

**INDEPENDENT
MULTIDISCIPLINARY
SCIENCE TEAM
(IMST)**

October 25, 2000

Kay Brown
Oregon Department of Fish & Wildlife
2501 SW First Avenue
Portland, OR 97207

Dear Kay,

In 1998, the Oregon Department of Fish and Wildlife (ODFW) staff was directed to review the performance of several hatchery programs. The review carried out was limited to state operated hatcheries for salmon, steelhead and trout in coastal watersheds and the Willamette trout hatchery program. Private and federal hatcheries and the Salmon and Trout Enhancement Program (STEP) were excluded from the review. The goal of the review was to evaluate the performance of hatchery programs relative to production goals, policy compliance, fish quality, operational, and economic considerations. A draft of the review was completed in March 1999.



State of Oregon

**John Buckhouse
Wayne Elmore
Stan Gregory
Kathleen Kavanagh
James Lichatowich
Logan Norris, Chair
William Pearcy**

The purpose of this letter is to report on the IMST's scientific review of the draft final report of the *Coastal Salmonid and Willamette Hatchery Program Review* (hereafter Hatchery Audit). This letter is Phase II of our evaluation of Oregon's artificial propagation program. Phase I addressed the consistency of hatchery measures in the Oregon Plan for Salmon and Watersheds with findings on salmon hatcheries from three scientific review panels (IMST Technical Report 1998-1). Phase III will address the scientific basis for the state's program of artificial propagation. We expect to complete Phase III in January 2001.

Analysis of the audit

The Hatchery Audit is tactical not strategic in its approach. It does not address the strategic direction of hatcheries in the state, nor does it identify the role any individual hatchery plays in this strategy. While this is a policy issue, we see compelling scientific reasons for having a hatchery policy and strategy within the context of the Oregon Plan for Salmon and Watersheds. Having a strategic plan would provide the basis on which hatchery management could be scientifically consistent with the mission of the Oregon Plan, and it would provide a useful technical basis for analysis of individual hatchery operations in future audits. Informal communication with ODFW indicates there is no strategic plan for a system of hatcheries for the State.

Strengths of the audit

Even with this limitation however, the Hatchery Audit is a useful tactical assessment document, and if its findings are utilized by ODFW, it could improve the programs of individual hatcheries. It identifies areas where

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improvements in individual hatchery operations are needed, and pinpoints specific programs that deserve additional attention. The Hatchery Audit's greatest potential benefit is in the improvement of operations within the hatcheries. The audit evaluated 43 performance measures and most of those were of operations within the hatcheries. Examples of those performance measures include an evaluation of the security alarm and the intake structure alarm and if the flow alarms are checked daily. An evaluation of predator control structures was another measure of performance within the hatchery. The audit evaluated many critical steps in the day-to-day operations of hatcheries.

Limitations of the audit

The audit offers very little insight into the issues and concerns that begin once the hatchery fish are released into the natural environment. For example, 41 of the 51 salmon and steelhead programs reviewed in the audit used smolt releases as a performance measure; 34 of the 51 salmon and steelhead programs used egg takes as a performance measure; and only 9 of the 51 salmon and steelhead programs evaluated performance using adult returns. These data clearly show the emphasis on activities inside the hatchery - egg takes and rearing juveniles to the smolt stage. Survival to adult, which takes place outside the hatchery, received little attention.

Where the audit tried to address performance measures outside the hatchery, the requisite data were often not available or it was not clear how the information was obtained. Evaluation of compliance with the Wild Fish Management Policy (WFMP) illustrates that point. For 36 of the 51 salmon and steelhead hatchery programs, it was appropriate to measure the percentage of hatchery strays on the natural spawning grounds to determine if the programs were in compliance with the WFMP. Of those 36 programs, 12 were not in compliance, 20 were in compliance, and for 4 programs the compliance status was not known.

However, it is not clear how compliance was measured, how data were obtained, or how estimates of proportions of hatchery fish on the spawning grounds and the confidence limits for those estimates were measured. For most of the 36 programs that needed to be reviewed for compliance with the WFMP, the Hatchery Audit contained language similar to the following example for the Applegate River winter steelhead program.

Estimates of the hatchery stock composition of naturally spawning fish were not made. However, for the purposes for this review, we assumed that the Applegate River wild winter steelhead population was most likely to be influenced by fish from this hatchery program, and further, that all hatchery winter steelhead spawning naturally in the Applegate River originated from this hatchery program.

The estimated proportion hatchery fish spawning naturally in the Applegate River was used to evaluate program compliance with the WFMP.

The methods for estimating compliance and the confidence limits on those estimates need to be included in the audit reports to permit a scientifically sound analysis of confidence.

From a review of the report *Status of Oregon Coastal Stocks of Anadromous Salmonids* (Jacobs et al., 2000) it appears that the department is trying to improve their estimates of

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the number of hatchery strays on the natural spawning grounds. The IMST realizes that making this estimate is a complex sampling problem that will take some time to resolve. However, this should be a high priority area and it is needed to bring the hatchery program in line with the goals of the Oregon Plan for Salmon and Watersheds.

Because the audit offers little insight to the post-release interaction between the hatchery fish and the ecosystem they are released into, it is not very useful in assessing the hatchery programs relative to the goals of the Oregon Plan for Salmon and Watersheds.

Wild fish management

We are concerned about the large differences that seem to exist among hatcheries in complying with the Wild Fish Management Policy. For some hatcheries all or nearly all of their programs (including different species) were in compliance with the WFMP. In contrast for other hatcheries, all or nearly all their programs were not in compliance (for example, see North Nehalem and Rock Creek hatchery programs). These differences indicate either that some programs may have been better at controlling strays than others, or perhaps there are differences in the methods used to determine compliance. We are not able to judge between these explanations because the methods used to estimate the strays on the spawning grounds were not described. In either case the issue needs attention.

Cost-benefit analysis

The cost-benefit analysis could be misunderstood because it does not clearly state the specific costs that are included and those that are excluded. It should specify whether or not the costs are included for administration of the program at the region and statewide level, for research, and for the time management personnel devote to hatchery issues.

Summary

The Hatchery Audit is an important first step in reforming hatcheries so their operation is consistent with the Oregon Plan for Salmon and Watersheds and they can make a contribution to the recovery of Oregon's listed salmon and steelhead ESUs. The Hatchery Audit revealed important shortcomings in the hatchery program that need correcting. The program appears to be weak in evaluating performance "outside the hatchery fence."

Recommendations

Based on our review, the IMST makes the following specific recommendations to ODFW:

1. Develop a strategic plan for the management of hatcheries to be consistent with the goals of the Oregon Plan for Salmon and Watersheds.
2. Develop a strategy for evaluating hatchery performance that includes assessing the performance of fish outside of the hatchery (survival of hatchery fish from smolt to adult).
3. Develop a strategy for the assessment of the impact of hatchery released fish on the performance, production and survival of naturally spawning wild stocks of fish.

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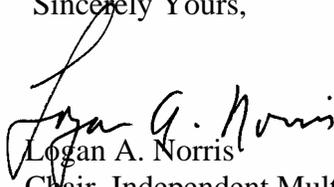
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4. Include direct and indirect costs in cost-benefit analyses.
5. Develop and use a consistent method for (a) evaluating the degree of straying of hatchery fish onto natural spawning beds and (b) assessing the impacts on wild stocks.

I hope these comments from IMST are useful in helping ODFW as they describe and implement a statewide hatchery strategy, and audit procedures and reporting methods that can be used to evaluate success.

Sincerely Yours,



Logan A. Norris
Chair, Independent Multidisciplinary Science Team

LAN:grs

Cc: Governor Kitzhaber
Senate President Adams
House Speaker Snodgrass
Joint Legislative Committee for Stream Restoration and Species Recovery
Roy Hemmingway, Manager Oregon Plan
IMST

Independent Multidisciplinary Science Team. 1998. Review of the Hatchery Measures in the Oregon Plan for Salmon and Watersheds. Report 1998-1 to the Oregon Plan for Salmon and Watersheds. Governor's Watershed Enhancement Board. Salem, Oregon.

Jacobs, S., Firman, J., Susac, G., Brown, E., Riggers, B., and Tempel, K. 2000. Status of Oregon coastal stocks of anadromous salmonids. Monitoring Program Report Number OPSW-ODFW-2000-3, Oregon Department of Fish and Wildlife, Portland, Oregon.