



Introduction

This report provides the Hatchery Scientific Review Group's (HSRG) synopsis and evaluation of state, tribal and (in two regions) federal implementation progress reports for each of the ten hatchery reform regions contained within Puget Sound and coastal Washington. Also included are an overview of Hatchery Reform Project 2004 accomplishments; information about project coordination, facilitation and communications; an update on investments made and needed at hatchery facilities; work in progress to continue implementation in 2005 and beyond; and a series of appendices.

In general, the HSRG is encouraged by the progress the co-managers are making in instituting hatchery reform throughout the Puget Sound and coastal Washington hatchery system. For example, the co-managers were explicit in their regional implementation progress reports in stating stock goals; defining management premises for biological significance, population viability, habitat and harvest; and employing new tools for better defining hatchery type (integrated or segregated). In some, but not all, regions the co-managers outlined current and future actions taken toward meeting stock goals for proper genetic integration or segregation, and described a process for incorporating natural-origin fish into the hatchery- and naturally-spawning broodstock.

The following comments are areas of concern that apply to some, but not all, regions and are meant as constructive criticism. The HSRG wishes to emphasize the overall good progress on the part of the co-managers in instituting hatchery reform in the ten regions.

GOAL SETTING

For the Stillaguamish/Snohomish, Hood Canal and Eastern Straits regions, it was clear that the co-managers reviewed and confirmed common stock goals. In some other regions, it was apparent that the co-managers had not established a unified process for regional reform. For example, it was not clear to the HSRG whether the stock goals provided by the co-managers for the regional review process in these regions had been revisited and confirmed. Having clear stock goals is essential to effectively evaluating benefits and risks from hatchery programs.

MANAGING FOR SUCCESS

Successful hatchery management is an ongoing, active process that focuses on long-term goals and adapts to changing circumstances, societal values, stock status and scientific information. It requires managers to make informed, scientifically defensible decisions based on available information. Future adaptive management of the system will require gathering new information (particularly bio-sampling surveys in the habitat, at hatcheries and in the fishery) and a systematic decision-making process that takes this information into account. An applied research agenda to address critical uncertainties and make better informed management decisions in the future is also necessary. Without such an approach, the system becomes static and unresponsive. Priority funding is urgently needed to make this system effective. For example, funds are needed to provide regular, timely gathering and analysis of data



about stock composition on the spawning grounds, in order to ensure scientifically-sound broodstock management strategies.

Managing for success and accountability (monitoring and evaluation, adaptive management) is the weakest element of hatchery reform at the present time, even in regions where good progress has been made in all other respects. No formal process for tracking progress and adaptively managing the system yet exists in any region. Even in the Stillaguamish/Snohomish region, where it appears that this topic has been given a fair amount of attention, a comprehensive adaptive management process is not yet in place. This is the top priority for the HSRG's work with the co-managers in 2005.

FUNDING

New funding is a necessity for implementing hatchery reform. Hatchery reform and adaptive management will require a significant investment of stable, new funding to annually evaluate escapement, stock identification, broodstock composition, natural/hatchery fish interactions, and other dynamic processes not previously required. In addition, the hatchery system desperately needs upgrading of its physical infrastructure, as significant improvements have not been made in several decades. In the near-term, capital funding should be prioritized to alleviate the negative interactions from hatcheries and hatchery fish with their ecosystems (for example, facilities for proper integrated and segregated programs, meeting federal and state laws for water withdrawal, and eliminating natural upstream and downstream migration delays). Future funding needs to be tied to explicit and quantitative goals for all hatchery- and naturally-spawning stocks in a given region. The flow of information must be sufficiently quantitative to properly size programs to meet those goals.

In the near-term, the greatest value is likely to be produced from investment in those regions where the co-managers are most prepared to implement hatchery reform. The co-managers in those regions—most notably the Stillaguamish/Snohomish, but also the Hood Canal, Eastern Straits and North Coast regions—have demonstrated a firm understanding of the process of hatchery reform and have made the decisions to implement change. The HSRG recommends that these regions receive priority funding from the state and federal governments.

Hatchery reform also means reprioritizing and reallocating existing resources. Many changes can be instituted without additional funding, and a lack of funding should not be used as an excuse for continuing activities inconsistent with stock goals. For example, genetic management of broodstocks should be a priority—on par with fish health and quality, water requirements, cost effectiveness, etc. The co-managers need to prioritize and develop alternate regional strategies if preferred strategies cannot be implemented. At a minimum, where funding is not currently available to implement preferred reforms, interim solutions consistent with goals for affected stocks should be identified and implemented.

GENETIC INTEGRATION AND SEGREGATION

Implementing genetically integrated or segregated broodstock management strategies is the key component to hatchery reform as described by the HSRG. It should be clearly noted that HSRG does not advocate the use of one strategy over the other. Each has its own set of benefits and risks. What is



critical is that the selected strategy is properly implemented and adaptively managed. There is encouraging evidence in several regions that this approach is becoming accepted by hatchery operators. The Stillaguamish/Snohomish region, in particular, is implementing this concept. Plans for integration/segregation are well advanced or planned in the Hood Canal, Eastern Straits and North Coast regions. Plans to implement this concept are also being developed in the Nisqually Basin (South Sound), on the Green River (Central Sound), and in the Nooksack/Samish region. However, integrated or segregated genetic broodstock management has not progressed to the point of implementation in most of these and other regions.

SIZING HATCHERY PROGRAMS

To assure that harvest and conservation goals are met, hatchery programs must be sized (in terms of the number of fish released) appropriately. Unfortunately, in most regions those goals are not sufficiently quantified to determine the appropriate size of a hatchery program. Quantifying these goals is the next key step to assure successful fisheries management. In many regions, it does not appear likely that natural stocks will be productive enough in the short-term to support properly integrated hatchery programs at current program sizes, due to the need to remove excessive numbers of natural spawners for hatchery broodstock. Correct sizing is also important to segregated programs. Even low levels of straying from a large segregated hatchery population can result in significant loss of fitness for a small natural population. If habitat improvements that increase the size and productivity of natural populations do not occur, either type of program may pose significant risk to natural populations. Therefore, co-managers need to either develop new strategies for stock integration or segregation (such as reductions in program size), or reconsider their stock goals, in those situations.

STEELHEAD WHITE PAPER AND MANAGEMENT PLAN

Throughout the regional reviews, the HSRG expressed concern about the current ubiquitous, system-wide approach to steelhead management, which uses segregated hatchery programs without adequate measures to monitor and manage genetic¹ and ecological² risks. In the HSRG's opinion, the current system of steelhead hatchery management in Puget Sound and coastal Washington is in greater need of change than most other programs, based on the principles of hatchery reform. The HSRG proposed a comprehensive change to this system consistent with reform principles and the co-managers' stock goals. This included taking steps to ensure segregated programs were operated correctly, and the establishment of hatchery-free management zones, where natural steelhead would be free from the influence of hatcheries.

¹ Mackey, G., J.E. McLean, and T.P. Quinn. 2001. Comparisons of run timing, spatial distribution, and length of wild and newly established hatchery populations of steelhead in Forks Creek, Washington. *North American Journal of Fisheries Management* 21:717-724.

² Kostow, K.E., A.R. Marshall, and S.R. Phelps. 2003. Naturally spawning hatchery steelhead contribute to smolt production but experience low reproductive success. *Transactions of the American Fisheries Society* 132:780-790.



The co-managers responded by proposing to develop a comprehensive, new approach to steelhead management, beginning with a white paper that would be the foundation for a new, genetically-based, statewide steelhead management plan. The HSRG was asked by the Washington State Department of Fish and Wildlife (WDFW) to work with the Department on developing this new steelhead approach, and has been prepared to assist in this effort. However, the HSRG is concerned that the release of the white paper and management plan has been delayed. This has prevented the HSRG from contributing to the plan, or commenting on progress made in implementing hatchery reform for steelhead programs. In the absence of a new approach that incorporates the elements of hatchery reform, the HSRG stands firmly by its previous recommendations, calling for significant changes in the management of steelhead hatchery programs.