

Additional background information on the strategy development is provided in the following areas:

1. [Mission, Goals, and Strategy for Conservation Measure Development](#)
2. [Defining the Conservation Outcome](#)
3. [Habitat Conservation Plan Headwaters Conservation Goal](#)
4. [Generating Supporting Information for Strategy Development](#)

1. Mission

Improving the implementation of the Habitat Conservation Plan through the use of the best available science and adaptive management.

Goals

Objectively create and evaluate operationally feasible alternatives for headwater conservation which meet the goals of the riparian conservation strategy.

Approach for Developing the Conservation Strategy

Convene an external independent [science panel](#) to objectively devise and evaluate a series of alternatives for headwater conservation. The alternatives will be consistent with the conservation objectives that have been pre-approved by DNR, US Fish and Wildlife Service, and NOAA Fisheries. The evaluation will not be a management recommendation, but instead an analysis of the likely conservation value of the components of each strategy and the probability that they contribute to the conservation objectives.

A committee process will be established to separate the development of alternatives using the best available science from negotiated agreements with stakeholders.

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2. Defining the Conservation Outcome

The headwaters conservation strategy is intended to evaluate the interim Type 5 conservation strategy and consider what improvements, if any, are needed to meet the intended conservation goal.

A key component in the development of alternative conservation strategies is a description of the role headwater streams play in meeting our riparian conservation goals. The Habitat Conservation Plan offers relatively little guidance given the predominance of non fish-bearing streams. It was estimated that Type 4 and 5 waters make up approximately 90 percent, by length, of the stream network in the five [Westside planning units](#). As to the ecological role of these streams, the HCP states:

Riparian management zones along all Type 4 and some Type 5 waters are intended to maintain the physical and biological processes that link hillslope inputs to fish-bearing streams (paraphrased from DNR 1997 p.IV.72).

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3. Habitat Conservation Plan Headwaters Conservation Goal

In partnership with the US Fish and Wildlife Service and NOAA Fisheries, DNR has used the guidance contained in the Habitat Conservation Plan to create the following working conservation goal for headwater streams.

The goal of the headwater (Type 5) stream conservation strategy is to support the Habitat Conservation Plan riparian conservation objectives of maintaining or restoring salmonid freshwater habitat and conservation of riparian obligate species. Management along headwaters will maintain or restore the important hydrologic, geomorphic, and biological processes that link hillslopes and headwater streams to downstream fresh water fish-bearing waters.

The above goal assumes that the conservation of riparian obligate species on headwaters is indirectly supported through the protection of these processes and that the conservation measures on headwaters do not function independently, but in concert with existing riparian management zone ecosystem protection.

Interpretations of the Type 5 Conservation Objective for the Trust Lands Habitat Conservation Plan

The Habitat Conservation Plan offers some guidance as to the intended role and objective of the Type 5 stream conservation:

"In the five west-side planning units, Types 4 and 5 waters make up approximately 90 percent (by length) of the stream network on DNR-managed forest lands. Low-order streams (i.e., Types 4 and 5 waters) are the major link between hillslopes and higher order fish-bearing streams (FEMAT 1993; MacDonald and Ritland 1989). Low-order streams provide water, sediment, nutrients, and wood to downstream fish habitat (Swanston 1991; Potts and Anderson 1990; Richardson 1992; Connors and Naiman 1984; Bilby and Bisson 1992). Riparian management zones along all Type 4 and some Type 5 waters are intended to maintain the physical and biological processes that form this linkage." (DNR 1997 IV.72).

The department is making the following assumptions as to the conservation role of type 5 streams:

Type 5 stream protections needs to be considered in the context of existing conservation and restoration along Type 4 and fish bearing streams. Together, the Type 4 and 5 streams are referred to as headwaters. Components of the riparian conservation strategy, including riparian management zone guidelines, road building standards, unstable slope protection and hydrologic maturity, work in concert to meet the intended objective. It is assumed that the influence of a Type 5 stream system on hillslope processes varies geographically as a function of climate, soils, geology, and disturbance history.

When Type 5 streams do provide hydrologic, geomorphologic or biological linkages to fish-bearing streams, management will be designed to maintain these processes. It may not be necessary nor possible to maintain hillslope processes on all streams.



Type 5 streams play an important role in protecting riparian obligate species as a riparian conservation objective. Harvesting in and near Type 5 streams influences the quantity, quality, and stability of large woody debris in stream channels. Sediment dynamics, stream flow, and flood peaks are influenced by road building, road use, yarding and removal of vegetation near Type 5 streams and can influence on-site habitat for riparian obligate species and ecological linkages with fish-bearing streams.

The goal of the long-term conservation strategy for Type 5 streams is to function in concert with existing riparian ecosystem protection to maintain and restore habitat and confidence that hillslope processes will be maintained on the majority of streams

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4. Generating Supporting for Long-Term Headwaters Conservation Strategy Development

Three projects have been undertaken by the HCP research group to support the development of the long-term headwater conservation strategy.

A [LITERATURE REVIEW](#) of headwater stream ecology and protection, and a forested wetland management literature review and synthesis.

The RIPARIAN ECOSYSTEM MANAGEMENT STUDY (REMS) - a large-scale, multi-disciplinary manipulative study of the role of alternative headwater buffer configurations on headwater stream in situ habitat and exports to downstream fish bearing systems.

A [RETROSPECTIVE ANALYSIS](#) of the implementation of the interim Type 5 conservation strategy. This review will enable us to provide the necessary context for the development of alternative headwater conservation strategies. Prior to this study, quantitative data on the implementation of the interim Type 5 strategy was lacking. The study aims to quantify the extent of the headwaters stream system, document how the HCP interim protection strategy has influenced management around these systems, increase our ability to model the headwater stream system, and document leave tree areas and notable ground and channel conditions. This data will help determine if any additional specifications are necessary as part of the long-term headwaters conservation strategy.

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Literature Cited

Washington State Department of Natural Resources. 1992. Forest Resource Plan: Policy Plan. Author, Olympia, WA.

Washington State Department of Natural Resources. 1997. Final Habitat Conservation Plan. Author, Olympia, WA.