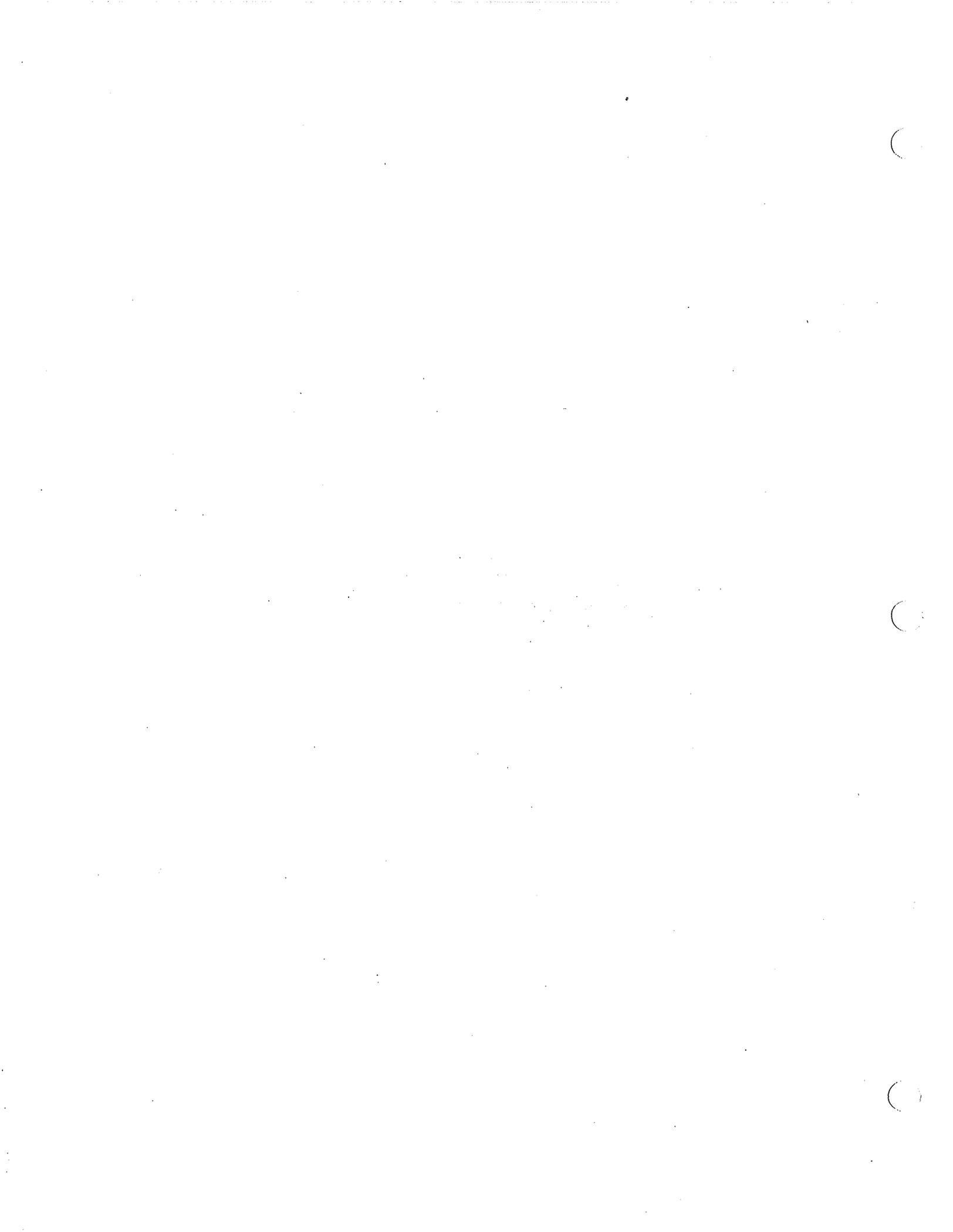


APPENDIX E
LAKES PROPOSED FOR REHABILITATION
1992



Quincy and Burke Lake Management Plans

Waters: Quincy and Burke Lakes

Location: Quincy Wildlife Area, Secs. 14 and 15, T19N, R23E, approximately five miles SW of Quincy, Grant County, Washington

Size: 62 and 57 surface acres, respectively

Maximum Depth: 26 and 27 feet, respectively

Water Source: Subsurface seep springs

Outflow: Westerly several hundred feet to disappear into basaltic fissures and rubble

Management History: Have been managed as trout waters for about 30 years. Annual stocking approximately 30,000 fry at 80 - 100 per pound. Stocking density averaged 500 - 550 fish per surface acre. Season originally opened in April and closed the end of September and produced opening day harvests of 50,000 trout of 11-inch size. This high early harvest made for a rapid fishout and an effective or productive season of about two weeks. The first chemical rehabilitations on these lakes occurred in 1966. Since that time the lakes have been subject to repeated illegal introductions of perch, pumpkinseed sunfish, largemouth bass and crappie. Tui chub have also been a problem in Quincy.

Rehabilitation was carried out as soon after presence of an unwanted species was detected as possible. Quincy Lake has been rehabilitated four times and Burke five times.

Serious upland habitat damage, litter accumulation and fire hazard resulted from the hundreds of campers and day-trippers visiting these waters in the usually sunny April days. In 1983 the season opening was changed to March 1 with a limit reduction to five fish and a subsequent earlier closing date of July 31.

Largely because of adverse weather and ice on the lakes, opening day crowds diminished and catch rates became highly variable. About 50 percent of the years finds ice still on during the March opener. Size of fish diminished as a consequence of shortened growing time. An earlier spawning rainbow stock (Goldendale) was used to partially compensate, i.e., obtain an average size of 10 - 10.5 inches.

Current Management Objectives: Manage as a trout-only water with a five fish limit and a season of March 1 - July 31. Provide an average harvest of 3 - 4 fish per person on opening day, realizing weather and ice conditions will cause some yearly variation in catch/effort. Stocking will continue at about 500 fish per acre, or 30,000 fry annually in each water. Maintain a carryover harvest of 13 - 17 inch rainbows that comprises 5 - 10 percent of the opening day catch. Monitor opening day effort and harvest as per the Brown Model. Check randomly for fishing success after the opening week. Sample prior to opening to estimate relative survival rate as weather conditions permit.

Sample also once each year for presence of non-trout species. Continue rehabilitations with rotenone as soon as possible after detection of unwanted fish species.

PREREHABILITATION PLAN

I. PROPOSAL

A. Justification for Proposed Rehabilitation

Burke and Quincy lakes are statewide resources. A WDW survey during the 1981-82 seasons indicated only 18% of those fishing Burke Lake were from Grant County. Over 45% were from western counties. A similar survey conducted in 1992 for all March 1 Opening Day waters indicated 20% participation from Grant County anglers and 47% of the total residing on the westside. Biologists in 1983 conservatively estimated 9,000 angler trips per season on Burke Lake, contrasted with an average estimate of 200 angler days on comparable warmwater lakes. Data collected at Quincy Lake in 1988 provides an estimate of over 6,400 angler trips per season.

After the 1977 rehab of Burke Lake, fish/angler reached a high of 8.8, declining to 1.1 just before the 1983 rehab. Catch limits on Burke were reduced to 5 fish per day in 1984. Catches after 1983 peaked out at 4.6 fish/angler and declined to 0.8 before the 1987 rehab. The Burke Lake rainbow fishery failed completely in 1991; no trout were checked the entire season. Quincy Lake was last rehabed in 1986 and catches peaked at 4.2 fish/angler in 1988. Only 1.7 fish/angler were recorded spring 1991 opening day. The 1992 fishery for both waters depended completely on catchables due to the complete failure of the fry plant.

Dr. Jim Walton and students from Peninsula State College investigated the fish populations of Burke Lake in 1991. The bulk of fish biomass was found to be yellow perch and pumpkinseed sunfish. Yellow perch made up 68.5% of the catch and the population was dominated by 2-3 year old fish. Sunfish comprised 31.5% of the total, and 2-4 year old fish dominated. Because of the weeds, collections of 0+ and 1+ fishes were difficult, and these age classes are probably vastly underestimated in the sample. Both species exhibited better than average growth their first year and less than average growth in later years. 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.

Gill net samples taken 1991 in Quincy Lake indicated largemouth bass were the most prevalent species in the lake, and 4-5 year old fish most abundant. Perch and bluegill were also present with 4 year olds again the dominant age class. No rainbow trout were captured. Growth for the bass and bluegill was average or better than average. Perch growth for the 4 year olds was slightly less than average.

Opening Day Catch and Effort Estimates:

Year	Angler Trips	Total Catch	Catch Hour	Catch Angler	Hours/Trip	Yrlg Size	Comments
<u>Quincy Lake -</u>							
1984			3.2		11.1		
1985			3.0		12.3		80 % Iced
1986							Spring Rehab
1987			3.5		9.5		Illegal Plant?
1988	1344	5647	3.6	4.2	1.9	11.2	
1989	104	219	1.3	2.1	1.6		Ice, Very Cold
1990			0.9	1.6		9.0	
1991			0.6	1.7		11.5	
1992	520	116	0.1	0.2	3.0	10.5	Catchables Planted
<u>Burke Lake -</u>							
1984			4.6		10.6		
1985			1.5		12.3		80 % Iced
1986			1.7		10.0		
1987	496	406	0.3	0.8	2.6	9.5	Fall Rehab
1988	254	131	0.3	0.5	1.8	8.2	Catchables Planted Illegal Plant?
1989	150	260	1.4	1.7	1.3		Ice, Very Cold
1990	352		454	0.4	1.3	3.5	10.0
1991	88	0		0	0	2.3	0 24 Checks
1992	781	1263	0.6	1.6	2.9	9.5	Catchables Planted

B. Physical Description of Water Proposed for Rehabilitation

1. Quincy Lake, Grant County
2. Sec 14 & 15, T19N R23E
3. 62
4. 26 ft.
5. 1,813,002,048 lbs.
6. Permanent
7. Miles: N/A, Flow: (cfs) N/A
8. Entire Lake
9. Public 100%, Private 0%
10. None

1. Burke Lake, Grant Co.
2. Sec 14,15,23 T19N R23E
3. 57
4. 27 ft.
5. 1,791,256,000 lbs.
6. Permanent
7. Miles: N/A, Flow: (cfs) N/A
8. Entire Lake
9. Public 100%, Private 0%
10. None

C. Proposed Management Actions

1. Quincy Lake
2. Largemouth bass, yellow perch, bluegill
3. March 1986
4. March 1993
5. Feb.-May '93
6. Rainbow trout

7. Catchables: 10,000, fry: 30,000
8. Rotenone, powder and liquid, 4 ppm
(Rotenone at 5% act. ingred.): 7,200 lbs., 30 gal.
9. Tow sack or slurry and spray
10. Jeff Korth (leader) and six to ten personnel

1. Burke Lake
2. Yellow perch, pumpkinseed sunfish, largemouth bass
3. October 1987
4. March 1993
5. Feb.-May '93
6. Rainbow trout
7. Catchables: 10,000, fry: 30,000
8. Rotenone, powder and liquid, 4 ppm
(Rotenone at 5% act. ingred.): 5,400 lbs., 30 gal.
9. Tow sack or slurry and spray
10. Jeff Korth (leader) and six to ten personnel

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 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

These lakes have a long history of being managed for trout and together account for approximately 15,000 angling trips per season when trout fishing is in its prime. A warmwater fishery will not create the same amount of recreation. 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. Proposed WDW policy states that lake rehabilitation is an option for eliminating illegally planted fish.

III. INTENDED OUTCOME/MEASURE OF SUCCESS

We intend to restore Quincy and Burke lakes to their former glory as trout only waters. Success of this measure will be apparent during annual creel surveys. Given a reasonable chance of eliminating the undesirable species and provided further illegal plants are curtailed, the beneficial effects should be everlasting. Aside from 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. Regional Habitat, Wildlife and Non-Game biologists have been appraised of our rehabilitation plans. No concerns were expressed on the potential impacts to non-targeted species for Quincy or Burke Lakes. Impacts to nontargeted resources in the lake are consistent with those covered in the Programmatic Environmental Impact Statement. 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) and herptiles are at risk. However, the chances of eliminating the entire population are minimal.
2. Quincy and Burke Lakes and their outflows are not used for domestic water, livestock watering, irrigation or skiing and related water sports. Swimming may occur infrequently during summer, but not during fall or spring when rehabilitations occur. A fishery is the primary use and the lakes support occasional waterfowl hunting in late fall.

Loss of the popular early spring fishery is likely during 1993 as the lakes will probably not detoxify in time for planting catchables. The existing warmwater fishery created by illegal planting will be eliminated.
3. No known endemic, rare, threatened or otherwise listed species will be impacted by the rehabilitation.

V. MITIGATING FOR ADVERSE IMPACTS

1. Trout fry survival and growth will be greatly enhanced, and future trout fisheries will attain their previous status. Catchable trout will be planted later in the spring to provide angling for the remainder of the season. Bluegill and largemouth bass will be saved, if possible, for replanting in other area lakes. The 1992 season will also be extended to provide greater opportunity for the harvest of the target species.

There will be no measurable impacts to waterfowl and waterfowl hunting. For a few weeks after the early spring rehab, invertebrate densities will be low, especially for zooplankton. This will have some adverse impacts to predatory invertebrates and ultimately to some wetland birds. Literature on this aspect and our own experience on these lakes and other nearby waters have shown little measurable changes in aquatic and terrestrial fauna beyond a few weeks. No mitigation for these impacts is deemed necessary as recovery is always rapid.
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. N/A
4. Protective wear for the eyes, face and hands will be supplied on-site for all purveyors of rotenone.
5. Lakes will be posted to discourage the public from consuming dead fish. In addition, enforcement agents will be on hand the day of the treatment to control public access and inform the public of the Department's action.

VI. RECREATIONAL IMPACT: ALSO SEE PROPOSAL I.A.

Fry plants are no longer an option for either Quincy or Burke, thus the only valid comparisons are with a warmwater or a mixed species fishery. If both lakes produced good warmwater fisheries (Burke has already overpopulated and produces no appreciable warmwater fishery), 400-500 trips per season are estimated. This is roughly 3 % of the 15,000 trips per season produced by a good trout only fishery. The results of catchable fish plants are so variable that angler interest will probably wane somewhat. Catchables planted for the 1992 opener produced roughly one third to one half the trips anticipated when fry are planted in competition free waters.

VII. ECONOMIC IMPACTS:

Using angler days estimated for Burke Lake and the 1983 WDG estimate of \$31.71 generated per angler day, that fishery had an annual value of \$285,390 to the state's economy. Quincy Lake estimates for 1988 of 6,400 trips produces \$202,944. Current estimates would be higher. The fishery as it now exists generates far less as participation decreases with the declining trout catch. Rehabilitation would bring back the fishery and associated economic activity.

Current total costs to Columbia Basin Hatchery to plant both lakes with 30,000 fry each is less than \$4,800. The cost of planting with advanced fry or legal, which are necessary to compete in a mixed species water, would exceed \$14,800. These rehabilitations will cost the Department conservatively \$20,000 (including time, travel, etc.). If rehabilitations continue to occur every four years, the cost of fry plants (4 yrs.), one catchable plant (optional-sustains the fishery on a rehab year), and the rehab totals \$54,000. Provided illegal activity does not resume and further rehabilitations are no longer necessary, the cost to manage for the same four year period equals \$19,200 for fish plus the cost of an opening day creel survey and analysis.

Maintaining a mixed species fishery and planting advanced fry (planted in the fall, rather than spring) every year for four years costs \$44,600, with as yet unknown results. Planting catchables every year for four years costs \$66,700 for fish alone. Hatchery space and water are fully utilized in accomplishing the current area program, and other waters would suffer cutbacks if greater numbers of larger fish were to be raised. In addition, Department time and equipment dollars to manage this type of fishery may be considerable in the long term.

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

See I.C.6. for fish planting data

Emergency regulation changes should be enacted to lengthen the season (currently March 1 to July 31). A season extension will allow increased harvest of available fish. Recommend until October 1, 1992. These waters will also be closed to the taking of fish for the period of the rehabilitation.

We are also proposing rehabilitation of nearby warmwater fisheries (see Coffin, H, Ancient Lakes proposal). Fish salvaged from Quincy will be used to repopulate these waters. Hopefully, we will convince the public that WDW is sincere in our commitment to manage area waters for both warmwater and trout fisheries.

Dr. Jim Walton and his students have conducted a thorough study of Burke Lake during 1991 and intends a follow-up after the rehabilitation. Region Two will investigate Quincy Lake. We intend to treat both lakes in two stages, approximately one month apart, to assure ourselves, once again, of a complete kill.

Increased penalties and enforcement activities are desirable if WDW is ever going to dissuade illegal plantings of state managed waters. Education of the public as to the costs in Department dollars and time, emphasis on what WDW might be able to accomplish with those resources, is advisable. This might help in terms of stemming recruitment to this ill advised group and turning local opinion against the offenders. This type of action would be a very worthwhile activity for I & E.

IX. PUBLIC CONTACT

With approximately 80% 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 (vis a vis Recreational Impacts).

Anglers at Quincy and Burke Lakes were queried as to being in favor of or against plans to rehab those lakes. Of the total, 71% were in favor of rehabilitation. Among anglers from the westside, 82% were in favor, while only 63% of eastside anglers favored keeping Quincy and Burke trout only lakes. Grant Co. anglers were split almost 50-50. My observations indicated that those opposed to the rehab wanted these waters managed as mixed species lakes (i.e. trout plus spiny rays). Only 1% of the total were at these lakes to fish for species other than trout. Additional creel survey days are planned for the summer to evaluate the warmwater anglers.

A public meeting was held May 21, 1992 in Ephrata to explain the rehabilitation plans for these waters and address local concerns. The meeting was announced in three area papers a week to three days in advance. Only three non-Department people attended, one being a newspaper reporter. Although many questions were raised, all in attendance seemed to understand and support the Departments plan, perhaps with some reservation. Either interest is lacking energy or the concerned parties have already decided their course of action. Proponents are probably the former and opponents the later.

Initiated by: Region Two Fisheries Management

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Stan Coffin, "H", and Ancient Lake Management Plans

Waters: Stan Coffin, H and Ancient Lakes

Location: Quincy Wildlife Area, Secs. 9, 10, and 11, T19N, R23E, approximately five miles SW of Quincy, Grant County, WA

Size: 54, 8 and 30 surface acres, respectively

Maximum Depth: 20, 17 and 25 feet, respectively

Water Source: Subsurface seep springs

Outflow: Average 1 cfs from Stan Coffin draining into H Lake and in turn into one of the Ancient Lakes group. Two of the Ancient Lakes are isolated and fed by subsurface seep springs.

Management History: Over 20 years ago the system was used to divert excess water from irrigation canals to the Columbia River. Ancient Lake then was a single, large lake of several hundred acres in size. It has since drained via natural fissures in the basalt underlayment to four small ponds totalling about 30 acres.

In recent years, irrigation managers have not used the system for canal diversion, but still retain the right to spill canal water through the system in an emergency. Management has had to contend with entry of several species of fish coming in from the canals. Development of sustainable warmwater or trout fishery was never satisfactorily achieved. The potential became evident with cessation of irrigation spills and the system was first rehabilitated in 1984. The plan was to develop a fishery centered on largemouth bass and bluegill. Following the rehab, broodstock bass and bluegill were released into Stan Coffin, H and three of the four Ancient lakes. The fourth pond in the Ancient pod was too shallow to support a fishery. Regulations were enacted to protect the few mature bass and maintain a sizeable population of large predators to counteract population growth of carp and other species. A slot limit sought to protect bass between 12" and 17". The plan was not effective because carp and pumpkinseed sunfish survived the chemical treatment in high numbers and quickly repopulated the system.

Rainbow trout were also planted after the 1984 rehab and provided a good fishery until competition by other species made trout releases ineffective.

Current Management Objectives: Manage as a warmwater lake with emphasis on largemouth bass and bluegill under present regulations of a daily catch limit of five bass, not more than 3 over 15 inches in length, and no slot limit on length. Season length will be year around.

Rehabilitation in the fall of 1992 will be necessary to build a satisfactory warmwater fishery. Broodstock will be collected from Quincy Lake prior to a planned spring, 1993 rehab for Quincy. Trout fry will also be planted annually at a density of 200 - 300 fish per acre until bass and bluegill populations expand to attractive harvest levels. This approach will provide angling opportunity during the first few years. We hope to develop

informational signs outlining the management plan and install these at each lake. It is hoped this step will discourage people from restocking these and the Quincy/Burke group themselves. In addition, this group of lakes may likely require periodic, partial rehabilitations to maintain predator/prey balance and/or to reduce numbers of undesired species which might re-enter the system.

PREREHABILITATION PLAN

I. PROPOSAL

A. Justification for Proposed Rehabilitation

Stan Coffin, H, and Ancient Lakes lie north of Quincy and Burke lakes on the Quincy Wildlife Area. Until the late 1960's, this chain of lakes was used as a spillway for the irrigation project, rendering maintenance of a scrapfish-free fishery impossible. As of 1977, the Bureau of Reclamation agreed not to release water through this drainage, barring an emergency. Rehabilitation was attempted in 1978 at 1 ppm rotenone without success. In 1984, 2 ppm rotenone was applied, yet carp and possibly other undesirable species persist. This is probably due to the physical attributes of the system (shallow, suspended organics, water temperature, littoral zones, etc.) creating a need for higher than normal concentrations of rotenone to achieve toxic levels.

Stan Coffin and the associated lakes currently provide virtually no fishery due primarily to the presence of carp and to a lesser extent sunfish. Populations of perch are severely stunted, and very few bass large enough to entice anglers remain. Warmwater fisheries of this size should produce 200-300 angler trips per year. Currently, so few anglers fish these waters that no angler contacts could be made.

Past attempts at this management scheme have failed for reasons already explained, but this is not reason to discontinue our efforts. Discouraging results should only illustrate that we have more to learn. We propose to try once again to rehabilitate these waters, employing greater concentrations of rotenone and varying techniques. These lakes will be re-stocked with largemouth bass and bluegill. This proposal is closely associated with the proposed Quincy/Burke rehabilitation.

B. Physical Description of Water Proposed for Rehabilitation

1. Stan Coffin, Grant County
2. Sec 10 & 11, T19N R23E
3. 54
4. 20 ft.
5. 799,134,336 lbs.
6. Permanent
7. Miles: .125, flow: (cfs) N/A
8. Entire Lake
9. Public 100%, Private 0%
10. None

B. Physical Description of Water Proposed for Rehabilitation (con't)

1. "H" Lake, Grant County
2. Sec 10 T19N R23E
3. 8
4. 17 ft.
5. 220,016,906 lbs.
6. Permanent
7. Miles: N/A, Flow: (cfs) N/A
8. Entire Lake
9. Public 100%, Private 0%
10. None

1. Ancient Lakes, Grant County
2. Sec 9 T19N R23E
3. 30
4. 25 ft.
5. 1,223,164,800 lbs.
6. None
7. Miles: N/A, flow: (cfs) N/A
8. Entire Lake
9. Public 100%, Private 0%
10. None

C. Proposed Management Actions

1. Stan Coffin Lake
2. Carp, yellow perch
3. March 1984
4. October 1992
5. Apr.-Aug. '93
6. Largemouth bass, bluegill
7. Broodstock: 100, fry: 30,000
(dependent on capture and production success)
8. Rotenone, powder and liquid, 4 ppm
(Rotenone at 5% act. ingred.): 3,200 lbs., 60 gal.
9. Tow sack or slurry and spray
10. Jeff Korth (leader) and six to ten personnel

1. "H" Lake
2. Carp, yellow perch
3. March 1984
4. October 1992
5. Apr.-Aug. '93
6. Largemouth bass, bluegill
7. Broodstock: 100, Fry: 30,000
(dependent on capture and production success)
8. Rotenone, powder and liquid, 4 ppm
(Rotenone at 5% act. ingred): 900 lbs., 15 gal.
9. Tow sack or slurry and spray
10. Jeff Korth (leader) and two to three personnel

C. Proposed Management Actions (con't)

1. Ancient Lakes
2. Carp, yellow perch, pumpkinseed sunfish
3. March 1984 4. PROPOSED TREATMENT DATE: October 1992
5. Apr.-Aug. '93
6. Largemouth bass, bluegill
7. Broodstock: 100, Fry: 30,000
(dependent on capture and production success)
8. Rotenone, powder and liquid, 4 ppm
(Rotenone at 5% act. ingred): 4,850 lbs., 15 gal.
9. Tow sack or slurry and spray
10. Jeff Korth (leader) and two to three personnel

II. PURPOSE

Removal of undesirable species and restocking with proper ratios of spinyray fishes is the best available option of managing these relatively small lakes for warmwater fisheries. Barring interference from over-zealous "helpers", these waters should produce fine warmwater fisheries.

III. INTENDED OUTCOME/MEASURE OF SUCCESS

The successful recovery of this warmwater fishery will be measured by random creel checks and biological sampling. Treatment will occur in two stages, to assure ourselves of a complete kill. The fishery will not actually reach its prime for 3-4 years and then continue to function for another 2-3 years before further management is required. The long term duration of beneficial effects will depend on how well Fisheries Management learns to manipulate these small warmwater fisheries, a new task for most of us.

If fish are available, we propose to stock rainbow trout for 3 - 4 years (fry origin) to provide an interim fishery until bass and bluegill reach harvestable numbers and size.

IV. RESOURCE IMPACTS

1. Regional Habitat, Wildlife and Non-Game biologists have been appraised of our rehabilitation plans. Non-Game found records of night heron nesting activity in the western marshes of Stan Coffin and was concerned for the disturbance of such during the rehab.

Impacts to nontargeted resources in the lake are consistent with those covered in the Programmatic Environmental Impact Statement. 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) and herptiles are at risk. However, the chances of eliminating the entire population are minimal.

2. These lakes are not used for domestic water, or by livestock, or for irrigation. Fishing is the primary use. A small amount of waterfowl hunting occurs also.

Loss of spinyray fishes will occur, but these are not currently supporting much of a fishery due to either small size or lack of abundance, depending on the species.

3. No known endemic, rare, threatened or otherwise listed species will be impacted by the rehabilitation.

V. MITIGATING FOR ADVERSE IMPACTS

1. Both fry survival and growth of largemouth bass and bluegill populations will be greatly enhanced. Night heron nesting activity will be unaffected as rehabilitation will occur during the fall. There will be no measurable impacts to waterfowl and hunting. The same is true for other non-targeted terrestrial species which use this water during spring through fall. The lakes are frozen in winter. By spring, aquatic invertebrates will have returned to former, or even greater, abundance to provide forage for non-target wildlife.
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. N/A
4. Protective wear for the eyes, face and hands will be supplied on-site for all purveyors of rotenone.
5. Lakes will be posted to discourage the public from consuming dead fish. In addition, enforcement agents will be on hand the day of the treatment to control public access and inform the public of the Department's action.

VI. RECREATIONAL IMPACT: ALSO SEE PROPOSAL I.A.

Quantification of increased use is currently impossible due to lack of data. These waters should be capable of producing 200-300 angler trips per season on each water. Provided trout fry become available and are stocked as an interim fishery, several hundred more angler trips each year can be assured for the first 3 - 4 years.

VII. ECONOMIC IMPACTS:

Using the 1983 WDG estimate of \$31.71 generated per angler trip, these waters should have an annual value of \$6,000 to \$10,000 to the state's economy. Warmwater fisheries of this size do not favorably compete with trout fisheries in terms of angler days and subsequent revenue generation. However, the maintenance of a good warmwater fishery in this area is inextricably tied to the success of other area fisheries. Maintaining variety in angling opportunity will also serve to encourage maximum participation.

VIII. RELATED MANAGEMENT ACTION: See I.C.6.

Bluegill and largemouth bass will be saved, if possible, for replanting in other area lakes. The 1992 season will also be extended to provide greater opportunity for the harvest of non-target species. Recommend until October 1, 1992. These waters will also be closed to the taking of fish for the period of the rehabilitation.

We are also proposing rehabilitation of nearby trout fisheries (see Quincy and Burke Lakes proposals). Fish salvaged from Quincy will be used to repopulate these waters. Hopefully, we will convince the public that WDW is sincere in our commitment to manage area waters for both warmwater and trout fisheries.

While the merits of this project stand on their own, the timing of the proposal itself is a related management action. If approved, this will be the first time that both warmwater and trout lakes in the area will be included in a single rehabilitation project. The Department will be showing "good faith" in treating both fisheries equally, and hopefully proponents of both will learn something of the management endeavors necessary to each type of program.

The warmwater fishery will likely require periodic partial rehabs or other means to control overabundance and maintain age class composition. In the future, special regulations might also be employed if conditions warrant.

As for the Quincy/Burke proposal, enforcement and education related to illegal stocking activities is very desirable.

IX. PUBLIC CONTACT

Unlike the opening day trout waters, most of the users of this warmwater fishery are probably local (Grant County). Opposition to this particular part of the overall plan is not expected. Public support may be best judged by the number of participants in the fishery (vis a vis Recreational Impacts). Additional creel checks (random) are planned for the 1992 summer to evaluate the warmwater anglers.

A public meeting was held May 21, 1992 in Ephrata to explain the rehabilitation plans for these waters and address local concerns. The meeting was announced in three area papers a week to three days in advance. Only three non-Department people attended, one being a newspaper reporter. Although many questions were raised, all in attendance seemed to understand and support the Departments plan.

Initiated by: Region Two Fisheries Management

Upper Caliche Lake Management Plan

Water: Caliche Lake, Upper

Location: Quincy Wildlife Area, Sec. 27, T18N, R23E, approximately five miles west of George, Grant County, WA

Size: 21 surface acres

Maximum Depth: 25 feet

Water Source: Surface and subsurface seep springs

Outflow: Average 2 - 3 cfs draining West into Lower Caliche and West Caliche, to eventually disappear into the ground about one mile from Upper Caliche

Management History: A series of lakes (four in group) have been managed for trout since their formation by elevated ground water from irrigation development over 20 years ago. Irrigation diversions and/or periodic breaks in canal systems allowed carp to enter these waters several years ago and four rehabs, the first in 1975, have been unsuccessful in total irradiation. Trout production has been very good and anglers use this small lake heavily with harvests generally high at about 4.5 fish per person on openers. Annual stocking densities have ranged as high as 850 rainbow fry per surface acre. In recent years stocking rates have dropped to 500 fish per acre. Growth has been excellent with fish averaging 11 inches on the opener. A fish barrier (permeable rock gabion) was installed on the dike built by WDW to form this lake, but has deteriorated to the extent that carp may be entering from Lower Caliche. Lower Caliche and the remaining waters in this drainage also supported good trout fisheries in their early years, but have not been managed for many years because of access by carp from private lands.

Current Management Objectives: Continue management of this popular water as a trout-only lake. Retain present season of March 1 - July 31 and daily catch limit of five trout per angler. Provide an average harvest of 3 - 4 fish per person on opening day, realizing weather and ice conditions will cause some yearly variation in catch/effort. Stocking will continue with 10,000 Goldendale rainbow fry at a density of 500 per acre. Maintain an a small carryover harvest of 13 - 15 inch rainbows that comprises 3 - 5 percent of the opening day harvest. Monitor opening day harvest and effort as per the Brown Model. Check randomly for fishing success after the opening week. Sample prior to opening to estimate relative survival of fry plant and growth/condition as weather permits. Sample once each year for presence of non-trout species. Continue rehabilitations with rotenone as soon as possible after detection of unwanted fish species. Reconstruction of the outlet fish barrier is currently funded and would be desired to prevent upstream migration of carp.

PREREHABILITATION PLAN

I. PROPOSAL

A. Justification for Proposed Rehabilitation

The persistence of carp in the Caliche Lakes has had a detrimental effect on the fishery. Rehabilitated in 1983, catch rates reached 4.9 fish per angler two years in a row in this 5 fish limit water before carp again flourished. Rehabilitation was again necessary in 1988. Low catch rates and unusually large yearlings in 1990 was the harbinger of bad news: poor fry survival. The 1991 catch rate reached 3.2 fish per angler, however yearling size was unusually small. Net samples taken that same summer indicated complete failure of the 1991 spring fry plant and a plethora of three year old carp. Failure of the outlet isolation barrier or an incomplete kill probably occurred immediately after the last rehab. The 1992 fishery was propped up with a catchable plant which yielded 4.0 fish per angler.

This March 1 opening day water is very popular because of its location near several communities and the easy accessibility. Catchables are usually planted whenever problems occur since large crowds are expected regardless of mediocre angling the previous year. Opening day 1992 provided an estimated 353 angler trips and 1,413 fish caught. By contrast, neighboring Lower Caliche, no longer planted and abandoned for the near future, had about 16 trips with 1 trout caught.

B. Physical Description of Water Proposed for Rehabilitation

1. Caliche Lake, Upper, Grant Co.
2. Sec 27, T18N R23E
3. 21
4. 25
5. 679,536,000 lbs
6. Permanent
7. .25 miles, Flow (cfs) 1.0
8. Entire Lake
9. Public 100%, Private 0%
10. None

C. Proposed Management Actions

1. Caliche Lake, Upper
2. Carp
3. October 1988
4. October 1992
5. April-May 1993
6. Rainbow trout
7. Catchables: 5,000 Fry: 10,000
8. Rotenone, powder and liquid, 4 ppm
(Rotenone at 5% act. ingred): 2,800 lbs., 90 gal.
9. Tow sack, spray
10. Jeff Korth (leader) and four to six personnel

II. PURPOSE

Upper Caliche Lake was once connected to the irrigation canals, whereby carp had established their minions in this water. Extensive marshes, springs and problems with isolation make this a difficult rehabilitation. Funding has been established for repairs to the outlet barrier and for the purchase of equipment which will render this rehabilitation more effective. An ATV with spray attachment will be used to treat the extensive marshes and pumps will be used to slurry powdered rotenone and reach the springs. Treatment will occur in two stages, at least two weeks apart, to assure ourselves of a complete kill.

III. INTENDED OUTCOME/MEASURE OF SUCCESS

This effort intends the restoration of the fry managed trout fishery for recreational as well as economic reasons. Annual creel surveys on opening day will be the measure of success. The complete elimination of carp from a system of this type is a challenge and certainly no certainty. Without a complete kill we can expect 3 - 5 years of good to excellent angling before rehabilitation is again necessary.

IV. RESOURCE IMPACTS

1. Regional Habitat, Wildlife and Non-Game biologists have been appraised of our rehabilitation plans. No concerns were expressed on the potential impacts to non-targeted species for Caliche Lakes. Impacts to non-targeted resources in the lake are consistent with those covered in the Programmatic Environmental Impact Statement. 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) and herptiles are at risk. However, the chances of eliminating the entire population are minimal.
2. Loss of the opening day fishery will ensue unless funding and hatchery space are authorized for the rearing of catchable trout.
3. No known endemic, rare, threatened or otherwise listed species will be impacted by the rehabilitation.

V. MITIGATING FOR ADVERSE IMPACTS

1. Trout fry survival and growth will be greatly enhanced, and future trout fisheries will attain their previous status. Catchable trout will be planted, if possible, for opening day anglers and to provide recreation for the remainder of the season. The 1992 season will also be extended to provide greater opportunity for the harvest of the remaining trout.
2. Those waters downstream not to be treated currently are also plagued by the target species and are future rehabilitation candidates.
3. N/A
4. Protective wear for the eyes, face and hands will be supplied on-site for all purveyors of rotenone.
5. Lakes will be posted to discourage the public from consuming dead fish. In addition, enforcement agents will be on hand the day of the treatment to control public access and inform the public of the Department's action.

VI. RECREATIONAL IMPACT: ALSO SEE PROPOSAL I.A.

Fry plants are no longer an option for Caliche Lake. Catchable trout plants have so far lured anglers to this water in normal numbers, but the results of catchable fish plants are so variable that angler interest may eventually wane somewhat. Catchables are also usually smaller and considered by many anglers to be of poorer quality than lake reared fish. Catchables planted for the 1992 opener produced roughly the same number of trips anticipated when fry are planted in competition free waters.

VII. ECONOMIC IMPACTS

Using angler trips estimated for Caliche Lake and the 1983 WDG estimate of \$31.71 generated per angler trip, that fishery had an annual value of \$11,194 to the state's economy. Current estimates would be higher. The fishery as it now exists may eventually generate far less as participation decreases with the variable trout catch. Rehabilitation would ensure the associated economic activity.

The 10,000 fish fry plant currently costs the Columbia Basin Hatchery about \$800. The cost of planting catchables would exceed \$3,000. This rehabilitation will cost the Department approximately \$10,000 (including time, travel, etc.). If rehabilitations continue to occur every four years, the cost of fry plants (4 yrs.), one catchable plant (optional-sustains the fishery on a rehab year), and the rehab totals \$16,200. Planting catchables every year for four years costs \$12,400 for fish alone. This also assumes the Department is able to provide the facilities to raise catchables for this water every year. Provided a complete kill is achieved, and rehabilitations are no longer necessary, the cost to manage for the same four year period equals \$3,200 for fish plus the cost of an opening day creel survey and analysis.

VIII. RELATED MANAGEMENT ACTION

See I.C.6. for fish planting data

Emergency regulation changes should be enacted to lengthen the season (currently March 1 to July 31). A season extension will allow increased harvest of available fish. Recommend until October 1, 1992. These waters will also be closed to the taking of fish for the period of the rehabilitation.

If available, catchable trout will be planted prior to opening day.

The complete elimination of carp from this part of the system is essential to reclaiming the downstream resources. Depending on our success at Upper Caliche, Lower Caliche and possibly one other lake downstream would be proposed for rehabilitation in the future. These projects are also dependent on isolation structures and/or landowner cooperation.

IX. PUBLIC CONTACT

A public meeting was held May 21, 1992 in Ephrata to explain the rehabilitation plans for this water and address local concerns. The meeting was announced in three area papers a week to three days in advance. Only three non-Department people attended, one being a newspaper reporter. Although many questions were raised, all in attendance seemed to understand and support the Department's plan. With approximately 80% 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 (vis a vis Recreational Impacts).

Initiated by: Region Two Fisheries Management

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BINGEN LAKE WETLANDS HABITAT IMPROVEMENT PROJECT

By The Columbia Gorge Audubon Society

The Columbia Gorge Audubon Society would like to present a plan for improving the wetland habitat of Bingen Lake, located along the Columbia River at Bingen, Washington. We propose to implement these ideas in conjunction with, and complementing, the Port of Klickitat's acceptance of Bonneville Spoils to raise the elevation of land surrounding the lake in preparation for development. We initiated this project at the invitation of the Port of Klickitat, and look forward to working together.

Wetlands and ponds are one of the planet's most productive and diverse ecosystems. Unfortunately, the US Fish and Wildlife Service has reported to Congress that 53% of the wetlands in the lower 48 states had been lost by 1990 (Dahl, 1990). Washington state lost 31% of its wetlands (Dahl, 1990). Although most of this loss has been attributed to draining and filling for agriculture and urban development, many remaining areas have been degraded by sedimentation and contamination (Turner 1990).

These losses place an ever greater importance on maintaining our existing wetlands, and ensuring that they provide high quality habitat for floral and faunal communities. We believe that project work at Bingen Lake offers us a unique chance to enhance the habitat quality of the lake and wetlands, while providing aesthetically pleasing educational and recreational opportunities for the public.

DESCRIPTION OF THE LAKE AND ITS USE

Bingen lake is located along the Columbia river at Bingen, Washington. The lake is approximately 20 acres, including the associated wetlands. The flora of the lake and a description of the method used to determine the wetland boundary are presented in a letter from IES Associates, (appendix A). The predominant emergent vegetation surrounding the lake are cattails, reed canarygrass, and willows.

The Columbia Gorge Audubon conducted a bimonthly waterfowl survey, from November 1990 through March 1991, to determine the winter usage of the lake. We discovered that the lake is used primarily by puddle ducks (mallards, green-winged teal, American widgeon, and wood ducks) and Canada geese, with some common mergansers, great blue heron, and coot. The vegetation surrounding the lake was used extensively by other birds, which were noted for species, but not counted. This information has been given to the Washington Department of Wildlife for analysis, and will be attached to this report when available.

There is no significant inflow of water into the lake, nor any outflow. Water levels are manipulated by a pump at the west end of the lake, which pumps water into and out of the Columbia river.

The area surrounding the lake has been farmed for several years for vegetables. We are concerned about the water quality of the lake, which may contain substantial levels of fertilizers and possibly pesticides. The results of a preliminary water quality analysis of the lake by Marc Harvey on August 2, 1990 at 10:15am were: lake depth = 14 inches, water temperature = 18.2c, dissolved oxygen at 12 inches = 8.9, pH = 8.8, nitrate (NO3) = 2mg/l, nitrite (NO3) = 1mg/l, ammonium nitrogen = <0.1 mg/l. We have not yet interpreted this data.

A fisheries survey of the lake will be conducted by John Weinheimer, with results attached to this report when available. Carp are clearly inhabiting the lake, and are strongly suppressing the development of submergent and emergent vegetation. They keep the water muddy and the lake bottom stirred up.

Bingen lake and the surrounding property is owned by the Port of Klickitat. The Port has agreed to accept up to 1.5 million cubic yards of rock and soil "spoils" from the Bonneville dam, for the purpose of raising the ground level surrounding the lake in preparation for commercial or industrial development. This material is projected to arrive approximately August 1992.

In August and September 1991, the Washington Department of Transportation deposited approximately 50K yards of excavated material at Bingen lake. The material was used to create a berm around the south and west end of the wetlands. The berm is sloped 3:1, and will be covered with topsoil and seeded with annual grass when completed. Installation of a silt fence at the bottom of the berm has been recommended.

It is the Farmers Home Administration understanding that the "first level of berm around the lake will be set back 50 and then raised 6 or 8 feet then go back another 50 feet. This second level will not be developed beyond trails, paths, interpretive areas and etc." (See appendix B).

PROJECT PREPARATION PHASE

The Columbia Gorge Audubon Society conducted several meetings at the lake, during which we solicited the advice and concerns of the Port of Klickitat, the Washington Department of Wildlife, US Fish and Wildlife Service, the Environmental Protection Agency, the Washington Environmental Council, the Underwood Conservation District, and Friends of the Columbia Gorge. The following issues, concerns, and opportunities were identified:

- 1) **Lack of water flow into and out of lake, and resultant water quality.** Water quality and any effects on flora and fauna need to be determined. Perhaps the Washington Department of Wildlife or the Institute of Environmental Toxicology and Chemistry (Western Washington University) could be of assistance.

There is a potential opportunity to develop a source of inflowing water by creating a wetland in the northeast corner of the land surrounding the lake. This created wetland might serve to expand the secondary sewage treatment plant across

(5)

the street. It is our understanding that the water discharged from the sewage treatment plant already meets quality standards, since it is currently discharged directly into the Columbia River. Concern about this program include the potential for a treatment failure to contaminate the lake water, although perhaps a safety valve might be arranged to prevent contamination. This idea merits further investigation.

If oxygen levels are insufficient, perhaps removal of the carp, followed by plantings of sago pondweed, arrowhead wapato duck potato, and other plants in the lake might suffice to improve the water quality and oxygen levels. Otherwise, it might be possible to purchase an oxygen aerator to install in the lake.

- 2) There is a concern about potential conflicts of interest between the Port's plans for development and the life history requirements of target wildlife species. Farmers Home Administration has asked the Port to slope the lands created by the spoils away from the lake, so that runoff should not pose a problem. We are concerned that noise levels associated with post-development not be overly disruptive. Visual disturbance should be mitigated by strategic plantings. In areas where physical access to the lake might not be desired, thickets of blackberry or other vegetation could be planted.
- 3) We are concerned about the carp population in the lake. Carp destroy submergent and emergent vegetation, and keep the waters turbid. We believe that removal of the carp would significantly increase the productivity of the lake for breeding puddle ducks and provide significantly greater winter forage for all wildlife. John Weinheimer will survey the lake and give us his recommendations.
- 4) There was a concern as to how this wetland fits into the larger picture of wetland habitats in the Columbia Gorge area and how we might tailor our actions to complement the habitat network of native flora and fauna. Tara Zimmerman indicated that this lake was probably one of only two shallow water foraging areas for waterfowl in the Columbia Gorge area. David Anderson felt that the lake would provide foraging opportunities for great blue heron that nest on nearby Wells island. Harold Cole felt that an interpretive trail around the lake would be complementary to the Conboy wildlife refuge, in that it would allow people a close up view of wetland ecology that is not accessible to the public at the refuge.
- 5) We will be looking to the Port of Klickitat and the Washington Department of Wildlife for aid in submitting appropriate permits, and for help in completing the enhancement projects.
- 5) We believe that there are several potential funding sources to complete the work, or to provide equipment and materials,

(4)
potentially: Washington Department of Wildlife Habitat Improvement Program, the Volunteer Cooperative Fish & Wildlife Enhancement Program, Ducks Unlimited, Port of Klickitat, US Forest Service, and Columbia Gorge Audubon Society.

- 7) Maintaining the habitat and the interpretive trail will be the cooperative responsibility of the Port of Klickitat and the Columbia Gorge Audubon Society.

OUR GOAL

To enhance the wetland ecosystem at Bingen Lake so that it will consist of more typical and more productive wetland floral and faunal communities, and will provide a greater diversity of habitats. We would also like to develop a trail around the lake to provide educational opportunities for wetland interpretation, and to provide an aesthetically pleasing wetland focal point for surrounding development and the local community.

ENHANCEMENT PROPOSALS

1. **REMOVE CARP FROM THE LAKE.** There are two possible ways to accomplish this: dry up the lake, or apply rotenone to poison the fish. John Weinheimer will advise and assist us. Following the removal, measures will need to be taken to reduce the likelihood of reintroduction of carp to the lake. This will probably result in the need for some type of screening or filtering of river water that is pumped into the lake. Additionally, we might utilize public education opportunities along the trail.

Once the lake has been cleared of carp, we would like to see it restocked with other suitable fish species. Gambouzi were recommended to feed upon mosquitos. At this time, it is not our intention to encourage a sport fishery at the lake.

2. **BUILD THREE EARTH ISLANDS IN THE LAKE.** Assuming that the lake can be dried up temporarily, bulldozing equipment that will be moving the Bonneville spoils might be utilized to push up rock and lake-bottom material into three islands. Two islands are designed with indented and asymmetrical shapes, and with gently sloping edges (3:1) for basking, nesting and cover. They should have an elevation of 3-4 feet above the water level. The north side of the islands would be planted with shrubs, maybe some trees, and the south side would be designed to retain a mud or grit beach. Logs would be placed on the islands, for perching or sunning. Two islands would be placed in the north half of the lake, about 2 acres and 1 acre in size. These sizes would probably necessitate the addition of spoil material to create the islands. The exact location might take advantage of any naturally high spots in the lake bottom. They would be placed and designed to provide visual screening and refuge for ducks. The third island would be in the south end of the lake and would emphasize mud flat habitat.

would be about 0.25 acre in size, and would have an elevation of about 1 foot above water level.

3. **BUILD AND INSTALL THREE NESTING BASKETS FOR CANADA GOOSE.** This is primarily to provide educational and aesthetic opportunities for the public. Baskets will be placed 300 feet apart, with the top edge 30 inches above water level. Baskets will be constructed of pipe and hardware cloth, and will be supplied with straw or hay nesting material seasonally by the Audubon Society. Alternatively, nest platforms of wood could also be designed.
4. **DREDGE AREAS OF THE LAKE TO FIVE FEET.** This would be to provide habitat for diving waterfowl, such as mergansers. It would also help provide a diversity of habitat in the lake, by controlling the establishment of certain plants. A varied contour of lake bottom would an interspersions of open water and emergent plants. If the lake is drained, this could be done in conjunction with building the islands.
5. **CREATE EIGHT POTHoles.** These are designed to provide territorial sites for breeding waterfowl. Potholes allow breeding pairs to disperse and maintain a measure of isolation from other members of the same species. Potholes would be located in the beds of cattails and canarygrass along the edges of the lake. If the lake is drained, preferably potholes would be scraped or excavated by construction equipment in order to create a wedge shaped bottom contour, which would provide a shallow sloped edge for ducks, regardless of water level. Bulldozing equipment could be used to also scrape meandering ditches connecting the potholes with the open water. Alternatively, potholes could be created by blasting a hole with ammonium nitrate fuel oil mixture. While possibly less expensive, these type of potholes have much steeper, almost vertical edges, less favorable for puddle ducks.
6. **STOCK THE LAKE WITH PRODUCTIVE AND AESTHETIC PLANTS.** Sago pondweed is one of the best all around duck foods available. Ducks feed on the seeds, then later on the tubers. It is also highly beneficial for fish, as it purifies and clarifies the water by taking up poisonous gases and releasing oxygen. Sago pondweed also shades and keeps the water below it cooler. Arrowhead wapato duck potato is also prized by ducks, geese and swans. This plant will filter polluted water, since it feeds heavily on phosphorus, potash, and other nutrients (which might be in high concentration due to the history of agriculture on the surrounding lands). Nodding smartweed and three-square rush also provide ample seed production for ducks. Several other plants, such as American lotus waterlily and blue and yellow water iris can be planted along strategic viewing areas from the trail. Plant tubers might be transferred from other wetlands or purchased from Kester's Wild Game Food Nurseries.
7. **DETERMINE ANY WATER QUALITY NEEDS.** (See concern #1 above.)

8. DEVELOP AN INTERPRETIVE TRAIL AROUND THE LAKE. In northeast corner of the lake, the trail will access a wooden viewing platform built over the water's edge. In the southeastern corner of the lake, the trail will consist of a boardwalk to actually allow visitors to walk through wetland vegetation. Along the northern and western ends of the lake, the trail would stay a distance from the lake, and along the southern edge of the lake the trail would pass relatively close to the wetland boundary, with an established viewing area. Interpretive signs would be developed to provide public educational opportunities. Benches would be constructed at the southern and northeastern viewing points. Shrubs which provide wildlife foods and pleasing aesthetics would be planted strategically along the trail to minimize wildlife disturbance, and to attract wildlife to the viewers. Nest boxes and bird feeders might be placed along the trail, depending upon commitment to their maintenance and public use. Educational opportunities might include self-guided brochures and occasional Audubon-led tours. A program will be developed and distributed to local schools encouraging classes to visit the wetland ecosystem. Trail should be designed to be easily maintained, and to minimize littering opportunities.

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June 18, 1991

Laurie Smith, President
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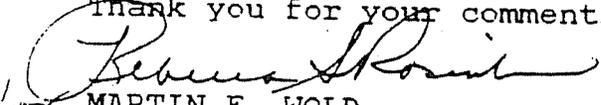
Dear Laurie:

We appreciate your input to the developments concerning Bingen Lake and the Port of Klickitat Industrial Park. In our discussions with the port they have expressed a desire to work closely with your organization as they plan the developments at the industrial park.

We too are concerned about drainage from the streets and roads into Bingen Lake. We are planning to require mitigation to the extent possible with slope requirements, drains to the Columbia and etc.

It is our understanding that the first level of berm around the lake will be set back 50 feet and then raised 6 or 8 feet then go back another 50 feet. This second level will not be developed beyond trails, paths, interpretive areas and etc. This appears to be a practical alternative to a 100 foot set back with a 15-18 ft slope to the top. It was our understanding that this concept was developed with at least partial input from you.

Thank you for your comments and suggestions.


MARTIN E. WOLD
Chief, Community and Business Programs

PREREHABILITATION PLAN

I. PROPOSAL

A. Justification for Proposed Rehabilitation

This is the Washington Department of Wildlife prerehabilitation plan for Bingen Lake in Bingen, Washington. The purpose of this rehab is to rid this shallow 20 acre lake/wetland area of carp to provide high quality waterfowl habitat. The carp are currently suppressing the development of submergent and emergent vegetation and keeping the water muddy and the bottom stirred up. This rehab is being done in conjunction with the Columbia Gorge Audubon Society and the Port of Klickitat County.

The fishery of the lake as it exists now is primarily carp and, to a lesser extent, bullhead. The lake is only 1.5 feet deep and water temperatures become severe during the winter and summer for other fish. The lake receives very little or no fishing pressure and many other local waters contain the same fish such as the mainstem Columbia and its numerous backwater areas north of Highway 14.

If the carp are eliminated, the lake/wetland area has the potential to become an excellent waterfowl habitat based on the survey work done by the Audubon Society and our own Wildlife Management Division. In addition to enhancing the habitat, the Audubon Society feels this rehab in conjunction with other work to be done will offer educational and recreational opportunities for the public about waterfowl.

B. Physical Description of the Water Proposed for Rehabilitation

1. Bingen Lake, Klickitat County
2. Township 3 North, Range 11 East, Section 29
3. 20 acres including vegetated area
4. 1.5 feet deep at deepest point, lake is very shallow
5. Estimated volume at full pool = 1,306,800 cubic ft.
Estimated volume at rotenone treatment = 326,700 cubic ft. = 2,456,391 gallons of water.
6. There is no significant natural inflow or outflow of water. Water levels are manipulated by a pump operated by the Port of Klickitat at the west end of the lake.
7. Stream miles = 0
8. Developed public access = 0
9. The lake and the surrounding area are owned by the Port of Klickitat County. The Port has agreed to accept up to 1.5 million cubic yards of rock and soil "spoils" from the Bonneville Dam for preparation for commercial and industrial development of the land around the lake. This is scheduled to start August, 1992.
10. There are no developed resorts or recreation areas.

C. Proposed Management Actions

1. Carp are the target species
2. Lake has not been rehabilitated before.
3. Proposed treatment is September, 1992.
4. Restocking of fish is not being recommended at this time.
5. None.
6. 0
7. Proposed toxicant is Cube Powder fish toxicant powder, 5% rotenone. 41 lbs. are estimated to be needed.
8. Lake will be pumped down as low as possible starting in June. Hopefully most of the remaining water will evaporate during the summer and rotenone treatment will start in September.
9. Estimate three WDW employees and two to three volunteers from the Audubon Club.

II. PURPOSE

The purpose of this rehab is to rid the lake of carp to optimize its potential as waterfowl habitat. The proposed enhancement of the waterfowl habitat by the Audubon Society is dependent on the elimination of the destruction of the aquatic vegetation caused by the carp population. See the Columbia Gorge Audubon Management Plan for Bingen Lake, "Bingen Lake Wetlands Improvement Project".

III. INTENDED OUTCOME/MEASURE OF SUCCESS

The intended outcome is an increase of submergent and emergent vegetation in the lake which will enhance the food availability and cover for waterfowl. Unless carp are reintroduced, this condition should last at least a decade.

IV. RESOURCE IMPACTS

The lake has been surveyed by our Wildlife Management Division for sensitive species, none were found. The rehab may make the lake a possible candidate for western pond turtle introduction. The lake is not used for any human uses anymore. Impacts to nontargeted resources in the lake are consistent with those covered in the Programmatic Environmental Impact Statement.

V. MITIGATION FOR ADVERSE IMPACTS

1. The Lake will be dried up as much as possible during the summer to reduce the amount of rotenone needed to treat the lake. Dead fish will be gathered up and taken to a renderer.
2. The lake has no downstream resources.

3. No rare species of plant or animal are found in the lake.
4. Applicants will comply with all safety rules.
5. Area will be posted to discourage public from collecting dead fish.

VI. RECREATIONAL IMPACT

The rehab will aid in the development of excellent waterfowl habitat and interpretive sites and trail for viewing by non-consumptive users. This site will be used by schools, clubs, and the general public as a site to view wetland ecology.

VII. ECONOMIC IMPACT

The area will be valuable to the community and the port.

VIII. RELATED MANAGEMENT ACTION

This rehab is in cooperation with the Columbia Gorge Audubon Society at their request to help with their proposed enhancement plans for waterfowl habitat. See "Bingen Lake Wetlands Habitat Improvement Project" by the Columbia Gorge Audubon Society.

IX. PUBLIC CONTACT

The Columbia Gorge Audubon Society has conducted several meetings with Washington Department of Wildlife, U.S. Fish and Wildlife Service, the Environmental Protection Agency, the Washington Environmental Council, the Underwood Conservation District, the Port of Klickitat County, and the Friends of the Columbia Gorge, about the enhancement of the lake which included the use of rotenone to get rid of the carp. All were favorable to the above actions. Several letters from the above agencies and clubs are available.

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PREREHABILITATION PLAN

I. PROPOSAL

A. Justification for Proposed Rehabilitation

The lake was enhanced for waterfowl habitat value by constructing dikes to separate/isolate it from Winchester Wasteway in 1984 and removal of carp and other fish in March 1985. Construction of dikes was funded jointly by WDW (Wildlife Management Division) and Washington Duck Hunters, Inc.

After rehabilitation, the lake appeared fish-free and remained very production for waterfowl through summer of 1989. Presence of carp was suspected (murky water) in 1989 and confirmed in the fall of 1990. The method of reintroduction is unknown but was likely that an incomplete kill occurred or carp were transplanted by humans or fish-eating birds (e.g., terns, herons, gulls).

Duck broods have been counted annually in the lake since 1983 (Fig. 1). In 1983 and 1984 (prerehab) a total of three broods (2 in 1983 and 1 in 1984) were observed on the lake during brooding counts. From 1985 to 1989 (postrehab) the number of broods observed on the lake averaged 106 annually, with a peak count of 142 broods in 1986.

B. Physical Description of the Water Proposed for Rehabilitation

1. Unnamed lake in Desert Unit of the Columbia Basin, WA, Grant County
2. TWN (18N), RGE (26E), SEC (11,14)
3. 75 surface acres
4. Maximum depth, approximately 6 feet. Average depth, approximately 3 feet.
5. 225 acre feet
6. Lake has no outlet and has no surface water connection to Winchester Wasteway and adjacent lakes, ponds, and wetlands.
7. N/A
8. Lake is approximately 1 mile from WDW access area on Dodson Road.
9. One hundred percent publicly owned (U.S. Bureau of Reclamation).
10. No resorts.

C. Proposed Management Actions

1. Carp
2. March, 1985
3. September 30, 1992 or March, 1993
4. No fish are to be restocked.

5. N/A
6. N/A
7. Rotenone, powder, 1 ppm, 450 pounds at 5 percent concentration, and 5 percent liquid concentration, 3 ppm 1,822 pounds powder and 20 gallons liquid.
8. Dispense rotenone from bags behind boats. Spray shoreline emergent zone with liquid.
9. Four people and one crew leader

II. PURPOSE

The primary objective of the carp removal is to improve quality of duck brood-rearing habitat. The pond is large and near optimum depth for maximum value to most species of ducks. Increased production and availability of submergent aquatic vegetation (primarily sago pondweed) and invertebrates after carp removal will also support more waterfowl use during other seasons of the year. Several species of aquatic wildlife will benefit from the rehab.

In its present state, the lake's primary limiting factor to waterfowl production and use is the presence of carp. However, the presence of other species of fish that would compete with ducks for invertebrates and the presence of fishermen disturbing waterfowl would also substantially limit waterfowl habitat value. In order to maximize benefit to waterfowl and other aquatic wildlife, the lake will be managed to remain fish-free.

III. INTENDED OUTCOME/MEASURE OF SUCCESS

Removal of carp is expected to result in increased production and use by ducks similar to the increase observed after the initial rehab in 1985.

Duck pair counts (May) and brood counts (July) are made annually. Nongame species are counted in conjunction with duck counts on the lake.

The lake can be expected to remain productive for at least 5 years postrehab, similar to that observed after the initial rehab and provide high-quality waterfowl habitat.

IV. RESOURCE IMPACTS

- A. Prior to the initial rehab the lake's fish population was dominated by carp but also had smaller numbers of pumpkin seed sunfish, bluegill, crappie, yellow perch, largemouth bass, bullhead, and sucker. Carp made up approximately 75 percent of the total fish number and about 95 percent of biomass. Species composition in the lake now is likely similar to that before the initial rehab, but no sampling has been done. A large number of carp, approximately 2-3 pound in size were observed in the lake in May, 1991.

- B. Impacts to nontargeted resources in the lake are consistent with those covered in the Programmatic Environmental Impact Statement.

V. MITIGATING FOR ADVERSE IMPACTS

- A. The lake is remotely located (approximately 1 mile from the nearest road) and is visited rarely by people except during waterfowl hunting season. It is not likely there would be a need to remove dead fish from the site or schedule the rehab for a specific time to reduce potential inconvenience to the public.
- B. The lake has no outlet and thus would not require protection of downstream resources.
- C. N/A
- D. Applicators will wear protective clothing and masks to reduce contact with rotenone.
- E. Signs will be posted at the lake to discourage public from collecting dead and dying fish.

VI. RECREATIONAL IMPACT

Prior to the initial rehab in 1985 the lake appeared to have a very low intensity fishery with less than 50 man-days annually of fishermen seeking primarily largemouth bass. No fishermen or evidence of fishing have been seen at the lake since 1985. The lake has been visited by the area wildlife biologist (Jim Tabor), approximately 6-8 times annually. On this basis, no loss of fishing recreation would occur as a result of the proposed rehab.

Increased waterfowl production and use at the lake would provide increased hunter opportunity/satisfaction and possibly recreation days for waterfowl hunters. The lake is also an important hunting site because in a carp-free condition it is attractive habitat for ducks during the hunting season.

VII. ECONOMIC IMPACT

The proposed rehab would be expected to provide a favorable cost/benefit ratio. Assuming a 5-year project life, the lake can be expected to produce about 100 duck broods (600 ducklings) annually, similar to that observed after the initial rehab, for a total of 3,000 ducklings. Cost of the rehab would be about \$3,000, for a cost of \$1.00 per duckling. In addition to ducklings produced, the improved habitat quality would support a large increase in waterfowl and other aquatic wildlife use-days.

Funding for the proposed rehab is the waterfowl stamp/artwork program

VIII. RELATED MANAGEMENT ACTION

None are anticipated.

IX. PUBLIC CONTACT

This rehab would be expected to produce little if any public controversy or concern, primarily because no fishery has existed in the pond since May 1985 and a very low-level one existed before 1985.

This proposed rehab will be included in the public meeting presented by Region Two Fisheries Management Division on May 21, 1992.

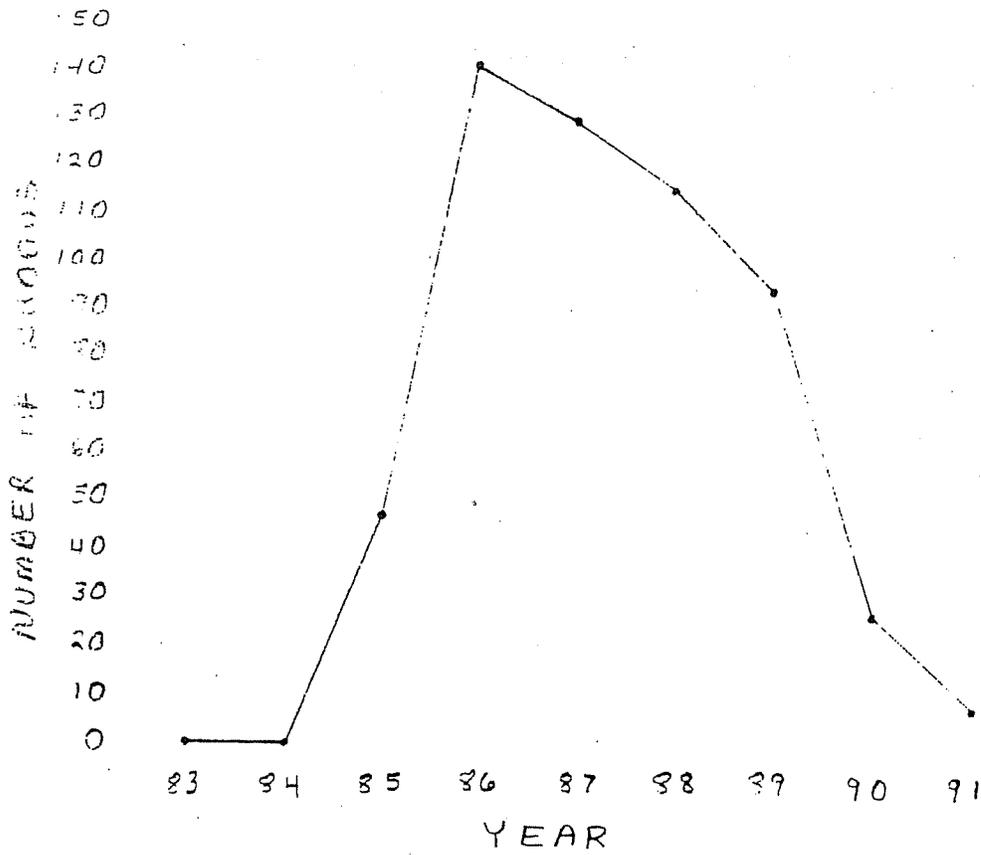
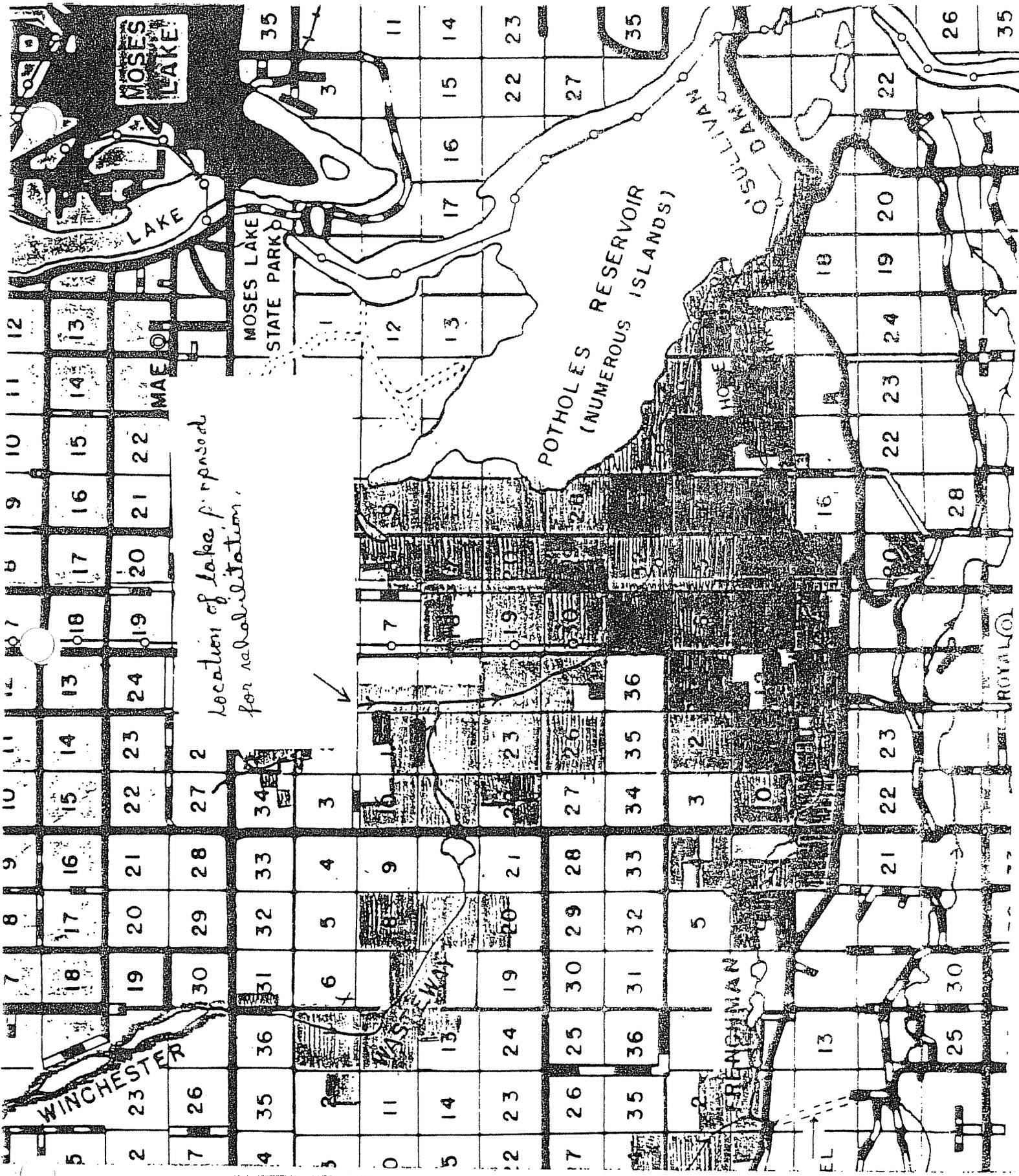
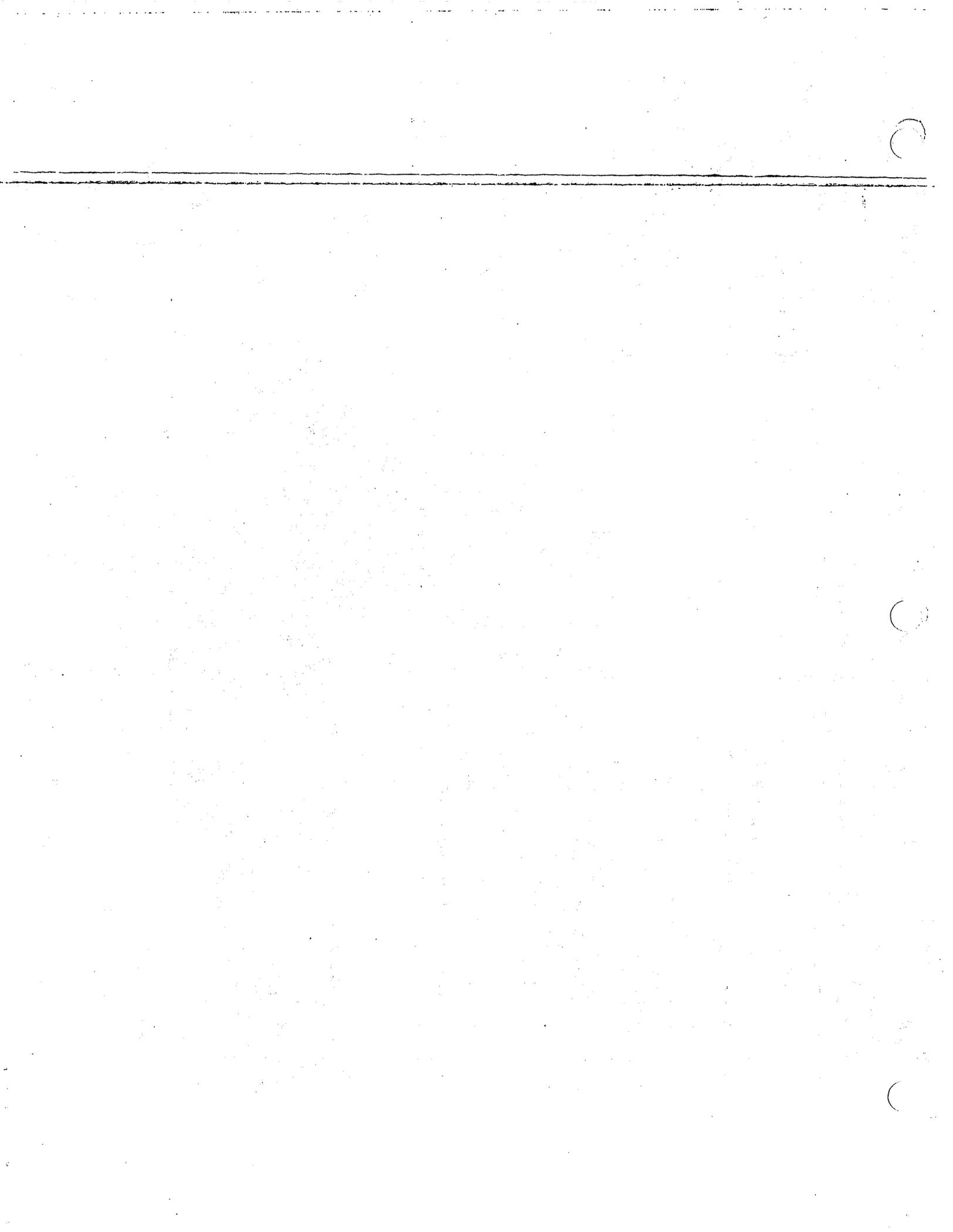


Figure 1. Number of duck broods counted in lake proposed for rehabilitation. This lake was rehabed in March 1985 (for first time). Presence of carp were suspected in 1989 and confirmed in 1990.





Buck Lake Management Plan

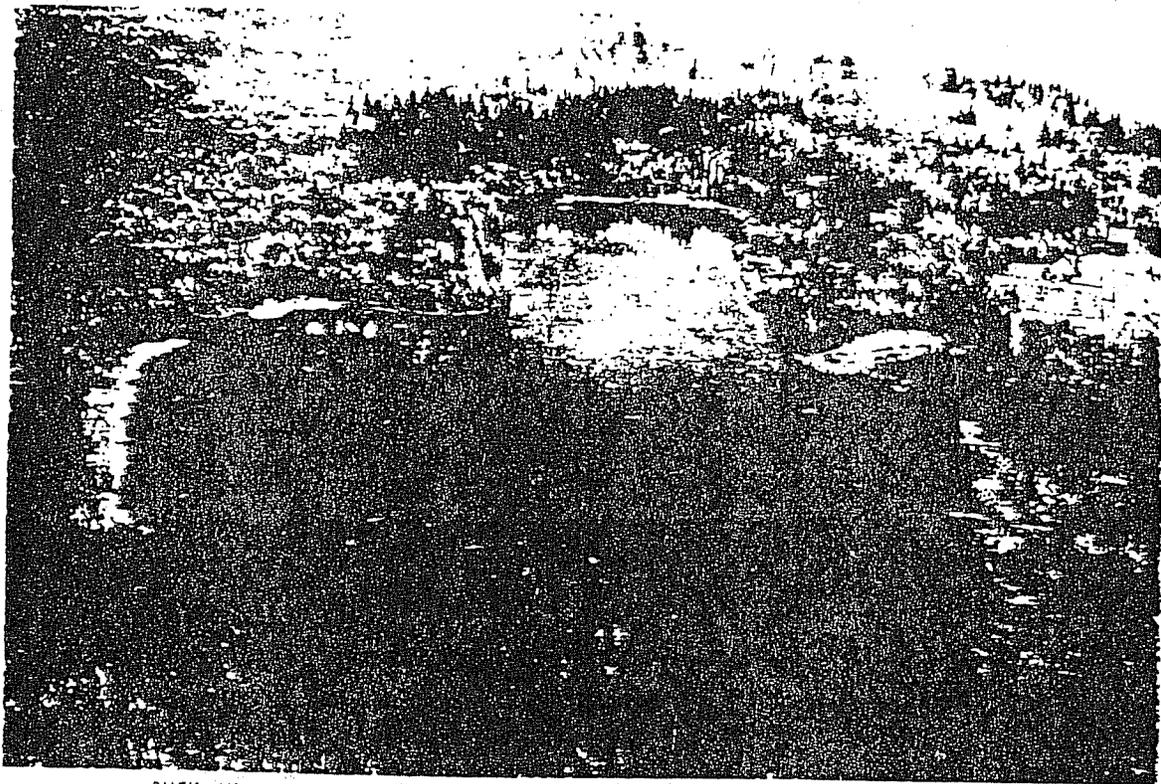
1) Location - Description: Kitsap County (Twp 28n Rge 2E Sec 21) located 1 1/2 miles southwest from Hansville. Volume of water is 157 acre feet and is 20 surface acres in size. It has an intermittent outlet stream and the north end shoreline is primarily covered with cattails.

2) Past and Present Recreational Fisheries: Recreational fisheries both past and present on Buck Lake have been dominated by rainbow trout anglers. The primary catch has been from fingerling stocked rainbow that reach an average of 11 inches by spring of the following year. Catchables are also stocked to supplement the recreational fishery due to the lake's remote location and popularity for trout fishing. See attached table for documented opening day catch statistics.

Fish Stocking Records:

<u>Year</u>	<u>Species</u>	<u>Number Fish</u>	<u>Size (#/lb.)</u>
April 92	Rainbow	2,000	5.0 (catchable)
May 92	Rainbow	1,000	4.0 (catchable)
March 91	Rainbow	2,550	5.0 (catchable)
May 91	Rainbow	1,200	4.0 (catchable)
May 91	Rainbow	8,010	89.0 (fingerling)
April 90	Rainbow	1,320	4.4 (catchable)
May 90	Rainbow	1,450	5.0 (catchable)
June 90	Rainbow	5,025	75.0 (fingerling)
June 90	E. Brook	498	6.0 (catchable)
May 89	Rainbow	1,802	5.3 (catchable)
June 89	Rainbow	5,025	75.0 (fingerling)
March 88	Rainbow	1,500	5.3 (catchable)
June 88	Rainbow	8,400	80.0 (fingerling)
March 87	Rainbow	2,502	5.7 (catchable)
June 87	Rainbow	7,865	65.0 (fingerling)
April 86	Rainbow	2,002	4.5 (catchable)
March 85	Rainbow	1,500	4.4 (catchable)
May 85	Rainbow	8,800	44.0 (fingerling)

4) Current Management Objectives: The present management objective of Buck Lake is to restore and maintain an active trout fishery from stocking fingerling rainbow trout annually and a supplemented catchable plant after opening day.



BUCK LK—Kitsap Co—T28N—R2E—Sec 21—Looking N'ly
 —————
 —————

Kitsap C

Section

25-B

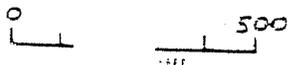
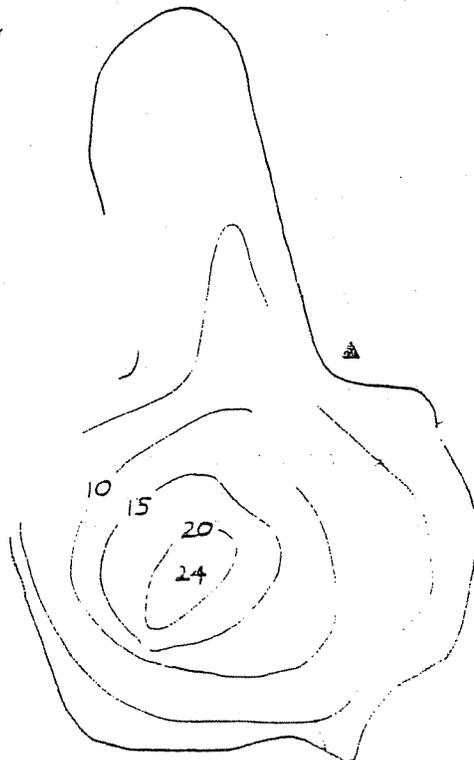
21-M

27-H

33-J

21-D

BUCK LAKE — KITSAP COUNTY
 T 28 N — R 2 E — Sec 21
 22 Surface Acres
 Surv. by State Dept of Game
 Volume — 57 Acre Feet



PREREHABILITATION PLAN

I. PROPOSAL

A. Justification for Proposed Rehabilitation

1. See graph that shows catch rates prior to last rehabilitation and after.
2. Seventy-five (75) to 100 angler days based on opening day creel information.
3. N/A
4. N/A

B. Physical Description of the Water Proposed for Rehabilitation

1. Buck Lake, Kitsap County
2. TWN (28N), RGE (2E), SEC (16,21)
3. 22 surface acres
4. See map
5. 157 acre feet
6. Intermittent outlet stream
7. N/A
8. Two developed access areas. Department of Wildlife boat access and County park.
9. Ten (10) percent public land ownership and 90 percent private.
10. County park used for swimming and fishing.

C. Proposed Management Actions

1. Largemouth bass
2. September 30, 1986
3. ~~September 30, 1992~~
4. April, 1993
5. Rainbow trout
6. 3,000 catchables and 8,000 fingerling
7. Rotenone, powder, 1 ppm, 450 pounds at 5 percent concentration
8. Dispense rotenone from bags behind boats
9. Four people and one crew leader

I. PURPOSE

The purpose of the proposed rehabilitation is to eradicate the largemouth bass fish population in order to reduce competition for food and eliminate predation of rainbow fingerling plants. Buck Lake is managed for trout only, employing primarily fingerling plants at approximately 400 fish per surface acre.

Buck Lake has been rehabilitated through the use of rotenone in 1950 and 1986 to control and eradicate the undesirable and illegally introduced speices of warmwater fish, primarily largemouth bass.

5) Regulations: Buck Lake is open for the general lake season.

c:\hueckel\buck-lk.mgt

III. INTENDED OUTCOME/MEASURE OF SUCCESS

Duration of beneficial effects should be five to ten years, and success will be measured by opening day creel checks and annual settings of gill nets.

IV. RESOURCE IMPACTS

- A. Impacts to nontargeted resources in the lake are consistent with those covered in the Programmatic Environmental Impact Statement.
- B. Potential impacts to human related uses include loss of recreational fishing opportunity during the month of October, and some swimming days at the county park.
- C. None that are known.

V. MITIGATING FOR ADVERSE IMPACTS

- A. Department of Wildlife personnel will remove dead fish from shoreline at county park to reduce any impacts to swimmers.
- B. None
- C. None
- D. Standard method of application and safety precautions will be employed.
- E. Department of Wildlife personnel will be present at the time of rehabilitation and signs will be posted around the lake.

VI. RECREATIONAL IMPACT

Angler participation will be increased by approximately 75 to 100 on opening day and a 25 to 50 percent increase annually. Angler success will probably double on fingerling stocked fish.

VII. ECONOMIC IMPACT

Economic benefits to our program include a reduction of catchable plants (3,000 fish) made annually to Buck Lake and a possible increase in license sales from increased angler participation. The local community will also benefit economically from increased angler participation.

VIII. RELATED MANAGEMENT ACTION

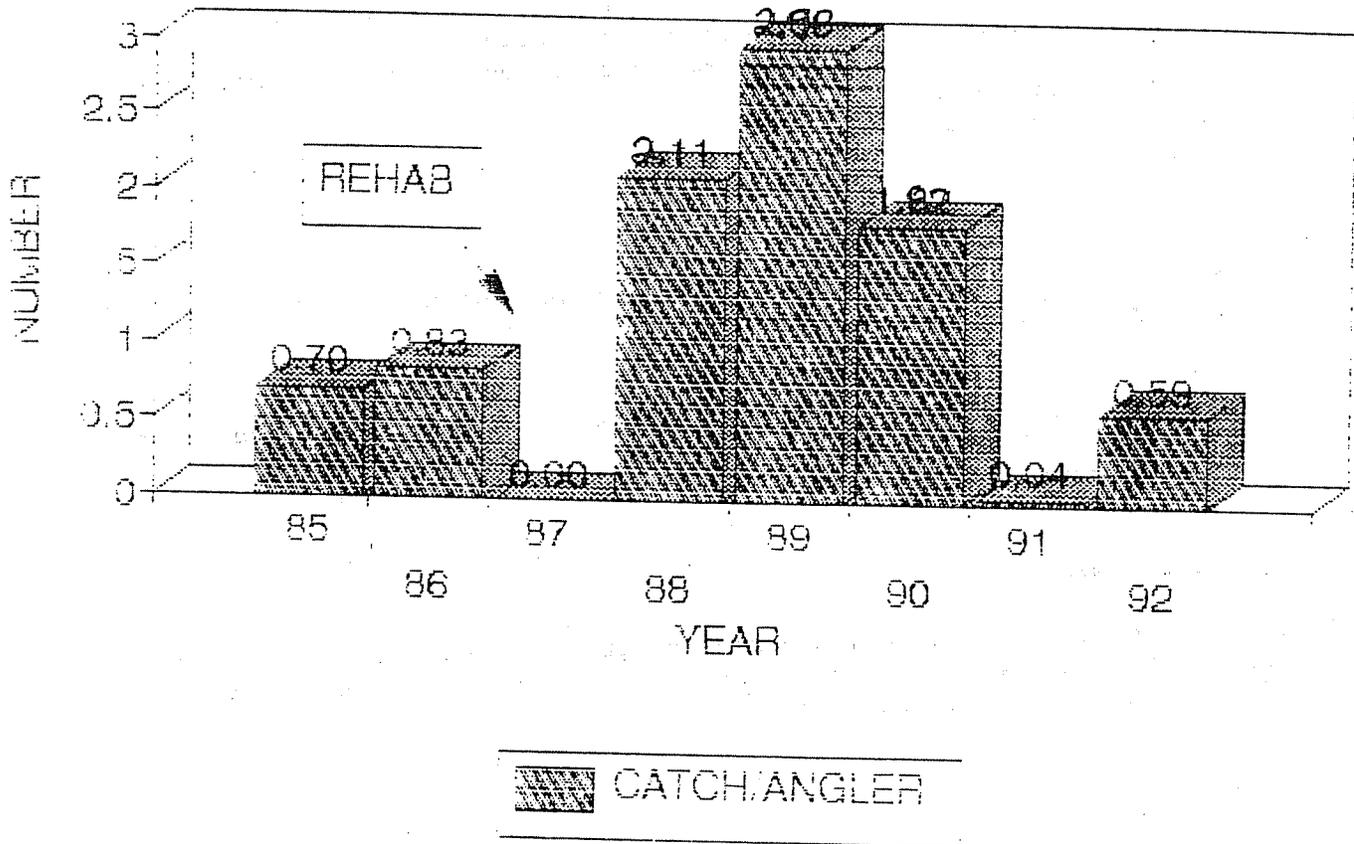
Buck Lake will be stocked annually with fingerling rainbow trout at approximately 400 fish per surface acre.

IX. PUBLIC CONTACT

A public meeting will be held in the vicinity of Buck Lake in June.

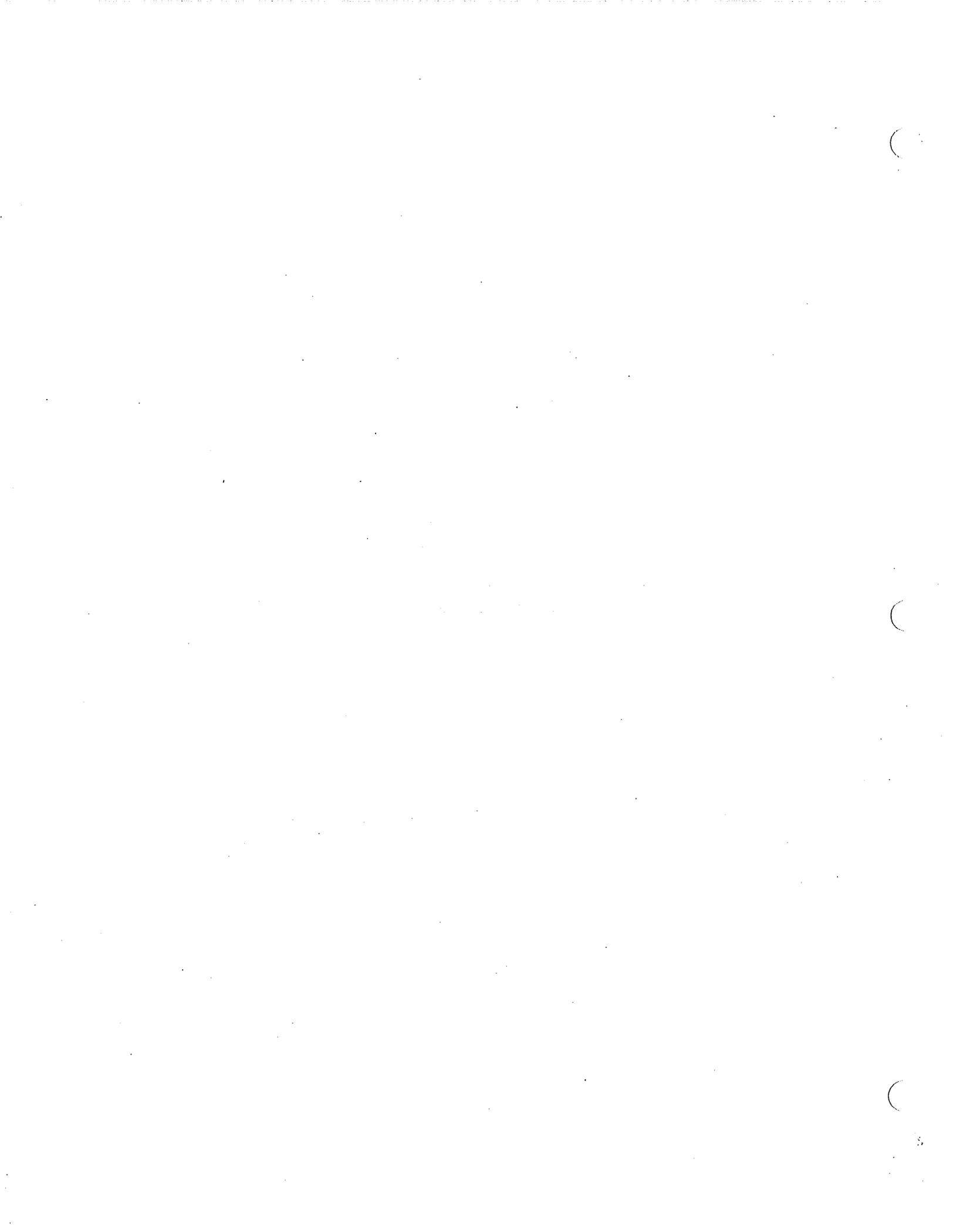
BUCK LAKE

OPENING DAY CATCH (FINGERLING)



APPENDIX F

DRAFT EIS
COMMENTS AND RESPONSES



MEMORANDUM

TO: Mr. Greg Hueckel
Fish Management Division
Washington Department of Wildlife
600 North Capitol Way
Olympia, Washington 98504

RECEIVED

JUL 31 1992

FROM: Mr. Ben Schroeter
Ben & Jerry's Paralegal Services
P.O.Box 2856
Olympia, Washington 98507-2856
(206) 866-3965

DEPARTMENT OF WILDLIFE
OLYMPIA FRONT DESK

DATE: July 30, 1992

RE: Comments on the Draft - Programmatic Environmental
Impact Statement Lake and Stream Rehabilitations -
1992-93. (PEIS)

I am extremely disappointed in the Washington Department of Wildlife's (WDOW) decision to spend a lot of time and taxpayer money on trying (again) to ram through this ridiculous and illegal program of nuking our lakes and waters with dangerous pesticides.

At last years meeting of the Wildlife Commission when the department withdrew it's proposal for the Lake and Stream Rehabilitation Plan (LSRP) because the EIS wasn't worth the paper it was printed on, I was assured by Patricia McClean that the department would work with us instead of trying to figure out some furtive way around the issues.

Needless to say, promises are meant to be broken and have been. Rather than again go through a long laundry list of deficiencies which at this time I have no time for, due to my involvement in another ongoing "pesticides in the water" action, I will simply refer interested parties to my comments from last year's Environmental Impact Statement Final Supplemental.

| I still maintain that the Legislature specifically stripped WDOW of the option to introduce pesticides into the water as a means of eradicating fish. This year's PEIS again misstates WDOW's legal standing on page 11. I will repeat myself - RCW 77.12.420 no longer empowers the Wildlife Commission to eradicate "undesirable types of fish by means of poisoning".

RCW 77.12.420 now reads: "The eradication of fish shall be authorized by the commission". To again misstate the law, especially when I advised you of the changes in the law in my comments last year, leaves me with no alternative but to accuse WDOW of purposely lying about the issue.

Since WDOE is now purposely lying about their legal standing, it makes you wonder how much more information contained in the PEIS is also lies.

I also find it amusing that the WDOE has had some incredible success with predator stocking and yet your PEIS summarily dismisses the option as too costly, totally disregarding the successes as well as the actual means of doing predator stocking.

The PEIS while trying real hard to "justify" the nuking of our lakes, still does not show any evidence of any wonderful successes. One noted lake that got botched real good was Caliche. After nuking it with rotenone, the catch averages for the opener following treatment were so poor that people actually stopped fishing the lake. Some way of improving fishing eh?

I've done some of my own surveys of Washington fishermen. My results show that over 75% would rather catch one or two large German Browns than a bunch of little genetically inferior stocked rainbow.

Despite your attempts to spruce up your EIS and make it a legal document, you still have left out a lot of crucial information necessary for making a proper assessment, cite rather bunk scientific data which does not properly address the impacts, and again fail to provide baseline studies of the current status of the waters you wish to rehabilitate.

For example, if you have small amounts of an industrial solvent already in one of these proposed lakes, what would be the synergistic effects of the solvent with the rotenone? Don't know? Neither do I. Therefore wouldn't it be prudent to find out first, before you create a major disaster and kill off some eagles and other animals?

I wish to be notified by WDOE of when you apply to DOE for your Water Quality Modification and NPDES permits. I need to be notified so I can legally challenge the issuance of these permits through the Pollution Controls Hearing Board (PCHB). I am already preparing to make this challenge.

This whole program is an antiquated stupid way of wasting state and federal monies. Why don't we put our money to good use building desirable fisheries?

Any person or organization who wishes to join me in a legal injunctive action against WDOE's Lake and Stream Rehabilitation Program, please contact me at my listed address or phone.

Sincerely,

Ben Schroeter

Washington Wildlife Commission
600 Capitol Way North
P.O. Box 3200
Olympia, WA 98501-3200

RECEIVED

AUG 17 1992

FISHERIES MGMT DIV

Greg Hueckel
Fish Management Division
Washington Department of Wildlife
600 Capitol Way North
Olympia, WA 98504

August 13, 1992

SUBJECT: Lake and Stream Rehabilitation Program

Dear Commissioners and Mr. Hueckel:

We are writing to express our deep concerns about the Department of Wildlife's Lake and Stream Rehabilitation Program and about what we believe was a badly implemented public input process.

As explained in our letter of August 8 to Commissioner Dean Lydig, we both submitted comments on the EIS for last year's program, and were assured at that time that we would be put on the mailing list for future program actions. However, neither of us received any information about this year's program until we learned from a friend last week that the Programmatic EIS had come out on July 1. Over the course of the past week we have learned that at least three other respondents (Renee Reed, Garret Jackson, Don Miller) whose letters, like ours, were printed in last year's FEIS, were not included on this year's mailing list; two environmental groups to which we belong (Greater Ecosystem Alliance, Washington Toxics Coalition) were also excluded, although we had requested they be sent copies.

We were anxious to get a copy of the EIS, but when we each individually requested a copy from Program Manager Greg Hueckel, he refused to send us one. After expending an entire day on phone calls, trying (unsuccessfully) to locate the EIS here in Seattle, making repeated requests from Wildlife, and also requesting an extension of the comment period, the Commission office agreed to send us a copy and Connie Iten, the acting SEPA official, granted us an additional four days to comment. However, Commissioner Lydig advised us to submit our comments as soon as possible, since the Commission is scheduled to meet on August 15th.

We are sending our comments to the Commission as well as Mr. Hueckel, because (1) Mr. Hueckel has been generally unresponsive to our concerns, and (2) we are unclear about the program's decision-making process. On page ii of the EIS, it is stated that a public hearing occurs on August 15th, with a final decision rendered on September 15th. On page 8, it is stated that the Commission approves or denies treatment of individual lakes at the August hearing.

"Rehabilitation" is a Misnomer for this Program

#1
L **rehabilitate:** *to put back in good condition; reestablish on a firm, sound basis; to bring or restore (normal or optimum state of health.*

poison (v.): *[to administer] any agent which, introduced into an organism, may chemically produce an injurious or deadly effect. (Webster's New World Dictionary)*

To begin with the basics, this program neither attempts nor achieves lake rehabilitation; its purpose is not to rehabilitate lakes as lakes, but to turn them into controlled ponds acting as "habitat" for selected species. These lakes are not being managed on a firm basis if they must be treated repeatedly, nor, obviously, are they being brought to a "normal or optimum" state of health when the organisms living in them are being periodically, and almost totally, eradicated.

While poison is a distasteful word (a word actually crossed out by hand on page 11 of the DEIS) poison is what this program is about. Calling it a rehabilitation program is also potentially very misleading in terms of public awareness. If the program were called the Undesirable Fish Poisoning Program, the Lake and Stream Rotenone Treatment Program or even the Fish Elimination and Exchange Program, it would not only be more accurate, but might draw the attention and input of more citizens.

Long-Term Effects of Rotenone on the Lake Community Are Not Understood

#2
This year's document contains an exhaustive review of literature on the effects of rotenone, but major gaps in knowledge remain. For example, page 117 tells us that there have been no long-term studies on the effects of rotenone use on native fish; page 123 says there have been no studies on the long-term effects on birds. There are detailed descriptions of how many of the fish will float, how often "complete kill" is achieved, and generally how effective rotenone is for the purpose of killing undesirable fish, while questions regarding long-term and cumulative effects are simply left unanswered.

Page 121 states that effects on reptiles have not been studied; page 123 cites high mortality of salamanders and turtles, and also says that aquatic insect reduction due to rotenone is rarely more than 71%, and full recovery "usually occurs with a month or two". The comparative impacts matrix (pp. 3-5) states that lakes can recover from loss of benthic fauna, phyto- and zooplankton in "two to twelve months", while birds and mammals which depend on fish or benthic organisms "may be temporarily impacted", and mitigated through timing of the application. If some effects last twelve months, it would seem that timing is not going to make a lot of difference. It is easy to dismiss temporary, partial impacts in this way when the data are merely being used to support the false premise that rotenone treatment is relatively benign to a lake, but the targeted fish; however, we don't know what the long-term impacts are of this repeated disruption of food sources, especially for already-marginal species or populations. With the kind of mortalities cited in the EIS, the long-term effects on the lake community must be assumed to be devastating.

#4
Even if long-term studies were available to assure us that rotenone itself has no long-term adverse effects, the rotenone formulation also needs to be examined. According to some literature on pesticides and their

formulations (see Attachment A), inert ingredients may be the worst offenders in these chemical treatments. On page 15 of the EIS, a discussion of odor associated with rotenone treatment mentions a kerosene odor attributed to the hydrocarbon solvents in the formulations. What are the "inert" ingredients in formulations used by WDW? These ingredients, too, may have long-term effects, particularly worrisome in cases such as McIntosh Lake, which drains into the Deschutes River, Lawrence Lake, a known bald eagle site, and Bingen Lake, where the actual long-term management goal is restoration of habitat.

The Program is Described But Not Justified: Genuine Restoration and Sustainable Management are Needed

In our last conversation with Mr. Hueckel, he energetically defended the EIS (of which he would not send us a copy), citing the thorough analysis provided. Yet this detailed review of past studies on rotenone, techniques of application, and percentage of "kill" achieved is ultimately irrelevant, because it does not explain the need for the program.

Reference to the Department's mandate to provide sport fishing does not indicate the need for massive and repeated poisoning of lakes and planting with a few "desirable" species. The mandate could have been (and probably should be) interpreted to mean that the Department should return the State's lakes to natural, balanced, ecosystems. The fact that many lakes are not now natural is not justification to leave them in their impaired state. In fact, the program itself is responsible for the unnatural state of many lakes.

The existence of "600,000 anglers" does not provide justification for the program; it is merely a head count of the fishing licenses issued by the State. It is doubtful that many of these anglers actually want complete kills of all life, fish and non-fish, in their lakes. Department effort and funding might be better spent helping its constituents appreciate and work toward more natural sporting opportunities.

Why are certain species considered "desirable"? Why are others considered "undesirable"? Where do the "desirable" fish come from? Are they being used because a "need" for them needs to be found, and because the Department needs work? Are the fish merely being moved from one side of the state to the other? Why are bass removed from Quincy and Burke Lakes and planted in Stan Coffin, H. and Ancient Lakes? Does the Department know that those who fish the latter like bass more than those who fish the former?

Is this the best way in the long run to spend state and federal funds for wildlife, or do the funds simply "need" to be spent, and this is the customary way to do it?

Fifty years ago, perhaps this program made sense. Now, it sounds like something that would only have been conceived of fifty years ago. It is not only archaic, but with what we now know about the comparative stability of natural systems, it is downright dangerous to continue to manipulate these lake systems. It is the same as turning forests to tree farms and rivers to reservoirs: it may serve a certain purpose, and it may seem like a good idea at the time.

But now we know that things have gone seriously awry with a lake when we are poisoning the undesirable non-native fish using it; writing off the temporary eradication of numerous other living things in that lake; replacing the fish with other non-native fish (that were undesirable in the lake from which *they* were removed); and repeating this process every seven years or so. The Department is perpetuating systems that are inherently unstable, simply because they are the systems that are in place. The program is not necessary, it is merely customary.

What the Department should be doing is truly rehabilitating these lakes, restoring them as much as possible to the state they enjoyed many years ago before all this manipulation began, and reintroducing native stocks. Does WDW even know what the native species were in these lakes? If so, the EIS should say so; if not, the Rehabilitation Program should be focusing on understanding and rebuilding the native communities that existed in these lakes before humans started reinventing them. The program should be working toward the goal of finding the best management scheme to ensure ecosystem health and provide fishing opportunities.

We request that:

1. The Commission cease authorization of the poisoning or artificial stocking of lakes or streams.
2. The Commission direct the Department to develop a comprehensive, long-term program for true rehabilitation of lakes and streams, with the goal of restoring the health and sustainability of these ecosystems. This program will benefit not only sports fishers, but the entire natural community.
3. That this program encourage the full involvement of the public and the environmental community.

Sincerely,



George Draffan
P.O. Box 95316
Seattle, WA 98145-2316



Janine Blaeloch
7040 14th NW
Seattle, WA 98117-5308

cc: Gov. Booth Gardner
Curt Smitch
Gordon Zillges
Connie Iten
Rep. Dick Nelson
Washington Toxics Coalition

Federal Regulation of Pesticide Inert Ingredients

By Martha McCabe

A significant weakness of federal pesticide regulation is the lack of information the U.S. Environmental Protection Agency (EPA) requires about the inert ingredients, metabolites, degradation products and impurities that are present in every pesticide product (see glossary below). Each one may be hazardous to human health, wildlife, or the ecosystem where it will be used. Each may increase the toxic properties of the active ingredient under certain conditions. Each may play a role in making the pesticide product to which people are actually exposed significantly more hazardous than the active ingredient standing alone.

Yet the way Congress has written the controlling law (the Federal Insecticide, Fungicide and Rodenticide Act or FIFRA¹) and the way EPA has enforced it leads the agency to ignore pesticide ingredients that may pose an "unreasonable risk to man [sic] or the environment" and thus fail to observe FIFRA's "risk benefit" registration standard.²

This article focuses only on the inert ingredients, though many of the limitations of federal regulation of in-

Martha McCabe is an Assistant Attorney General in the Environmental Protection Bureau of the New York State Department of Law in Albany, New York. She coordinates litigation and legislative and educational work on pesticides for New York Attorney General Robert Abrams.

Martha gratefully acknowledges the research assistance of Kevin Hogan, a student at Vermont Law School and a legal intern in the Environmental Protection Bureau in the summer of 1989.

This article reflects the author's personal views and not necessarily those of the Department of Law.

erts affect EPA's treatment of metabolites, impurities, and degradation products as well.

General Registration Requirements

In general, no one can distribute or sell a pesticide in the United States unless the product has been registered by EPA. FIFRA Section (§) 3 outlines the basic steps it takes to get a product registered; § 4 governs registration of pesticides containing active ingredients first registered before November 1, 1984. Besides submitting a copy of the chemical formula and proposed labeling, the applicant has to submit information about the product.

"Both Congress and the Executive share responsibility for what an increasing number of critics believe is an excessively narrow focus on active ingredients to the exclusion of other potentially hazardous components of pesticides."

Congress has told EPA to "publish guidelines specifying the kinds of information... required to support the registration."³ Those guidelines, the "Data Requirements for Registration," are contained in the Code of Federal Regulations (CFR).⁴ As recently as 1988, Congress again amended FIFRA without improving regulation of inert ingredients.⁵

Both Congress and the Executive share responsibility for what an in-

creasing number of critics believe an excessively narrow focus on active ingredients to the exclusion of other potentially hazardous components of pesticides.

This narrow focus is most easily described by comparing the amount of data required for inerts with amount of data required for active ingredients, manufacturing use products and end use products (see glossary). Most data points used by EPA to assess a product's ecological and toxicological impacts require applicants to test only active ingredients, manufacturing use products and, to much lesser extent, end use products (full formulations).

Inert ingredients alone have generally been subjected to the requirements for any health or environmental impacts.⁶ In those cases where the test substances are manufacturing or end use products, testing will reflect the presence of inerts. Because the end use product must usually be tested for acute toxicological effects, EPA has been gathering no data on the inerts' subchronic (short term chronic, or genetic toxicity).⁷

One regulation permits, although does not require, EPA to require more testing on inerts than would otherwise be required by the general registration regulations. The Data Requirements for Registration include a policy statement on additional testing providing that, where EPA determines the required data are not sufficient to determine whether the pesticide poses the "unreasonable adverse risk to man or... the environment proscribed by FIFRA §§ 2(bb) and 3(a), the Administrator will, on a case-by-case basis, require additional testing. An explicit and definitive standard by which the EPA decide whether data are sufficient is unavailable (see 40 CFR § 158.75).

EPA may also require testing of intentionally added inert ingredients, impurities of an active or inert ingredient, plant or animal metabolite or degradation product.⁸

"Because the end use product must only be tested for acute toxicological effects, EPA has been gathering no data on the inerts' subchronic, chronic, or genetic toxicity."

Regulation of Inert Ingredients

EPA regulates inerts both under standard registration requirements and under newer policies prepared in response to specific criticisms that the inerts present significant risks of adverse health effects and environmental harm. Those are separately discussed below.

In all cases, the following information is required for each inert ingredient (if any) in the product:

1. *Chemical name of the ingredient according to the Chemical Abstracts Society (CAS) nomenclature, the CAS Registry Number, and any common names. If the identity or composition is unknown to the applicant because it is proprietary information known only by the producer of the ingredients, the applicant must ensure that the producer submits this information to the EPA;*

2. *The nominal concentration in the product;*

3. *The upper and lower certified limits;⁹ and*

4. *The purpose of the ingredient in the formulation.¹⁰*

If an inert ingredient is used to produce the product, EPA requires the following information:

1. Each brand name, trade name or other commercial designation of the ingredient; and

2. All information the applicant knows about the composition of the ingredient including specifications, data sheets, or other documents.¹¹

3. If requested by EPA, the name and address of the producer of the ingredient or, if that information is not known to the applicant, the name and address of the supplier of the ingredient.¹²

No other data, testing, or informa-

tion are required for ingredients currently registered as inerts.

Recent Developments at EPA

For over a decade, EPA has been reviewing and to some extent strengthening its regulation of inerts. In 1977, it identified 52 inert ingredients posing health or environmental threats.¹³ Seven years later, EPA admitted that it lacked the information necessary "to prioritize inerts for further review and regulation on the basis of risk," and lacked the resources to do so in any event.¹⁴

In 1987, EPA published a Policy Statement on Inert Ingredients in Pesticide Products in the *Federal Register*.¹⁵ Again, EPA conceded that "[i]nert ingredients in products registered only for non-food use... have received little review."¹⁶ EPA formally divided all 1,200 inerts as follows: List 1 (toxicological concern); List 2 (potentially toxic/high priority for testing); List 3 (unknown toxicity); and List 4, those of minimal concern.

EPA announced a data call-in for any product retaining a List 1 inert after April 22, 1987. EPA states that few, if any, List 1 inerts (e.g., benzene, cadmium, mercury) are still being used in products sold in the U.S., though it is unlikely that the Agency can prove that assertion.

Meanwhile, inerts on Lists 2 and 3 are increasingly recognized as posing potential problems. As early as 1984, EPA expressed concern about petroleum distillates, many of which are now on List 2.

The EPA notes, "The polynuclear aromatic components of petroleum distillates have a high potential for carcinogenicity and the aliphatic content may pose problems as well... [They] occur in about 80% of all pesticide formulations as inerts or actives and pose significant regulatory problems."¹⁸

As of June, 1989 EPA lists toluene as an inert in 112 registered pesticide products; xylenes in another 1,948.¹⁹

In the April 22, 1987 policy statement, EPA indicated a number of toxicology tests may be required of "new" inerts, including 90-day feeding studies, a rodent teratology (birth defects) study, genetic damage assays, and a 96-hour fish lethality test.²¹ These tests may be waived, however. Similarly, these tests may (or may not) be required of some food

use inerts when use changes or additional exemptions from residue limits on food are requested.

On November 22, 1985, EPA again published an inert ingredient policy statement in the *Federal Register*.²² Revised Lists 1 and 2 respectively include 40 and 64 inerts currently in use. In addition, EPA added a rather incomprehensible twist to already confusing lists: There is now a List 4A and 4B. Inerts on List 4A (the previous List 4) represent inerts generally regarded as safe. List 4B is composed of inerts that may not be "safe," but their current use patterns supposedly will not adversely affect public health and the environment.

Moreover, certain inerts may appear on two lists simultaneously. Gamma butyrolactone, for instance, will be on List 4B because health effects are known and on List 3 because the ecotoxicity of this is unknown.²⁴

"Until Congress and EPA squarely address the need to assess the risks of exposure to inerts... the whole data-gathering effort on which the U.S. pesticide regulation relies is guaranteed to produce inadequate answers to serious questions."

Conclusion

EPA's regulation of pesticides yields relatively little information about the human and ecotoxicological effects of these integral components of pesticide products. Until Congress and EPA squarely address the need to assess the risks of exposure to inerts, (quite apart from exposure to metabolites, impurities and degradation products), the whole data-gathering effort on which U.S. pesticide regulation relies is guaranteed to produce inadequate answers to serious questions. In other words, EPA must balance pesticide benefits against "any reasonable risk,"²⁵ not just the risks posed by the active ingredients.

References

1. Known by its acronym "FIFRA," the law is found at 7 United States Code § 136. This is abbreviated as 7 U.S.C. § 136. Citations to the law refer to the sections of FIFRA as Congress passed it; thus, FIFRA § 3 is more formally cited as 7 U.S.C. § 136a.
2. Contained in FIFRA §§ 3(a) and 2(b).
3. FIFRA § 3(c)(2), 7 USC § 136a(c)(2).
4. 40 CFR Part 158.
5. Rogers, William H. 1988. *Environmental law: Pesticides and toxic substances*. St. Paul, MN: West Publishing Co.
6. 40 CFR § 158.108.
7. 40 CFR § 158.340.
8. Policies of Flexibility and Waiver also exist in the Data Requirements for Registration. Sections 158.35 and 158.45. EPA considers its policy of flexibility a policy to increase as well as decrease requirements as necessary in specific situations in order to fulfill the purposes of this rule. 49 Fed. Reg. 42, 856. Through its waiver policy, the EPA may waive specific data requirements on a case-by-case basis and in

- response to specific written requests by the applicant. 49 Fed. Reg. 42, 858. Waiver decisions are supposedly based on scientific judgments and regulatory policy.
9. In Section 158.175 "Certified Limits," a table for calculating standard certified limits is included. Applicants may propose certified limits or choose to have the EPA set them.
10. Section 158.155.
11. The manufacturer may not have first-hand knowledge of ingredients it uses to make a pesticide product. The EPA asks the manufacturer to submit only the information (of the types specified) that is available. No new tests for chemical composition are required. 49 Fed. Reg. 37, 929.
12. Section 158.160.
13. General Accounting Office. 1986. *Pesticides: EPA's formidable task to assess and regulate their risks*. Gaithersburg, MD.
14. EPA Office of Pesticides and Toxic Substances, Memorandum, February 1984.
15. 52 Federal Register 13305 (April 22, 1987). In 1984, EPA said that "an inert ingredient is defined as any ingredient in a

pesticide product which is not pesticidally active. This definition includes... non-pesticidally active impurities in the technical grade of the active ingredient or formulation." U.S. Environmental Protection Agency, Office of Pesticides and Toxic Substances. February 11, 1984: Memorandum concerning criteria for determining which inert ingredients are of toxicological concern and should be given priority review.

In 1987, EPA specifically excluded impurities from the regulatory definition of inerts. 52 FR 13305.

16. 52 FR 13305.
17. U.S. Environmental Protection Agency, Discussion paper on inerts prepared for the Administrator's Pesticide Advisory Committee, October 25, 1983, p. 3.
18. Freedom of Information Act File No. R114 3825-89, author to U.S. Environmental Protection Agency, responded to August 21, 1989.
19. 52 FR 13308.
20. 54 FR 48314.
21. 54 FR 48315.
22. FIFRA § 2(bb) (emphasis supplied).

Glossary of Pesticide Terms: Legal and Standard Definitions¹

Active Ingredient: Any substance (or group of structurally similar substances, if specified by the Agency) that will prevent, destroy, repel, or mitigate any pest, or that functions as a plant regulator, desiccant, or defoliant within the meaning of FIFRA § 2(a). 40 C.F.R. § 158.153.

Biochemical Pesticide Data: Data concerning the fate and potential adverse effects of biochemical pesticides; biochemical pesticides include products such as insect pheromones, juvenile growth hormones and natural plant regulators. 49 Fed. Reg. 42, 856.

Certification of Limits: For all quantities of the product noted in § 158.110, the maximum (or upper) and minimum (or lower) value of concentration of the variability of that substance when normal quality assurance procedures are utilized in the production process. 40 C.F.R. § 158.110.

¹ Most terms are followed by a definition as found in the federal pesticide law (FIFRA); Code of Federal Regulations, Section 158; Federal Register; or a standard reference. Others have been defined by the author.

Degradation Process: Substance produced when one compound is transformed into another substance through physical, chemical or biological processes.

Efficacy Data: Data that demonstrate whether a pesticide product will control the pests as specified in the claims on product labels. 49 Fed. Reg. 42, 856.

End Use Product: A pesticide product whose labeling "(1) Includes directions for use of the product (as distributed or sold, or after combination by the user with other substances) for controlling pests or defoliating, desiccating or regulating growth of plants, and (2) Does not state that the product may be used to manufacture or formulate other pesticide products. 40 C.F.R. 158.153.

Environmental Fate Data: Data that demonstrate the fate of pesticides in the environment through degradation, metabolism, mobility, dissipation, and accumulation. 49 Fed. Reg. 42, 856.

General Use Pattern: Nine categories of pesticides that distinguish between the concepts and intended uses of pesticides; a Use Pattern Index is included in Appendix A of 40 C.F.R. § 158 (Data Requirements for Registration) to aid in classifying unique and ambiguous cases. 40 C.F.R. § 158.55.

Formulation: (1) The process of mixing, blending or diluting of one

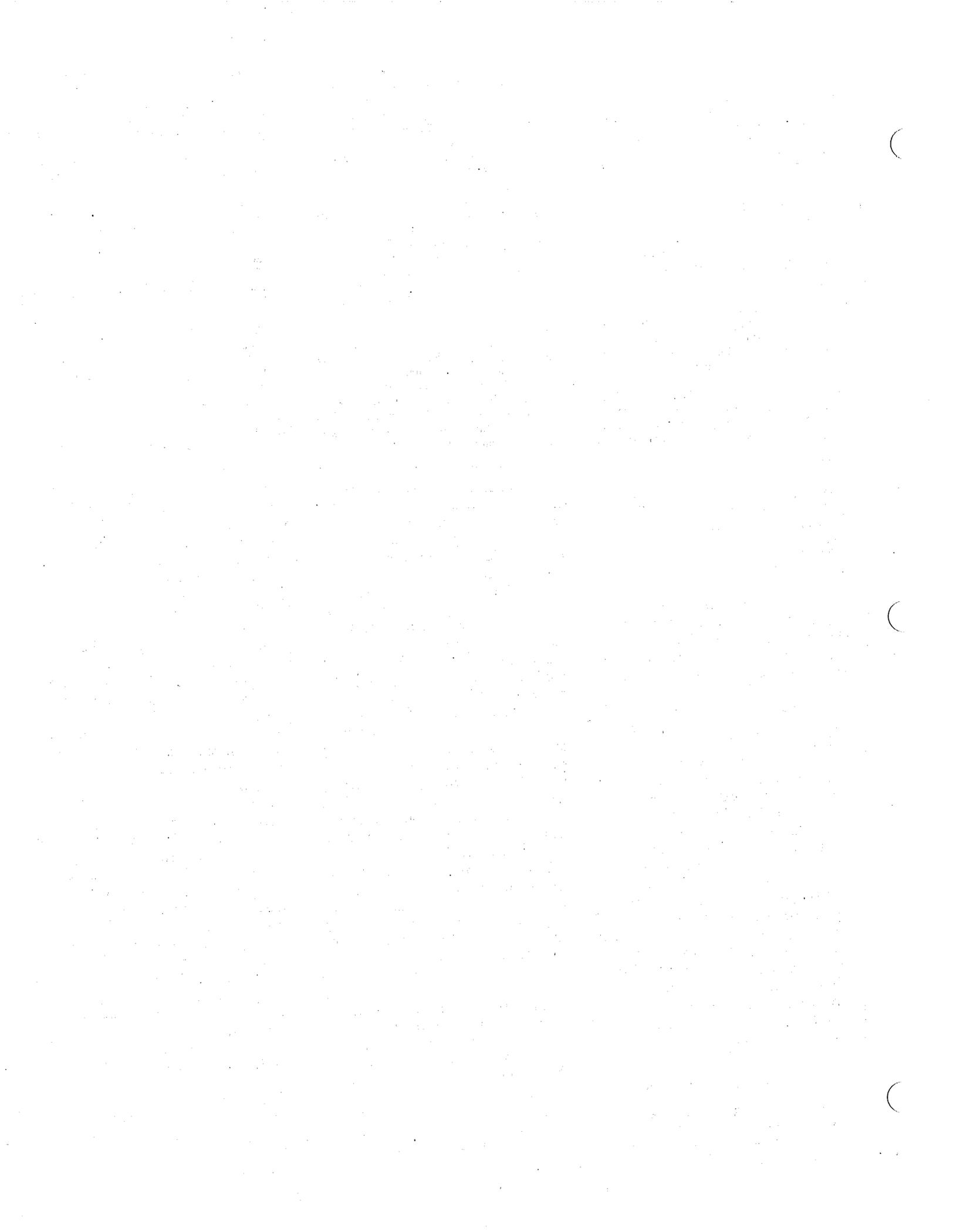
or more active ingredients with one or more other active or inert ingredients, without an intended chemical reaction, to obtain a manufacturing use product or an end use product, or (2) The repackaging of any registered product. 40 C.F.R. § 158.153.

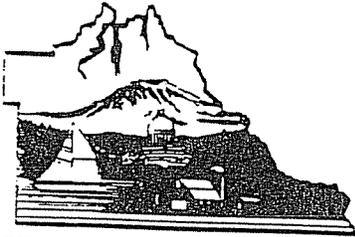
Impurity: Any substance (or group of structurally similar substances if specified by the Agency) in a pesticide product other than an active ingredient or an inert ingredient, including unreacted starting materials, side reaction products, contaminants and degradation products. 40 C.F.R. § 158.153.

Impurity Associated With An Active Ingredient: (1) Any impurity present in the technical grade of active ingredient; and (2) Any impurity which forms in the pesticide product through reactions between the active ingredient and any other component of the product or packaging of the product. 40 C.F.R. § 158.153.

Inert Ingredient: Any substance (or group of structurally similar substances if designated by the Agency), other than an active ingredient, which is intentionally included in a pesticide product. 40 C.F.R. § 158.153.

Integrated System: A process for producing a pesticide product that: (1) Contains any active ingredient derived from a source that is





THURSTON COUNTY

WASHINGTON

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FISHERIES MGMT DIV

BOARD OF COUNTY COMMISSIONERS

July 8, 1992

Greg Hueckel
State Resident Trout Manager
Washington Department of Wildlife
400 N. Capitol Way
Olympia, WA 98501

Dear Mr. Hueckel:

SUBJECT: PROPOSED ROTENONE TREATMENT OF LAWRENCE AND MC INTOSH LAKES

The Board of Thurston County Commissioners is opposed to the proposed use of rotenone in Lawrence and McIntosh Lakes. This is an invasive technique which sacrifices a multitude of resident fish, amphibians, insects and other species to create a planted trout fishery. We do not believe there is justification for such drastic measures in these lakes.

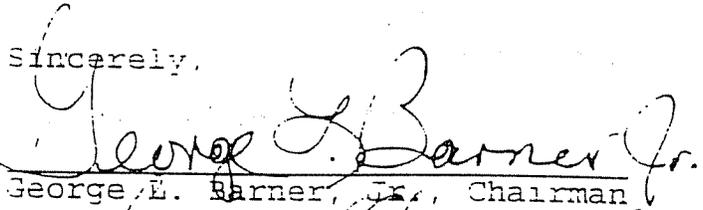
We are also concerned about the lack of integration with the Lake Lawrence management plan. The comprehensive study of this lake revealed very high nutrient loading rates - which could be severely exacerbated by the rotenone treatment.

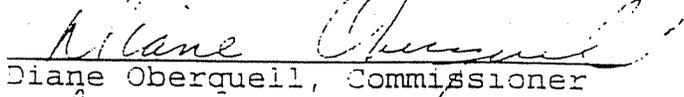
Thurston County encourages the development of comprehensive lake management programs. In the case of Lawrence and McIntosh Lakes, we encourage the Department to work with lake residents, fishing groups and other agencies to develop clear objectives for fishery management which are compatible with multiple-use lake management. Techniques could then be selected which would best meet fishery management and other objectives in the long term, with least disruption of the environment. Thurston County - and many lake residents - would be very willing to assist with developing and implementing such a program.

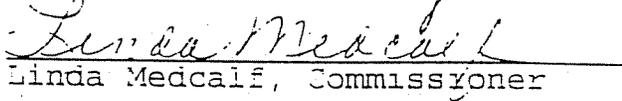
We welcome the Department of Wildlife's role in providing productive sport fisheries for our State's residents. However, we are very concerned that lake fishery management be conducted using a wholistic, ecological approach. We strongly oppose the repeated use of rotenone to turn these natural systems into virtual trout ponds. We also urge that you carefully consider comments made by lake residents at your recent public hearing.

Please contact our office or Tom Clingman at Thurston County Public Works, 786-5485, if you have any questions or would like to have a meeting on this issue.

Sincerely,


George E. Barner, Jr., Chairman


Diane Oberquell, Commissioner


Linda Medcalf, Commissioner

C:
Bill Freymond, WDW
Lorena Lindley, Sec't, Lake Lawrence Improvement Club
Mark Swartout, Office of Community and Environmental Programs



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

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AUG 10 1992

FISHERIES MGMT DIV

August 7, 1992

Mr. Greg Hueckel
Department of Wildlife
P.O. Box 43200
Olympia, WA 98504-3200

Dear Mr. Hueckel:

We have completed our review of the Draft Programmatic Supplemental Environmental Impact Statement for Lake and Stream Rehabilitation (PSEIS) and have the following comments. We will be providing comments on the specific project proposals under separate cover as part of the permit review process. However, we have highlighted for your convenience those comments that may impact the permitting process.

In general, we were very pleased to find that this document provides an in-depth, scientific and objective analysis of the rehabilitation program. Ecology is still fundamentally opposed to the use of aquatic pesticides, including piscicides, other than as part of an integrated, watershed or waterbody management plan. However, this document alleviates many of our previous concerns regarding the use of piscicides through the addition of several planning and public review enhancements to the rehabilitation program.

Some specific comments regarding the draft PSEIS include the following:

- #1 - (pg. 9) Agree with the concept of netting, reviving and relocating unwanted species. This discussion could be elaborated on regarding how long after treatment is reviving likely to be successful, what volume or number of fish could realistically be revived and relocated, and how would revival and relocation be accomplished.
- #2 - (pg. 9) Should note that the use of potassium permanganate will also require a short-term modification (permit) to the Water Quality Standards. Some additional discussion of the properties, behavior, toxicity and potential impacts of potassium permanganate (or other proposed oxidizing agents) should be included.
- #3 - (pg. 9) Would encourage the use of water column chemical analysis for rotenone in addition to the in situ trout bioassay. In addition, given the potential impacts of a rotenone treatment on

the planktonic community and the dependence of re-introduced species on an adequate food supply, we would suggest monitoring the abundance and composition of the planktonic community as part of the post-treatment procedures and report.

- #4 - (pg. 9) Nutrient levels, particularly phosphorus, should be monitored and reported as part of the post-treatment procedures. The potential for a pulse of nutrients following a treatment to result in accelerated macrophyte growth or an algal bloom, and particularly blooms of the potentially toxic algae anabaena, makes this important information to resource managers.
- #5 - (pg. 12) Having only one study, and that being in Texas, is inadequate for assessing impacts to water quality. This section does a good job of analyzing and discussing the scattered data, but points out the need for more detailed monitoring and comprehensive studies of rotenone's impacts on water quality.
- #6 - (pg. 13-15) Only a passing reference is made regarding the impact that increased nutrients and enhanced clarity may have on macrophyte growth. If information exists, additional discussion would be helpful. If information does not exist, some monitoring of macrophyte composition and abundance would seem necessary.
- #7 - (pg. 14-15) Depth and substrate composition of the various study lakes are key factors influencing turbidity and transparency which are not discussed. If this information is unknown for the study lakes, at least some discussion of the relative role of depth and substrate composition is warranted (i.e., in a deep lake with gravelly substrate, turbidity from stirred up mud is not likely to be a problem. However, nutrient re-suspension resulting in bloom conditions and reduced transparency could be a factor).
- #8 - (pg. 15-16) The potential presence of hydrocarbon solvents in the liquid formulation of rotenone is of major concern to us. Until additional information is provided regarding the chemistry, quantity, and toxicity of such solvents, we will likely be unable to permit the use of liquid formulations.
- #9 - (pg. 17) Although we recognize that the Action Level (AL) and Suggested No-adverse Response Level (SNARL) are conservative levels and based on long-term exposure scenarios, we believe they are applicable and that California's policy of no measurable levels of rotenone in drinking water is prudent. This would only be an issue where water from a treated water body is used for domestic purposes, therefore, in completing item 2., section IV of the Pre-Rehabilitation Plan form, it will be necessary for WDW to identify whether water intakes exist (legal or illegal) for a lake proposed for treatment.

Mr. Greg Hueckel

Page 3

August 7, 1992

#10 - (pg. 17) The last paragraph regarding "...no significant change in any water quality parameter..." appears to contradict the previous discussion in this section. Perhaps wording relating to "no changes beyond those which have historically occurred as part of previous rehabilitation and stocking of trout-only lakes" would be more appropriate.

#11 - (pg. 18) Given that the proposed treatment doses are generally higher than the toxic effects levels reported by Wollitz and Almquist, some discussion of the conflict between these studies and those referenced as showing no direct affect of rotenone on phytoplankton would seem warranted.

The discussion on plants, particularly as relating to nutrients and algae, is very indepth and well done. As previously mentioned, additional consideration of nutrient loading on macrophyte growth is warranted (pg. 24, #2 and 3), and the addition of information relating to depth and sediment type (if known) would be useful (pg. 28).

#12 (pg. 43) Question the statement that "...no phosphorus budgets exist for the other Western Washington Lakes..." If this statement refers to the lakes in Table E, then it may be accurate, however, if it refers to Western Washington lakes in general, researchers at Metro, the University of Washington, Ecology, and consultants involved with lake restoration grant projects have all been active in developing phosphorus budgets for various lakes.

#13 - (pg. 47-50) As previously mentioned, concern exists regarding the potential for nutrient pulses to result in blooms of toxic or noxious strains of algae, primarily blue-green algae such as Anabaena. Blooms of specific toxic-producing strains of Anabaena have resulted in domestic animal deaths in American and Clear lakes in Pierce County, necessitating closures of these lakes to human use. Therefore, additional discussion of the composition of the algal populations relative to green and blue-green algae, and the potential implications of the various species and strains, would seem warranted, particularly given that many of these species may bloom as a result of a nutrient pulse but not be affected by grazing (per table F). Ecology may require algal composition analysis as part of the pre- and post-treatment plans and reports.

#14 - The discussion of impacts to zooplankton (pg. 57-76) is very well done. Although we recognize the lake rehabilitation program is not likely to include oligotrophic alpine lakes, the long recovery time (2-3 years) for zooplankton and benthic communities (pg. 98) in oligotrophic lakes, particularly alpine oligotrophic lakes, suggests that rehabilitation of such lakes may be inappropriate.

Mr. Greg Hueckel
Page 4
August 7, 1992

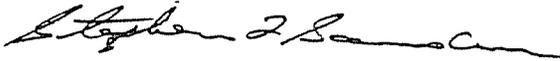
Also, the variability in recovery time, when combined with the critical function of zooplankton in supporting fish populations, would suggest that WDW should do pre- and post-treatment monitoring of zooplankton populations.

- #15 - (pg. 77) The importance of access to bottom muds and the potential role of bottom vegetation in the survival of benthic fauna reinforces the need to include information on bottom substrate and aquatic macrophytes in the Pre-Rehabilitation Plan forms.
- #16 - (pg. 94) The potential for populations of aquatic snails to increase following rotenone applications raises a concern for potential increases in swimmer's itch, caused by a parasite associated with snails. The number of serious cases of swimmer's itch reported to Ecology, including reports of associated serious illnesses, have increased significantly this past year, raising our concern and that of other health and natural resource professionals regarding this affliction. Therefore, we may consider rotenone treatments to be inappropriate for lakes which also support recreational swimming as a major beneficial use and, at the very least, would require pre- and post-treatment monitoring of snail populations in such lakes.
- #17 - (pg. 99) The potentially severe impacts reported on stream benthos indicates that rehabilitation of streams using rotenone is ill-advised. Although we recognize the possibility of such a request is remote, Ecology would likely be opposed to issuing short-term modifications for such projects.
- #18 - (pg. 114-115) The variability in % of dead fish surfacing relative to water temperature re-enforces the need to include water temperature and discussions on fish collection, revival and relocation plans in the pre- and post-treatment reports.
- #19 - (pg. 119) A typo in the first sentence, last paragraph: need an "e" in "Repeated us of pesticides..."
- #20 - (pg. 121) The reference to potential toxicity to the spotted frog re-enforces the need to check and report listings of threatened or endangered species when completing the Pre-Rehabilitation Plan form as there is a threatened or endangered species of spotted frog in Washington.
- Although this document is very well written, we did note some spelling errors; most of which could be rectified by running the document through a spell checker.

Mr. Greg Hueckel
Page 5
August 7, 1992

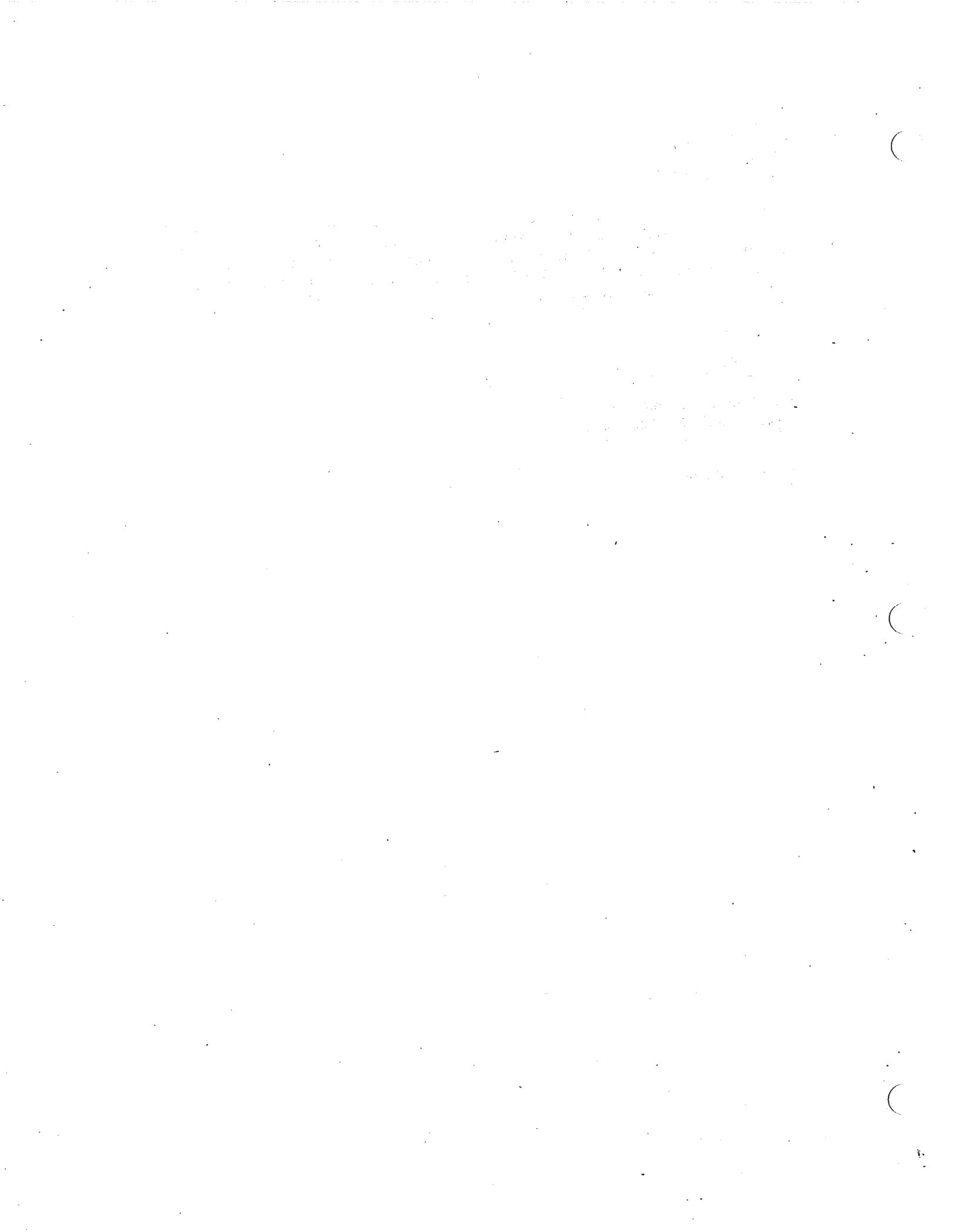
Thank you for the opportunity to review and comment on this document, and our apologies for the delay in getting comments to you. The PSEIS is very well done and we commend WDW for undertaking this effort. Please contact me at (206) 438-7086 if you have questions or concerns regarding our comments.

Sincerely,



Stephen L. Saunders
Water Quality Program

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RECEIVED

6959 NE Buck Lake Rd
Hansville, WA 98340
July 30 1992

AUG 03 1992

FISHERIES MGMT DIV

RE: Supplemental Programmatic Environmental Impact Statement
Lake and Stream Rehabilitation

Greg Hueckel
Fish Management Division
Washington Department of Wildlife
600 N. Capitol Way
Olympia, Washington 98504

Dear Mr Hueckel,

I attended the public hearing in Port Orchard regarding the use of rotenone in Buck Lake.

There didn't appear to be anyone there that was in favor of this treatment. Many questions were asked of the biologist present. The public was against such treatment of an ecosystem and was knowledgeable in the ecosystem concept of interrelationships. The biologist present has his mind made up to manage Buck Lake as a trout only lake. At one time during the meeting the Wildlife Dept. even questioned the value of the hearing since no one present was in favor of rotenone treatment.

I am one of the local area residents involved in an inventory of Buck Lake and the adjoining beaver ponds. We have been doing the survey since April and find a wide diversity of wildlife. Following is a list of my concerns.

#1. 1. The decision to use rotenone is based on opening day creel counts. Was this the only data available? Is it just an assumption that the fingerling trout survival rate is due to bass predation. Could there be other factors that could affect fingerling survival?

#2. 2. Using rotenone in Buck Lake has been done in the past, but bass are still present. Obviously bass are getting or remaining in the system.

#3. 3. Were alternative methods considered? Many people at the hearing volunteered manpower to the use of an alternative.

#4. 4. Attached is a list of some of the wildlife inventoried at Buck Lake. We have not done the month of proposed treatment so do not know what uses the lake during that time the lake is recovering from the use of rotenone. Does your department know what other wildlife will be affected during this time?

#5 5. A benefit of rotenone use is listed as increased angler participation. Buck Lake is a very small lake. How do you know that more anglers would be willing to fish in such crowded conditions? Is catching fish all that is important to fisherman.

#6 6. Another benefit listed is economic return to the area. Have the anglers on Buck Lake been surveyed to see where they come from? I think you would find the majority of them are from the local area. I do not know why the Wildlife Dept. thinks fishing on Buck Lake contributes many dollars to the local economy.

#7 7. Washington State Dept. of Ecology is asking private citizens to get lakes off drugs. Attached is copy. Why not have public agencies do the same?

#8 From your document pg 125-"Kingfishers are highly territorial so that temporary disappearance of fish could force them off a lake and into competition with birds on other waters." We see kingfishers regularly at Buck Lake.

From your document-Significant impact due to increased human activities. If there is increased use as the Dept. predicates, there will be impact on the wildlife that use Buck Lake.

CONSIDER: Maybe the best use for Buck Lake isn't as a fishery but as WILDLIFE HABITAT.

Sincerely

Barbara Fournier

Following as a partial list of the wildlife inventoried at Suck Lake. There have been other people participating in the inventory.

April:

Bald eagles
Bufflehead
Swallows
Pied bill grebes
Canadian geese
Bonaparte gulls
Belted kingfisher
Red shafted flicker
Pileated woodpecker
Song sparrow
Red winged blackbirds
Mallards
Crows
Osprey
Cinnamon teal
Audobon warblers
Brown headed cowbird
Great blue heron
Black capped chickadees
Common yellowthroat
Marsh wren
Frogs
Nuthatch
Hooded merganser

Wood ducks
Calif. quail

May:

Red wing blackbirds
Tree swallow
Marsh wren
Song sparrow
Barn swallow
Starling
Pacific slope Flycatcher
Ruby crowned kinglet
Great blue heron
Osprey
Red shafted flicker
Canada Geese
Mallard
Wood duck
Bald eagle
Crow

May (continued)

Hooded merganser
Red shafted flickers
Belted kingfisher
Crows
Otters
Racoons
Downy Woodpecker
Dragonflies

June:

Osprey
Redwinged blackbirds
Frogs
Dragonflies
Cedar waxwings
song sparrow
Crows
Marsh wren
Tree swallows
Common loon
Belted kingfisher

July:

Green backed heron
Bald eagles
Tree swallows
Song sparrow
Redwing blackbirds
Belted kingfisher
Mallard.

Getting lakes off drugs

Many Washington lakes are on drugs — herbicides — that are used by residents to control plants that interfere with lake access. Ecology's Water Quality Program is asking people who routinely use herbicides to pursue more natural approaches and reduce their lake's dependence on chemicals.

A newly released Environmental Impact Statement written by Ecology looks at ways to control lake weeds other than by using herbicides. The EIS looks at the effects that both chemical and non-chemical controls have on the environment. Chemicals are of particular concern because they can leach into groundwater, collect on the lake floor in sediments and cause other impacts.

"Any healthy lake has aquatic plants, just as a forest has trees. It is the over-abundance of these plants that creates problems," said Water Quality Program Manager Mike Llewellyn.

The irony is that excessive growth is often caused by lake-area residents in the first place. When people remove trees, brush and other plants from around the lake, they remove a natural filter, giving nutrients such as lawn and garden fertilizer a direct path to the water. Leaking septic tanks and inadequate drain fields close to a lake can add more nutrients. The nutrients spur the growth of aquatic plants and algae.

"The environmentally sound system for dealing with the problem

is to involve the community in an effort to make sure that water draining into the lake is not contaminated, so the lake can return to a more natural state," said Llewellyn.

Some grant money is available for lake protection efforts. In the meantime, the use of chemicals is becoming more difficult. A permit is required for any application of chemicals into the water. When applying for permits, residents are being asked to look at alternatives.

Using chemicals that are not permitted by Ecology could jeopardize the health of people, landscape plants, and the fish and wildlife that

need clean water to survive.

"We want people to look at ways to keep the plants from becoming a nuisance in the first place," said Kari Rokstad, environmental specialist with Ecology's Water Quality Program. "Waterbody plans may eventually be required before permits are issued."

For more information

For information on the new Environmental Impact Statement, call Kari Rokstad at (206) 459-6366. For more about permits for chemical applications, call Ecology's Chris Maynard at (206) 459-6360.



Photo: Brian Walsh

Sue Koenig
P.O. Box 393
Indianola, WA 98342

July 29, 1992

Greg Hueckel
Fish Management Division
Washington Department of Wildlife
600 North Capitol Way
Olympia, WA 98504

RECEIVED
JUL 31 1992
FISHERIES MGMT DIV

Dear Greg:

I am writing to put on record the concerns I expressed to you per our phone conversation July 28, 1992. This is in regards to the proposed poisoning of Buck Lake.

I am a member of a group doing a detailed inventory of Buck Lake, the two adjoining beaver ponds and their stream. When completed in spring of 1993, the survey will be presented to the county for planning purposes. Wetlands will be professionally mapped, plants and wildlife listed.

The Buck Lake team consists of Barbara Fournier and I. Since we are the most familiar with the lake in our group, we will both be submitting letters. Since March, we have spent at least two hours per week canoeing the lake and listing the wildlife. Bald Eagles and Osprey have fished the lake heavily all spring and summer. Barbara has again sighted the Green-backed Heron, a repeat of last year. They are not common in our area. The Great Blue Herons have brought their young to the lake. Five were fishing the north end Saturday, one was obviously this year's fledgling, still somewhat fuzzy.

In early spring Wood Ducks, Mergansers, and Pied-billed Grebes used the lake for a month to feed, rest, and court before moving on to quieter nesting areas. The woods shelter a wide variety of warblers, woodpeckers, and thrushes. Otter, beaver, and turtles live and feed at the lake. Large colonies of Tree Swallows and Red-winged Blackbirds have had a good nesting year and there is a conspicuous absence of mosquitoes.

The prerehabilitation plan for Buck Lake answers "none that are known" when asked to list endemic, listed species that may be affected. The entire lake will be taken out of the system from October to April. It

is now serving as an important food source to species listed by D.O.W. as priority along with many others not listed but just as important in maintaining the balance.

Specific concerns:

1. I understand that rotenone is relatively harmless to warm-blooded animals. However, there will be a large windfall of dead fish (the plan states fish will only be retrieved from the park's shore, about one-tenth of the total shoreline). The eagles in our area tend to stay year-round. Does D.O.W. want to accept responsibility for the possibility these birds may ingest large numbers of poisoned fish? The E.I.S. also doesn't address possible genetic problems as a result of ingestion.

2. As almost-year-round residents, how will the eagles be affected this winter? Two adults and at least one young from a previous year may be joined by two more nestlings since this has been a good year. The lack of the lake as a food source will push them into already overburdened surrounding areas. Will nesting season be affected next spring? A lower food supply for winter plus increased competition may trigger a lower nesting response in spring.

3. With the insect population lowered or eliminated next spring, nesting of swallows, blackbirds and woodland birds will suffer. The colonies that return will have to "disperse" into already occupied territory. This is almost never successful.

4. One painted turtle and one unidentified turtle may also suffer from lowered insect count. Otters will not be able to feed here.

At the public meeting, the local bass club offered (under direction of D.O.W.) to overfish the bass at the end of the season to reduce predation. This would be free to the public and much kinder on the ecosystem of the lake. It would also allow a choice in fishing. Buck Lake is the only public fishing lake in the north end of the county. It seems very one-sided to manage it as a trout-only lake.

I believe more research should be done on the wildlife using the lake. It is my feeling that D.O.W. doesn't realize the importance of this lake as habitat to its own priority-listed species. Buck Lake is not for trout only.

Sincerely,

Gue Keeling

Gue Keeling



Greg - 11

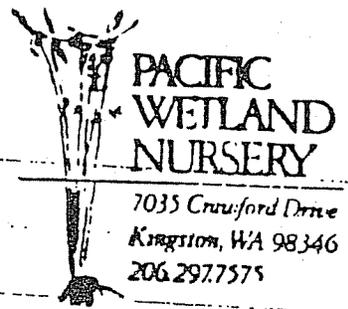
Greg:

I AM INCLUDING MY WILDLIFE LISTS FROM 3/1 TO 7/25. I APOLOGIZE FOR THE SLOPPINESS BUT I DON'T HAVE TIME TO TYPE THEM OUT. I THOUGHT IT MIGHT GIVE YOU SOME IDEA OF WHAT WE HAVE OUT THERE. I'VE HIGHLIGHTED SPECIES FROM ROW'S "PRIORITY HABITATS & SPECIES" LIST TO (HOPEFULLY) MAKE IT CLEARER.

I WILL ATTEND THE AUC 15 MEETING & PRESENT SOME MORE GENERAL E.I.S. COM

Sue Koehn





HANSVILLE WETLANDS
WILDLIFE OBSERVATIONS

NAME: SUE KOENIG

SITE: BUCK LAKE

DATE: 3/1/92 SUN

TIME OF OBSERVATIONS:

UPPER BEAVER POND

8:15 AM - 10:45 AM

LOWER BEAVER POND

LOCATION: CANOED PERIMETER OF LAKE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
GREAT BLUE HERON	④, ⑨ MARSHY	2	FROM SHORELINE - FLEW INTO WOODS, FE IN TREES
RED-WING BLACKBERRY	①-⑦, ⑩ MARSHY	10+	CALLING, FLYING
CROW	①-③ WOODS	3+	CALLING, FLYING
FROGS (HEARD, NOT SEEN)	③-⑥ MARSHY	LOW-? 2 HIGH TREE FROG 5+	CALLING
SONG SPARROW	③-④ "	5	CALLING, FIGHTING
RACCOONS	④ TREE @ WOODS EDGE	2	FORAGING, SINGING
2-YOUG-SIDED TOWHEE	④-⑤ SNAGS @ MARSH EDGE	1 MALE	CLIMBING, PLAYING LARGE CEDAR (LAST YR. YOUNG)
ZOWNY WOODPECKER	⑤, ② ALDERS	3	CALLING, FORAGING
BLACK-CAPPED CHICKADEE	⑤ SNAG	1	FIGHTING, FEEDING
ROBINS	①, ② ALDERS, SHRUBS	3	PREPARING NEST - SNAG HOI
HEMLOCK-BACKED CHICKADEE	② ALDERS	10+	MALES FIGHTING, SINGING, FEMALE WAIT
BROWN CREEPER	② ALDERS	1	FLOCK FORAGING
OLDEN CROWNED KINGLET	② ALDERS	1	FEEDING
WATER TURTLE	OPEN WATER	10+	FLOCK FORAGING
LOON		PAIR (2)	FLYING INTO LAKE
OSPREY		1	FLYING OVER



PACIFIC
WETLAND
NURSERY

7035 Crawford Dr
Kingston, WA 98346
206.297.7575

HANSHVILLE WETLANDS

WILDLIFE OBSERVATIONS

NAME:

DATE: 3/1/92

SITE: BUCK LAKE

TIME OF OBSERVATIONS:

UPPER BEAVER POND

8:15 AM - 10:45 AM

LOWER BEAVER POND

LOCATION: CANOE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
BALD EAGLE	TREES, SHORELINE	1 ADULT 1-2 ⁺ YR. OLD IMMATURE	HUNTING, PERCHING
<p>FLUSHED FROM WOODS BY HORSE & RIDER ON NORTHWEST SHORE. THE ADULT EXHIBITED INTERESTED FEEDING BEHAVIOR - FLEW DOWN TO SHORELINE, WADED INTO SHALLOWS & OCCASIONALLY GRABBED AT SOMETHING. IT REPEATED THIS IN SEVERAL PLACES THEN FLEW INTO THE WOODS. THE YOUNG EAGLE JUST WATCHED THEN FOLLOWED THE ADULT</p>			
LONG-BILLED MARSH WREN	⑥ CATTAILS	1	GUARDING TERR FUSSING AT ME
PILEATED WOODPECKER	④ WOODS	1	HEARD HAMMER (NOT SEEN)
HIDDEN BEAVER LODGE	HEARD GRUNTING SOUNDS (FRUSTRATED INSIDES?) RECENTLY CUT WILLOW STEMS NEXT TO LODGE.		



HANAUVILLE WETLANDS
WILDLIFE OBSERVATIONS

NAME: SUE KOENIG

DATE: 3/21/92

SITE: BUCK LAKE

TIME OF OBSERVATIONS: 8:00

UPPER BEAVER POND

10 A

LOWER BEAVER POND

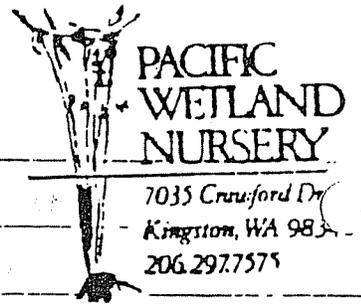
LOCATION: CIRCLED PERIMETER

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
CANADA GOOSE	(4) MARSHY	3	FLYING FROM LAKE
BUFFLEHEAD	(7-8) OPEN WATER	5 MALE 3 FEMALE	SWIMMING, DIVING
PELAGIC CORMORANT	(18) "	1	"
REDWING BLACKBIRDS	(6,1) TREES, CATTAILS	5 +	FLYING, SINGING, CALL
GREAT BLUE HERON	(4-7) TREES, SHOESLINE	1	FLYING, PERCHING
MAILLARD	(7,4) SHOESLINE	1 MALE 1 FEMALE	SWIMMING, CIRCULAR
WINTER WREN	(4) WOODS	1 (HEARD)	SINGING
RING-NECKED DUCK	(7) SHOESLINE	2 MALE 1 FEMALE	SWIMMING
FROGS	(6) "	2 (HEARD)	LOW CROAKING
INT OF (LILIES ARE EMERGING) DIE (THE BOG BUCKLEHEAD IS MAKING A BIG PATCH			THIS YEAR (4)
CROW	(6,11) TREES	3 +	FLYING, CALLING
LONG-BILLED MARSH WREN	(4-5) CATTAILS	1	CATHERING CATTAIL F POPPING IN NEST FUDDING
BLACK-CAPPED CHICKADEE	(4) BLACKBERRIES	2	FORAGING, FLYING
STARLING	(5) SNAGS	2	SINGING, EITHER PAIRING OR BUILD NEST IN SNAG #

pg 2 OF 2

HANSHVILLE WETLANDS

WILDLIFE OBSERVATIONS



NAME: SUB KOENIG

DATE: 3/21/92

SITE: BUCK LAKE

TIME OF OBSERVATIONS: 8 AM

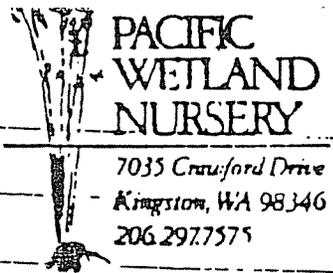
UPPER BEAVER POND

10 AM

LOWER BEAVER POND

LOCATION: CANALS

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
TREE SWALLOW	(6) SWAGS WATER	2	FEEDING OVER WATER
CHESTNUT-BACKED CHICKADEE	(6) FIR ALBERS	3-4	FORAGING
PAID EAGLE	(7) SHORELAND	1 IMMATURE	FLEW IN TO DRINK W
WOOD DUCKS	(1-11) SHOESING - ATTAILS	4 MALE, 1 FEMALE	SWIMMING, FEED
AMERICAN KOENIG	(10) TREES, LAWN	2+	FEEDING, SINGING
SONG SPARROW	(3-4) WOODS	1 HEARD	SINGING



HAUSVILLE WETLANDS
WILDLIFE OBSERVATIONS

NAME: SUE KOENIG

DATE: 4/11/92

SITE: BUCK LAKE

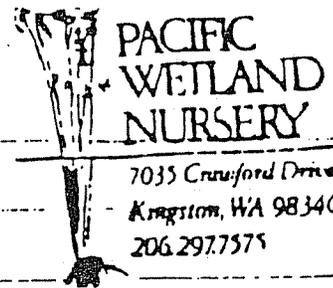
TIME OF OBSERVATIONS: 9-11

UPPER BEAVER POND

LOWER BEAVER POND

LOCATION: CANOE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
REARING BLACKBIRD	10-3 CATTAILS, TREES	5±	SINGING, FLYING, CALLING, FORAGING
CROW	10-3 TREES	4	CALLING, FLYING
AMERICAN ROBIN	9-11 TREES	10+	SINGING, FLYING, CALLING, FORAGING
STARLING	10, 6 SWALS, TREES	10+	FLYING, CALLING
BUFFLEHEAD	8 OPEN WATER	1 FEMALE, 5 MALES	SWIMMING, FEEDING
FROGS	6-7 SHRUBS	10+	LOW CROAKING (HEAR)
TREE SWALLOWS	3, 6-7 WILLOWS	10+	FLYING, CALLING, PER
PIED BILL GREBE	3 OPEN WATER	1 VISIBLE	MAY BE NESTING
BOG BUCK BEAN IN BLOOM		1 IN RUSHES	PERIODS - 1 REMAINED HIDDEN BUT ANSWERED CALLS FROM VISIBUS
POO-SHAPED FLICKER	6, 8 SWALS	2	CALLING, FLYING, FEED
BLACK-CAPPED CHICKADEE	8 SHRUBS	3+	CALLING (HEARD)
SONG SPARROW	3, 6, 9 SHRUBS	5+	SINGING, FORAGING
WINTER WREN	4 WOODS	1	SINGING (HEAR)
LOW-BILLED MARSH WREN	5 CATTAILS	1	FORAGING, CALLING
RUFOUS HUMMINGBIRD	5 CATTAILS	1 FEMALE	GATHERING CATTAIL FLUFF FOR NEST



7035 Crawford Drive
 Knappton, WA 98346
 206.297.7575

HANSVILLE WETLANDS
 WILDLIFE OBSERVATIONS

NAME: SUE KOENIG

DATE: 4/11/92

SITE: BUCK LAKE

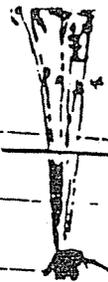
TIME OF OBSERVATIONS: 9-11A

UPPER BEAVER POND

LOWER BEAVER POND

LOCATION: CANOE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
RUFOUS-SIDED TOWHEE "MIRAGE" FORM	⑥ SHRUBS, SWAG, TREES	3	FEEDING, PERCH
YELLOW-RUMPED WARBLER	⑥ TREES	1	FEEDING, SING
TREE SWALLOW	SHRUBS, SWAG, TREES WATER		
RED-TAILED HAWK	⑨ TREE	1 IMMATURE	PERCHING
CANADA GOOSE	⑩ WATER, LAWN	2	FEEDING, SWIMM
GREAT BLUE HERON		2	FLYING OVER
BROWN CREEPER	⑨ SHRUBS	1	CALLING (HEARD)



HANSHVILLE WETLANDS

WILDLIFE OBSERVATIONS

NAME: SUE KEELING

DATE: 4/27/92

SITE: BUCK LAKE

TIME OF OBSERVATIONS: 8-10

UPPER BEAVER POND

WINDY, RAINY

LOWER BEAVER POND

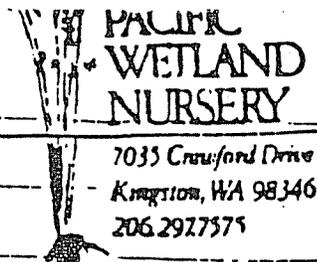
DAY AFTER OPENING

LOCATION: CANALS

SEASON - FISHING,

5 OTHER BOATS PRE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
Red-winged Blackbird	(11, 16) TREES, CATTAILS	10+ FEMALES & MALES	FEEDING, NESTING, CALL
SWALLOW	FLYING OVER	1	
Brown-headed Cowbird	(3, 6) SHRUBS, SNAG	2	CALLING, FEEDING
Mallard	(5, 10) CATTAILS	1 PAIR	FLYING
Belted Kingfisher	(8) SNAG	1	CALLING, FEEDING
Tree Swallows	(3, 6) WILLOWS, SNAGS	10+	FEEDING, CALLING, FEEDING OVER WATER
Great Blue Heron	(4) WOODS	1	FLYING FROM WOODS
Song Sparrow	MOST OF CATTAILS PERIMETER - SHRUBS	10+	CALLING, SINGING, FEEDING
Yellow-rumped Warbler	(6) ALDERS	3	SINGING, FEEDING
Black-capped Chickadee	(4) WOODS	1	CALLING (HEARD)
Common Yellowthroat	(4-5) SHRUBS, CATTAILS	1 MALE	FORAGING, SING
Marsh Wren	(5) CATTAILS	1	CALLING
Frog	(4-5) POND EDGE	1	CALLING (LOW) (HEARD)
Nuthatch	(3) WOODS	1	HEARD CALLING
PATCHES OF MILFOIL ARE LARGE & SPREADING MOSTLY (4, 8, 10)			



HANSHVILLE WETLANDS
WILDLIFE OBSERVATIONS

NAME: SUE KEONIG

DATE: 5/15/92

SITE: BUCK LAKE

TIME OF OBSERVATIONS: 2:30 -

UPPER BEAVER POND

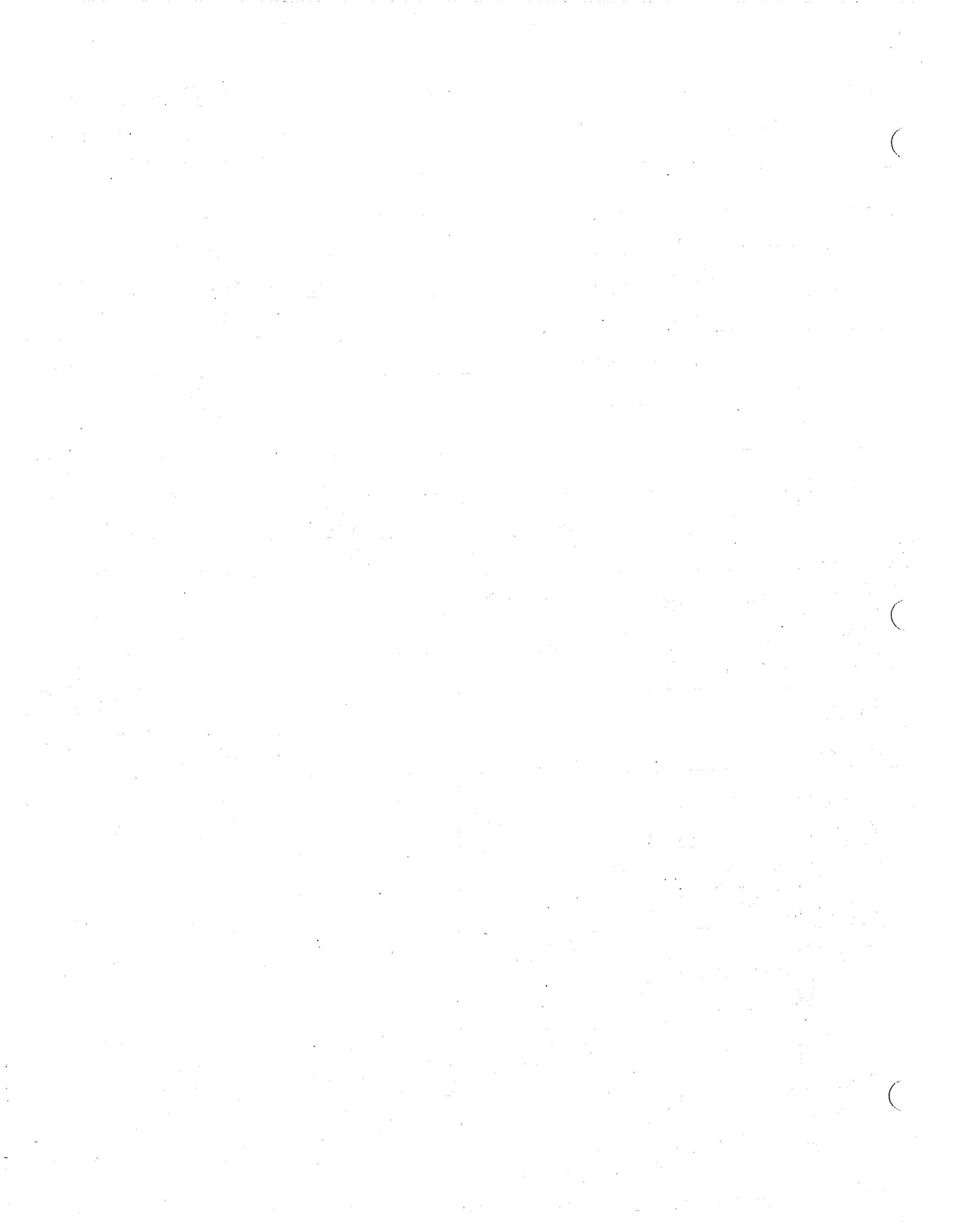
4:30 PM

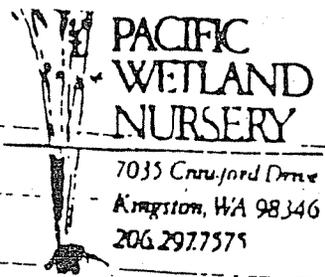
LOWER BEAVER POND

2 OTHER BOATS PRESENT

LOCATION: CANALS

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
ROBIN	(11) CAT-TAILS, TREES	4	FEEDING, SINGING
TRUSS SWALLOW	(6, 3) SWAGS	7	FEEDING
MARSH WREN	(5) CAT-TAILS	1	SINGING
SONG SPARROW	(3, 6) SHELLING BUSH	5	SINGING, FORAGING
BARN SWALLOW	(6) OVER WATER	1	FEEDING, BATHING, IN FLIGHT
ROBIN	(1, 5) LAWN, TREES	5	FEEDING, SINGING
STARLING	(3) SWAG	1	PERCHING, SINGING
PACIFIC SWAMP FLYCATCHER	(4) DEAD TREES	1	FEEDING FROM SWAG
RUBY-CROWNED KINGLET	(4) ALLEN	1	FORAGING
GREAT BLUE HERON	(7)	1	FLYING OVER
OSPREY	(7) SWAG WATER	1	FEEDING - CAUGHT FISH
ROB-DRAFTON FLYCATCHER	(5) SWAGS	2	CALLING, FEEDING
CANADA GOOSE	(11) OPEN WATER	1 PAIR	SWIMMING
MALARD	OPEN WATER	1 FEMALE W/ 3 YOUNG / 1 PAIR	USING / FEEDING
WOOD DUCK	(8-6) WATER	1 MALE	FLYING OVER
PARULA WAXWING	(7) TREES	1 IMMATURE	FLYING OVER
CROW	(7) GROUND		CALLING, FLYING





HANSVILLE WETLANDS
WILDLIFE OBSERVATIONS

NAME: SUE KOENIG

DATE: 5/25/92

SITE: BUCK LAKE

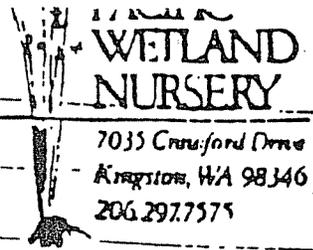
TIME OF OBSERVATIONS: 8-10

UPPER BEAVER POND

LOWER BEAVER POND

LOCATION: CHANCE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
RED WING BLACKBIRD	CATTAILS, BRUSH	14 MALES/FEMALES	NESTING, FEEDING, SINGING
ROBIN	TREES, GRASS	5	SINGING, FEEDING
TREE SWANOW	OPEN WATER SWALS	10+	FORAGING, NESTING
BARN SWANOW	NESTING IN OLD SHACK	1 PAIR	FEEDING, NESTING
CEBRAL WAXWINGS	TREES	30+	FORAGING IN FLOCKS
WILLOW FLYCATCHER	BRUSH, SWALS	3	SINGING, PERCH
SONG SPARROW	SHORELINE BRUSH	4	SINGING, FORAGING
PIED BILLED GREBE	NORTH OF BUCK LAKE	1	HEARD CALLING
MARSH WREN	CATTAILS	2	SINGING
WILSON'S WARBLER	TREES	1	SINGING (HEARD)
PACIFIC SONG FLYCATCHER	TREES	3	SINGING (HEARD)
YELLOW THROAT	TREES	2	SINGING (HEARD)
BLACK-CAPED CHICKADEE	SHRUBS	2	SINGING
CROW	TREES	5	CALLING
SWAINSON'S THRUSH	WOODS	1	SINGING (HEARD)



HANESVILLE WETLANDS
WILDLIFE OBSERVATIONS

NAME: SUE KOENIG

DATE: 6/27/92

SITE: BUCK LAKE

TIME OF OBSERVATIONS: 11-12

UPPER BEAVER POND

1 OTHER BOAT

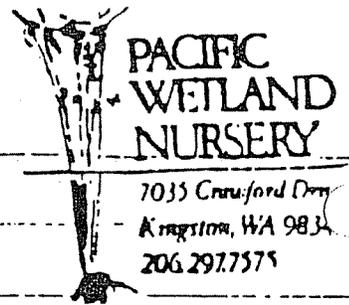
LOWER BEAVER POND

LOCATION: CANOE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
RED TAILED HAWK	④ SHORE	1	CIRCLING OVER POND
KILLDEER	⑨ SHORELINE	2	FLYING, CALLING
TREE SWALLOW	③⑥ SNAGS	10+	FLYING, NESTING, FEEDING
RED WINGED BLACKBIRD	①⑦ BRUSH, CATTAILS	10+	" " "
SWAINSON'S THRUSH	④⑧ WOODS, BRUSH	4	SINGING, FORAGING
SONG SPARROW	PERIMETER BRUSH-SHORELINE	6	" "
BARN SWALLOW	③ OVER OPEN WATER	2	FLYING - FEEDING
BLACK-CAPPED CHICKADEE	⑤⑧ WOODS, BRUSH	2	FEEDING, CALLING
ROBIN	③ TREES	3	SINGING, FEEDING
PURPLE FINCH	④ TREES, BRUSH	3	" "
ORANGE-CROWNED WOODPECKER	④ "	1	" "
BUSH TIT	④ "	2	FORAGING
CORPSE WAXWING	④⑦ TREES, SNAGS	5	"
P. BUS SHASTA TOWHEE	① WOODS	1	SINGING
YELLOW THROAT	③ WOODS	1	"
HELD EAGLE	④ SNAGS	1 IMMATURE	FORAGING

FOUNDED 1984

DATA SHEETS TAPES MICROFILM CLIPPINGS RAIN GAGES BOATS FOOD & DRINK



7035 Crawford Dr
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206.297.7575

HANSHVILLE WETLANDS
WILDLIFE OBSERVATIONS

NAME: SUE KOENIG

DATE: 6/27/92

SITE: BUCK LAKE

TIME OF OBSERVATIONS: 11 AM

UPPER BEAVER POND

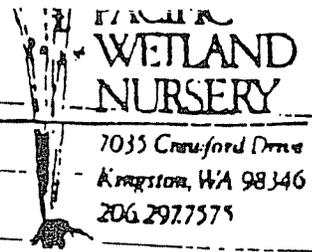
OTHER BOAT

LOWER BEAVER POND

LOCATION: CANOE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
AMERICAN GOLDFINCH	(7) TREES	1	CALLING
TURTLE (? SPECIES)	(8) LOGS IN WATER	1-8" LONG	SUNNING
CROW	(51) TREES	6	PERCHING, FLYING, (1)
GREAT BLUE HERON		1	FLYING OVER
MARSH WREN	(5) CANALS	2	SINGING
NEW CUTTINGS	ON & NEXT TO OLD BEAVER LODGE		
WHITE WATERLILIES IN BLOOM			} VERY ABOVE THIS YEAR
BRIGHT BLUE DAMSELFLIES			
ORANGE ROSS DRAGONFLIES (MEDIUM)			
DARK DRAGONFLIES W/ WHITE WINGSPOTS (LARGE)			
MILFOIL	NOT AS NOTICEABLE		

PAGE 1 OF 1



HANSHVILLE WETLANDS

WILDLIFE OBSERVATIONS

NAME: SUE KOENIG

DATE: 7/10/92

SITE: BUCK LAKE

TIME OF OBSERVATIONS: 5 PM - 7 PM

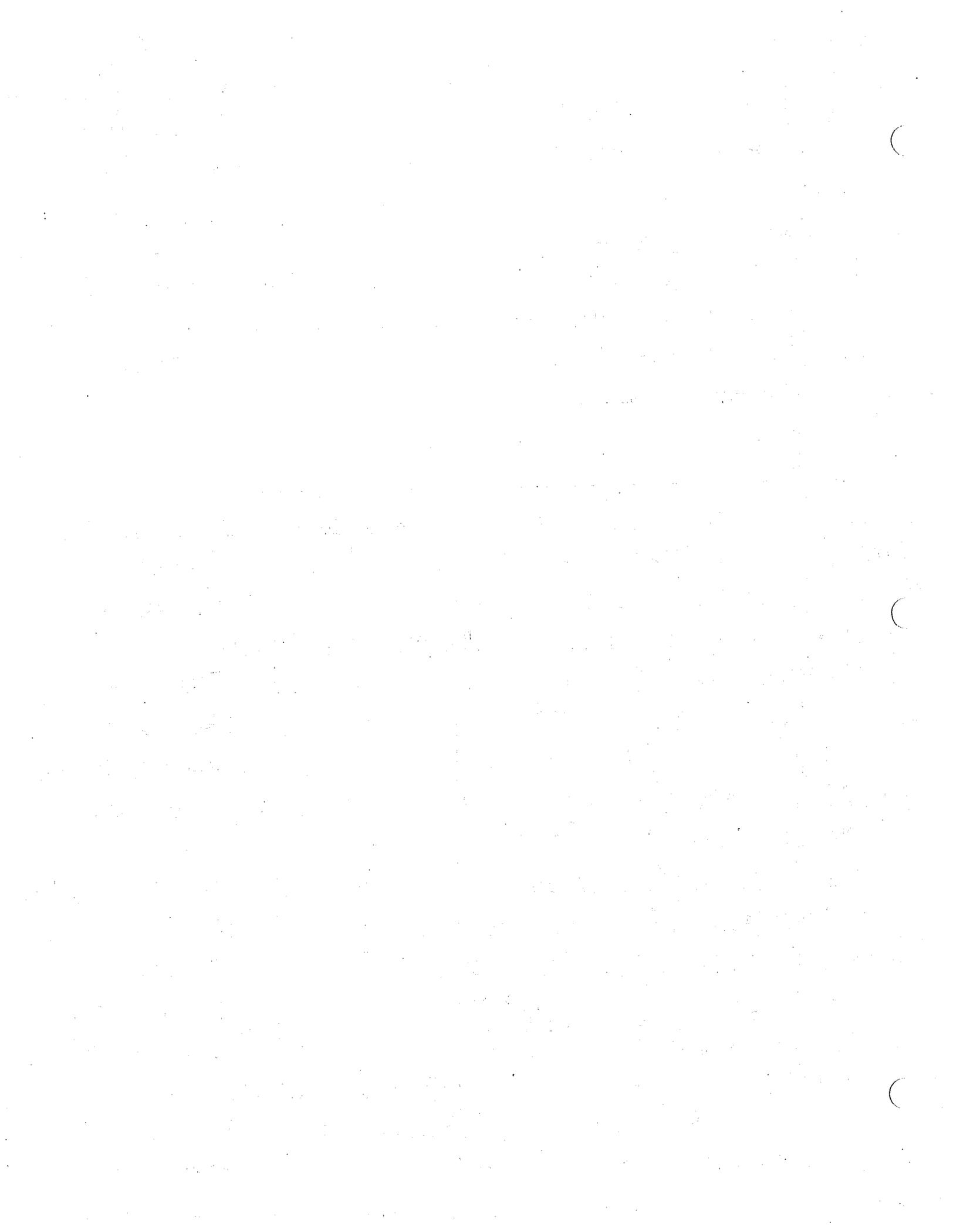
UPPER BEAVER POND

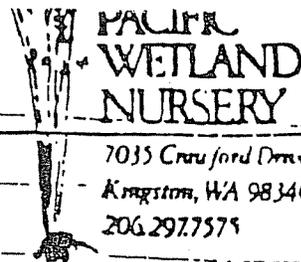
LOWER BEAVER POND

WITH BARBARA

LOCATION: CANOE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
BLACK-CAPPED CHICKADEE (10)	WILLOWS	7	FORAGING
SONG SPARROW (10)	SHRUBS	2	SINGING
DEAD CROW	CATCH IN TREE BY FISHING LINE		
SWAINSON'S THRESH (9)	WOODS	2	SINGING
RED-WINGED BLACKBIRD (1)	REEDS, BRUSH	5-6	FORAGING
CROW (2)	TREES	2	CALLING, FLYING
BARN SWALLONS (2)	WOODS/MARSH	3	FORAGING
TREE SWALLOW (3)	SNAG	2	PERCHING
CECIL WAXWING (2)	TREES	6	FORAGING, CALLING
WILSON'S WARBLER (4)	WOODS	1	SINGING
PILEATED WOODPECKER (4)	SNAGS	2	FORAGING
BELTED KINGFISHER (10)	SNAGS	1	CALLING, FLYING
GREY BUBB HERON (4)	REEDS, BRUSH	1	PERCHING, FISHING
PURPLE LOOSTRIFE	IN 5-6 AREAS @		
NORTH END - BARBARA WILL REMOVE			
WILLOW FLUTCHER (7, 9)	SHRUBS	2	FORAGING





HANSHVILLE WETLANDS

WILDLIFE OBSERVATIONS

NAME: SUB KOENIG

DATE: 7/25/92

SITE: BUCK LAKE

TIME OF OBSERVATIONS: 5:30

UPPER BEAVER POND

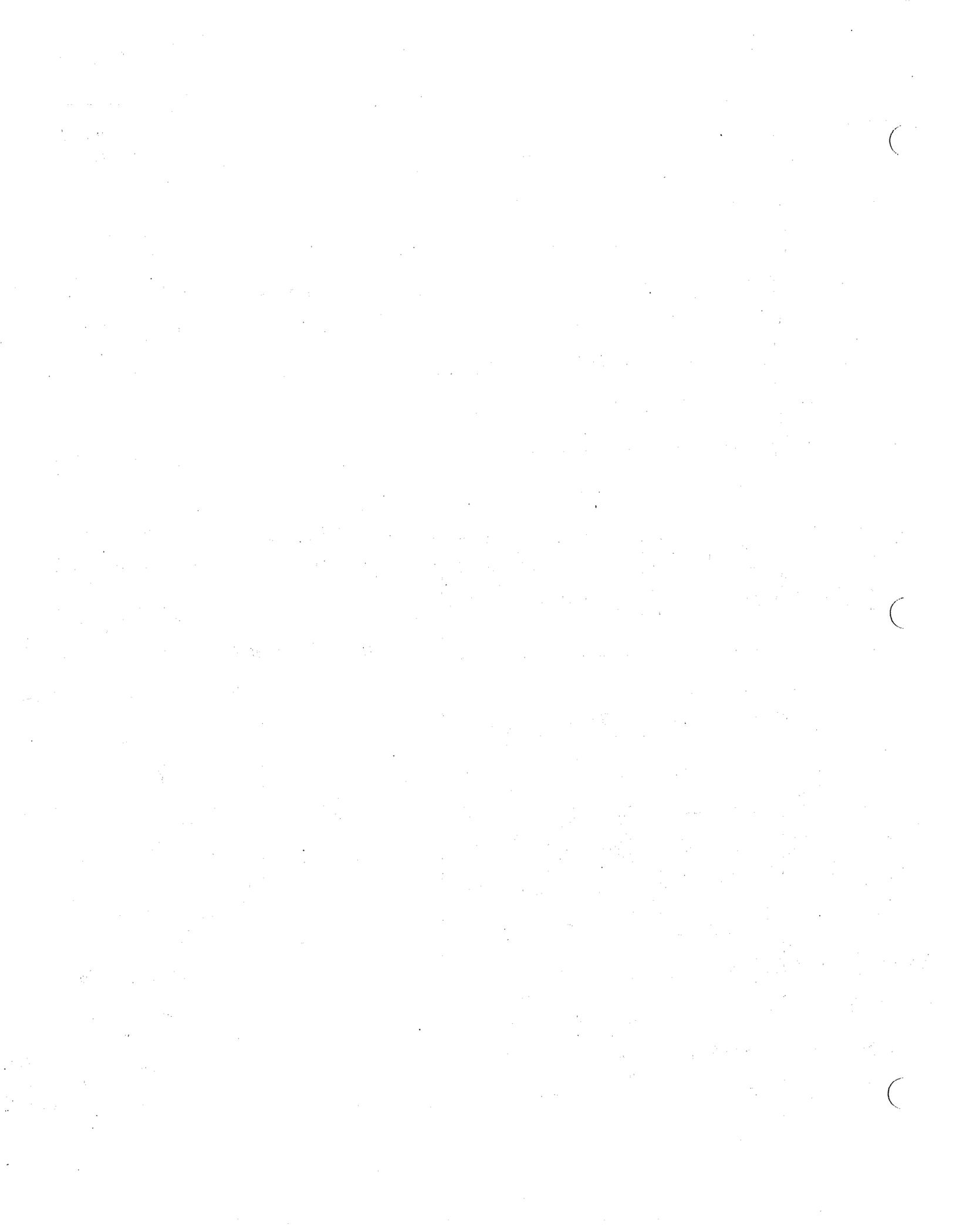
7:30 PM

LOWER BEAVER POND

LOCATION: CANOE

SPECIES	HABITAT	# OF INDIVIDUALS	ACTIVITY
BARN SWALLOW	MARSH, OPEN WATER	2-3	FEEDING, PERCH
TRUSS SWALLOW	MARSH, OPEN WATER	20+	FEEDING, PERCH
		THOSE 2 WERE FEEDING TOGETHER IN A LARGE FLOCK	
BLACK-CAPED CHICKADEE	WEDGES	3	CALLING
WILLOW FLYCATCHER	SHRUBS	4	FORAGING, CALL
GREAT PALE HERON	SNAGS, SHRUBS	3 YOUNG 1 ADULT	FISHING, PREEN
RED WINGED BLACKBIRD	CATTAILS	5	FEEDING, CALLING
REDTAIL KINGFISHER	SNAGS	2	FLYING, PERCHING, CAL
SONG SPARROW	BRUSH	1	SINGING
Hairy Woodpecker	SNAG	1	PREENING
MARSH WREN	IN WATER ON LOG	1	PREENING
WESTERN Tanager	TREES	1	FLYING, CALLING, SINGING
ROCK DOVES	ON OLD HOUSE	3	FLYING, PERCHING

Pinell &



Sue Koenig
P.O. Box 393
Indianola, WA 98342

August 15, 1992

Greg Hueckel
Fish Management Division
Washington Department of Wildlife
600 North Capitol Way
Olympia, WA 98504

RECEIVED
AUG 17 1992
FISHERIES MGMT DIV

Dear Greg:

Due to lack of transportation, I will be unable to attend the meeting today in Wenatchee to present my comments on the lake rehabilitation E.I.S. Several people also entrusted me with their letters containing their comments. I know July 31 was the last date to send comments but I was hoping you could "unofficially" read and consider these comments.

#1
I feel the lake rehab program focuses entirely on fish management with no scientific consideration of effects on the surrounding terrestrial communities. Impressive amounts of data are given for below-waterline lifeforms. Only two short pages in the E.I.S. address "probable" effects on birds, reptiles, and mammals. Targeted lakes should be thoroughly researched for the presence of endangered species, either by D.O.W. or local conservation groups. Assumptions should not be made as to what "might" happen. Solid research should be done to gather data necessary to confidently say species won't be affected. Increased human disturbance through development of surrounding areas and usage are already putting pressure on local species. To state that they will simply "move on" from disruption (through poisoning) of what little balance is left is very short sighted. It is time to consider these lakes as part of entire ecosystems, not just as large fish-rearing pools.

42
I would like to suggest choosing some key lakes in varying habitats that will, because of public preference or true necessity, be poisoned, and doing detailed studies on them before and after. U.W. apparently conducted detailed research on Koeneman Lake in Kitsap County but no "above-water" results seem to be available. I realize resources

are limited but the data could be gathered utilizing graduate students in wildlife biology or ecology, internships, or local groups such as Audubon. Our study is showing a wide range of usage as the year progresses so a year would probably be the minimum amount needed to get needed data. Insect populations and bird feeding and nesting successes would be good indicators to stress.

Thank-you for bringing this to the public this year. I hope alot of useful local information will come out of this to help you in your decisions.

Sincerely,

Sue Koenig



Lake Lawrence Improvement Club

Fish
public
input

Save Lake Lawrence

16646 Pleasant Beach Dr. • Lake Lawrence, WA 98597 • (206) 894-36

July 22, 1992

State of Washington
Governor Booth Gardner
Olympia Wa 98504-0413

RECEIVED

JUL 3 1992

Board of County Commissioners
George L Barner, Jr
Diane Oberquell
Linda Medcalf
2000 Lakeridge Dr SW
Olympia Wa 98502-6045

WILDLIFE COMMISS

Director of Wildlife Commission
Dean Lydig Terry Karro
Jim Walton John McGlenn
Mitch Johnson Norm Richardson
600 Capitol Way N
Olympia Wa 98501-1091

We are writing on behalf of Lake Lawrence Improvement Club a non-profit consolidated group representing all segments of the population surrounding Lake Lawrence. Lake Lawrence Improvement Club is committed to enhancing the quality of Lake Lawrence and preserving lake use for a broad base of diverse uses and enjoyment, both for present users and future generations.

We strongly protest the proposed use of Rotenone in Lake Lawrence by the Department of Wildlife. Strong expressions of opposition to this proposal were made at the public hearing on July 1, 1992 by individuals in our area. In a very short time, with very limited effort, petitions were solicited to people in our area and over 270 signatures were obtained to express opposition to this proposal. Our purpose in writing is to confirm a collective opposition to this proposal by a consolidated group representing Lake Lawrence. We have decided to write to you because of our feeling that the Department of Wildlife has been unresponsive to public opinion expressed at the public hearing and will make a decision on this matter contrary to the overwhelming opposition by those of us most directly impacted by the decision.

Such a conclusion on our part appears justifiable as it was very clear at the public hearing that the Department of Wildlife had made little or no effort to articulate with our Lake Management District and other county and state agencies involved in activities related to lake restoration and lake management in proposing the use of Rotenone.

Although we will not attempt to present all of our concerns relative to this issue, we would like to state some specific reasons for our strong opposition to the proposal.

(1) The diverse interest in fishing Lake Lawrence go well beyond the proposed "trout preserve" created by the proposal. Lake Lawrence is regarded as one of the finest bass fishing lakes in our state.

(2) Residents and public lake users will have to endure and clean-up rotting fish from the lake and beaches.

(3) The bald eagle habitat, with their protected rights and heron families living on our lake will have their food supply significantly impacted for a number of years.

(4) Our aquifers may be contaminated by the use of Rotenone.

(5) Algae blooms, already a major problem, will intensify with the decay of fish.

(6) The weed problem will increase without fish and wildlife eating the weeds. Our weed problem is already a significant problem. We have had to spend thousands of dollars.

(7) The finances used to poison the lake could be spent on re-stocking fish and other projects having a positive impact on lake use.

We are enclosing a copy of a letter sent to the Department of Wildlife by members of our Board of County Commissioners in which they state their strong opposition to the proposal. We urge you to read this document and to carefully consider the position of our local governing officials.

Thank you for this consideration. Please inform all those considering this issue of our concerns. We also request that we be informed of all developments relative to this proposal.

Lake Lawrence Improvement Club
David M. Olson, President

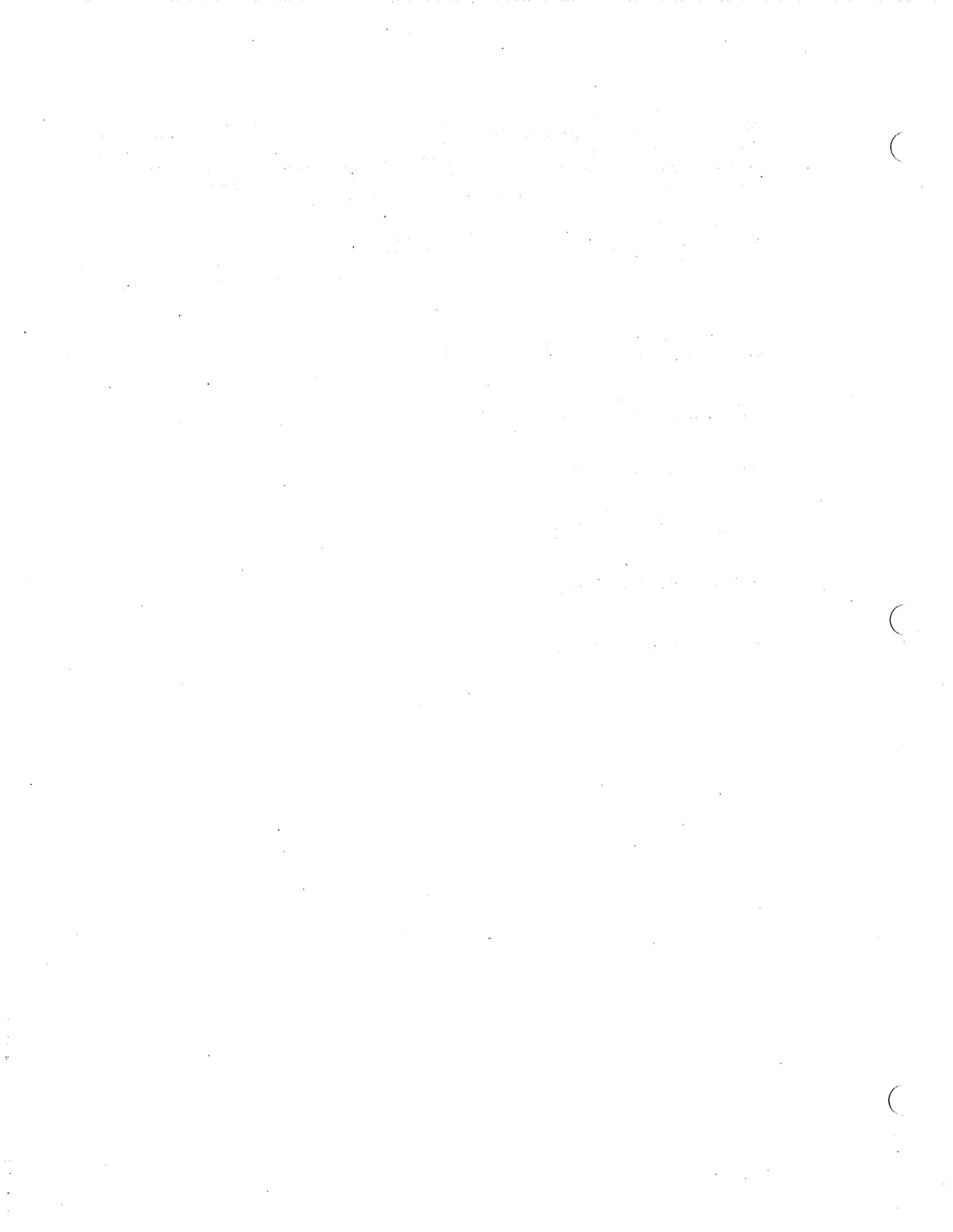
David M. Olson

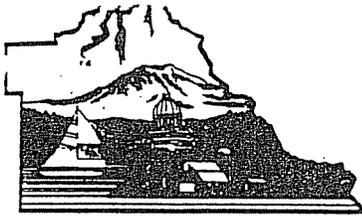
Robert Lindley, Vice President

Robert Lindley

Joan Patrick, Secretary

Joan Patrick





THURSTON COUNTY

WASHINGTON
SINCE 1852

George L. Barner, Jr.
District One
Diane Oberquell
District Two
Linda Medcalf
District Three

BOARD OF COUNTY COMMISSIONERS

July 8, 1992

Greg Hueckel
State Resident Trout Manager
Washington Department of Wildlife
500 N. Capitol Way
Olympia, WA 98501

Dear Mr. Hueckel:

SUBJECT: PROPOSED ROTENONE TREATMENT OF LAWRENCE AND MC INTOSH LAKES

The Board of Thurston County Commissioners is opposed to the proposed use of rotenone in Lawrence and McIntosh Lakes. This is an invasive technique which sacrifices a multitude of resident fish, amphibians, insects and other species to create a planted trout fishery. We do not believe there is justification for such drastic measures in these lakes.

We are also concerned about the lack of integration with the Lake Lawrence management plan. The comprehensive study of this lake revealed very high nutrient loading rates - which could be severely exacerbated by the rotenone treatment.

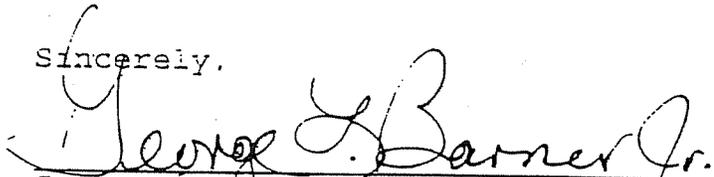
Thurston County encourages the development of comprehensive lake management programs. In the case of Lawrence and McIntosh Lakes, we encourage the Department to work with lake residents, fishing groups and other agencies to develop clear objectives for fishery management which are compatible with multiple-use lake management. Techniques could then be selected which would best meet fishery management and other objectives in the long term, with least disruption of the environment. Thurston County - and many lake residents - would be very willing to assist with developing and implementing such a program.

We welcome the Department of Wildlife's role in providing productive sport fisheries for our State's residents. However, we are very concerned that lake fishery management be conducted using a wholistic, ecological approach. We strongly oppose the repeated use of rotenone to turn these natural systems into virtual trout ponds. We also urge that you carefully consider comments made by lake residents at your recent public hearing.

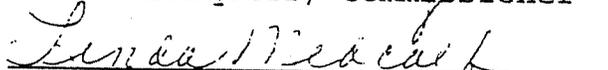


Please contact our office or Tom Clingman at Thurston County Public Works, 786-5485, if you have any questions or would like to have a meeting on this issue.

Sincerely,


George L. Barner, Jr., Chairman


Diane Oberquell, Commissioner


Linda Medcalf, Commissioner

C:
Bill Freymond, WDW
Lorena Lindley, Sec't, Lake Lawrence Improvement Club
Mark Swartout, Office of Community and Environmental Programs

8-7-92

Dear Greg Hueckel,

I write to you as a concerned citizen regarding the proposed poisoning of Buck Lake and Kaeneman Lake. The time has long passed that the practice of lake poisoning be removed from Department of Wildlife policy.

My training & degree is in natural sciences from the University of Washington. My readings and research conclude the entire food chain for plant and animal life is negatively impacted by lake poisoning.

#1 I urge you to decide against the proposed October poisoning of Buck and Kaeneman Lakes.

#2 (at present I am a team leader in an eight month observation of a rich beaver pond biome south of Buck Lake. The Hansville Environmental Committee has sponsored the evaluation of Buck Lake and the 2 connected beaver ponds south of Buck Lake for the purposes of wetlands designation. We must do all that is possible to maintain the stable quality of the waters and adjacent habitats in their present balance.

#3 There are species designated by the state to be protected that are dependent on the waters of Buck Lake and the 2 beaver ponds for their fish and amphibian food sources. It is critical to the total food chain

the poisoning not be done.

Another coming trauma to the Buck Lake habitat is the clear cutting proposed for the west and south shores. Even though a buffer is proposed the lake will be adversely impacted.

Too much - for the large sector - is at stake to poison Buck Lake.

Sincerely,

Marion D. King

2860 N. E. Edman Ave.

Hingston,

Washington

98346

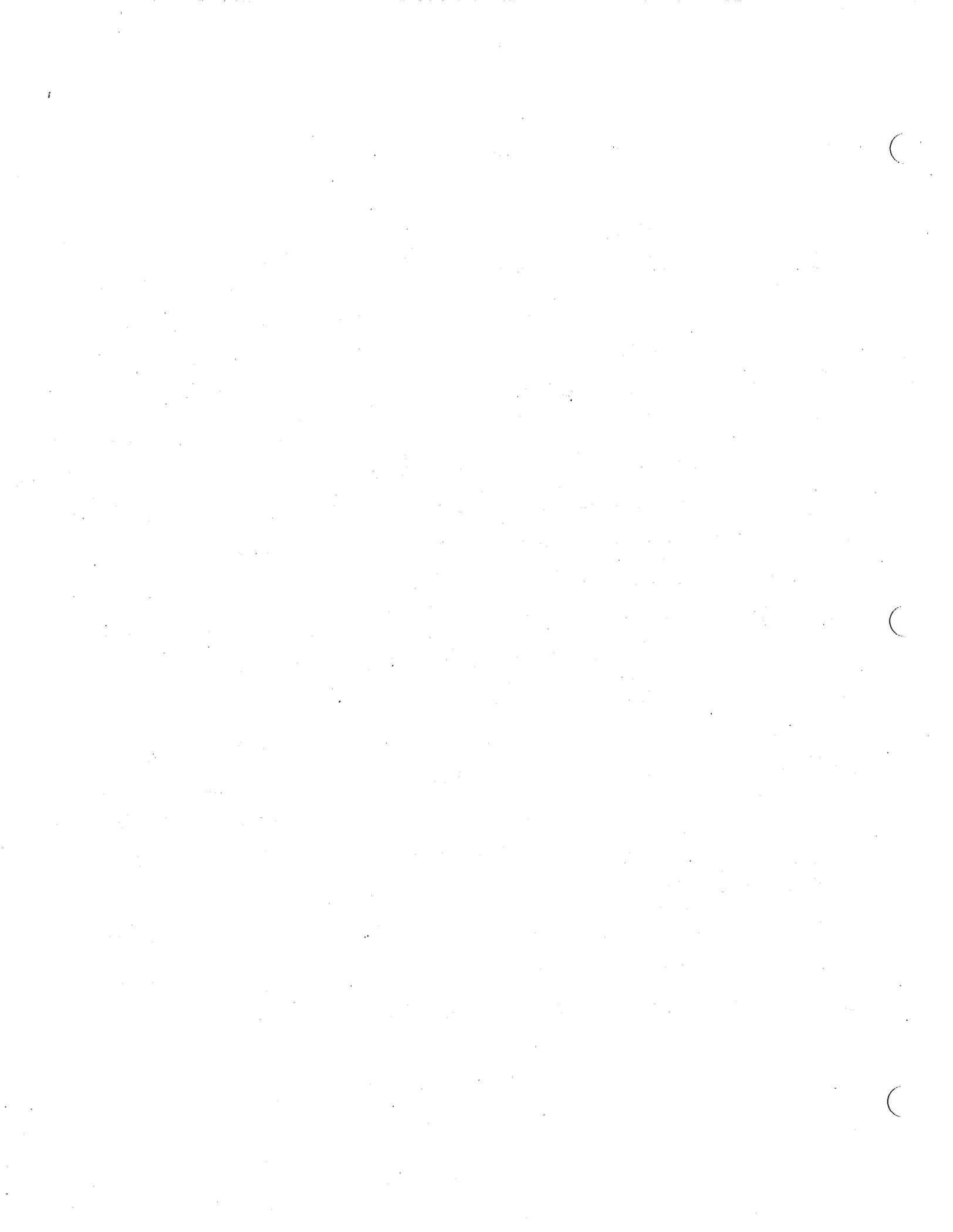
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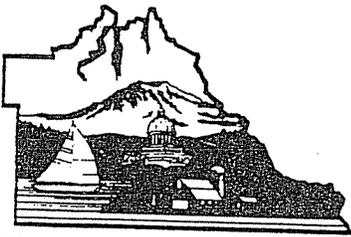
Dear Greg Hueckel,

#1
I am writing to you about the Dow plan to "sterilize" Buck Lake in Kitsap County. I think it is an error to manage a lake for "trout only." I think it is wise to view the lake as an entire ecosystem which includes the plankton & insects as well as the many species of birds. I fear ~~on~~ the plankton & the insects will also be killed which ~~is~~ will impact those animals which eat them.

I want you to reverse your decision to poison the lake. Further, I want you to reevaluate Dow policy which would allow the poisoning of any lake. We simply must look at whole systems when we are making management decisions.

Sincerely,
Mike Er Quenter
P.O. Box 224
INDIANOLA, Wa. 98342





THURSTON COUNTY
 WASHINGTON
 SINCE 1852

COUNTY COMMISSIONER
 George L. Barner, Jr.
 District One
 Diane Oberquell
 District Two
 Linda Medcalf
 District Three

PUBLIC HEALTH AND
 SOCIAL SERVICES DEPARTMENT

Patrick M. Libbey, Director
 Diana T. Yu, MD, MSPH

July 30, 1992

Greg Hueckel
 Department of Wildlife
 600 North Capitol Way
 Olympia, WA 98504

RECEIVED

AUG 03 1992

FISHERIES MGMT

Dear Mr. Hueckel:

Thank you for the opportunity to comment on the supplemental programmatic environmental impact statement (SPEIS) on lake and stream rehabilitation. The following comments are consolidated from three county departments: Health, Public Works, and Office of Community and Environmental Programs.

General Comments

1. Description of Proposed Action and Scope of EIS

The draft SPEIS is a significant improvement over the past SEPA document used for this program. However, the document contains a great deal of data about specific aspects of rotenone treatments while failing to explore other alternatives as intended by SEPA. The WDW and interested reviewers of the EIS might be better served by basing the document in a more comprehensive description of problems and objectives, followed by a more thorough exploration of alternatives.

On page 1, the draft document uses the term "manage" to refer solely to lakes with periodic rotenone treatment by WDW. This would appear to be too narrow to accommodate the actual interest and scope of activities of WDW: The agency "manages" all lakes where planting or other action is conducted. Optimally, the SPEIS should assess all alternative actions which may be utilized to address the various types of fish species management problems encountered by WDW in various waterbodies.

The problems which the SPEIS "proposed action" would address are not clearly defined in the Justification section (page 6). "...Overpopulation in the Justification section (page 6). emphasis" (p. 6) doesn't adequately describe the problems for the reviewer. In appendices regarding specific lakes, the following



appear to be the types of problems which need to be addressed by WDW in managing fish species:

- a.) Predation on planted fingerling trout by piscivorous fish;
- b.) Competition by overpopulation of planktivorous fish which reduces food source too low for adequate fingerling trout growth; and
- c.) Carp overpopulation which:
 - (1) Affects success of trout plants;
 - (2) Triggers excessive nutrient cycling from bottom feeding, and;
 - (3) Damages dabbling duck habitat.

3
The focus of the document is on "elimination" as the sole management strategy for addressing competing fish species. Alternatives to rotenone are found inadequate (after very brief review) for achieving elimination of target species, with rotenone the preferred alternative. However, on page 112 the SPEIS explains that complete eradication is not likely to be achieved, with "improved fishery" identified as a more accurate goal. This is a crucial difference in establishing the criteria for evaluating alternative actions. These alternatives would compare more favorably if the goal is reducing rather than eliminating target species.

If the above three problems are an accurate grouping of issues, perhaps the SPEIS could then examine alternatives for each one. Each problem could be defined utilizing Integrated Pest Management (IPM) principles, including clear definition of the "injury" (damage caused) and "action level" (point at which action is necessary to avoid reaching the injury level.) The following is not intended to be an exhaustive list but does illustrate an alternate approach which might better meet the intent of SEPA to explore alternatives:

- a.) Predation on trout fry problem (alternative actions):
 - (1) Plant catchables
 - (2) Shift to warmwater management
 - (3) In-lake rearing of fingerlings to acclimate and increase size
 - (4) Plant fingerlings mid-lake to reduce predation on stressed fry by littoral-dwelling bass;
 - (5) Reduce numbers of predator fish via rotenone treatment.
 - (6) Integrated approach
 - (7) No action
- b.) Food source competition from planktivorous fish:
 - (1) Increase predation by increasing number of brown trout, bass, etc.
 - (2) Reduce overabundance of aquatic plants which limit predation and favor overpopulation;
 - (3) Complete drawdown;
 - (4) Rotenone treatment to reduce number of competing fish.

- (5) Integrated approach
- (6) No action

c.) Carp:

- (1) Netting/killing schools in shallows;
- (2) Fish derby/bounty;
- (3) Partial drawdown;
- (4) Rotenone with strong and/or double treatment.
- (5) Integrated approach
- (6) No action

Some of these techniques would need to be initiated at an early stage ("action level") in contrast to periodic use of rotenone after conditions are highly degraded. Again, the focus on "elimination" (which may not be achievable) leads to dismissal of all alternatives rather than exploration of alternatives and disclosure of potential environmental impacts. The alternative of removing congregations of spawning fish (page 2) is noted as requiring repeated action. However, this is also the case for rotenone treatment - it must periodically be repeated.

#4
Exploration of the "no action" alternative also should be included: In many cases, the same factor which is degrading the sport fishery may also degrade the lake ecosystem (ex. over-predation on zooplankton) if no action is taken.

2. Evaluation approach

#5
The SPEIS should use a uniform evaluation approach throughout the document. While portions of the SPEIS, such as the sections on phytoplankton and zooplankton, present the reader with a large array of results and interpretations of many individual studies, the sections on environmental fate and toxicity rely heavily on other researchers' reviews. The level of detail and type of data presented (individual studies, studies with interpretations provided by WDW, tables, summaries, etc) should be consistent. Enough information should be presented to provide the reader with an understanding of the issues involved and bases for conclusions reached.

Further, the SPEIS should adopt a reasonable worse-case approach to explore possible adverse effects. The existing approach is based largely on "best-cases," resulting in a document in which the potential hazards are understated and minimized. For example, permanent species shifts, permanent species losses, and changes in community structure are documented in several of the studies cited. Without exception they are discounted due to poor sampling technique, sample design, or unusual circumstances. Using a reasonable worse-case approach, these effects would be considered rather than discounted.

3. Public Process

WV The "pre-treatment process" might be improved through a more direct approach including local groups and local governments involved with lake management: First build consensus on broad management objectives for the lake fishery using an IPM approach; then explore all options and define the best management actions. WDW management plans for the lake -- whether rotenone or other technique(s) -- would then hopefully have concurrence of the working group. See also the letter from Board of County Commissioners dated July 8.

4. Data gaps and uncertainty

Any discussion of significant data gaps -- the information needed but unavailable to make a thorough evaluation of the proposal -- is lacking. Data gaps should be clearly identified, and the cost and feasibility of obtaining the information should be evaluated. Uncertainties should also be identified, to assist decision-makers in distinguishing known and uncertain risks.

5. Rotenone product chemistry (contaminants, metabolites, degradation products, and inert ingredients)

#8 Additional information on rotenone should be included in the SPEIS: a) The toxicity, persistence, and environmental fate of degradation products. b) The toxicity of the metabolites. c) A discussion on possible contaminants. According to the Science Chapters for registration of rotenone, the manufacturing process uses trichloroethylene and carbon tetrachloride. Has the product been tested for residual levels of these compounds? The Science Chapters also noted rotenone crystals are 72 percent rotenone. What is known about the remaining 28 percent? d) The composition and toxicity of inert ingredients. What efforts has WDW made to try to identify the inerts?

Specific Comments

#9 p. 9 Description of rotenone treatment procedures. Typical Washington rotenone dosage rates should be described here, to assist reviewers with comparing dosages used in various studies to common dosages in WDW treatments.

#10 p. 12 Air. The discussion should be expanded beyond odor concerns. It should assess the potential for workers, nearby residents (including children), persons pursuing recreational activities in or near the lake, and wildlife being exposed to air-borne rotenone powders from typical application techniques and accidental spills.

p. 16 Residual Toxicity in Drinking Water. This section states that rotenone residues must be removed to produce a finished drinking water of good quality. Options to treat surface water supplies are mentioned. However, most residents in Thurston County obtain their drinking water from ground water. Many homes are on individual wells. Yet no mention is made of options available to treat ground water supplies. The likelihood of rotenone entering ground water in lakes which flow into aquifers should be evaluated. For example, what risk would residents using sand point wells have of drinking rotenone contaminated water (given the increased persistence of rotenone in anaerobic aquatic environments)?

11
Instead of including a broad statement that rotenone "breaks down quickly in the environment," a more detailed discussion of the results from field use would be more useful in estimating risk. For example, what would be the expected range of the half-life of rotenone in the mud in the bottom of a lake? In aerobic versus anaerobic conditions? Does the half-life vary with the size of the lake, clarity of water, temperature, etc?

12
p. 17, 2nd paragraph. Why is California's Action Level cited here? It seems a more appropriate level to mention is the Acceptable Daily Intake. There is also a typographical error. The factor of 1.000 should be 1,000.

3
p. 18 Plants. Effects on macrophytes should be discussed (e.g., possible increases in macrophyte growth resulting from decreased turbidity, effects resulting from changing nutrient balance, etc.)

14
p. 123 Birds. Temporary loss of forage for birds feeding on lake fish is mentioned. However, no mention is made of the possible direct toxicity to birds from eating fish with rotenone residues. In one study submitted for EPA's registration process, bluegill sunfish had a bioconcentration factor of 3,607x in viscera. While rotenone may only be slightly acutely toxic to the bird species studied, 3,607 x 0.25 ppm is a fairly high concentration. What are the LD50s for the piscivorous species mentioned in the last paragraph on page 123? If they are unknown, how can the hazard or the risk to these species be adequately assessed? The implications of bioconcentration factors should be included in estimating exposure.

15
p. 125 Mammals. Similar to the above comments about birds, the discussion of mammalian oral toxicity may underestimate the actual exposure by not considering elevated concentrations in dead fish. The exposure should be recalculated and the risk re-evaluated.

16
On page 125 is also the statement "To produce subacute effects such as weight loss or liver damage also requires very high dosages fed continuously in the diet for many months." Yet the associated table on page 133 lists weight loss or liver damage at

0.4 mg/kg, 10 mg, 50 ppm, 100 ppm, and 130 ppm. By what measure (is 0.4 mg/kg considered a very high dosage?

#17 The statement "The EPA (1981) considers it safe to water livestock with rotenone-treated water" is misleading. FIFRA prohibits any manufacturer from making any claim that a pesticides is "safe." The registration process is not a measure of "safety" but rather benefits and risks.

#18 Last paragraph. More detail should be provided on the potential impact to mammalian species. (1) Are mink, otters, and water shrews the only mammals which rely on the fish and invertebrates of a lake? (2) How may water shrews be indirectly affected? (3) If otters rely almost entirely on fish for food, stating that the temporary loss of prey following treatment "may" disturb them seems an understatement -- especially when the lake is not restocked for several months. Unfortunately, the next sentence in the paragraph does not clarify. "But otters forage widely, sometimes travelling 50-60 miles during a year (Banfield, 1974), and would may not be displaced permanently." Does this refer to other otters coming in as replacements or resident otters moving to other waterbodies? If the latter, given that the niche may already be filled, the potential to displace other otters should be discussed. (4) What are the effects on the rest of the system when fish-eating mammals disappear?

#19 p. 127, Human Health. Almost no discussion of the risk to applicators is included. While the focus of this section is understandably the larger public, a discussion (similar to the one on page 131, 3rd paragraph) of the signs and symptoms experienced by applicators after using rotenone should be included.

#20 The residue levels in fish are likely underestimated because bioconcentration is not included in the calculations of exposure. Using the highest bioconcentration factor submitted to EPA, potentially a 0.25 ppm level in lake water could result in a 34 ppm level in fish, which is far in excess of California's suggested ADI level of 0.0004 mg/kg/day.

#21 If the statement "The original use of rotenone-bearing plants in South America was the collection of fish for the table..." is offered to assure the reader of the safety of rotenone, the supporting documentation of the lack of any health problems from this practice should be included. Just because a practice is historical does not mean it is safe. Tobacco has been used as a stimulant for centuries. That does not lessen its cancer-causing properties.

#22 Last paragraph. The SPEIS cites Cohen's conclusion in 1960 that "the use of rotenone to kill fish in public reservoirs was consistent with the objective of safe and potable water." Standard methods of weighing risks and benefits have changed significantly since 1960. Further, insufficient data is provided

to document the hazard, exposure, or risk to the public from drinking water containing rotenone. The SPEIS should re-evaluate this issue independently, rather than rely on a 1960 review.

#23
p. 129 The SPEIS states "Municipal water supplies have been treated...in at least six states with no harmful effects." How was it determined that no harmful effects occurred? It seems unlikely that epidemiological studies were performed. Did the water suppliers interview consumers? Make note of any complaints received? The statement is overly broad as it stands.

#24
p. 131. Similar to previous comment on livestock. The statement "The U.S. Environmental Protection Agency (1981) considers it safe to swim in water treated with rotenone" should be modified or deleted. The registration process is not a measure of "safety" but rather benefits and risks.

#25
The last paragraph of page 131 mentions the "low mammalian toxicity" of rotenone. Yet EPA's reregistration guidance document classifies rotenone in Toxicity Category I (most toxic) "because of its high toxicity" -- listed as 39.5 mg/kg for female rats and 102 mg/kg for male rats.

#26
Last paragraph. Relying on another reviewer's general conclusion that "the margin of safety is so great that water would be safe for swimming and other recreational use" is difficult to support when data are not presented to allow calculations of margins of safety.

#27
p. 132. Results from mutagenicity studies should also be reviewed and evaluated. The relative weights of the positive studies (such as DNA breakage, micronucleus test in mouse cells, gene mutation in mouse lymphocyte cells, sister chromatid exchange in hamster ovary cells) versus the negative studies (such as bacteria gene mutations, unscheduled DNA synthesis in human fibroblast cultures, rat hepatocyte assay) should be compared.

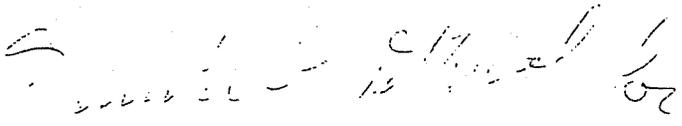
The discussion of developmental and reproductive effects should be broadened to include studies (see enclosed references) which have found adverse effects not mentioned such as: decreased live birth, nerve damage, neural tube defects, increased incidence of unossified sternbrae, urinary tract abnormalities, decreased litter size, and increased incidence of extra ribs. These studies do not support Marking's statement that "even high doses of rotenone do not cause tumors or reproductive failure, nor adversely affect fetal development."

#28
3. Appendix E page 37: Lake Lawrence Management Plan - Extensive data exists for Lawrence Lake which should be summarized in this document: fish population and growth rates, creel census, and fish/effort ratios (Thomas et al. 1990 Feasibility of Aquatic Plant Control in Lake Lawrence, Washington Using Triploid Grass Carp, UW School of Fisheries) Also, more

complete and recent phosphorus loading and water budget data are available (Gibbons et al. 1991 Lake Lawrence Phase I Lake Restoration Analysis, Thurston County.)

If you have any questions, please contact Marie Zuroske with Health (786-5457), Tom Clingman with Public Works (786-5485), or Mark Swartout with Community and Environmental Programs (754-4111). We look forward to your response.

Sincerely,


Paula Ehlers
Environmental Review Officer

Enclosures

cc: Tom Clingman
Marie Zuroske
Mark Swartout

Response to Mr. Ben Schroeter, Ben and Jerry's Paralegal Services,
P.O. Box 2856, Olympia, WA 98507-2856 (letter dated July 30, 1992):

1). Legal Authority - I consulted with the Office of Attorney General concerning the question of the Wildlife Commission's authority to approve the use of rotenone to rehabilitate lakes. Their response was that the wording changes made by the 1987 Legislature were housekeeping, non-substantive changes, and were not intended to restrict the Commission's ability to approve rotenone for this use. On page 9, the first sentence under Legal Standing now reads:

"RCW 77.12.420 empowers the Wildlife Commission to eradicate "undesirable types of fish."

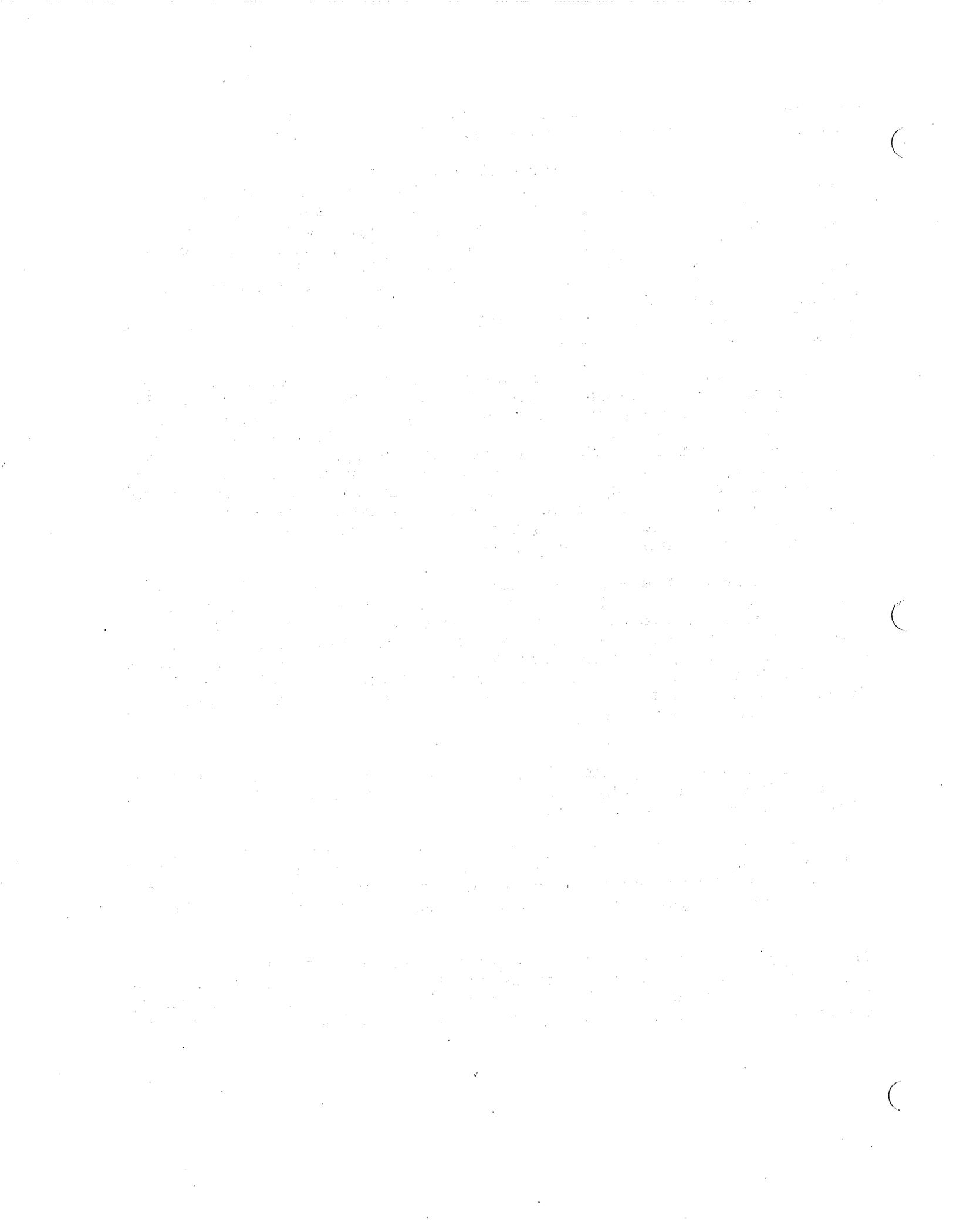
2). Concerning your reference to the inert ingredients in liquid formulations of rotenone, the Minnesota Department of Health conducted a risk assessment of these ingredients in Nusyn-Noxfish from the Minnesota Department of Natural Resources. Their assessment determined that "There is negligible risk to human health from the contaminants found in the rotenone whether the exposure is from drinking, swimming, or eating fish from treated waters. Treatment with rotenone will introduce the contaminants into the lakes, but at concentrations considerable lower than a level that would harm human health."

3). You are on the mailing list to receive all publications of future Draft and Final Environmental Impact Statements on Lake and Stream Rehabilitations. We have requested from the Department of Ecology permits for Water Quality Modifications on Burke, Quincy, Upper Caliche, H, Ancient, and Stan Coffin Lakes and an unnamed lake in Desert Unit of the Columbia Basin TWN(18N), RGE(26E), SEC(11,14) in Grant County, Bingen Lake in Klickitat County, and Buck Lake in Kitsap County.

Response to Mr. George Draffan, P.O. Box 95316, Seattle, WA 98145
and Ms. Janine Blaelock, 7040 14th NW, Seattle, WA 98117-5308
(letter dated August 13, 1992):

1). Your names have been put on our mailing list to receive all future Supplemental Environmental Impact Statements on Lake and Stream Rehabilitations from the Washington Department of Wildlife. I apologize for you not receiving copies this year at the time of issue.

2). Terminology: WDW uses the term "rehabilitation" because we use rotenone to restore fisheries in the state's waters to optimum production. This term is used throughout the United States by other natural resource agencies who also treat their state's waters with rotenone.



3). Long-Term Effects of Rotenone on the Lake Community:

Comments noted. WDW believes there is sufficient information in the Environmental Impact Statement which documents the impacts of rotenone on the lake community in most cases. If there are data gaps concerning potential impacts in waters which may be of special concern, WDW will collect the necessary information to monitor those impacts, as time and resources allow.

4). Inert Ingredients:

The Minnesota Department of Health (MDH) analyzed the impurities of the rotenone stock from the Minnesota Department of Natural Resources (MDNR). The MDNR obtains their rotenone from the same supplier as the WDW. The MDH identified the following compounds in the liquid formulation of rotenone Nusyn-Noxfish: 1) Trichloroethene (740 mg/kg), 2) Tetrachloroethene (90 mg/kg), 3) n-Propylbenzene (430 mg/kg), 4) 1,3,5-Trimethylbenzene (890 mg/kg), 5) 1,2,4-Trimethylbenzene (2950 mg/kg), 6) Ethylbenzene (260 mg/kg), 7) m/p-Xylene (990 mg/kg), and 8) o-Xylene (560 mg/kg).

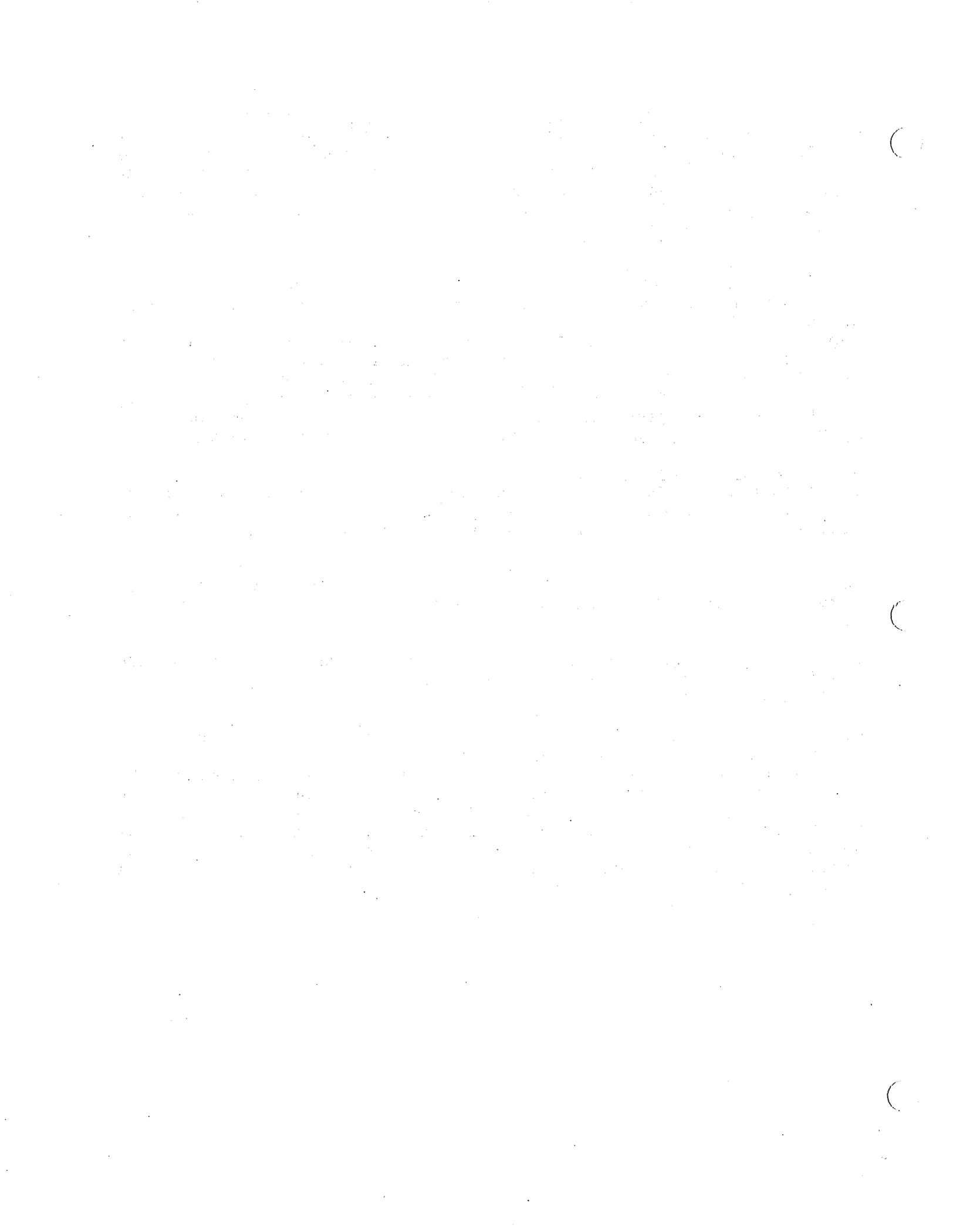
5). Justification of the Program:

Comments noted. Justification of the proposed action is found on pages 6-7. Fisheries management plans for the individual waters proposed for rehabilitation are detailed in Appendix E.

Response to Thurston County Commissioners, Building #1, 2000 Lakeridge Drive SW, Olympia, WA 98502-6045 (letter dated July 8, 1992):

Following the agency's internal review process, and the public meeting in Rainier, we have decided to withdraw our proposals to treat Lawrence and McIntosh Lakes.

We agree with you of the necessity to work with all interested parties on lake management plans. At this time, we will continue to manage these lakes as mixed species waters, supplementing the trout populations with catchable size fish from our hatcheries in early spring as hatchery space and funds will allow. Because of the extra costs required to raise trout to catchable size, the decision not to rehabilitate these lakes may have a significant impact on future trout fishing in these waters if our agency's budget continues to decline.



Response to Mr. Stephen L. Saunders, Washington State Department of Ecology, Mail Stop PV-11, Olympia, Washington 98504-8711 (letter dated August 7, 1992):

1). Comments noted. We have added to this section as follows: Fishing regulations are liberalized, when possible and upon approval by the Wildlife Commission, to utilize fish in waters scheduled for rehabilitation. Warmwater game fish, usually mature bass, are collected (depending on need) prior to rehabilitation, to be utilized as broodstock for waters nearby which are managed for warmwater fisheries. On some lakes, bass that have floated to the surface have been netted by WDW employees and bass club volunteers, revived by dipping the fish in potassium permanganate, and moved to mixed-species or spiny-ray lakes to augment or start a population (Fletcher, 1976). WDW has typically transplanted 200-300 fish from a single lake during this type of procedure.

2). We have added the following sentence to this section: "The use of potassium permanganate also requires a short-term modification (permit) to the Water Quality Standards issued by the Washington Department of Ecology."

We will further expand this section with the potential impacts of potassium permanganate when we propose to use it in conjunction with rotenone. We do not propose to use potassium permanganate for the rehabilitations we are proposing for 1992-1993.

3). WDW will work closely with DOE to collect abundance and composition information of phyto- and zoo-planktonic communities in waters which may be of special concern as time and resources allow.

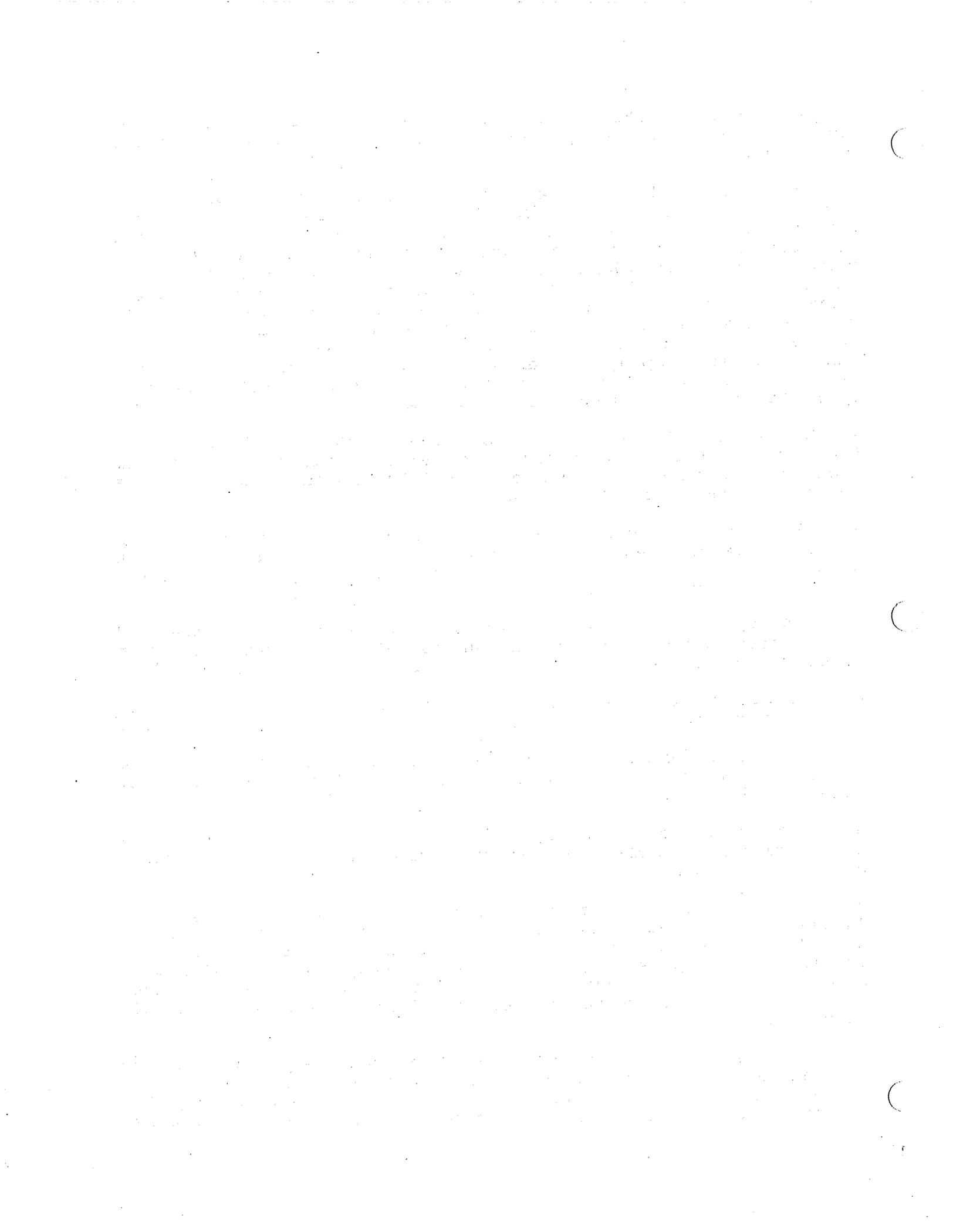
4). WDW will work closely with DOE to measure phosphorus levels in waters which may be of special concern as time and resources allow.

5). WDW agrees, and we will continue our search of the scientific literature for more studies on how water quality is affected by lake rehabilitations.

6). WDW will work closely with DOE to measure macrophyte composition and abundance in waters which may be of special concern as time and resources allow.

#7). We have added the following sentences to the end of 3): "However, in a deep lake with a coarse or gravelly substrate, turbidity from bottom-scavenging fish is not likely to be a problem. It is possible that nutrient re-suspension resulting in bloom conditions following a rehabilitation can reduce water transparency, although no studies were found to substantiate this speculation."

#8). We understand this concern. However, the WDW proposes to use minimal amounts of the liquid formulation of rotenone only in densely vegetated areas where fish may hide. Using only the powder, fish can more easily escape the treatment, which increases



the frequency of rehabilitations we must propose. We are currently experimenting with applying the powdered formulation in a "slurry" (following procedures used in other states) to further minimize our use of the liquid formulation.

Additionally, the Minnesota Department of Health conducted a risk assessment of the inert ingredients found in the liquid formulation of rotenone Nusyn-Noxfish from the Minnesota Department of Natural Resources. Their assessment determined that "There is negligible risk to human health from the contaminants found in the rotenone whether the exposure is from drinking, swimming, or eating fish from treated waters. Treatment with rotenone will introduce the contaminants into the lakes, but at concentrations considerably lower than a level that would harm human health."

9). On the pre-rehabilitation planning form, the phrase "Identify whether water intakes exist (legal or illegal)" has been added to IV. RESOURCE IMPACTS, (2).

10). We have changed this sentence to read:

"In annual stocking of trout-only lakes in Washington state, no changes in any water quality parameter would be expected beyond those which have historically occurred as part of similar previous rehabilitation and stocking efforts."

11). We understand your concern because of this conflicting information. We will work closely with DOE to conduct pre- and post-treatment surveys of macrophytes in waters of special concern as time and resources allow.

12). This statement now reads:

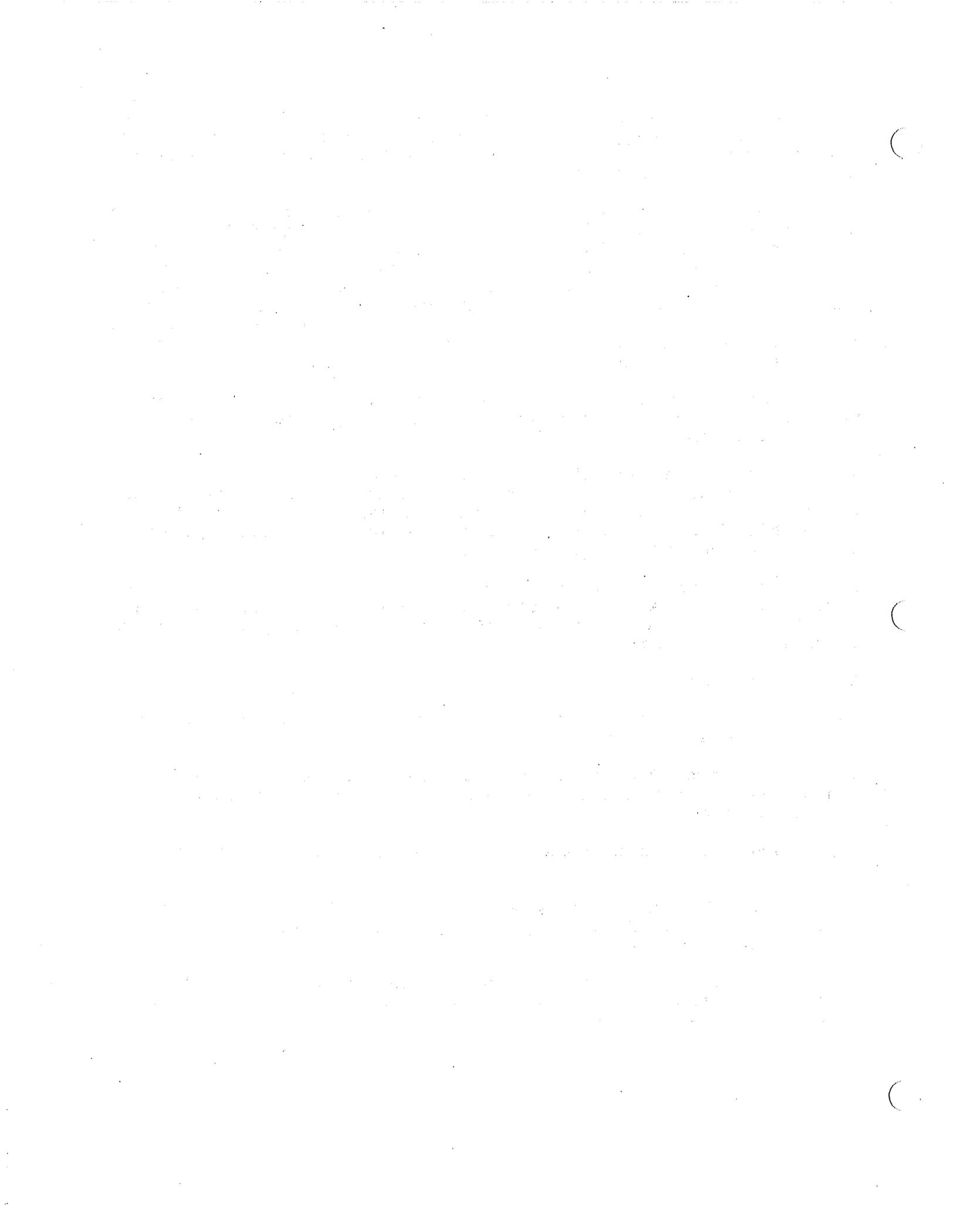
"Since no phosphorus budgets exist for the other western Washington lakes in Table E, ..."

13): WDW shares DOE concerns. We will work closely with DOE to monitor algal composition in waters of special concern as time and resources allow.

14): WDW does not propose to rehabilitate any oligotrophic or alpine lakes during 1992-1993.

15): WDW will work closely with DOE to conduct pre- and post-treatment surveys of macrophytes in waters of special concern as time and resources allow.

16): WDW will work closely with DOE to conduct pre- and post-treatment surveys of snail populations in waters of special concern as time and resources allow.



17): WDW no longer rehabilitates streams which are not directly connected to targeted lake or pond waters. These streams are normally short "waterways". The last stream-only rehabilitation conducted in Washington was in 1988 when WDW, in conjunction with DOE, treated Rocky Ford Creek in Grant County.

18): WDW has expanded the pre-rehabilitation and management plans from previous years to include this information.

19): Typo corrected.

20): The Non-game Program of the Washington Department of Wildlife reviews all proposed rehabilitations. They check the statewide distribution list of threatened or endangered species as part of their review.

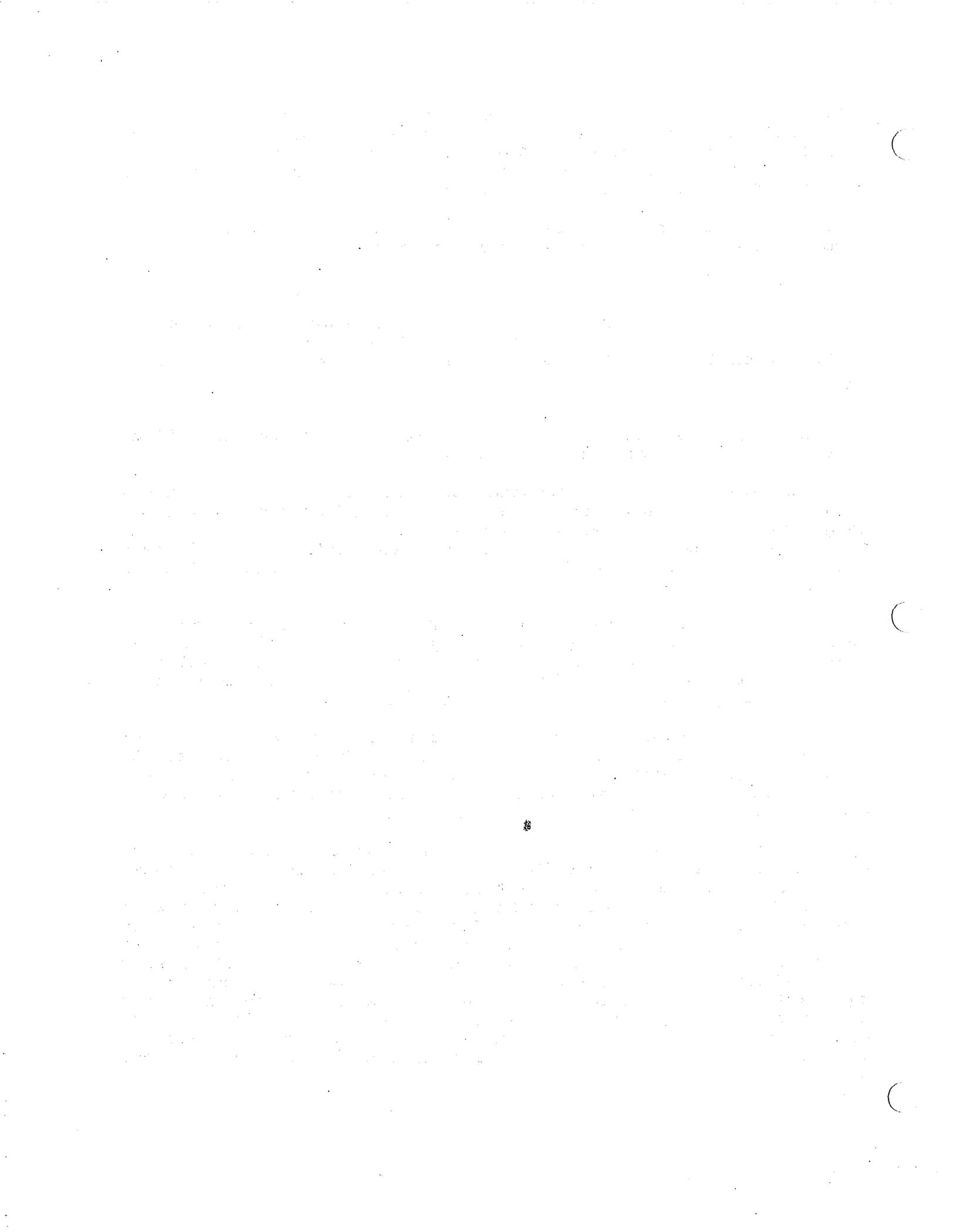
Response to Ms. Barbara Fournier, 6959 NE Buck Lake Rd, Hansville, WA 98340 (letter dated July 30, 1992):

1). The decision to use rotenone was based on decreased rainbow trout fry survival and the presence of a significant population of largemouth bass. Based on our experience with lowland lake fisheries management, the presence of largemouth bass, who feed voraciously on trout fry, is the probable cause for the decline in the trout fishery.

2). Bass are indeed returning to the system. Either they are being illegally planted (it is illegal to plant fish into the state's waters without first obtaining a fish planting permit from the Washington Department of Wildlife), or the past treatments have not completely eradicated the populations.

3). The Department of Wildlife uses alternative methods of management in over 1 million acres of water throughout the state. These methods are detailed in the Draft Supplemental Environmental Impact Statement. To manage Buck Lake as trout-only, we see no other feasible alternative than to use rotenone.

4). We are aware of the wildlife present in the Buck Lake area, and will do everything possible to minimize the impacts to these species. Our wildlife management biologists who have reviewed the pre-rehabilitation plan do not believe the rotenone treatment will create significant impacts on wildlife living on or near the lake. We will be applying the rotenone in October when the majority of birds have migrated from the area, and the populations of insects are at their lowest. We are replanting the lake with trout fry in the early spring, which will replenish the lake with fish lost during the rehabilitation. We anticipate insects will also be present once again in the lake during this time. Trout, as well as returning birds, depend upon these insects as a primary food source.



5). Based on our knowledge of trout fisheries, anglers never seem bothered with crowded conditions if fishing is good. Based on our angler surveys, catching fish is one of many reasons people choose to go fishing.

6). Based on our surveys of anglers, people will drive from all parts of the state to fish in waters which provide productive trout fishing.

7). Comment noted.

8). See comment listed under 4) above.

**Response to Ms. Sue Koenig, P.O. Box 393, Indianola, Wa. 98342
(to letter dated July 29, 1992):**

1). We are aware of the wildlife present in the Buck Lake area, and will do everything possible to minimize the impacts to these species. Our wildlife management biologists have reviewed the pre-rehabilitation plan and has assessed the rotenone treatment of Buck Lake would not create significant impacts to the wildlife which utilizes the lake and surrounding habitats. The fact that Buck Lake was rehabilitated in 1986 and the numerous wildlife species and populations you have sighted also indicates that any potential impacts are temporary.

2). We do not anticipate a large amount of fish being killed during this rehabilitation. We also feel the risk of oral toxicity is minimal, based on the quick breakdown of rotenone in the environment.

3-5). We are aware of the wildlife present in the Buck Lake area, and will do everything possible to minimize the impacts to these species. Our wildlife management biologists who have reviewed the pre-rehabilitation plan do not believe the rotenone treatment will create significant impacts on nesting eagles, swallows, blackbirds or woodland birds, and other wildlife living on or near the lake. We will be applying the rotenone in October when the majority of birds have migrated from the area, and the populations of insects are at their lowest. Eagles normally feed on salmon during this time. We are planting the lake with trout fry in the early spring, which will replenish the lake with fish lost during the rehabilitation. We anticipate insects will also be present once again in the lake during this time. Trout, as well as returning birds, depend upon these insects as a primary food source.

6). The Department of Wildlife manages the state's lowland lakes to maximize and diversify recreational opportunity. The Department manages over 1 million acres of mixed species (trout and warmwater fish) waters statewide. Trout-only waters, such as Buck Lake, produce at least four times more trout than those managed as mixed species. Additionally, mixed species waters require planting

catchable sized trout, which are more expensive to raise than the fry planted in trout-only waters. It is unlikely that trying to overfish Buck Lake with hook-and-line gear will allow the Department to manage this water as trout-only.

Response to Ms. Sue Koenig, P.O. Box 393, Indianola, WA 98342 (letter dated August 15, 1992):

1). Targeted lakes are researched for the presence of any state or federally listed species during the review process of the pre-rehabilitation and management plans. We have withdrawn our proposal to rehabilitate Koeneman Lake because of a Western pond turtle sighting by a Woodland Park Zoo official. We will substantiate this sighting by conducting surveys with our fish and non-game biologists prior to making a future proposal to rehabilitate this lake.

2). Your idea to choose some key lakes to conduct intensive research on the impacts of rehabilitations to fill data gaps on terrestrial animals is an excellent one, and one that I will pursue through the University of Washington Cooperative Fishery Research Unit at the School of Fisheries. In the meantime, we are committed to conduct before and after rehabilitation surveys on waters which may have special concerns as time and resources allow.

Response to Lake Lawrence Improvement Club, 16646 Pleasant Beach Dr., Lake Lawrence, WA 98597 (letter dated July 22, 1992):

Following the agency's internal review process, and the public meeting in Rainier, we have decided to withdraw our proposals to treat this lake.

The Department of Wildlife will continue to manage these lakes as mixed species waters, supplementing the trout populations with catchable size fish from our hatcheries in early spring as hatchery space and funds will allow. Because of the extra costs required to raise trout to catchable size, the decision not to rehabilitate these lakes may have a significant impact on future trout fishing in these waters if our agency's budget continues to decline.

Response to Ms. Marion Kling, 8800 N.E. Ohman Road, Kingston, WA. 98346 (letter dated August 7, 1992):

1). We have removed our proposal to rehabilitate Koeneman Lake for 1992-1993 because of a Western pond turtle sighting by a Woodland Park Zoo official. The Western pond turtle is a threatened species which may be detrimentally impacted by rotenone. Our fish and non-game biologists will conduct surveys throughout the next year to try to verify this sighting. Our future proposals to rehabilitate Koeneman will be dependent on these surveys.

2). We are aware of the wildlife present in the Buck Lake area, and will do everything possible to minimize the impacts to these species. Our wildlife management biologist has reviewed the pre-rehabilitation plan and has assessed the rotenone treatment of Buck Lake would not create significant impacts to the wildlife which utilizes the lake and surrounding habitats. The fact that Buck Lake was rehabilitated in 1986 and the numerous wildlife species and populations at the lake also indicates that any potential impacts are temporary.

3). We will be applying the rotenone in October when the majority of birds have migrated from the area, and the populations of insects are at their lowest. We are planting the lake with trout fry in the early spring, which will replenish the lake with fish lost during the rehabilitation. We anticipate insects will also be present once again in the lake during this time. Trout, as well as returning birds, depend upon these insects as a primary food source.

Response to Ms. Nike Eir Quester, P.O. Box 224, Indianola, WA 98342 (letter dated August 12, 1992):

1). The Department of Wildlife manages the state's lowland lakes to maximize and diversify recreational opportunity. The Department manages over 1 million acres of mixed species (trout and warmwater fish) waters statewide. Trout-only waters, such as Buck Lake, produce at least four times more trout than those managed as mixed species. Additionally, mixed species waters require planting catchable sized trout, which are more expensive to raise than the fry planted in trout-only waters.

2). We are aware of the wildlife present in the Buck Lake area, and will do everything possible to minimize the impacts to these species. Our wildlife management biologists have reviewed the pre-rehabilitation plan and has assessed the rotenone treatment of Buck Lake would not create significant impacts to the wildlife which utilizes the lake and surrounding habitats. The fact that Buck Lake was rehabilitated in 1986 and the numerous wildlife species and populations at the lake also indicates that any potential impacts are temporary.

We will be applying the rotenone in October when the majority of birds have migrated from the area, and the populations of insects are at their lowest. We are planting the lake with trout fry in the early spring, which will replenish the lake with fish lost during the rehabilitation. We anticipate insects will also be present once again in the lake during this time. Trout, as well as returning birds, depend upon these insects as a primary food source.

Response to Ms. Paula Ehlers, Environmental Review Officer, Social Services Division, Thurston County, 529 Fourth Avenue W., Olympia, WA 98501-1097 (to letter dated July 30, 1992):

- 1). This sentence is accurate as written. The WDW actively manages 5.9% of the states lowland lakes. The third sentence in the first paragraph further explains that "...elimination of non-game or competitor species in a portion of these lakes ...".
- 2). Comments noted. We have added the following to the Justification Section on page six to serve as examples of our goal to manage fisheries and waterfowl in the state's lowland lakes:
"Occasionally, these waters become overpopulated with fish species outside this management emphasis. This often results in increased predation and/or competition, hence poor growth and survival, of targeted game fish. If carp overpopulate, fish survival decreases and nesting bird habitat is degraded due to siltation and uprooting of emergent vegetation."
- 3). While the chances of complete eradication of fish decreases as lake size increases, our goal of complete eradication does not change. We do not treat lakes for complete eradication whose size would prohibit us from obtaining our goal.
- 4). We believe we have listed and discussed in sufficient detail on pages 1-5 the alternatives (many of which we currently use) to using rotenone for game fish management.
- 5). Comments noted. The level of detail varied throughout the document with respect to the number and detail of scientific publications we found which dealt with the particular issues.
- 6). Comments noted.
- 7). Comments noted. If there are data gaps in potential impacts in waters which may be of special concern, WDW will collect the necessary information to monitor those impacts as time and resources allow.
- 8). The Minnesota Department of Health (MDH) analyzed the impurities of the rotenone stock from the Minnesota Department of Natural Resources (MDNR). The MDNR obtains their rotenone from the same supplier as the WDW. The MDH identified the following

compounds in the liquid formulation of rotenone Nusyn-Noxfish: 1) Trichloroethene (740 mg/kg), 2) Tetrachloroethene (90 mg/kg), 3) n-Propylbenzene (430 mg/kg), 4) 1,3,5-Trimethylbenzene (890 mg/kg), 5) 1,2,4-Trimethylbenzene (2950 MG/KG), 6) Ethylbenzene (260 mg/kg), 7) m/p-Xylene (990 mg/kg), and 8) o-Xylene (560 mg/kg).

The MDH also conducted a risk assessment of the inert ingredients found in liquid formulation of rotenone Nusyn-Noxfish from the MDNR. Their assessment determined that "There is negligible risk to human health from the contaminants found in the rotenone whether the exposure is from drinking, swimming, or eating fish from treated waters. treatment with rotenone will introduce the contaminants into the lakes, but at concentrations considerably lower than a level that would harm human health."

9). The following sentence has been added to the section under Treatment Procedures:

"Common dosages of rotenone (5%) in lakes treated in Washington ranges between 1-4 ppm."

10): The following sentences has been added to the section under AIR:

"Rotenone droplets or mist may be carried in the air from the liquid applications. Powder rotenone is applied by towing an open sack underwater, so escape of particles in the air should be minimal."

11): A thorough, detailed discussion on the detoxification of rotenone appears in Appendix B, pages 4-5.

12): California has been the most conservative state with regards to the use of rotenone for fish management purposes over the past 10 years. Typographical correction noted and corrected.

13): Effects of fish removal on aquatic macrophytes is discussed on page 24. The WDW will monitor macrophytes in rehabilitated lakes which are of special concern as time and resources allow.

14): We have listed the LD50's for many different types of birds in Table R. We believe the information presented in this Table, along with the discussion presented on Page 123 to adequately address the potential impacts to birds which may feed on fish killed during lake rehabilitations.

15): We believe the information presented on the page adequately addresses the potential impacts to mammals which may feed on fish killed during lake rehabilitations.

16): The results of long-term oral dosages of rotenone on dogs you refer to in Table U, on Page 133, demonstrated that 0.4 mg/kg had no effect on dogs following 180 days of daily treatment. The EIS is referring to only those dosages which had an impact on the health of mammals. In Table U, the lowest dosage which had an impact was 2.0 mg/kg pure rotenone fed to dogs over a 180 period.

A 10 pound (22 kg dog) would have to eat 44 kg of pure rotenone over 180 days to have the same impacts. This dosage is well beyond that found in fish killed during a rehabilitation, as detailed on page 127.

17): We are citing a memorandum from the EPA on the completion of pre-RPAR review of rotenone from Marcia Williams (Director, Special Pesticide Review Division) to Douglas Campt (Director, Registration Division), June 22, 1981.

18): We believe the information presented on this page adequately addresses the potential impacts to mammals which may feed on fish killed during lake rehabilitations.

19): The section on Acute Respiratory Toxicity and Symptoms of Acute Rotenone Poisoning on pages 129-132 adequately covers, and also refer to, potential impacts to applicators of rotenone.

20): Comment noted. We feel these concentrations are appropriate to use, even without bioaccumulation (what if only one fish is eaten?) to speculate on risk, since we are not allowing for probable losses of rotenone through natural degradation and cooking.

21): The statement "The original use of rotenone-bearing plants in South America was the collection of fish for the table." is stated because it is fact, and sheds light on the historical use of rotenone.

22): Comment noted. We are actively working to expand on the literature supporting this, and future EIS's for Lake and Stream Rehabilitations.

23): This statement is made without supporting literature. We have removed it from the EIS.

24): We are citing a June 28, 1981 memorandum from the EPA on the pre-RPAR review on rotenone. We do not feel justified to change its contents.

25): Comment noted. However, this was what Dawson (1991) concluded.

26): Comment noted. However, this was what Dawson (1991) concluded.

27): Comment noted. We are actively working to expand on the literature supporting this, and future EIS's for Lake and Stream Rehabilitations.

28): We are no longer proposing to rehabilitate Lake Lawrence during 1992-1993.

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The Journal American
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The Columbia Basin Daily
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The Seattle Times
P. O. Box 70
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The Tacoma News Tribune
P. O. Box 11000
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The Omak Chronicle
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The Spokesman Review
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The Journal Times
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