Chapter 6

Monitoring and Adaptive Management

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6.0 Introduction and Overview

Monitoring is a key element in fulfilling the Washington Department of Fish and Wildlife's (WDFW) mission of preserving and perpetuating Washington's fish and wildlife resources. The fifth element required of State Wildlife Action Plans (SWAP) is to provide for periodic monitoring of Species of Greatest Conservation Need (SGCN), habitats (represented by Ecological Systems of Concern [ESOC] in this document), and the effectiveness of conservation actions, as well as monitoring to use for adapting conservation actions as appropriate to respond to new information or changing conditions (adaptive management). The sixth required element is the SWAP should provide for review and revision of the action plan. This chapter addresses both of these elements by providing an overview of WDFW's approach and commitment to monitoring and adaptive management, describing how monitoring and adaptive management are addressed in the SWAP, and indicating how the SWAP will be reviewed and revised.

Where monitoring needs are discussed in the SWAP

Chapter 3 – Species of Greatest Conservation Need provides an overview and summary of all the SGCN species and includes a high level discussion of threats and conservation actions, which may include monitoring or research oriented objectives. Detailed fact sheets for each SGCN (see Appendix A) include more discussion on monitoring needs and objectives for specific species. Similarly, Chapter 4 – Habitats of Greatest Conservation Need includes discussion of research and data needs, including monitoring, related to improving habitat for fish and wildlife at two scales (vegetation formation and ecological systems of concern). Fact sheets are provided for all ecological systems of concern, which include a discussion of stressors and conservation actions needed, and includes monitoring or baseline survey needs.

Selective prioritization – monitoring outcomes may not be outlined for all conservation actions

As discussed elsewhere in the SWAP, WDFW has adopted a flexible approach to prioritization of the SGCN and the ecological systems of concern, one that allows the agency to prioritize conservation activity in response to changes in internal priorities, organizational capacities, targeted funding opportunities or the availability of other resources. Our SGCN list is larger than in 2005, with an explicit recognition that the agency doesn't currently have capacity to adequately fund the conservations actions for all SGCN identified. Thus, inclusion of a species as an SGCN or inclusion of an ecological system as an ecological system of concern doesn't necessarily imply we will initiate action; rather that the need for conservation action exists. We will, however, consider the full suite of SGCN to inform actions directed towards higher priority species or ecological systems in an effort to maximize the effect of our conservation actions and increase the efficiency of our efforts.

Since we may not yet have projects in place or planned, monitoring objectives are not identified for all conservation actions. As funding or partnership resources become available and actions are queued up for implementation, monitoring and adaptive management plans will be developed. Where feasible, new WDFW monitoring programs will incorporate existing data and surveys and collaborate with monitoring partners. See Chapter 7 – Implementation for more discussion on prioritization within the SWAP and opportunities for working collaborative with conservation partners in advancing implementation of the SWAP.

6.1 WDFW Approach to Monitoring and Adaptive Management

There are many ways to describe and categorize the various types of monitoring related activities. For the purposes of this chapter, we will focus on two categories of monitoring activities as a means to describe WDFW's approach and commitment to monitoring and adaptive management: population assessment (status and trends) and compliance and effectiveness monitoring. For each category, we have described activities currently underway, and discussed outstanding needs and opportunities to address them.

6.1.1 Population Assessment (status and trends monitoring)

Population assessment, including inventory, status, and trends, can be defined as activities to track changes in wildlife and fish populations and their associated habitats over time, such as tracking the population status of four target species in a wildlife area.

WDFW works extensively with its partners to conduct baseline surveys or complete inventories in order to determine population numbers and distribution of a wide variety of wildlife species across the state. We will not present a comprehensive list of all the monitoring activities underway at WDFW, but rather we provide selected examples and focus on gaps and opportunities to address those gaps.

Examples include monitoring conducted for game species (several are on the SGCN list). Game species are monitored to evaluate their trends relative to the effects of different types of hunting seasons and to determine the numbers of animals that may be harvested when developing or modifying hunting seasons. Examples of these are breeding population surveys, midwinter counts and banding programs conducted for waterfowl. More information on game species monitoring is available in the WDFW Game Status and Trends Report for 2014, found here (wdfw.wa.gov/conservation/game/). About a third of our SGCN are salmonids. Intensive monitoring for salmonids is generally referred to as validation monitoring because the great body of knowledge surrounding anadromous salmon allows for hypothesis testing of the population response to specific management actions. WDFW also conducts validation monitoring to periodically reevaluate anadromous salmonid productivity, and uses that information to inform fishery management. WDFW's hatchery program also evaluates the effects of artificial production problems on wild salmonid stocks. Information on WDFW's salmon monitoring programs can be found here (wdfw.wa.gov/conservation/research/projects/salmon_abundance_research_methods).

Priorities for Population Assessment Monitoring

Monitoring is in place for only a portion of our 268 SGCN, and there is a significant need for expanded inventory and population assessments for SGCN and the habitats on which they depend. Our highest priority is to address outstanding monitoring needs for our 46 state and federally listed species – currently we have sufficient monitoring in place for only about half of these species. Addressing this gap is our highest priority because of their population persistence concern as well as our legal obligation to identify and report on the conservation status of these species and to develop status review documents, recovery plans and landscape management plans such as Habitat Conservation Plans.

A second tier of priority is a subset of species listed as "candidate" under Washington Administrative Code 232-12-297. These species may require survey activities to complete a full status assessment and make a recommendation regarding listing. Survey work will establish baseline data for long-term monitoring of species that are ultimately listed as threatened or endangered. A third tier of priority, are those SGCNs associated with an emerging or urgent threat; for example, bats at risk of white nose syndrome. And finally a fourth priority is to address gaps in our knowledge about species we know little about, including all taxa, but especially reptiles, amphibians, and invertebrates. For example, we only have sufficient occurrence data to map distribution for about 80 of our terrestrial SGCN.

Other priorities include the need for increased monitoring in order to better understand how climate change is affecting highly vulnerable species and ecosystems and how to develop appropriate response strategies. Each of our climate watch species (see Chapter 5) warrants additional monitoring to determine how distribution or habitat use may be shifting.

Needs and Opportunities
Strategies currently under consideration to address the needs for population assessment in a time of limited resources include the following:

- **Conduct multi-species monitoring**
  With only about half of state-listed species with sufficient data to establish population trends, we currently lack the information and capacity to evaluate the status and distribution required to enact conservation measures for the majority of our SGCN. Multi-species monitoring is a strategy being developed by WDFW to increase the number of species for which we have credible, scientific information upon which to make inferences of population change. We aim to develop multi-species monitoring strategies that will link species occurrences to both associated habitats and to conservation action. In doing so, we hope to be able to efficiently evaluate species populations as well as their response to management actions. This will allow us to better understand what actions are directly impacting populations and/or habitats, where population growth constraints are, and how to improve our conservation effectiveness.

  In addition, survey methods for species monitoring will be developed with consideration of the threat of climate change. Data should be appropriate to conduct predictive modeling to understand the impact climate change has on species and their habitats, and inform decisions about targeting areas for long term conservation benefit.

- **Employ citizen scientists or improve citizen science program to augment monitoring capacity**
  Citizen Scientists – volunteers working under the direction of professional biologists, trained to help answer a specific question, and following a set of data collection protocols – have long been recognized as an important asset to help our agency answer important species' and habitats' distribution and health questions. Beyond "volunteer opportunities," WDFW teams Citizen Scientists and professional biologists for specific targeted priorities set by the agency and our conservation partners. Recent examples include Greater Sage-grouse lek counts and Ecological Integrity Monitoring on Wildlife Areas. Baseline work by Citizen Scientists can identify questions we need to ask, inform the next stages of research-grade science, and help evaluate conservation actions.

  In 2014, WDFW committed a portion of the income from the Wild On Washington "Bald Eagle" license plate to create a more strategic network of Citizen Scientists and Citizen Science projects. WDFW is currently 1) creating a project development process to enhance purposeful data collection, high quality volunteer recruitment and retention, data compatibility, conservation effectiveness and communication; 2) supporting the use of certain online applications and tools to collect certain kinds of crowdsourced data; and, 3) drafting a framework for a statewide network of Citizen Scientist "nodes" to help in every ecoregion.

- **Ecosystem monitoring**
  Focus on ecosystem monitoring as a coarse filter strategy. The SWAP Revision process has created new tools to understand the relationship between spatial habitat priorities and the SGCN that

depend on specific ecological systems for some or all or their life history needs. (See Chapter 4 – Habitats for more discussion on these tools).

6.1.2 Effectiveness and Compliance Monitoring

These are two related, but distinct concepts. Effectiveness monitoring can be described as activities intended to document the success of conservation actions in achieving the desired resource condition, such as determining whether a prescribed burn on a wildlife area achieved the desired result of maintaining a plant community of native prairie grasses. It is an essential component of adaptive resource management and is used to guide how we can improve resource management to achieve desired conditions. Compliance monitoring, on the other hand, reports on the implementation of stated projects and programs, and gauges how well they achieved their stated goals, for example, did the prescribed burn occur as planned and what was the result. Combined, the products of these monitoring activities helps us to inform and prioritize programmatic decisions so we can maximize conservation benefit with existing resources. Each is discussed in more detail below.

Compliance Monitoring

Many of the conservation strategies and actions described in the Washington SWAP will be implemented by WDFW, either alone or in cooperation with our conservation partners. Other projects may be carried out solely by conservation partners, either as part of their own mandates and programs or through funding arrangements with WDFW. Projects that are carried out and funded by WDFW will be monitored to ensure that the funds were properly spent and to document that the projects were effective in addressing the objectives stated in specific grants.

A prime example of compliance monitoring efforts at WDFW include monitoring under the Adaptive Management Program of the Forests and Fish Agreement, which addresses timber-managed landscapes and became law in 2000. Forests and Fish is a multi-stakeholder agreement in which the timber industry, three Washington State agencies (the Departments of Ecology, Natural Resources, and Fish and Wildlife), Native American tribes, Washington State counties, and the US Fish and Wildlife Service participate. This agreement, the largest Habitat Conservation Plan in North America, covers over 9 million acres. Since 2000, WDFW has designed and implemented several research-linked monitoring projects, the ultimate purpose of which is to evaluate the effectiveness of the state riparian buffer prescription for non-fish-bearing streams in protecting natural resources. Amphibians, as the focal aquatic vertebrates in non-fish-bearing streams, are a focus of this monitoring.

A recent effort has focused on assessing the effectiveness of the Hydraulic Project Approval (HPA) program in protecting fish life. WDFW has designed and implemented an HPA compliance and effectiveness monitoring program for culvert-related water crossing structures on fish bearing streams and marine shoreline bank protection. Results of this monitoring of water crossing structures and marine bank protection is being used to improve HPA Program performance over time.

To ensure compliance with our grants, WDFW has been using a system known as “CAPS”. It is a shared database system for tracking WDFW contracts and their associated projects. Previously, WDFW has successfully used CAPS for compliance monitoring on several Federal Energy Regulatory Commission (FERC) projects, as well as on projects affected by Washington Forest Practice laws. We are currently in the process of transitioning to Novatus, a similar type of contract management system. Novatus is designed to provide necessary management controls and reporting capabilities and to address the various programmatic and financial accountability expectations of federal, state, and local contracting and grant agencies. WDFW will use Novatus to build accountability for contract and grant performance. In particular, it contains a nexus with the US Fish and Wildlife Service’s (USFWS) Tracking and Reporting Actions for the

Conservation of Species (TRACS) system. Wildlife TRACS is the tracking and reporting system for conservation and related actions funded by the, USFWS's Wildlife and Sport Fish Restoration (WSFR) Program. When fully implemented, the results achieved through State Wildlife Grant projects will be available for review through a publicly available website, found here.

Effectiveness Monitoring

Effectiveness monitoring is an ongoing and emerging need at WDFW. It is particularly important within the context of SWAP implementation and revolves around Adaptive Resource Management. The approach for effectiveness monitoring for species and habitats is a focus of the multi-species monitoring approach described above. Functionally, the steps taken in this SWAP revision to link species to closely and generally associated habitats will form the basis for being able to monitor the effectiveness of on-the-ground conservation action through appropriate indicators of either habitat response, species response, or both.

6.2 Review and Revision of the SWAP

Element 6 of the required SWAP elements states that there must be provisions to review the plan at intervals not to exceed ten years. WDFW intends to initiate a formal review of progress on the SWAP and changes needed in preparation for an updated revision no later than two years prior to the next submission date (assumed to be October 1st, 2025).

In addition, if changes are needed to either the SGCN list or the list of Habitats of Greatest Conservation Need prior to the date of the next SWAP submission, WDFW will submit a request to USFWS as per USFWS guidance.

We also fully expect that the data provided in this document will change over the years. For example, timing of the submittal date only allowed for a preliminary assessment of climate change vulnerability for our SGCN. In some cases, we identified species with likely high vulnerability, but were not able to locate sufficient references to establish a high confidence in this ranking. As our work to understand how climate change will impact our SGCN and the habitats on which they depend continues, we expect to be updating our rankings and perhaps as a result identifying new actions or priorities. The State Wildlife Action Plan as represented by this document is a snapshot in time, but the data products that comprise it are designed to be dynamic and accommodate the availability of new research, or other changes, in the understanding of the conservation needs or status of an individual species.

The maps depicting range and potential habitat distribution presented in Appendix B are another example of a product that is designed to be responsive to new data and updated continuously as new information becomes available.

6.3 Summary

Monitoring and adaptive management are critical elements of Washington's State Wildlife Action Plan. The commitment to status and trends, as well as project effectiveness and implementation monitoring efforts as described in this chapter provide the means for gauging the health of Washington wildlife and fish populations and for determining whether or not conservation projects and programs are meeting WDFW's goals. These monitoring activities also serve as the cornerstone of Washington's adaptive management approach to implementing agency conservation programs, including the SWAP. Through systematic, ongoing review of conservation management strategies and monitoring programs, WDFW will aim to continually improve its effectiveness at conserving Species of Greatest Conservation Need, associated habitats and ecological systems at both the localized and regional scales, and will ensure that the monitoring requirements of the State Wildlife Grants program are met.