

# Ridding Diamond Lake Of Trash Fish Poses Big Problem

## Poisoning Water To Restore Picturesque Fishermen's Retreat Being Considered

By CHARLES V. STANTON  
Diamond Lake, one of Oregon's most valuable scenic and recreational assets, is in grave danger of becoming a "biological wilderness." Such is the report from the research staff of the Oregon Game Commission.

Diamond Lake, only a few years ago, was the world's largest rainbow trout egg-taking station. Its fishery today is critically depleted. This is because anglers a few years ago unthinkingly introduced into the lake a species of trash fish known as roach. Because roach multiply six times faster than trout, they have virtually crowded the game fish out of the lake.

The Game Commission knows how to rid the lake of its trash fish population. E. I. there remains a \$64 question. Can the lake recover from damage already inflicted, even if trash fish are destroyed? That question cannot now be answered. Only experience will tell.

The answer lies in the ability of organisms upon which fish feed to bounce back into abundance. Rehabilitation of the lake's fishery depends largely upon the factor of food supply.

In 1946, when the Game Commission began to take note of the encroachment of trash fish, a test was made of the abundance of bottom feed. It was found that the supply amounted in that year to 292 pounds per acre.

Bottom feed includes a wide range of organisms. There are fresh water shrimp, leeches, worms, scores of species of insect larvae, etc.

Ample supply or bottom feed permits the lake to yield an abundance of big, gamey trout. When the lake had 292 pounds of food per acre it could produce the "bunkers" for which it was noted—rainbow trout occasionally weighing more than 20 pounds.

Supply Diminished  
No test was made of bottom feed conditions in 1947. In 1948 a shocking fact was revealed. The supply of bottom feed had dropped from 292 pounds per acre to 14.4 pounds. In 1949 it was down to 10.5 pounds. In 1950 only 5.3 pounds. In 1951 tests revealed only 2.3 pounds per acre.

Last season the millions of swarming, hungry roach minnows were so industriously rooting out organisms from the silt of the lake bed that the water became turbid.

Effects of the drop in food supply and the competition for food is shown by tests to determine trout pounds per acre. In 1947 the lake yielded 15.4 pounds of fish per acre of water.



**FISHERY PROBLEMS STUDIED AT DIAMOND LAKE** — The above photo by News-Review Photographer Paul Jenkins, is a view of Mount Thielsen taken from the shore of scenic Diamond Lake. One of the most beautiful of the many Cascade lakes, Diamond Lake is losing much of its recreational business because of impairment of its sport

fishery. The Oregon Game Commission is conducting extensive studies into the possibility of poisoning the waters of the lake to destroy its population of trash fish, and then to replant it with rainbow trout in the hope of restoring the lake to its once productive capacity.

In 1948 poundage was reduced to 6.2. The figure was 3.7 in 1949, 1.7 in 1950, 0.9 in 1951, and 0.8 in 1952.

The relationship between abundance of feed is no different with fish than with beef cattle. Productivity of an acre of water is measured by the amount of feed it contains.

**Roach Eating Food**  
In the case of Diamond Lake all available feed is being consumed by roach. They are rapidly destroying all organisms in the lake. Because they are small, they can force their way into the weed beds and narrow crevices the larger trout cannot reach. It will not be long until the roach, too, will begin to starve. If left undisturbed they will eventually reach a population balance in proportion to the annual food production of the lake. In the meantime, trout will become virtually

extinct, being less fitted for competition. Many types of organisms, such as leeches, shrimp, worms, etc., will be totally destroyed. There will be left only the eggs and larvae from flying insects.

When the lake supported trout only there was little problem of food and population balance. There are too many places the trout cannot reach, or will not attempt to reach while food is plentiful. Thus from an ample supply of organisms, Nature could produce an ever increasing abundance.

Now, however, the base stock of all varieties has been critically reduced. Can Mother Nature, from this scarce supply, restore an abundance of feed, even if roach are removed, or is Diamond Lake destined to become forever a lake with a limited fish population balanced against food scarcity? This is a question biologists can't answer. Only time will tell. That is why biologists speak of the possibility of a "biological wilderness."

**Can Destroy Trash Fish**  
Game Commission researchers know they can destroy the trash fish in the lake. They have had only two failures in more than 30 previous poisoning experiments. Diamond Lake can be poisoned more effectively than some of the other lakes and reservoirs which have more inlets, more swampy ground, etc. But Diamond Lake also poses some problems not previously encountered.

Tampering with the level of the lake will produce fluctuations in the main river. Will those fluctuations affect spawning of salmon and steelhead? Higher water rights be affected? Higher water in the summer and fall and lower water in the winter will interfere with sports fishing. Will sports anglers remonstrate? There might be some effect upon Copco's power generation at its main river stations.

But there is another risk that has the staff trembling in its collective boots. It is a remote risk. Nevertheless it must be considered. Suppose there is an undiscovered seepage from the lake into the river, other than the one known outlet. Or suppose an accident should occur. Poison from the lake might then conceivably get into the river. It could wipe out virtually all fish life and destroy one whole cycle of migratory fish of all species.

**Danger Believed Remote**  
The danger of such accident is very remote indeed. Yet it must be taken into consideration as a calculated risk.

The poison used is rotenone. It is a crystalline powder coming from a South American root. Dissolved in water, it affects all gill-breathing fishes, insects and organisms. It kills by suffocation, not by toxic action.

One of the problems connected with Diamond Lake has been the depth of the water. Under previous practice it was found that the poison penetrated only to a depth of about 20 feet. As Diamond Lake approaches 50 feet in depth in places, early engineering plans called for drawing the water down to a 20-foot level.

Heretofore the practice has been to tow sacks filled with the powder behind boats, allowing the poison to dissolve and settle. This required many boats and much manpower. A new method now has been invented.

A metal tube—well casing or culvert pipe—about 24 inches in diameter and 20 feet long, is suspended in the water between boats or barges. Outboard motors operate through two holes cut at intervals in the tube. A hopper at the front of the tube receives the poison. As

this contrivance is propelled through the water, poison is shoveled into the hopper. The outboard motor propellers within the tube cause the powder to be mixed and the disturbance kicked up results in much deeper penetration than under the old system. Thus thorough distribution of the poison to a depth of 50 feet is no longer a problem.

**Lower Water Five Feet**  
Engineers now calculate it will be unnecessary to draw the lake level down more than five feet. Instead of being compelled to call upon hundreds of sportsmen with boats to lend assistance, the game department would be able to handle the job with its own crews, using the new equipment.

What would happen if not all roach were killed? This is a question asked whenever biologists discuss the Diamond Lake problem.

Biologists believe the danger of leaving any roach alive would be very remote. They have had much experience, having already poisoned more than 30 lakes and reservoirs. While the Diamond Lake job would be the biggest ever attempted in the United States, it is comparatively simple from an engineering standpoint. It is much less difficult than in some of the areas where treatment already has worked successfully but which involved adjacent swamps where minnows might escape. The treatment would involve all tributary streams and all potholes adjacent to the lake.

But should there be a failure and a few of the roach survive, biologists estimate it would be from 10 to 12 years before the trash fish again would become a problem, whereupon it might become necessary to poison the lake again.

**Unrestricted Fishing**  
Plans now being considered, should poisoning be attempted, would be first to fill all available hatcheries in Southern Oregon with rainbow trout fry. Diamond Lake then probably would be open to unrestricted and unlimited fishing, permitting the removal of all game fish anglers could capture. At spawning season an effort would be made to capture as many surviving adults as could be trapped. These fish would be removed to hatchery holding ponds, after the eggs had been taken from them.

During the month of July of the year chosen for poisoning, water from the lake would be turned into a drainage ditch dug between the Lake and Lake Creek to permit reduction of the lake level five feet, or to such other depth as might be determined upon. The water would be drawn down gradually, thus limiting the effect on the river. Draining the lake probably would continue until late September or early October.

The drainage outlet would be screened to prevent roach from escaping into the river. As an additional precaution, an electric barrier would be erected which would kill any fish coming into the electric field.

**Plug Artificial Outlet**  
After the water has been drawn down to the desired level, the artificial outlet would be plugged. Waters of the lake then would be poisoned.

The poison dissipates after about two weeks. It is estimated that four months would be required to bring the lake back to normal level. Thus, without accident no poison should escape into the river system.

People ask what would be the effect of the dead carcasses of millions of roach and a few hundred trout killed in the lake

three million in 1947 and two million in 1948. None were returned in 1949. Since 1949, approximately 50,000 fish have been planted in the lake annually and these have been larger fish. The 1952 planting, consisted of 11,085 pounds of fish 7 to 10 inches in length.

Stocking has not produced results, biologists state. In Diamond Lake the return has been only one ton for each three tons planted. Experience elsewhere has been just the reverse, three tons returned for each ton planted.

Furthermore plantings are costing \$1 per pound in Diamond Lake, whereas they should cost only a few cents per pound.

Another economic factor to be considered is the recreational income from the fishery resource. In its big year, Diamond Lake's income was estimated at \$300,000. Population within the area has greatly increased since 1948. If the lake were to be restored to its original condition, income certainly would be well in excess of \$500,000 annually. This amount would increase still more with construction of a road up the North Umpqua river to permit the Roseburg area equal access with Medford and Klamath Falls.

To kill off the roach and replant the lake would cost, it is estimated, between \$60,000 and \$100,000. Money is available through state and federal-aid funds to do the job if and when decided upon.

**Question Needs Answer**  
The \$64 question still remains, however. Can the food supply be restored?

Biologists are confident they can kill off the trash fish and can put trout back into the lake.

They know they are assuming certain calculated risks. They know they have many legal problems to settle. These are comparatively minor things however. They know, too, that, from the standpoint of economics, poisoning the lake is desirable.

But, if they kill off the roach, and if they replant the lake with trout, can the scarce supply of

bottom feed now left in the lake rehabilitate itself to the point of previous abundance?

Mother Nature will have to answer that one.

In the meantime, the Game Commission makes it very clear and positive that no decision has been reached. The problem is being explored from every angle. Every possible alternative to complete poisoning has been considered. Biologists say there is no other way to get rid of the trash fish. They say, too, that if the lake is left much longer in its present condition it will become a "biological wilderness." The Game Commission will be the final authority as to whether poisoning is to be attempted. The Commission won't give its approval until every risk, every hazard, has been fully estimated. It will not give approval until convinced that every safeguard against accident has been erected.

Then, and only then, will authority be granted to proceed with the poisoning experiment.

After that, Mother Nature, exercising the female prerogative, will have the last word.

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