation would restore the fishery and associated economic activity. An estimated 10,000 or more trips will be made to Spectacle Lake as a result of the proposed management action, with an economic impact totaling \$1,320,000 per year (2004 dollars; based on WDW estimate of \$132 per trip). Fingerling plants will cost the agency \$8,750, but is far less than the \$70,000 it now costs to produce the larger fish needed to counteract the present of competing spiny ray species.

The cost of treatment will be approximately \$50,000, but the increase in license sales and subsequent boost to the local economy will more than offset that loss within two years after treatment.

#### VIII. RELATED MANAGEMENT ACTION:

Approximately 30,000 catchable (8"-10") and 125,000 fingerling (3"-4") rainbow trout will be stocked in early spring to provide immediate fishing opportunity. After the first year, subsequent fish plants will consist of fingerling trout only. Creel checks will be done annually on Spectacle Lake, as well as population analysis to help in future management plans.

#### IX. PUBLIC CONTACT:

Public concern over the increasing numbers of lakes in Okanogan County with undesirable species infestations prompted this action.

A public meeting was held in Loomis on July 26<sup>th</sup> to discuss the proposed treatment of Spectacle Lake. There were six people at the meeting located at the west end of Spectacle Lake at the Whitestone Reclamation District office. Most of the discussion concerned the lowering of the lake level prior to the rehabilitation, which should help to reduce the amount of rotenone needed as well as saving costs. All were in favor of the rehab to restore Spectacle back to trout only water. There was some discussion on proposed season modifications, both in changing the

opener to April 1<sup>st</sup> and allowing unlimited fishing prior to the rehab. In addition, there has been over 50 letters received in favor of the plan to rehabilitate the lake from fisherman all across the state. As yet, there are no negative comments about the proposal.

Initiated by: Region Two Fisheries Management

### LAKE MANAGEMENT PLANS

**Water:** Big and Little Green Lakes and connecting channel

**Management Type:** Trout Only

**Location:** Four miles west of the town of Omak, WA, Sections 12-13-24, T34N, R25E in Okanogan County

**Size:** 58 acres, 40 feet maximum depth, 990 acre feet

**Water Source:** Subsurface flow

**Outflow:** Intermittent during spring only

**Management History:** Both Green Lakes have been managed in the past as an opening day fishery with standard gear rules and daily limits. The desire by some anglers to have a winter trout fishery prompted the department in 1988 to change over to a December 1<sup>st</sup> through March 31<sup>st</sup> season with standard gear rules. In addition, the season was further extended in 2000 to include a catch and release portion running from April 1<sup>st</sup> until November 30<sup>th</sup>. These changes provided a variety of fishing opportunities for the local anglers on a yearlong basis. Recent illegal introductions of largemouth bass have seriously compromised the quality as well as the quantity of the trout populations. Fingerling trout survival has been very poor with very few yearling trout showing up in the catch.

**Current Management Objectives:**

Continue to manage this lake for a trout only fishery with the present season. Provide at least four yearling and one carryover rainbow trout per angler trip during the winter fishery for up to 5,000 angler trips per season.

**(1) Fishery Objectives:**

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg.Size</u>	<u>Exploit.</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Standard	2-3	4+	11 inches	80% 1-yr-olds
		Fishery		1+	15+ inches	20% 2+-yr-olds

**(2) Angler use objective (# angler days):** Season - 5,000 +

**(3) Stocking Objectives:**

<u>Lake</u>	<u>Species</u>	<u>Number of Trout Stocked</u>			<u>Planting Month</u>
		<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	
Big Green	Rainbow	10,000	49	100	April/May
Little Green	Rainbow	2,000	5	100	April/May

**(4) Management Strategy:**

- Check yearling growth; should be about 11 inches, adjust stocking rate as necessary.
- Expect 80% loss of yearling fish by end of season due to harvest and hooking mortality.
- Maintain about 15-20 percent of the catch at age 2+ years old, 15+ inch fish.
- Monitor angling activity and catch rates annually at opening day surveys.
- Monitor all fish species periodically by electrofishing or netting.
- Control spiny-ray species with rotenone when trout survival is inadequate to produce an acceptable fishery.
- Consider the use of sterile, triploid rainbow trout

**PRE-REHABILITATION PLAN**  
**Big and Little Green Lakes**

**I. PROPOSAL**

**A. Justification for Proposed Rehabilitation**

(1-2) In recent years both Green Lakes have suffered a decline in both the quality and quantity of the trout population. The illegal introduction of largemouth bass has created a serious problem of competition and predation that has effectively reduced survival of the fingerling trout plants. Rehabilitation would seem the best way to reduce the competition from illegal introductions as well as providing the necessary survival advantage for fingerling trout.

(3) Primary management of these waters is for trout only.

(4) Lake rehabilitation with rotenone was a successful management tool for Big and Little Green Lakes in 1990.

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

1. WATER: Big Green Lake
2. LOCATION: Sec 12-13, T34N R25E, Okanogan Co.
3. SURFACE ACRES: 49
4. MAX. DEPTH: 40
5. VOLUME: 882 acre feet 2,398,447,296 lbs water
6. OUTLET: Connection to Little Green Lake
7. STREAM: MILES N/A FLOW (cfs)
8. PUBLIC ACCESS: One day use site (WDFW) with launch
9. LAND OWNERSHIP: Public 80% Private 20%;
10. ESTABLISHED RESORTS: None

**C. Proposed Management Actions**

1. WATER: Big Green Lake
2. TARGET SPECIES: largemouth bass
3. DATE LAST REHABED: Mar 21, 1990
4. PROPOSED TREATMENT DATE: Oct/Nov 2005 or April/May 2006
5. REPLANTING DATE: Summer/Fall 2006
6. SPECIES: Rainbow trout
7. STOCKING: 10,000 fingerling rainbow trout
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 1 ppm  
AMOUNT (ROTENONE AT 5% ACT. INGRED): 2,398 lbs., 10 gal.
9. METHOD OF APPLICATION: pumper boats - slurry and spray; ATV with sprayer; small boat with small sprayer, backpack sprayers
10. CREW DESCRIPTION: Leader(s) Robert Jateff, Personnel 6-8

## B. Physical Description of Water Proposed for Rehabilitation

1. WATER: Little Green Lake
2. LOCATION: Sec 24, T34N R25E, Okanogan Co.
3. SURFACE ACRES: 9
4. MAX. DEPTH: 28
5. VOLUME: 108 acre feet 293,687,424 lbs water
6. OUTLET: None
7. STREAM: MILES N/A FLOW (cfs)
8. PUBLIC ACCESS: One day use site (WDFW)
9. LAND OWNERSHIP: Public 60% Private 40%;
10. ESTABLISHED RESORTS: None

## C. Proposed Management Actions

1. WATER: Little Green Lake
2. TARGET SPECIES: largemouth bass
3. DATE LAST REHABED: Mar 21, 1990
4. PROPOSED TREATMENT DATE: Oct/Nov 2005 or April/May 2006
5. REPLANTING DATE: Summer/Fall 2006
6. SPECIES: Rainbow trout
7. STOCKING: 2,000 fingerling rainbow trout
8. PROPOSED TOXICANT: Rotenone, powder and liquid . CONCENTRATION: 1 ppm  
AMOUNT (ROTENONE AT 5% ACT. INGRED): 294 lbs., 5 gal.
9. METHOD OF APPLICATION: pumper boats - slurry and spray; ATV with sprayer; small boat with small sprayer, backpack sprayers
10. CREW DESCRIPTION: Leader(s) Robert Jateff, personnel 6-8

## II. PURPOSE:

Big and Little Green Lakes have been managed as a lowland lake trout waters since the 1950's. Complete rehabilitation is the only feasible method of restoring these waters to the trout type of management scheme. Complete removal of all competing species is the goal of the rehabilitation.

## III. INTENDED OUTCOME/MEASURE OF SUCCESS:

We intend to restore Big and Little Green Lakes to its popular harvestable trout fishery, and improve its popularity by maintaining quality trout throughout the duration of the season. Success of this measure will be apparent during annual creel surveys. Given a reasonable chance of eliminating the populations of undesirable species, the beneficial effects should be noticeable one-two years post treatment.

#### IV. RESOURCE IMPACTS:

1. Target species: largemouth bass
2. District and Regional Habitat, Wildlife and Non-Game biologists have been apprised of our rehabilitation plans. No 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 the population average 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.

3. Participation in the trout fisheries should exceed that currently found for existing fisheries. The water in the lake is used solely for recreation. Dead fish along the shoreline may be offensive to the property owners for a short time after treatment.
4. Professional biologists and other naturalists have visited this site frequently over the past 50 years. Fingerling and larger rainbow trout will be planted in the lake in the early spring for the fishery as well as providing forage fish for any bird populations using the lake at that time.

#### V. MITIGATING FOR ADVERSE IMPACTS:

1. Trout survival and growth will be greatly enhanced. 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 numbers of spiny-rayed fishes are eliminated in favor of easily balanced populations of trout. It is in the interest of all species being managed to refrain from over-taxing the food-base.
2. Water will be confined to the lake proper, since there is no outfall at this time of the year.
3. Fingerling and larger fish plants during the summer will provide the needed forage species for any bird populations that might be using the lake.
4. Protective gear for the eyes, face, hands and clothes will be supplied on-site 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. The landowners will be notified of the rehabilitation and consequent exposure of livestock to rotenone.

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

Recreational angling opportunity will be increased if the undesirable species are removed from Big and Little Green Lakes. The level of participation will dwindle to almost nothing if no action is taken immediately. Given the success of the planned management action, as many as 5,000 fishing days are estimated for the season. Anglers should average about four-five fish per trip if the treatment is successful. Yearling trout should average about 11 inches. Carryovers should be expected to be about 20 percent of the catch, and average 15 inches for 2-year-old fish.

## VII. ECONOMIC IMPACTS:

Rehabilitation would restore the fishery and associated economic activity. An estimated 5,000 or more trips will be made to Big and Little Green Lakes as a result of the proposed management action, with an economic impact totaling \$660,000 per year (2004 dollars; based on WDW estimate of \$132 per trip). Fingerling plants will cost the agency \$840, but is far less than the \$20,000 it now costs to produce the larger fish needed to counteract the presence of competing spiny ray species.

The cost of treatment will be approximately \$5,000, but the increase in license sales and subsequent boost to the local economy will more than offset that loss within two years after treatment.

## VIII. RELATED MANAGEMENT ACTION:

Approximately 12,000 fingerling rainbow trout will be stocked as soon as possible after the treatment to provide a winter fishery the following year. Creel checks will be done annually on Big and Little Green Lakes, as well as a population analysis to help in future management plans.

## IX. PUBLIC CONTACT:

Public concern over the increasing numbers of lakes in Okanogan County with undesirable species infestations prompted this action.

A public meeting was held in Loomis on July 26<sup>th</sup> to discuss the proposed treatment of Big and Little Green Lakes. At the meeting, there was no objection to the proposed treatment of either lake.

Initiated by: Region Two Fisheries Management

## LAKE MANAGEMENT PLANS

*Updated July 2005 – J. Korth*

### **Water(s): Warden, South Warden, and Annex (Index) Lakes**

**Location:** Seep Lakes Wildlife Area, Sec 10,11,15 T17N R29E; approximately 4 miles west of Warden and 5 miles southeast of the southeast corner of Potholes Reservoir, Grant County, WA

	Size:	Maximum Depth:
Warden	211 acres	70 feet
South W Warden	25 acres	30 feet
Annex Lake 1	2 acres	8 feet
Annex Lake 2	18 acres	30 feet
Shay Pond	4 acres	5 feet

**Water Source:** subsurface seepage springs

**Outflow:** 5 cfs to Lind Coulee

**Management History:** The Warden, South Warden, and Annex chain of lakes lie in the Seep Lakes Wildlife Area. Warden Lake is 211 acres and among the largest trout-only waters in Grant County, while the remaining waters in this system are rather small and have limited public access through agreements with the landowners. Warden Lake has been a popular trout fishery since first stocked with rainbow trout in 1954. Through the mid-1960's as many as 2,000 anglers attended the fishery on an opening day, and catch rates were as high as 7 to 9 fish per angler (Table 1). Boating access is available at Warden Lake, while anglers must walk into the remaining smaller lakes.

**Seasons, regulations:** Regulations have generally followed statewide rules for most of Warden Lake's history. The daily limit is currently five trout, and bait is allowed. The Annex lakes are open to angling year-round. The Warden lakes were originally on the statewide April Opening Day season. The small, state-owned access area was insufficient to handle the large crowds. Anglers roamed everywhere, including vehicles, and upland habitat suffered. In 1980 and in conjunction with many other Basin waters suffering the same habitat degradation, the opening day was changed to March 1<sup>st</sup> through July 31 in an attempt to spread out and control crowds. Weather in early March is unpredictable, and often these waters are covered with ice. Opening day crowds were indeed dissuaded; however, unfavorable weather conditions also often diminished angling success. Improved access areas and landowner agreements offered better crowd control than in the past. In 2001, the season was changed back to the statewide late-April opener (last Saturday in April through September 30) to encourage more anglers to ply their wares on Warden Lake, a complete turn around from the perceptions that instigated the March 1<sup>st</sup> opener over twenty years before. Opening day catch rates of fingerling-origin yearlings initially improved.

Table 1. Warden Lake opening day catch and effort summary: 1954 - 2005.

Year	Fish/ angler	Fish/ hour	Age 1+ average length	Age 2+ average length	Age 2+ % of catch	Total Effort (angler trips)	Total Harvest	Comments
54	First stocked with rainbow trout fry @ 100-200/lb; produced 11-12" fish.							Frank White
55-64:	no creel data. April Opener.							#RB Stocked
64								140K @100
65	9.0					2,013	18,237	140K @100
66	7.0					1,267	8,894	100K @8
66								Sept Rehab
67	9.0					860	7,740	82K@140
68	7.0					1,580	13,277	60K@170
69	1.0					728	750	
69								July Rehab
70-73:	no creel data							
72								80K@160
73								81K@135-160
74	7.7					186	1,426	80K@103-123
75	3.0					91	306	25K@138
76	1.5					20	35	0
77						0		20K@138
78-79:	no creel data							
80	Begin March 1 Opener with 75K@80-100 RB Stocked							April Rehab
81	1.0		12.0		0.0			
82								No data
83								No data
84	1.2		10.3	15.0	2.0			
85	2.0	0.9	10.0	13.0	?			Ice cover 80%
86	3.2		11.0		10.0			
87	1.9		10.6	15.0	9.0			Perch present
88	3.2		10.8	14.5	10.0			
89								No data
90	0.2	0.1	10.5		0.0			
91								April Rehab
92	3.6	1.7	10.6					
93	2.3	0.7	12.0	14.9	41.0			Iced 100%
94	2.0	0.6	12.3	20.9	1.0	517	1,020	
95	0.2	0.1	14.4	18.3	67.0	253	68	

96	0.6	0.2	13.4	17.7	18.0	210	152	Ice cover 95%
97	0.1	0.1	none	17.3	100.0	no estimate possible		Ice cover 50%
98	1.5	0.9	9.2		0.0	368	463	October rehab
99	0.3	0.1	9-10			none	Catchable RB added	
						(30K); Windy		
00	1.2	0.2	12.0		14-16	92 ?	Yrlg-carryover sig size overlap?	
01	4.7		13.0	19	3	change to late-April Opener Catchable RB added (30K) Yrlg-carryover sig size overlap		
02	4.7		13.4	15+?	1-2	Catchable RB added (14K) Yrlg-carryover sig size overlap		
03	2.1		14.7	18.5	1-2All	RB all fingerling origin. Yrlg-co sig size overlap 12-17"		
04	3.8		11.9	16.8	8	RB all fingerling origin.		
05	3.6		10.0	15.5	5	Catchable RB added (25K)		
05	<b>proposed October Rehab</b>							

**Rehabilitations:** Contamination by spiny-ray species has been the largest obstacle to managing these waters as trout fisheries. Carp and other spiny rayed fishes eventually invaded the system from Lind Coulee, and the first rehabilitation was necessary in 1966. Only one part per million was used in 1966, and the carp were not eliminated from Warden Lake. Within two years, the carp population had rebounded dramatically, and a second rehabilitation in 1969 using toxaphene was probably successful in removing the carp from the system. After each of the first two rehabilitations of this lake, anglers enjoyed a period of very good trout fishing, averaging 4-9 fish on opening day. It was 5 years after the second rehabilitation before sufficient numbers of carp re-invaded from Lind Coulee, reproduced, and over-ran the lake once more.

An outlet barrier on the outflow of Warden Lake was constructed in 1979 with financial assistance from the U.S. Bureau of Reclamation. In addition, a semi-permeable barrier was constructed blocking the inflow to Warden Lake from the Index Lakes. The third rehabilitation in April, 1980 employed 4 ppm rotenone and successfully eradicated carp from the system. Yellow perch, however, persisted. This was probably due to that species' early spawning behavior (~40 F water temperature), long incubation period (~21 days), and the inability of rotenone to kill fish in the egg stage. If large numbers of perch spawned just previous to rehabilitation, the fry would not emerge from those eggs until three weeks later. The rotenone would likely have detoxified by that time, and a large year class of perch would be available to take advantage of the lake's unclaimed food base. About three years later, the perch would mature and create an overwhelming year class followed by poor trout fry survival. The fourth

rehabilitation of Warden Lake in April of 1991 suffered the same fate in-so-far as its failure to eradicate the perch. Perch eggs were actually observed during that treatment.

The fifth treatment was conducted in the fall of 1998 in order to avoid the perch spawn, and no yellow perch have been observed since. While the perch population may have been eradicated, it is possible that some small number remain. Brown bullheads and pumpkinseed sunfish have persisted and comprised an overwhelming portion (> 90%) of fish numbers and biomass in Warden Lake by 2005 (June 2005 electrofishing survey). Fisheries for these species were non-existent at Warden Lake.

**Stocking allotments:** Early stocking rates for Warden Lake exceeded 500 fish per acre and still produced an 11-12 inch rainbow by opening day. Stocking rates have been reduced from the early years to about 350 fish per acre (about 70,000 rainbow fingerlings @ 80-100/lb), usually Goldendale or Spokane rainbow broodstock. Brown trout became part of the annual allotment in 1992; however, this species did little to slow down the expanding population of perch. Catchable-sized (9-10") rainbow were added to the fishery previous to opening day in 2001 and 2002; however, these additional fish failed to make a significant contribution to the catch during either year, so were discontinued. Yearling size has regularly exceeded expectations to the extent that it was difficult to separate yearlings from carry-overs, especially in 2003. Excessive yearling size has been an indication of poor fingerling survival. In 2004, size began to diminish, and in anticipation of a failed fingerling-based fishery, catchables were added previous to the 2005 opener. Almost all the rainbow checked opening day 2005 and all rainbow observed in a subsequent survey were attributed to the addition of the catchables.

**Avian predation:** Since the late 1980's, a relatively new management issue for this water has been the increasing number of piscivorous birds frequenting the area. Cormorants have become spring breeders and summertime residents. Pelicans are also frequent summertime residents on Warden Lake, and mergansers are primarily winter predators. While no uncontested proof of damage to the fishery exists, these species are primarily fish eaters. It is suspected that many of the unpredictable and unexplainable failures of the fisheries which occur periodically in the Seep Lakes Area, including Warden Lake, could be attributable to these avian species.

During the last five or six years, large numbers of cormorants (100's) and pelicans (dozens) have been frequently observed feeding at the lake through spring and into mid-summer. Fish species consumed are unknown, and the impact to fingerling rainbow remains unquantified; however, even an average of 20 cormorants each consuming 2 lbs per day could remove 36,000 rainbow fingerlings (@ 30/lb avg.) per month. The stocking allotment for Warden Lake is only 70,000 rainbow trout.

**T&E Flora and Fauna:** Professionals from many resource fields have visited this site countless times during the last 40 years. No known report exists of any threatened or endangered species

habitually found in or near these lakes. Double-crested cormorants, discussed above, are spring to fall visitors, although all known nesting occurs on Potholes Reservoir. Occasional visits from both bald and golden eagles occur, and no nests of these two species are known in the area. Protected species of waterfowl and other birds frequently are found here at times, as well.

### Current Management Objectives: Warden and South Warden Lakes

Last Saturday in April through September 30, production type fishery. Five fish limit, no size or gear restrictions. Provide ~ 4 yearling rainbow trout per angler trip for 1,000 anglers on opening day, and 3 trout per angler for the remaining part of the season for at least 3,000 additional angler trips. Warden Lake could sustain well over 10,000 angler trips per year.

#### 1. Fishery Objectives:

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg. Size</u>	<u>Exploit.</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Opening Day	2-3	4	11 inches	90% 1-yr-olds
		Season Average	1-2	3	12-14 inches	90% 1-yr-olds

2. Angler use objective (# angler days): Season - 4,000 minimum; up to 12,000.

#### 3. Stocking Objectives:

<u>Lake</u>	<u>Species</u>	<u>Number of Fish Stocked</u>			<u>Planting Month</u>
		<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	
Warden	Rainbow	70,000	310	<80	May
	Brown Trout	10,000	50	<80	May
South Warden	Rainbow	8,000	320	<80	March
	Brown Trout	1,300	50	<80	May

#### E. Management Strategy:

- Plant rainbow fry in spring.
- Check yearling growth; should be about 11 inches, adjust stocking rate as necessary.
- Harvest 90% of yearling fish by end of season.
- Monitor all fish species periodically by electrofishing or netting.
- Substitute fall fingerlings for at least a portion of the spring fry when competing species begin to impact trout fry survival.
- Control spiny-ray species with rotenone when trout survival is inadequate to produce an acceptable fishery.
- Manage the Annex Lakes as low key, walk-in fisheries on a year around season consistent with the landowners' desires. Stocking rates 100-200 rainbow and/or brown trout per acre.

## PRE-REHABILITATION PLAN

### Warden, South Warden, and Annex Lakes

#### I. PROPOSAL

##### A. Justification for Proposed Rehabilitation

The Warden, South Warden, and Annex chain of lakes lie in the Seep Lakes Wildlife Area southeast of O'Sullivan Dam and Potholes Reservoir. Warden Lake is 211 acres and among the largest trout-only waters in Grant County, while the remaining waters in this system are rather small and have limited public access. Warden Lake has been a popular trout fishery since the mid-1950's, and as many as 2,000 anglers have attended the fishery on an opening day (see Warden Lake Management Plan for a detailed history).

Carp and other spiny rayed fishes eventually invaded the system from Lind Coulee. It was not until an outlet barrier on the outflow of Warden Lake was constructed in 1979, and the third rehabilitation, that carp were successfully eradicated from the system. Yellow perch, however, persisted. This was probably due to that species early spawning behavior (~40 F water temperature), long incubation period (~21 days), and the inability of rotenone to kill fish in the egg stage. Perch eggs were actually observed during the fourth rehabilitation of Warden Lake in April of 1991. The fifth treatment was conducted in the fall of 1998, and no yellow perch have been observed since. While the perch population may have been eradicated, it is possible that some small number remain. Brown bullheads and pumpkinseed sunfish have persisted and currently comprise an overwhelming portion (> 90%) of fish numbers and biomass in Warden Lake (June 2005 electrofishing survey). Fisheries for these species are non-existent at Warden Lake.

Other factors have also plagued management of Warden Lake, complicating the consistent production and evaluation of the fishery. The March 1<sup>st</sup> opener remained in effect after the last rehabilitation, and unfavorable weather conditions often diminished participation and angling success (Table 1). In 2001, the season was changed to the statewide late-April opener (last Saturday in April through September 30). Opening day catch rates of fingerling-origin yearlings improved. Catchable-sized (9-10") rainbow had also been added to the fishery previous to opening day in 2001 and 2002; however, these additional fish failed to make a significant contribution to the catch during either year, so were discontinued.

Yearling size has regularly exceeded expectations to the extent that it was difficult to separate yearlings from carry-overs, especially in 2003. Excessive yearling size has been an indication of poor fingerling survival. In 2004, size began to diminish, and in anticipation of a failed fingerling-based fishery, catchables were added previous to the 2005 opener. Almost all the rainbow checked opening day 2005 and all rainbow observed in a subsequent survey were attributed to the addition of the catchables.

Avian predation has also increased on Warden Lake and is assumed to be a factor in fingerling

survival. Large numbers of cormorants (100's) and pelicans (dozens) are frequently observed feeding at the lake through spring and into mid-summer. Fish species consumed are unknown, and the impact to fingerling rainbow remains unquantified; however, even an average of 20 cormorants each consuming 2 lbs per day could remove 36,000 rainbow fingerlings (@ 30/lb avg.) per month. The stocking allotment for Warden Lake is only 70,000 rainbow trout.

**Table 1. Warden Lake opening day catch and effort summary: 1991 - 2005.**

Year	Fish/ angler	Fish/ hour	Age 1+ average length	Age 2+ average length	Age 2+ % of catch	Comments
91	<b>April Rehab</b>					
92	3.6	1.7	10.6			
93	2.3	0.7	12.0	14.9	41.0	Iced 100%
94	2.0	0.6	12.3	20.9	1.0	
95	0.2	0.1	14.4	18.3	67.0	
96	0.6	0.2	13.4	17.7	18.0	Ice cover 95%
97	0.1	0.1	none?	17.3	100.0	Ice cover 50%
98	1.5	0.9	9.2		0.0	Catchable RB added (30K)
98	<b>October Rehab</b>					
99	0.3	0.1	9-10		none	Catchable RB added (30K); Windy
00	1.2	0.2	12.0	14-16	92 ?	Yrlg-carryover sig size overlap?
01	<b>change to late-April Opener</b>					
01	4.7		13.0	19	3	Catchable RB added (30K) Yrlg-carryover sig size overlap
02	4.7		13.4	15+?	1-2	Catchable RB added (14K) Yrlg-carryover sig size overlap
03	2.1		14.7	18.5	1-2All	RB all fingerling origin. Yrlg-co sig size overlap 12-17"
04	3.8		11.9	16.8	8	RB all fingerling origin.
05	3.6		10.0	15.5	5	Catchable RB added (25K)
05	<b>proposed October Rehab</b>					

It has been seven years since the last treatment of these lakes, and angling continues to decline. WDFW policy states that lake rehabilitation is an option for eliminating undesired fish in an effort to restore the intended management scheme. Alternatives to rehabilitation are costly or impractical. To maintain a comparable fingerling-stocked trout fishery in Warden Lake with catchable-sized fish would take 50,000 catchable rainbow. This would constitute more than half of the District's entire normal allotment of catchable trout. Region Two lacks the hatchery space

and water to institute a catchable fish- stocking program as a substitute for lake rehabilitation. Stocking catchable sized fish also costs almost ten times the cost of a fry plant. Optimistic estimates of survival of even 4-6 inch advanced fry in these waters range from 10-20 percent. Spring fingerling survival in lakes free of competing species ranges from 50-80 percent.

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

### **1. WATER: Warden Lake**

2. LOCATION: Sec 10,15 T17N R29E Grant Co.
3. SURFACE ACRES: 211 MAXIMUM DEPTH: 70 feet
4. VOLUME: 5,721 acre-feet; 15,550,502,000 lbs. H2O
5. OUTLET: Permanent, small creek drains to Lind Coulee/Potholes Reservoir.
6. STREAM: ~1 mile FLOW: 5 cfs
7. PUBLIC ACCESS: Parking, toilets, shoreline access, and boat launch at northwest end; shoreline access at southwest end.
8. LAND OWNERSHIP: PUBLIC 20% PRIVATE 80 %
9. ESTABLISHED RESORTS: One resort on the north end of the lake, and a small semi-retirement community (Mallard Haven) on the northeast end of the lake.

### **1. WATER: South Warden Lake**

2. LOCATION: Sec 15, T17N R29E Grant Co.
3. SURFACE ACRES: 25 MAXIMUM DEPTH: 30 feet
4. VOLUME: 348 acre feet; 945,914,000 lbs. H2O
5. OUTLET: Permanent, small creek drains to Warden Lake.
6. STREAM: 50 ft. FLOW: 1-2 cfs
7. PUBLIC ACCESS: Shoreline access through agreement with private landowner.
8. LAND OWNERSHIP: PUBLIC 0% PRIVATE 100 %
9. ESTABLISHED RESORTS: None; public fishing access by agreement with the landowner.

### **1. WATER: Annex Lakes (formerly referred to as Index Lakes, and including Shay Pond)**

2. LOCATION: Sec 11,15 T17N R29E Grant Co.
3. SURFACE ACRES: 26 MAXIMUM DEPTH: 30 feet
4. VOLUME: 213 acre feet; 577,744,000 lbs. H2O
5. OUTLET: Permanent, small creek drains to Warden Lake.
6. STREAM: ~0.5 miles FLOW: 1-2 cfs
7. PUBLIC ACCESS: Shoreline access through agreement with private landowner.
8. LAND OWNERSHIP: PUBLIC 0% PRIVATE 100 %
9. ESTABLISHED RESORTS: None; public fishing access by agreement with the landowner.

## **C. Proposed Management Actions**

### **1. WATER: Warden Lake**

2. TARGET SPECIES: brown bullheads, pumpkinseed sunfish, possibly yellow perch

3. DATE LAST REHABED: October 1998
4. PROPOSED TREATMENT DATE: September-November, 2005
5. REPLANTING DATE: Spring 2006
6. SPECIES: rainbow trout, brown trout
7. CATCHABLES: 50,000 FINGERLINGS: 80,000
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 3 ppm  
AMOUNT (ROTENONE AT 5% ACT. INGRED): 46,261 lbs., 45 gal.
9. METHOD OF APPLICATION: pumper boat slurry and airboat/ATV spray
10. CREW DESCRIPTION: Leader(s) Jeff Korth Personnel ~12

1. WATER: **South Warden Lake**

2. TARGET SPECIES: brown bullheads, pumpkinseed sunfish, possibly yellow perch
3. DATE LAST REHABED: October 1998
4. PROPOSED TREATMENT DATE: September-November, 2005
5. REPLANTING DATE: Spring 2006

6. SPECIES: rainbow trout, brown trout

7. CATCHABLES: 5,000 FINGERLINGS: 12,000
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 3 ppm  
AMOUNT (ROTENONE AT 5% ACT. INGRED): 2,814 lbs., 15 gal.
9. METHOD OF APPLICATION: pumper boat slurry and airboat/ATV spray
10. CREW DESCRIPTION: Leader(s) Jeff Korth Personnel ~2-4

1. WATER: **Annex Lakes** (formerly referred to as Index Lakes, and including Shay Pond)

2. TARGET SPECIES: brown bullheads, pumpkinseed sunfish, possibly yellow perch
3. DATE LAST REHABED: October 1998
4. PROPOSED TREATMENT DATE: September-November, 2005
5. REPLANTING DATE: Spring 2006
6. SPECIES: rainbow trout, brown trout
7. CATCHABLES: 200 FINGERLINGS: 5,000
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 3 ppm  
AMOUNT (ROTENONE AT 5% ACT. INGRED): 1,718 lbs., 60 gal.
9. METHOD OF APPLICATION: pumper boat slurry and airboat/ATV spray
10. CREW DESCRIPTION: Leader(s) Jeff Korth Personnel ~2-4

**TOTAL PROPOSED TOXICANT:** Rotenone CONCENTRATION: 3 ppm

AMOUNT (ROTENONE AT 5% ACT. INGRED): 50,793 lbs. powder and 120 gal. liquid.

## **II. PURPOSE:**

Warden, South Warden, and the Annex lakes have a history of being managed as trout fisheries over the last 50 years. Management intends to return these lakes to trout fisheries, as per the established Management Plan. Rehabilitation will eliminate or drastically reduce interspecific competition and predation, allowing the trout fisheries to flourish.

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

Success of this measure will be apparent as angler participation increases. Given a reasonable chance of eliminating the undesirable species and provided illegal plants are curtailed, the beneficial effects could be everlasting. If the undesirable 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.

## **IV. RESOURCE IMPACTS:**

1. The populations of the target species, which are exotic species in Washington, will be severely and negatively impacted.
2. Regional and District Habitat, Wildlife and Non-Game managers have been apprised of our rehabilitation plans. No unmitigated concerns have been 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.

3. The lakes will be closed to angling during the treatment and until the season reopens the following spring. 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 potable water for humans. A portion of the waters treated are sources of drinking water for livestock. Levels of rotenone used in the treatment will be too low to adversely affect the livestock.
4. 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 will be significantly impacted by the rehabilitation.

## V. MITIGATING FOR ADVERSE IMPACTS:

Because rotenone will not kill fish in the egg stage, WDFW rehabilitates lakes during spring or fall to avoid the spawning seasons of the fish typically targeted. Spring rehabilitations are also chosen take advantage of the cold water, which lengthens the period during which the lake remains toxic. This results in more time for the rotenone to mix throughout the lake, resulting in a better kill. Initial treatments of Warden Lake occurred in the spring in order to avoid impacting downstream resources. Irrigation flows through an adjacent lateral canal delivered another 20 cfs of water at the lake's outlet at this time, which dilutes the treated water so that rotenone residues are below toxic levels for most fish. Unfortunately, water temperatures frequently approached 40 F, the lower limit for the spawning of any remaining perch.

The last rehabilitation of Warden Lake was done in the fall of 1998 to avoid the perch spawn. As there appears to be a good chance that perch were eliminated during that treatment, the current rehabilitation proposal will also be for the fall of 2005, sometime during September, October, or November, to be sure any remaining perch are eradicated. Bullhead spawning should also have ceased. While not likely, sunfish may still spawn during this time; however, the eggs of this species hatch in a few days, and the lake would still be sufficiently toxic to destroy any resulting progeny. The deeper portions of large lakes are also often anoxic during the fall, and these conditions will add to the stress of fish attempting to escape into the depths of the lake.

The outlet will be blocked at the culvert on O'Sullivan Dam Road as long as possible (about three weeks at last treatment) to contain treated water until sufficiently detoxified to an estimated 0.1 ppm or less (0.3 ppm maximum). WA DOT and East Irrigation District will be apprised of these plans. At the time of lake water release, outflow toxicity will be monitored via bioassay. Irrigation return flows in the lateral canal adjacent to the lake's outlet will still deliver sufficient flow (~ 4 cfs) to dilute any treated water to less than 0.05 ppm (0.15 maximum). Oxygenation at a downstream falls would further decrease toxicity before the treated water entered Lind Coulee, where flows in excess of 20 cfs would quickly dilute any remaining rotenone below normally detectable levels.

Provided catchable-sized fish are available the following spring, no loss of recreational fishing time will occur. Trout fingerling survival and growth will be greatly enhanced, and future trout fisheries will attain their previous status. No removal of dead fish is planned as the nutrient base contained therein enhances the productivity of the lake. A season extension from early September until the time of treatment and dropping the daily limit will be sought to allow harvest of as many of the remaining desirable fishes as possible by the public.

Livestock use of the waters to be treated will not be significantly affected. The concentration of rotenone used in the treatment will be far below that considered harmful to mammals. The landowners will be notified of the rehabilitation and consequent exposure of livestock to rotenone.

Fall rehabilitation will not interfere with waterfowl spring nesting. The eradication of spiny-ray fishes would also benefit waterfowl through increased production of invertebrates. Stocked

populations of trout will not be anywhere near as numerous as the current spiny-ray population.

The treatment will either occur before waterfowl hunting season opens or will be timed to interfere as little as possible with hunters utilizing these waters.

3. Most cormorants typically migrate west during October, and few are expected during the proposed treatment. Any cormorants still utilizing the lake will be displaced to other near-by waters. No other endemic, rare, threatened or otherwise listed species are known to inhabit this area during the time proposed for this treatment.

4. Protective wear for the eyes, face and hands will be available 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 PROPOSAL I.A.**

Recreational opportunity will be increased. When free of competing species, these lakes may be conservatively estimated to provide at least 4,000 angler trips during the usual angling season. The lakes could sustain three to five times that amount of pressure if the anticipated levels of success are continued and anglers gain confidence in these waters once again.

Angler success should reach three to five fish per trip. Yearling trout should average about 11 inches. Carryovers should be expected to be about 10% of the catch and average 14-16 inches for 2-year-olds and 16-18 inches for 3-year-olds.

## **VII. ECONOMIC IMPACTS:**

An estimated 4,000 trips made to these lakes as a result of the proposed management action would result in an increased economic impact totaling \$151,160 per year (1991 dollars; based WDW estimate of \$37.90 per trip). If used to its full potential, the annual value could be over \$600,000 to the state's economy. The fishery as it now exists generates maybe \$20,000 per year and will continue to decline. Rehabilitation would bring back the fishery and associated economic activity.

The total annual costs to stock these lakes with fingerlings is roughly \$8,000. The rehabilitation currently as proposed will cost the Department about \$100,000 (including costs of rotenone, time, travel). This is about three times as expensive as past treatments of this water due to the excessive amount of rotenone necessary to eradicate bullheads (3 ppm proposed compared to 1 ppm in the past to eradicate perch). If this rehabilitation provides a fishery for at least five years,

the cost including fingerling plants (5 yrs.) and the rehabilitation totals \$140,000. The cost of stocking catchable-sized trout, if this were possible (see IA), would be over \$160,000 for this five-year period, and the quality of the fishery would be diminished due to the smaller, less desirable condition of the yearlings. The economic impact due this fishery, whether stocking fingerlings or catchables, over five years is at least \$750,000 and as much as \$3,000,000 to the state's economy.

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

See I.C.6. for fish planting data

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

A public hearing was held in Ephrata at 7pm on July 25, 2005 and in Olympia at 7pm on July 28, 2005 to explain Region Two 2005-06 rehabilitation proposals, assess public opinion, and address local concerns. The announcement was provided statewide and to area papers and radio stations and hand delivered or mailed to landowners and residents near the lakes. No members of the public attended the Ephrata meeting. Approximately 15 landowners and residents near the lakes were contacted in person or by phone. Four of these contacts expressed some concern over DFW's management of the lake via rehabilitation and trout stocking, but after discussion only one person continued to oppose DFW's proposal to rehabilitate Warden Lake. With many of the lake's users living outside Grant County, actual percentages pro and con are difficult to obtain. Public support may be best judged by the number of participants in the fishery (via Recreational Impacts).

Initiated by: Region Two Fisheries Management

## LAKE MANAGEMENT PLANS

*updated July, 2005 - J.W. Korth*

**Water(s):** Quincy and Burke Lakes

**Location:** Quincy Wildlife Area, Sec 14, 15, 23 T19N R23E; approximately 6 miles south southwest of Quincy, Grant County, WA

	Size:	Maximum Depth:	Volume:
Quincy	62 acres	26 feet	667.0 acre feet
Burke	57 acres	27 feet	659.0 acre feet

**Water Source:** surface and subsurface seepage springs

**Outflow:** small creeks, eventually subsurface

**Management History:** Quincy and Burke lakes are the middle two of four adjacent waters. They have been managed as trout fisheries since the mid-fifties and continue to be popular opening day fisheries. The two lakes north and south (Stan Coffin and Evergreen Reservoir) are managed as warmwater fisheries. The greatest complicating factor in the management of Quincy and Burke lakes is recurring illegal introductions of yellow perch, largemouth bass, black crappie, bluegill and pumpkinseed sunfish. Both lakes have 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.

The season begins March 1<sup>st</sup>, and the season extends through July. Statewide regulations apply - the daily limit is five trout, and bait is allowed. Boating access is available at both lakes. Plants of rainbow trout occur annually, usually Goldendale rainbow. Yearlings based on the previous year's stocked fingerlings are typically 10 inches on opening day. When competing species are controlled, Burke and Quincy lakes are capable of producing excellent openers and good catches through late spring.

Burke and Quincy lakes are statewide resources. WDFW surveys since the early 1980's indicate less than 20% of the anglers attending these fisheries were from Grant County. Over 45% were from western counties. At least 9,000 angler trips per season were conservatively estimated on Burke Lake in 1983 and over 6,400 angler trips per season at Quincy Lake in 1988. Even on 'off' years, when ice and/or cold prevail, these waters attract 1-2,000 anglers on the opener. Participation at near-by Stan Coffin Lake, managed for warmwater fisheries, is estimated at less than 1,000 angler days *per season* during the best years after rehabilitation in 1992.

Rehabilitation and total fish eradication are not difficult enterprises for either lake; however, the re-introduction of spiny-rayed fishes will always be a problem because Burke and Quincy lakes are easily accessible and lie in close proximity to several other waters managed for spiny-rayed

fishes. Angler participation in the trout fisheries make these projects worthwhile relative to the amount of effort and cost involved in treatment even if required every five years.

*T&E Flora and Fauna:* Professionals from many resource fields have visited this site countless times during the last 40 years. No known report exists of any threatened or endangered species habitually found in or near these lakes. Occasional visits from both bald and golden eagles occur, although no nests of these two species are known in the area. Protected species of waterfowl and other birds frequently are found here at times, as well.

### Current Management Objectives:

March 1<sup>st</sup> through July 31, production type fishery. Five fish limit, no size or gear restrictions. Provide ~ 4 yearling rainbow trout per angler trip for 3-4,000 anglers on opening day, and 3 trout per angler for the remaining part of the season for at least 10,000 additional angler trips. These waters could sustain well over 15,000 angler trips per year.

#### 1. Fishery Objectives:

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg. Size</u>	<u>Exploit.</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Opening Day	2-3	4	11 inches	90% 1-yr-olds
		Season Average	2	3	12-14 inches	90% 1-yr-olds

2. Angler use objective (# angler days): Opening Day - 3-4,000; Season - 15,000

#### 3. Stocking Objectives:

<u>Lake</u>	<u>Species</u>	<u>Number of Fish Stocked</u>			<u>Planting Month</u>
		<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	
Quincy	Rainbow	30,000	500	<80	March
Burke	Rainbow	30,000	500	<80	March

#### E. Management Strategy:

- Plant rainbow fry in spring.
- Check yearling growth; should be about 11 inches, adjust stocking rate as necessary.
- Harvest 90% of yearling fish by end of season.
- Monitor all fish species periodically by electrofishing or netting.
- Substitute fall fingerlings for at least a portion of the spring fry when competing species begin to impact trout fry survival.
- Control spiny-ray species with rotenone when trout survival is inadequate to produce an acceptable fishery.

## PRE-REHABILITATION PLAN Quincy and Burke Lakes

### I. PROPOSAL

#### A. Justification for Proposed Rehabilitation

1-2. Burke and Quincy lakes, located on the Quincy Wildlife Management Area, are managed as trout fisheries. The season begins March 1<sup>st</sup>, and statewide regulations apply to limits. Stocking of rainbow trout occurs annually. When competing species are controlled, Burke and Quincy lakes are capable of producing excellent openers and good catches through late spring.

Both waters consistently turn out good trout fisheries after rehabilitation. Since new regulations limited the catch to five fish per day in 1984, post-rehabilitation catches of three to four fish per angler ensue, thereafter declining to less than one fish per angler before the next rehabilitation cycle. Yearlings based on the previous year's stocked fingerlings are typically 10-12 inches.

Periodic rehabilitation has been required to control populations of spiny-rayed fishes. Rehabilitation and total fish eradication are not difficult enterprises for either lake; however, the re-introduction of spiny-rayed fishes will always be a problem because Burke and Quincy lakes are easily accessible and lie in close proximity to several other waters managed for spiny-rayed fishes. Angler participation in the trout fisheries make this project worthwhile relative to the amount of effort and cost involved in treatment even if required every five years.

Burke and Quincy lakes are statewide resources. A WDFW surveys since the early 1980's indicate less than 20% of the anglers attending these fisheries were from Grant County. Over 45% were from western counties. At least 9,000 angler trips per season were conservatively estimated on Burke Lake in 1983 and over 6,400 angler trips per season at Quincy Lake in 1988. Even on 'off' years, when ice and/or cold prevail, these waters attract 1-2,000 anglers on the opener. Participation at near-by Stan Coffin Lake, managed for warmwater fisheries, is estimated at less than 1,000 angler days per season during the best years after rehabilitation in 1992. The cost for producing a mixed species fishery is an order of magnitude greater for the larger trout necessary to compete with other species and will not produce the same quality fishery that trout-only management can achieve.

3. Primary management of these waters is not for waterfowl production, although these rehabilitation tends to promote waterfowl use.

4. Burke Lake has been rehabilitated in 1966, 1970, 1975, 1977, 1983, 1987, 1993, and 1999. Quincy Lake has been rehabilitated in 1967, 1972, 1979, 1986, 1993, and 1999. WDFW policy states that lake rehabilitation is an option for eliminating illegally planted fish.

## B. Physical Description of Waters Proposed for Rehabilitation

1. WATER: Quincy Lake
2. LOCATION: Sec 14 & 15, T19N R23E Grant Co.
3. SURFACE ACRES: 62
4. MAX. DEPTH: 26 feet
5. VOLUME: 667.0 acre feet 1,813,002,048 lbs H<sub>2</sub>O
6. OUTLET: sub-surface
7. STREAM: MILES - NA FLOW (cfs): NA
8. PUBLIC ACCESS: Entire Lake 9. LAND OWNERSHIP: Public 100%; Private 0 %
10. ESTABLISHED RESORTS: None

1. WATER: Burke Lake
2. LOCATION: Sec 14,15,23 T19N R23E Grant Co.
3. SURFACE ACRES: 57
4. MAX. DEPTH: 27ft.
5. VOLUME: 659.0 acre feet 1,791,256,000 lbs H<sub>2</sub>O
6. OUTLET: sub-surface
7. STREAM: MILES - NA FLOW (cfs): NA
8. PUBLIC ACCESS: Entire Lake
9. LAND OWNERSHIP: Public 100%; Private 0 %
10. ESTABLISHED RESORTS: None

## C. Proposed Management Actions

1. WATER: Quincy Lake
2. TARGET SPECIES: pumpkinseed sunfish, largemouth bass
3. DATE LAST REHABED: October 1999
4. PROPOSED TREATMENT DATE: Fall 2005 - Spring 2006
5. REPLANTING DATE: February - May 2006
6. SPECIES: rainbow trout
7. CATCHABLES: 10,000 FINGERLINGS: 30,000
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 2 ppm  
AMOUNT (ROTENONE AT 5% ACT. INGRED): 3,600 lbs., 30 gal.
9. METHOD OF APPLICATION: pumper boat slurry and airboat/ATV spray
10. Crew Description: Leader(s) Jeff Korth Personnel 3-5

1. WATER: Burke Lake
2. TARGET SPECIES: yellow perch, pumpkinseed sunfish, may be other spiny-rayed fishes
3. DATE LAST REHABED: October 1999
4. PROPOSED TREATMENT DATE: Fall 2005 - Spring 2006
5. REPLANTING DATE: February - May 2006
6. SPECIES: rainbow trout
7. CATCHABLES: 10,000 FINGERLINGS: 30,000

8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 2 ppm  
AMOUNT (ROTENONE AT 5% ACT. INGRED): 3,600 lbs., 30 gal.  
9. METHOD OF APPLICATION: pumper boat slurry and airboat/ATV spray  
10. Crew Description: Leader(s) Jeff Korth Personnel 3-5

**TOTAL PROPOSED TOXICANT:** Rotenone CONCENTRATION: 2 ppm  
AMOUNT (ROTENONE AT 5% ACT. INGRED): 7,200 lbs. powder and 60 gal. liquid.

## II. PURPOSE:

Quincy and Burke lakes are the middle two of four adjacent waters. They have been managed as trout fisheries since the mid-fifties and continue to be popular opening day fisheries. The two lakes north and south (Stan Coffin and Evergreen Reservoir) are managed as warmwater fisheries. The greatest complicating factor in the management of Quincy and Burke lakes is recurring illegal introductions of yellow perch, largemouth bass, black crappie, bluegill and pumpkinseed sunfish. Both lakes have 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 both Burke and Quincy lakes 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 warm water 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 spiny-rayed fish populations 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 un-wanted species of fish 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 were found many nine inch, fat 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 the undesirable species and provided illegal plants are curtailed, the beneficial effects could be everlasting. If the undesirable 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 incursions across the state.

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

1. The populations of the target species will be severely and negatively impacted. All exotic species.

2. District and Regional Habitat, Wildlife and Non-Game biologists have been apprised of 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.

Both waters, and especially Burke Lake, were 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 probably benefit from the removal of the majority of the bullfrogs from these waters.

3. Loss of the year 2006 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. Provided catchable-sized fish are available the following spring, no loss of recreational fishing time will occur. The fingerling-based fishery will again be available by the spring of 2001. Trout survival and growth will be greatly enhanced. Participation in the trout fisheries will exceed that currently found for existing fisheries. Sizeable or desirable gamefish present, such as bluegill and largemouth bass, will be saved where possible for replanting in other area lakes. The 2005 season may also be extended to provide greater opportunity for harvest of the target species.

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 numbers of spiny-rayed fishes 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 the spiny-rayed fishes are removed from these waters and fingerling trout stocking programs are reinstated. Angler success should reach three to four fish per angler on opening day. Yearling trout should average about 11 inches. Carryovers should be expected to be about five percent of the catch, and average 14 inches for 2-year-old fish.

If both lakes produced good warmwater fisheries (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-sized trout in spiny-ray waters are so variable that angler interest generally wanes. Catchables stocked previous to rehabilitation to provide fisheries for the 1992, 1998, and 1999 openers produced less than one fish per angler, and participation was less than one third to one half the trips anticipated when fry are planted in competition free waters.

## **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.

lake. Disturbance of waterfowl during treatment or by the anticipated fishery will be offset by increased food availability as the uncontrollable numbers of spiny-rayed fishes 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 the spiny-rayed fishes are removed from these waters and fingerling trout stocking programs are reinstated. Angler success should reach three to four fish per angler on opening day. Yearling trout should average about 11 inches. Carryovers should be expected to be about five percent of the catch, and average 14 inches for 2-year-old fish.

If both lakes produced good warmwater fisheries (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-sized trout in spiny-ray waters are so variable that angler interest generally wanes. Catchables stocked previous to rehabilitation to provide fisheries for the 1992, 1998, and 1999 openers produced less than one fish per angler, and participation was less than one third to one half the trips anticipated when fry are planted in competition free waters.

#### **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 costs to Columbia Basin Hatchery to plant these lakes with 60,000 fingerlings is roughly \$5,220. The cost of stocking with 40,000 catchable-sized trout for the first season after the rehabilitation is \$26,000. The rehabilitation will cost the Department about \$17,000 (including costs of rotenone, time, travel). If the lakes are treated every five years on average (Burke averages 4.5 years, Quincy averages 6.5 years), the total five-year program would cost \$69,100.

The cost of stocking with catchable-sized trout, necessary to compete in a mixed species water, for the entire five year program is \$130,000. Raising catchable-sized 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-sized 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 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:

Quincy and Burke lakes will each be stocked with 30,000 rainbow trout fingerlings @ < 100/lb. Provided the fish are available, 10-20,000 catchable-sized rainbow trout will be stocked in each lake for the March 1<sup>st</sup>, 2000 opener. Creel checks will be done annually on opening day, and population surveys will occur as time is available.

#### IX. PUBLIC CONTACT:

A public hearing was held in Ephrata at 7pm on July 25, 2005 and in Olympia at 7pm on July 28, 2005 to explain Region Two 2005-06 rehabilitation proposals, assess public opinion, and address local concerns. The announcement was provided statewide and to area papers and radio stations and hand delivered or mailed to landowners and residents near the lakes. No members of the public attended the Ephrata meeting, and no other comment was received concerning DFW's proposal to rehabilitate these waters. With many of the lake's users living outside Grant County, actual percentages pro and con are difficult to obtain. Public support may be best judged by the number of participants in the fishery (via Recreational Impacts).

Initiated by: Region Two Fisheries Management

Attachment 1: Waters Proposed by WDFW for Treatment With Rotenone

Name Location		Grid Location		Size		Rotenone required @ 5%		Treatment History		Proposed Treatment		Added Comments
County	Water	Section	Township	Range	Acres	Acre Ft.	Powder (lbs.)	Liquid (gal.)	Years Previously Treated	Target Species	Treatment Dates	Outflow at Treatment
Grant	Warden	10,15	17N	29E	211	6330	23,125	45	66,69,80,91,99	BBH,PS,YP	Oct 06 or 07	Lind Coulee, can be blocked/treated
Grant	S. Warden	15	17N	29E	25	250	1,407	15	69,80,91,99	BBH,PS,YP	Oct 06 or 07	Warden Lk
Grant	Annex Lks	11,15	17N	29E	26	130	860	30	66,69,80,91,99	BBH,PS,YP	Oct 06 or 07	Warden Lk
Planned Treatment in Oct 2005 not accomplished												
Okanogan	Pearrygin Lk	1,6,31,36	35N	21E	212	6,620	18,002	30	51	LMB	Oct 06 or 07	None at time of treatment
Stevens	McDowell Lake	6,7,8	34N	41E	26,08	139	0	185	73,84,88	TNCH	October 06	Little Pend Orielle R - can be blocked
Okanogan	Long Lake	13	36N	29E	14	212	565	0	54,75,94	Spiny Rays	Autumn 2006	None
Grant	Park	10,11,15	24N	27E	342	13,049	58,000	15	59,63,76,81,86,96	PS,YP	October 06	To Blue Lk.
Grant	Blue	20,21,29	24N	27E	532	21,353	36,150	25	52,59,63,69,76,81,86,96	PS,YP	October 06	To Alkali Lk.
Grant	Alkali	36	24N	26E	308	2,449	0	0	52,59,63,83,96	PS,YP	October 06	None
							Powder (lbs.)	Liquid (gal.)				
							1182	36,851	40			
Alternate Lakes												
Little Pend Orielle Chain												
Pend Orielle	Leo	3	36N	42E	43	785	23,260	90	52,60,68,88,97	PS,YP	Fall 2006	Flows to Heritage Lk.
Stevens	Heritage	8,9,17	36N	42E	81	747	60,68,88,97	60,68,88,97	60,68,88,97	PS,YP	Fall 2006	Flows to Thomas Lk.
Stevens	Thomas	8,17	36N	42E	164	4,869	52,60,68,88,97	52,60,68,88,97	52,60,68,88,97	PS,YP	Fall 2006	Flows to Gillette Lk.
Stevens	Gillette	17,18,19,20	36N	42E	48	1,628	52,60,68,88,97	52,60,68,88,97	52,60,68,88,97	PS,YP	Fall 2006	Flows to Sherry Lk.
Stevens	Sherry	19,20	36N	42E	26	818	52,60,68,88,97	52,60,68,88,97	52,60,68,88,97	PS,YP	Fall 2006	None at time of treatment
Grant	Canal	28	17N	29E	92		10,600	20	59,68,75,82,87,90,97	PS,YP	Fall 06 - Spr 07	Pit Lk - can be blocked
Grant	Windmill	28	17N	29E	37		5,800	10	68,75,82,87,90,97	PS,YP	Fall 06 - Spr 07	Canal
Grant	N Windmill	27	17N	29E	20		1,850	20	75,90,97	PS,YP	Fall 06 - Spr 07	Windmill
Grant	NN Windmill	22	17N	29E	4		250	10	90,97	PS,YP	Fall 06 - Spr 07	N Windmill
Grant	June	21	17N	29E	11		840	10	90,97	PS,YP	Fall 06 - Spr 07	NN Windmill
Grant	Marco Polo	21	17N	29E	10		840	10	never been done	PS,YP	Fall 06 - Spr 07	None
Grant	Heart	28	17N	29E	26		4,800	10	59,87,97	PS,YP	Fall 06 - Spr 07	Canal
Grant	Dot	22	19N	23E	1		50	10	62,67,73,76	LMB, PS, YP	Fall 06 - Spr 07	U Spring
Grant	Cup	22	19N	23E	1		50	10	62,73,76	LMB, PS, YP	Fall 06 - Spr 07	none
Grant	Upper Spring	22	19N	23E	1		50	10	75,76	LMB, PS, YP	Fall 06 - Spr 07	L Spring
Grant	Lower Spring	22	19N	23E	1		50	10	75,76	LMB, PS, YP	Fall 06 - Spr 07	Cliff
Grant	Cascade	22	19N	23E	3		100	10	80,84	LMB, PS, YP	Fall 06 - Spr 07	Cliff
Grant	Crystal	16	19N	23E	2		100	10	never been done	LMB, PS, YP	Fall 06 - Spr 07	Dusty, can be blocked
Grant	Crystal	22	19N	23E	2		150	10	never been done	LMB, PS, YP	Fall 06 - Spr 07	Cascade
Okanogan	Leader	15,16	33N	25E	159	4,770	12,971	20	62,74,98	SMB, PS	Fall 2006	None at time of treatment
Irrigation reservoir, drawn down												

Dam at outlet, drawn down and r

Irrigation reservoir, drawn down

## Fall 2006 Treatment Preliminary Proposals

**Warden Lake (211 acres):** About five miles east of O'Sullivan Dam, just south of Road 7 SE. Last Saturday in April through September 30 open season. Rainbow and brown trout fingerlings are stocked annually, but survival has been poor due to sunfish and bullhead catfish competition. Rehabilitation is proposed for 2006 or 2007. Catchable-size rainbows will be added this year before the opener to ensure that Warden will be a good bet for large lakes in this area. An access with parking, toilets and a rough launch is available at the north end, and a resort at the north end has recently re-opened. Access at the south end off of Seep Lakes Road is for shore angling only. Please respect adjacent private property.

South Warden (24 acres) lakes: The opening date will be later in 2006, starting the last Saturday in April.

Annex (Index) Lakes, including Shay Pond, are 26 acres of small lakes feeding into the Warden Lakes drainage. These are on private lands, but need to be treated to keep invasive non-native fish from re-infesting the Warden lakes.

### Park Lake

**Park Lake (346 acres):** Located north of the city of Soap Lake in Sun Lakes State Park, this popular lake was rehabilitated in the fall of 1996, and excellent fisheries occurred in 1998 and 1999. Over 120,000 rainbow and brown trout fry should form the basis of a very good fishery on 10-1/2 to 11-inch yearlings. A good crop of carry-over rainbows in the 14- to 16-inch range can also be expected. In addition to the state park, there is a resort. Open season runs from the last Saturday in April through September 30.

**Park Lake (346 acres):** North of the city of Soap Lake in Sun Lakes State Park. Last Saturday in April through September 30 open season. This popular lake is stocked annually with more than 120,000 rainbow and brown trout fingerlings. Their survival has been poor, though, due to an over-population of perch, bullhead catfish, and other warmwater species. Larger fingerlings were stocked last fall and more catchable-size rainbows will be stocked for this year's opener. This should provide at least a fair fishery for nine- to 10-inch yearlings. Last rehabilitated in 1996, Park Lake will be proposed again for treatment in 2006. In addition to the state park, there is a resort.

### Alkali Lake

308 acre lake located nine miles north of Soap Lake on Hwy 17. Contains spiny rays and rainbows. Public access

**McDowell Lake (33 acres):** Located about 11 miles southeast of Colville, on the Little Pend Oreille National Wildlife Refuge, at 2300 feet elevation. Last Saturday in April through October 31 open season. Fly-fishing-only and catch-and-release are the rules here, and motorized boats are prohibited. Large rainbow and an occasional eastern brook trout provide good angling in the spring and again in the fall when water temperatures are cool. The department has trapped tench in recent years in an effort to improve fishing. Public access is walk-in only.

**Long Lake (17 acres):** Located in the Aeneas Valley chain of lakes, about 15 miles southeast of Tonasket. Last Saturday in April through October 31 open season. Fishing should be fair for 9- to 10-inch rainbow trout. There is a USFS campground with graveled boat launch.

**Blue Lake (Lime Belt) (15 acres):** Located in the Lime Belt 6 1/2 miles NW of Riverside. Year-round season. No record of previous treatments. Infested with Brown Bullhead catfish, resulting in poor trout fry survivals.

**Pearrygin Lake (212 acres):** One mile northeast of Winthrop on the Methow Wildlife Area. Last Saturday in April through September 30 open season. Expect good fishing for 10- to 11-inch rainbow trout, plus carry-overs to 15 inches. State park facilities and a public access with launch and toilets are available. Disabled accessibility - Level 2 at the state park, with accessible camping sites and an accessible fishing pier.