Excerpts from the December 2025 Oregon Private Forest Accord Aquatic Habitat Conservation Plan

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HCP Currently under Review—Content Subject to Change

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ICF. 2025. *Oregon Private Forest Accord Aquatic Habitat Conservation Plan*. December. (ICF 104528.0.001.) Seattle, WA. Prepared for Oregon Department of Forestry, Salem, OR.

4.2 Biological Goals and Objectives

The following BGOs reflect the broad scale of this HCP and advance guiding principles to describe desired conditions. Two overarching biological goals are established—one for the Western Oregon georegion and another for the Eastern Oregon georegion—that are consistent with differences in conservation measures and monitoring approaches required in each georegion. Objectives and subobjectives describe how the goals will be achieved via the conservation measures, which are fully described in this chapter. The subobjectives are specific, measurable, assignable, realistic, and time-bound (SMART). Each subobjective is categorized into one or more monitoring groups that reflect different approaches for assessing the effectiveness of the conservation measures to meet the BGOs.

All HCP monitoring groups are fully explained in Chapter 6, *Compliance Monitoring and Adaptive Management*, but are briefly described here (Table 4-1). Implementation monitoring (Group 1) is conducted directly by ODF. Actions to be taken based on identified implementation issues may include new training, guidance, rule clarification, or other actions with the intended goal of

[1] *Slash* is defined as coarse and fine woody debris generated during logging operations.

improving implementation and compliance (Chapter 6, Section 6.3.10, *Compliance Monitoring Program Phase 5: Review and Communication of Compliance Monitoring Program Study Results*). All sub-objectives are classified as Group 1, and a sub-set of sub-objectives will have additional monitoring requirements (Groups 2 through 4). Evaluation through status and trend monitoring (Group 2), targeted monitoring studies (Group 3), and targeted monitoring studies after triggering events (Group 4) will be conducted by the Adaptive Management Program Committee and the Independent Research and Science Team. Actions to be taken based on Groups 2, 3, or 4 monitoring may include adjustments to existing conservation measures through modification of OFPA Regulations, new or modified technical guidance, or no action (Chapter 6, Section 6.4, *Effectiveness Monitoring and Adaptive Management Program*). All monitoring will occur throughout the permit term; however, the location, timing, and scale will vary over time depending on priorities and direction from the BOF for targeted monitoring.

Table 4-1. Description of Monitoring Groups

Group	Monitoring Requirements
Group 1: Implementation Monitoring Applies to all objectives	ODF will evaluate all conservation measures by monitoring their implementation and reporting annually to the Services. Conservation measures with robust best available science regarding the effectiveness of the conservation measure in meeting the objective will not have additional monitoring requirements and will only be classified as Group 1.
Group 2: Status and Trend Monitoring	ODF will evaluate the effectiveness of these conservation measures in meeting the objective(s) via status and trend monitoring and will report annually to the Services. Group 2 includes: • Simple conservation measures where the best available science has gaps or is less robust; and • Conservation measures with multiple components that address a chronic process, such as the road rules that target chronic sediment delivery.
Group 3: Targeted Monitoring Studies	ODF will evaluate the effectiveness of these conservation measures in meeting the objective(s) via discrete research projects conducted through the Adaptive Management Program and will report annually to the Services. Group 3 includes simple conservation measures with clear gaps in the scientific literature.
Group 4: Targeted Monitoring Studies After Triggering Events	ODF will evaluate the effectiveness of these conservation measures in meeting the objective(s) via retrospective analysis after significant triggering events and will report annually to the Services. Group 4 includes conservation measures with multiple components subject to episodic events (e.g., landslides).

Overarching Biological Goal: Forest practices in the Western Oregon georegion support the persistence and recovery of the covered fish and amphibian species by providing clean, cool, connected, and complex habitats.

Objective 1: Forest practices in the Western Oregon georegion near streams minimize sediment delivery to support the needs of the covered species.

1.1: Forest practices in the Western Oregon georegion near streams minimize sediment delivery to support the needs of the covered species by establishing no-harvest riparian management areas (RMAs) along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring)

1.2: Forest practices in the Western Oregon georegion near streams minimize sediment delivery to support the needs of the covered species by establishing no-harvest RMAs along small non-fish-bearing perennial streams (Type Np) for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring)

1.3: Forest practices in the Western Oregon georegion near streams minimize sediment delivery to support the needs of the covered species by establishing equipment limitation zones (ELZs) or retention-equipment limitation zones (R-ELZs) for the full length of all streams, including non-fish-bearing seasonal streams (Type Ns). (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

1.4: Slope retention areas (SRAs) in the Western Oregon georegion minimize episodic sediment delivery to fish-bearing streams to support the needs of the covered species throughout the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

1.5: Designated debris flow traversal areas (DDFTAs) in the Western Oregon georegion minimize episodic sediment delivery to fish-bearing streams to support the needs of the covered species throughout the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

1.6: Forest practices in the Western Oregon georegion near streams minimize sediment delivery to support the needs of covered species by extending no-harvest RMAs up to 170 feet to encompass the perimeter of all identified stream adjacent failures throughout the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

1.7: Road runoff directly to streams is minimized by implementation of the Forest Road Inventory and Assessment (FRIA) through 2044 to reduce hydrologic connectivity throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

1.8: Road runoff directly to streams is minimized by implementation of standards for new road construction to reduce hydrologic connectivity throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

1.9: Road runoff directly to streams is minimized by implementation of standards for existing road maintenance to reduce hydrologic connectivity throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

1.10: Roads are not a significant source of episodic sediment delivery to streams by implementation of FRIA through 2044. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

1.11: Roads are not a significant source of episodic sediment delivery to streams by implementation of standards for new road construction throughout the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

1.12: Roads are not a significant source of episodic sediment delivery to streams by implementation of standards for existing road maintenance to reduce hydrologic connectivity throughout the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

Objective 2: Forest practices in the Western Oregon georegion near streams maintain shade to support the stream temperature needs of covered fish species.

2.1: Forest practices in the Western Oregon georegion near streams maintain shade to support the stream temperature needs of the covered fish species by establishing no-harvest RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring)

2.2: Forest practices in the Western Oregon georegion near streams maintain shade to support the stream temperature needs of the covered fish species by establishing no-harvest RMAs along small non-fish-bearing perennial streams for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

Objective 3: Forest practices in the Western Oregon georegion near streams maintain shade to support the stream temperature needs of the covered amphibian species.

3.1: Forest practices in the Western Oregon georegion near streams maintain shade to support the stream temperature needs of the covered amphibian species by establishing no-harvest RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring)

3.2: Forest practices in the Western Oregon georegion near streams maintain shade to support the stream temperature needs of the covered amphibian species by establishing no-harvest RMAs along small non-fish-bearing perennial streams for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

3.3: Forest practices in the Western Oregon georegion near streams maintain shade to support the stream temperature needs of the covered amphibian species by establishing R-ELZs on small non-fish-bearing perennial streams for a distance within and/or upstream of the no-harvest RMA during all timber harvest throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Research Studies)

3.4: Forest practices in the Western Oregon georegion near streams maintain shade to support the stream temperature needs of the covered amphibian species by establishing no-harvest DDFTAs during all timber harvest throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

Objective 4: Forest practices in the Western Oregon georegion maintain connectivity to support the needs of covered fish species.

4.1: Forest practices in the Western Oregon georegion near streams maintain aquatic connectivity to support the needs of the covered fish species by extending RMAs around seeps, springs, side channels, and stream-associated wetlands throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

4.2: Forest practices in the Western Oregon georegion maintain in-stream connectivity and fish passage to support the needs of the covered fish species by requiring new and existing permanent water crossings on fish streams to meet standards under OAR 629-625-0320 throughout the permit term. (Group 1: Implementation Monitoring)

4.3: Forest practices in the Western Oregon georegion maintain in-stream connectivity to support the needs of the covered fish species by implementation of FRIA and rules related to vacating roads and stream crossings. (Group 1: Implementation Monitoring)

Objective 5: Forest practices in the Western Oregon georegion maintain connectivity to support the needs of covered amphibian species.

5.1: Forest practices in the Western Oregon georegion near streams maintain connectivity to support the needs of the covered amphibian species by establishing no-harvest RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring)

5.2: Forest practices in the Western Oregon georegion near streams maintain connectivity to support the needs of the covered amphibian species by establishing no-harvest RMAs along small non-fish-bearing perennial streams for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

5.3: Forest practices in the Western Oregon georegion near streams maintain connectivity to support the needs of the covered amphibian species by establishing R-ELZs on small non-fish-bearing perennial streams for a distance within and/or upstream of the no-harvest RMA throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

5.4: Forest practices in the Western Oregon georegion near streams maintain connectivity to support the needs of the covered amphibian species by extending no-harvest RMAs around seeps, springs, side channels, and stream-associated wetlands throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

5.5: The applicant will conduct research to better understand how the steep slope protections (SRAs and DDFTAs) provide habitat connectivity to affect persistence of populations, focusing first on Columbia torrent salamander (*Rhyacotriton kezeri*) and southern torrent salamander (*Rhyacotriton variegatus*). (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

5.6: Forest practices in the Western Oregon georegion maintain in-stream connectivity to support the needs of the covered amphibian species by requiring new and existing permanent

water crossings on fish streams to meet standards throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

5.7: Forest practices in the Western Oregon georegion maintain in-stream connectivity to support the needs of the covered amphibian species by requiring new and existing permanent water crossings on non-fish streams to meet standards throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

5.8: Forest practices in the Western Oregon georegion maintain in-stream connectivity to support the needs of the covered amphibian species throughout the permit term by implementation of FRIA and rules related to vacating roads and stream crossings. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

5.9: The applicant will prioritize a research program that will examine the following.

- The current distribution of the covered amphibian species in Oregon and the factors that influence where they occur.
- Quantification of population trends of the covered species through time, prioritizing Columbia torrent salamanders and southern torrent salamanders. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

Objective 6: Forest practices in the Western Oregon georegion maintain riparian function and complex habitats, including but not limited to the delivery of large wood, to support the needs of covered fish species.

6.1: Forest practices in the Western Oregon georegion near streams maintain riparian function and complex habitats to support the needs of the covered fish species by establishing no-harvest RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring)

6.2: Forest practices in the Western Oregon georegion near streams maintain riparian function and complex habitats to support the needs of the covered fish species by establishing no-harvest RMAs along small non-fish-bearing perennial streams for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

6.3: SRAs in the Western Oregon georegion maintain riparian function and complex habitats to support the needs of the covered fish species throughout the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

6.4: DDFTAs in the Western Oregon georegion maintain riparian function and complex habitats to support the needs of the covered fish species throughout the permit term (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

Objective 7: Forest practices in the Western Oregon georegion maintain riparian function and complex habitats, including but not limited to the delivery of large wood, to support the needs of covered amphibian species.

7.1: Forest practices in Western Oregon georegion near streams maintain riparian function and complex habitats to support the needs of the covered amphibian species by establishing no-

harvest RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring)

7.2: Forest practices in the Western Oregon georegion near streams maintain riparian function and complex habitats to support the needs of the covered amphibian species by establishing no-harvest RMAs along small non-fish-bearing perennial streams for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

7.3: Forest practices in the Western Oregon georegion near streams maintain riparian function and complex habitats to support the needs of the covered amphibian species by extending RMAs around seeps, springs, side channels, and stream-associated wetlands throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

7.4: SRAs in the Western Oregon georegion maintain riparian function and complex habitats to support the needs of the covered amphibian species throughout the permit term. Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

7.5: DDFTAs in the Western Oregon georegion maintain riparian function and complex habitats to support the needs of the covered amphibian species throughout the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

Overarching Biological Goal: Forest practices in the Eastern Oregon georegion that support the persistence and recovery of the covered fish and amphibian species[2] by providing clean, cool, connected, and complex habitats.

Objective 8: Forest practices in the Eastern Oregon georegion near streams minimize sediment delivery to support the needs of the covered species.

8.1: Forest practices in the Eastern Oregon georegion near streams minimize sediment delivery to support the needs of the covered species by establishing tree-retention RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring)

8.2: Forest practices in the Eastern Oregon georegion near streams minimize sediment delivery to support the needs of the covered species by establishing tree-retention RMAs on small non-fish-bearing perennial streams for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

8.3: Forest practices in the Eastern Oregon georegion near streams minimize sediment delivery to support the needs of the covered species by establishing R-ELZs or ELZs for the full length of all streams, including non-fish-bearing seasonal streams (Type Ns). (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

8.4: Forest practices in the Eastern Oregon georegion near streams minimize sediment delivery to support conditions important to the needs of covered species by extending no-harvest RMAs up to 170 feet to encompass the perimeter of all identified stream adjacent failures throughout

[2] Objectives for amphibians apply across the permit area; however, monitoring of subobjectives will be limited to within the known ranges of covered amphibian species.

the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

8.5: Road runoff directly to streams is minimized by implementation of FRIA through 2044 to reduce hydrologic connectivity throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

8.6: Road runoff directly to streams is minimized by implementation of standards for new road construction to reduce hydrologic connectivity throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

8.7: Road runoff directly to streams is minimized by implementation of standards for existing road maintenance to reduce hydrologic connectivity throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

8.8: Roads are not a significant source of episodic sediment delivery to streams by implementation of FRIA through 2044. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

8.9: Roads are not a significant source of episodic sediment delivery to streams by implementation of standards for new road construction throughout the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

8.10: Roads are not a significant source of episodic sediment delivery to streams by implementation of standards for existing road maintenance to reduce hydrologic connectivity throughout the permit term. (Group 1: Implementation Monitoring; Group 4: Targeted Monitoring Studies After Triggering Events)

Objective 9: Forest practices in the Eastern Oregon georegion near streams maintain shade to support the stream temperature needs of covered fish species.

9.1: Forest practices in the Eastern Oregon georegion near streams maintain shade to support the stream temperature needs of covered fish species by establishing tree-retention RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

9.2: Forest practices in the Eastern Oregon georegion near streams maintain shade to support the stream temperature needs of covered fish species by establishing tree-retention RMAs on small non-fish-bearing perennial streams for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

Objective 10: Forest practices in the Eastern Oregon georegion near streams maintain shade to support the stream temperature needs of covered amphibian species.

10.1: Forest practices in the Eastern Oregon georegion near streams maintain shade to support the stream temperature needs of covered amphibian species by establishing tree-retention RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

10.2: Forest practices in the Eastern Oregon georegion near streams maintain shade to support the stream temperature needs of covered amphibian species by establishing tree-retention RMAs on small non-fish-bearing perennial streams for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

10.3: Forest practices in the Eastern Oregon georegion near streams maintain shade to support the stream temperature needs of covered amphibian species by establishing R-ELZs on small non-fish-bearing perennial streams for a distance within and/or upstream of the tree-retention RMA throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Research Studies)

Objective 11: Forest practices in the Eastern Oregon georegion maintain connectivity in riparian areas to support the needs of covered fish species.

11.1: Forest practices in the Eastern Oregon georegion near streams maintain aquatic connectivity in riparian areas to support the needs of the covered fish species by extending RMAs around seeps, springs, side channels, and stream-associated wetlands throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

11.2: Forest practices in the Eastern Oregon georegion maintain in-stream connectivity and fish passage to support the needs of the covered fish species by requiring new and existing permanent water crossings on fish streams to meet standards under OAR 629-625-0320. (Group 1: Implementation Monitoring)

11.3: Forest practices in the Eastern Oregon georegion maintain in-stream connectivity to support the needs of the covered fish species by implementation of FRIA and rules related to vacating roads and stream crossings. (Group 1: Implementation Monitoring)

Objective 12: Forest practices in the Eastern Oregon georegion maintain connectivity in riparian areas to support the needs of covered amphibian species.

12.1: Forest practices in the Eastern Oregon georegion near streams maintain connectivity to support the needs of covered amphibian species by establishing tree-retention RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

12.2: Forest practices in the Eastern Oregon georegion near streams maintain connectivity to support the needs of covered amphibian species by establishing tree-retention RMAs on small non-fish-bearing perennial streams (Type Np) for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

12.3: Forest practices in the Eastern Oregon georegion near streams maintain connectivity to support the needs of the covered amphibian species by establishing R-ELZs on small non-fish-bearing perennial streams for a distance within and/or upstream of the tree-retention RMA throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

12.4: Forest practices in the Eastern Oregon georegion near streams maintain connectivity to support the needs of the covered amphibian species by extending the no-harvest zone of RMAs around seeps, springs, side channels, and stream-associated wetlands throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

12.5: Forest practices in the Eastern Oregon georegion maintain in-stream connectivity to support the needs of the covered amphibian species by requiring new and existing permanent water crossings on fish streams to meet standards throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

12.6: Forest practices in the Eastern Oregon georegion maintain in-stream connectivity to support the needs of the covered amphibian species by requiring new and existing permanent water crossings on non-fish and fish streams to meet standards throughout the permit term. (Group : Implementation Monitoring; Group 3: Targeted Monitoring Studies)

12.7: Forest practices in the Eastern Oregon georegion maintain in-stream connectivity to support the needs of the covered amphibian species throughout the permit term by implementation of FRIA and rules associated with vacating roads and stream crossings. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

Objective 13: Forest practices in the Eastern Oregon georegion maintain riparian function and complex habitats, including but not limited to the delivery of large wood, to support the needs of covered fish species.

13.1: Forest practices in the Eastern Oregon georegion near streams maintain riparian function and complex habitats to support the needs of covered fish species by establishing tree-retention RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

13.2: Forest practices in the Eastern Oregon georegion near streams maintain riparian function and complex habitats to support the needs of covered fish species by establishing tree-retention RMAs on small non-fish-bearing perennial streams (Type Np) for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

Objective 14: Forest practices in the Eastern Oregon georegion maintain riparian function and complex habitats, including but not limited to the delivery of large wood, to support the needs of covered amphibian species.

14.1: Forest practices in the Eastern Oregon georegion near streams maintain riparian function and complex habitats to support the needs of covered amphibian species by establishing tree-retention RMAs along the full length of all fish-bearing streams and all large and medium non-fish-bearing perennial streams throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

14.2: Forest practices in the Eastern Oregon georegion near streams maintain riparian function and complex habitats to support the needs of covered amphibian species by establishing tree-retention RMAs on small non-fish-bearing perennial streams (Type Np) for a distance upstream of the junction with a fish-bearing stream throughout the permit term. (Group 1: Implementation Monitoring; Group 2: Status and Trend Monitoring)

14.3: Forest practices in the Eastern Oregon georegion near streams maintain riparian function and complex habitats to support the needs of the covered amphibian species by extending the no-harvest zone of RMAs around seeps, springs, side channels, and stream-associated wetlands throughout the permit term. (Group 1: Implementation Monitoring; Group 3: Targeted Monitoring Studies)

Chapter 6
Monitoring and Adaptive Management

6.1 Introduction

The monitoring framework for the Oregon Private Forest Accord Aquatic Habitat Conservation Plan (HCP or plan) evaluates overall implementation and effectiveness of the conservation measures using a two-pronged approach that uses both implementation monitoring and effectiveness monitoring to document the success of the HCP (Figure 6-1). Results from the compliance monitoring program (CMP) and Oregon Department of Forestry (ODF) tracking and reporting of enforcement actions are used to monitor implementation of the conservation measures. Implementation monitoring results along with findings of the adaptive management program (AMP) from status and trend monitoring and targeted monitoring studies will be considered in assessing the effectiveness of the conservation measures to achieve the biological goals and objectives (BGOs).

This monitoring framework was established by the enacting legislation of the Private Forest Accord (PFA). It includes regulatory requirements for monitoring under the Oregon Forest Practices Act (OFPA) and will function as the required monitoring program for this HCP. The monitoring framework allows for adaptive management to make timely adjustments in how the rules are being applied on the ground and in the rules themselves, as necessary. ODF oversees both the administration and the monitoring of the OFPA. Implementation monitoring and effectiveness monitoring will be critical to ensure the HCP is being implemented as intended and achieving the BGOs.

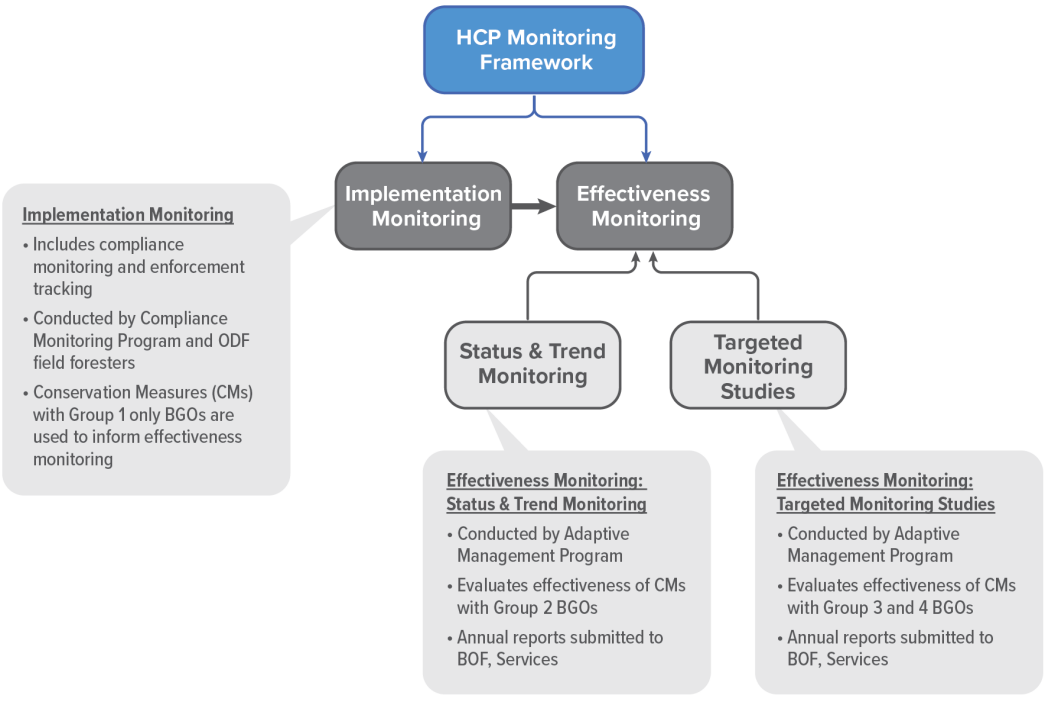

Figure 6-1. Monitoring Framework for the Habitat Conservation Plan

The monitoring framework and its implementation are described here, as well as in Chapter 5, *Implementation*. Monitoring results and outcomes will be included in annual reports to the U.S. Fish and Wildlife Service and National Marine Fisheries Service (collectively, the Services), as described in Chapter 5, Section 5.3, *Data Tracking and Reporting.* The conservation measures administered by Oregon Department of Fish and Wildlife (ODFW) will be tracked by ODFW and will also be included in HCP reporting, as described in Chapter 5, *Implementation*.

6.2 Monitoring Framework and Biological Goals and Objectives

This HCP uses a two-tiered approach to measure success by focusing on both implementation monitoring and effectiveness monitoring, and, in some circumstances, using results from implementation monitoring to inform effectiveness (Figure 6-1). Monitoring and tracking will be evaluated through the CMP, OFPA enforcement tracking and reporting, and the AMP. Additional information is provided below regarding the specifics of the CMP (Section 6.3), enforcement tracking and reporting (Chapter 5, Section 5.2.2.6, *Enforcement Program*, and Section 5.3, *Data Tracking and Reporting*), AMP (Section 6.4, *Effectiveness Monitoring and the Adaptive Management Program*), and how the adaptive management process (Section 6.5, *Outcomes of Implementation and Effectiveness Monitoring—Mechanisms for Change*) will be used to evaluate results and implement any needed changes to ensure continued successful implementation of this HCP.

The BGOs for this HCP are described in Chapter 4, Section 4.2, *Biological Goals and Objectives*. Chapter 4 establishes two overarching biological goals: one for the Western Oregon georegion and another for the Eastern Oregon georegion. Each biological goal has multiple objectives and subobjectives that describe how the goals will be achieved via the conservation measures, which are fully described in Chapter 4, *Conservation Strategy*. The subobjectives are specific, measurable, assignable, realistic, and time-bound (SMART) and tied to specific HCP conservation measures.

Each subobjective is categorized into one or more monitoring groups that reflect different approaches for assessing the effectiveness of the conservation measures to meet the BGOs. Monitoring groups are assigned to subobjectives based on the strength of the supporting scientific literature and complexity of the associated conservation measures.

6.2.1 Group 1: Implementation Monitoring

Throughout the permit term, ODF will evaluate all objectives and subobjectives by monitoring and reporting on the implementation of the conservation measures. Implementation monitoring will evaluate whether the conservation measures, as required in the Oregon Revised Statutes (ORS) and the Oregon Administrative Rules (OAR; together, OFPA Regulations), are being applied on the ground as intended. Implementation will be evaluated through a combination of compliance monitoring conducted by the CMP (Section 6.3, *Implementation Monitoring*) and tracking of enforcement issues (Chapter 5, Section 5.2.2.6, *Enforcement Program*, for more information). Results of compliance monitoring studies and statistics for enforcement issues will be reported to the Services in annual reports (Chapter 5, Section 5.3, *Data Tracking and Reporting*). ODF will take actions to address identified implementation issues at the direction of the Board of Forestry (BOF). These actions may include new training, guidance, rule change or clarification, or other actions, with the intended goal of improving implementation and compliance (Section 6.2.10, *Compliance*

Monitoring Program Phase 5: Review and Communication of Compliance Monitoring Program Study Results).

Conservation measures that have been established as effective by past studies that link the covered activities, rules, and ecosystem processes will not have additional monitoring requirements (Table 6-1). The subobjectives related to these conservation measures are classified as Group 1 (Table 6-1). These conservation measures are assumed to be effective at achieving the intended objectives and subobjectives if they are implemented as required under the OFPA. Conservation measures are assigned to an additional monitoring category (Group 2, 3, or 4) if the supporting scientific literature has gaps or is less robust, or if the conservation measures include multiple components that address a chronic or episodic process.

6.2.1.1 Group 2: Status and Trend Monitoring

Status and trend monitoring will evaluate whether conditions that are important to the survival and recovery of the covered species are trending toward or meeting the condition as specified in the associated biological objective and subobjective. In other words, is the conservation measure achieving the intended environmental condition or improving the intended environmental condition such that it is trending in the desired direction? It is assumed that the conservation measure is effective if conditions are trending toward meeting the objectives.

Subobjectives assigned to Group 2 (Table 6-1) include those with simple conservation measures where additional status and trend monitoring will assess assumptions made from past studies on their effectiveness has gaps or is less robust than for Group 1 and conservation measures with multiple components that address a chronic process. For example, conservation measures and associated OFPA Regulations that are intended to minimize runoff and sediment delivery from roads to streams are identified for status and trend monitoring.

Status and trend monitoring will be conducted through the AMP (Section 6.4, *Effectiveness Monitoring and the Adaptive Management Program*). Actions to be taken based on identified issues may include recommendations to the BOF for rule clarification or other changes via the adaptive management process (Section 6.5, *Outcomes of Implementation and Effectiveness Monitoring*). In addition, if status and trend monitoring identifies an issue but more information is needed to identify the source of an undesirable status and trend result, the Adaptive Management Program Committee (AMPC) may recommend additional study and the BOF may direct additional study through targeted monitoring research studies. That is, if status and trend monitoring indicates further research is needed, the subobjective will be moved to Group 3, described below.

6.2.1.2 Group 3: Targeted Monitoring Studies

Effectiveness monitoring studies will evaluate whether a specific subobjective or rule comprising a conservation measure is effective at meeting the intended resource benefit. For this group, effectiveness will be evaluated based on targeted studies. Examples of the types of studies that may be conducted include but are not limited to experimental before-after-control-impact or retrospective studies.

Subobjectives assigned to Group 3 (Table 6-1) include those with simple conservation measures where additional effectiveness studies will provide greater certainty of the effectiveness of the conservation measures.

Effectiveness monitoring studies will be conducted through the AMP (Section 6.4). The AMP will determine when targeted studies should begin and what topics should be considered. Study results will be included in annual reports to the Services. Actions taken based on identified issues may include recommendations to the BOF including modification of the conservation measures through changes to OFPA rules, as described in Section 5.5 *Outcomes of Implementation and Effectiveness Monitoring*.

6.2.1.3 Group 4: Targeted Monitoring Studies After Triggering Events

This is a special group of targeted monitoring studies for conservation measures and associated subobjectives that are related to episodic disturbance events. These studies will be used to evaluate the effectiveness of the steep-slope conservation measures (CM 2) and road measures (CM 3) to minimize delivery of sediment to streams due to episodic events (Table 6-1). Such studies may be conducted also to assess the effectiveness of other conservation measures after an episodic event such as a fire or windstorm.

Post-triggering event analyses will be conducted through the AMP (Section 6.4, *Effectiveness Monitoring and Adaptive Management Program*). Results of studies will be included in annual reports to the Services. Recommended actions to the BOF based on identified issues may include, but are not limited to, modification of the conservation measures through changes to OFPA rules, as described in Section *Outcomes of Adaptive Management Program*.

Table 6-1 describes the effectiveness monitoring groups assigned to each BGO subobjective. Chapter 4, Section 4.2*, Biological Goals and Objectives,* provides the full text of each BGO. Every subobjective receives implementation monitoring, but subobjectives for which this is the primary means to assess effectiveness are listed as Group 1. Those subobjectives do not receive additional monitoring under Groups 2, 3, or 4. Subobjectives that apply to both fish and amphibians are followed by (both).

Table 6-1. Effectiveness Monitoring Groups Assigned to Each BGO Subobjective

Monitoring Group	Subobjective (number and abbreviated text)
Group 1: Implementation Monitoring to Inform Effectiveness [a]	**Western Oregon** **1.1:** Minimize sediment delivery via no-harvest RMAs along all fish-bearing streams and large and medium Np streams (both). **1.2:** Minimize sediment delivery via no-harvest RMAs along small Np streams (both). **2.1:** Maintain shade via no-harvest RMAs along all fish-bearing streams and large and medium Np streams (fish). **3.1:** Maintain shade via no-harvest RMAs along all fish-bearing streams and large and medium Np streams (amphibians). **4.2:** Maintain in-stream connectivity by requiring new and existing crossings on fish streams to meet standards (fish). **4.3:** Maintain in-stream connectivity via FRIA implementation and rules related to vacating roads and stream crossings (fish). **5.1:** Maintain habitat connectivity via no-harvest RMAs along all fish-bearing streams and large and medium Np streams (amphibians). **6.1:** Maintain riparian function and complex habitats by establishing no-harvest RMAs along all fish-bearing streams and large and medium Np streams (fish).

Monitoring Group	Subobjective (number and abbreviated text)
	7.1: Maintain riparian function and complex habitats by establishing no-harvest RMAs along all fish-bearing streams and large and medium Np streams (amphibians). **Eastern Oregon** **8.1:** Minimize sediment delivery via tree-retention RMAs along all fish-bearing streams and large and medium Np streams (both). **11.2:** Maintain in-stream connectivity and fish passage by requiring new and existing permanent water crossings on fish streams to meet standards (fish). **11.3:** Maintain in-stream connectivity by implementing FRIA and rules related to vacating roads and steam crossings (fish).
Group 2: Status and Trend Monitoring	**Western Oregon** **1.7:** Minimize direct road runoff to streams via FRIA implementation (both). **1.8:** Minimize direct road runoff to streams via new road construction standards (both). **1.9:** Minimize direct road runoff to streams via new road maintenance standards (both). **2.2:** Maintain stream shade via RMAs along small Np streams (fish). **3.2:** Maintain stream shade via RMAs along small Np streams (amphibians). **3.4:** Maintain stream shade via DDFTAs (amphibians). **6.2:** Maintain riparian function and habitat complexity via RMAs along small Np streams (fish). **7.2:** Maintain riparian function and habitat complexity via RMAs along small Np streams (amphibians). **Eastern Oregon** **8.2:** Minimize sediment delivery to streams via tree-retention RMAs on small Np streams (both). **8.5:** Minimize direct road runoff to streams via FRIA implementation (both). **8.6:** Minimize direct road runoff to streams via new road construction standards (both). **8.7:** Minimize direct road runoff to streams via new road maintenance standards (both). **9.1:** Maintain stream shade via RMAs along all fish-bearing streams and medium and large Np streams (fish). **9.2:** Maintain stream shade via RMAs along small Np streams (fish). **13.1:** Maintain riparian function and complex habitats via tree-retention RMAs along all fish streams, large and medium Np streams (fish). **13.2:** Maintain riparian function and complex habitats via tree-retention RMAs on small Np streams (fish). **14.1:** Maintain riparian function and complex habitats via tree-retention RMAs along all fish streams, large and medium Np streams (amphibians). **14.2:** Maintain riparian function and habitat complexity via RMAs along small Np streams (amphibians).

Monitoring Group	Subobjective (number and abbreviated text)
Group 3: Targeted Monitoring Studies	**Western Oregon** **1.3:** Minimize sediment delivery via ELZs, R-ELZs (fish). **3.3:** Minimize sediment delivery via ELZs, R-ELZs (amphibians). **4.1:** Maintain connectivity via RMAs around seeps, springs, side channels, wetlands (fish). **5.2:** Maintain connectivity via no-harvest RMAs along small Np streams (amphibians). **5.3:** Maintain connectivity via R-ELZs on small Np streams (amphibians). **5.4:** Maintain connectivity via RMAs around seeps, springs, side channels, stream-associated wetlands (amphibians). **5.5:** Conduct research to better understand how steep-slope protections provide habitat connectivity (amphibians). **5.6:** Maintain in-stream connectivity by requiring new and existing permanent water crossings to meet standards (amphibians). **5.7:** Maintain in-stream connectivity by requiring new and existing water crossings to meet standards (amphibians). **5.8:** Maintain in-stream connectivity by implementing FRIA (amphibians). **5.9**: Prioritize research examining: o Distribution of covered amphibians. o Factors influencing where covered amphibians occur. o Population trends of covered amphibians over time. **7.3:** Maintain riparian function and complex habitats by extending RMAs around seeps, springs, side channels, and stream-associated wetlands (amphibians). **Eastern Oregon** **8.3:** Minimize sediment delivery to streams by establishing R-ELZs or ELZs (both). **10.1:** Maintain shade by establishing tree-retention RMAs on fish-bearing streams and large and medium Np streams (fish). **10.2:** Maintain shade by establishing tree-retention RMAs on small Np streams (amphibians). **10.3:** Maintain shade by establishing R-ELZs on small Np streams (amphibians). **11.1:** Maintain aquatic connectivity by extending RMAs around seeps, springs, side channels, and stream-associated wetlands (fish). **12.1:** Maintain connectivity by establishing tree-retention RMAs along streams (amphibians). **12.2:** Maintain connectivity by establishing tree-retention RMAs on small Np streams (amphibians). **12.3:** Maintain connectivity by establishing R-ELZs on small Np streams (amphibians). **12.4:** Maintain connectivity by extending RMA no-harvest zones around seeps, springs, side channels, and stream-associated wetlands (amphibians). **12.5:** Maintain in-stream connectivity by requiring new and existing water crossings on fish streams to meet standards (amphibians).

Monitoring Group	Subobjective (number and abbreviated text)
	12.6: Maintain in-stream connectivity by requiring new and existing water crossings on nonfish and fish streams to meet standards (amphibians). **12.7:** Maintain in-stream connectivity by implementing FRIA and rules associated with vacating roads and stream crossings (amphibians). **14.3:** Maintain riparian function and complex habitats by extending the no-harvest zone of RMAs around seeps, springs, side channels, and stream-associated wetlands (amphibians).
Group 4: Targeted Monitoring Studies after Triggering Events	**Western Oregon** **1.4:** Minimize episodic sediment delivery to streams via slope retention areas (both). **1.5:** Minimize episodic sediment delivery to streams via designated debris flow traversal areas (both). **1.6:** Minimize sediment delivery to streams by extending RMAs to encompass identified stream adjacent failures (both). **1.10:** Implement FRIA through 2044 so roads are not a significant source of episodic sediment delivery to streams (both). **1.11:** Implement new standards for road construction so roads are not a significant sources of episodic sediment delivery to streams (both). **1.12:** Implement standards for existing road maintenance so roads are not a significant source of episodic sediment delivery to streams (both). **6.3:** Maintain riparian function and complex habitats via slope retention areas (fish). **6.4:** Maintain riparian function and complex habitats via designated debris flow traversal areas (fish). **7.4:** Maintain riparian function and complex habitats via slope retention areas (amphibians). **7.5:** Maintain riparian function and complex habitats via designated debris flow traversal areas (amphibians). **Eastern Oregon** **8.4:** Minimize sediment delivery to streams by extending RMAs to encompass stream adjacent failures (both). **8.8:** Minimize episodic sediment delivery to streams from roads by implementing FRIA through 2044 (both). **8.9:** Minimize episodic sediment delivery to streams from roads by implementing new road construction standards (both). **8.10:** Minimize episodic sediment delivery to streams from roads by implementing standards for existing road maintenance (both).

RMA = riparian management area; FRIA = Forest Road Inventory and Assessment; DDFTA = designated debris flow traversal area ; ELZ = equipment limitation zone; R-ELZ = retention-equipment limitation zone

[a] All BGO subobjectives listed in Chapter 4, Section 4.2 will receive implementation monitoring. The subobjectives listed as Group 1 in this table do not receive additional monitoring. Effectiveness for these BGOs will be evaluated through implementation monitoring only.

6.3 Implementation Monitoring

6.3.1 Role of Compliance Monitoring and Enforcement Tracking

Implementation monitoring will evaluate whether the conservation measures, as described in this HCP and as regulated under the OFPA, are implemented as intended. Implementation monitoring will be conducted through two separate components of ODF's programs: (1) formal compliance monitoring studies, as conducted by the CMP, and (2) enforcement of the OFPA Regulations and tracking of enforcement statistics. Implementation monitoring will be the primary means of assessing effectiveness for those subobjectives assigned only to Group 1 (Table 6-1). These subobjectives are related to conservation measures where past studies have demonstrated effectiveness, thus it is assumed the conservation measure will be effective and no additional monitoring is planned.

Figure 6-2 highlights the key aspects of the two components of implementation monitoring: CMP and OFPA enforcement (including related aspects of OFPA implementation). Whereas the OFPA enforcement program focuses on day-to-day administration of the HCP and associated OFPA Regulations, including enforcement actions, the CMP allows for formal, scientifically rigorous studies to evaluate compliance. The OFPA enforcement program will resolve any individual, on-the-ground HCP compliance issues that are discovered before, during, and after forest operations, and the CMP will identify potential statewide issues with HCP compliance that need to be addressed more broadly. Together, these programs are critical to improving the public's trust in implementation of the OFPA, successful administration of the HCP, and improving landowner compliance with the OFPA.

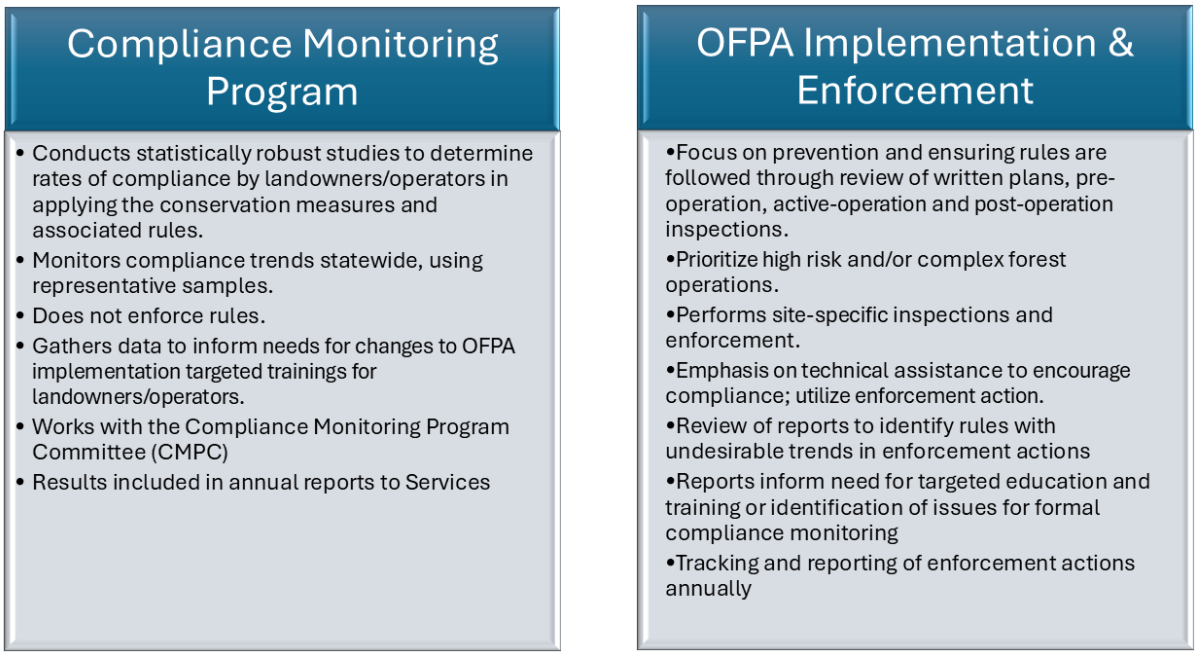

Figure 6-2. Purpose and Function of the Compliance Monitoring Program and Implementation and Enforcement of the Oregon Forest Practices Act Pertaining to Implementation Monitoring

The CMP will determine statewide compliance rates and trends over time with the HCP conservation measures and the OFPA. Compliance monitoring involves conducting statistically robust studies and monitors compliance trends statewide by gathering administrative and field data from a representative sample of completed notifications. The CMP works with a contracted statistician to generate reports that include study results and with the ODF training program to identify any training and education necessary to improve future compliance rates.

OFPA enforcement action is taken when an issue exists. Use of enforcement statistics to evaluate patterns and trends for any particular HCP conservation measure or associated OFPA rule is inherently biased. A sample of enforcement actions is not representative of the entire regulated community because operations with no enforcement actions are not represented in the sample. However, tracking and reporting enforcement actions can be helpful for early identification of specific rules with a relatively high rate of enforcement action. Enforcement tracking and reporting can be used by ODF to conduct targeted education and training to ODF field foresters, landowners, and operators. In addition, specific components of conservation measures or specific rules may be identified for further evaluation through formal compliance monitoring studies through the CMP.

Information on the CMP is described further in Section 6.3.2, *Purpose of the Compliance Monitoring Program*, to Section 6.3.10, *Compliance Monitoring Program Phase 5: Review and Communication of Compliance Monitoring Program Study Results*. Information on OFPA enforcement actions, and reporting to the Services, is included in Chapter 5, Section 5.2.2.6, *Enforcement Program,* and Section 5.3, *Data Tracking and Reporting*.

6.3.2 Purpose of the Compliance Monitoring Program

The CMP is in place to systematically monitor and track rates of compliance with the HCP's conservation measures, as reflected in the OFPA Regulations. Within the context of the HCP, ODF's CMP verifies that the conservation measures are being implemented as described in this HCP. More specifically, the CMP evaluates if forest landowners are in compliance with the OFPA regulations .

As stated in the OAR, the purpose and goals of the CMP are as follows (OAR 629-678-0000).

- The purpose of the CMP is to monitor forest practice rules implementation and analyze compliance rates.
- The CMP shall assess the OFPA and rule compliance and report findings to the BOF, the legislature, and federal services under the terms of an approved HCP.
- The CMP is intended to provide information that will allow for improvement in compliance of the OFPA rules through training, guidance, clarification, and targeted enforcement, and to increase the public's trust in the implementation of the OFPA and rules.

6.3.3 Compliance Monitoring Program Committee

The CMP is supported by the Compliance Monitoring Program Committee (CMPC), a stakeholder group with expertise in the rules being monitored, including, but not limited to, landowners, operators, Tribes, and public representatives (OAR 629-678-0100(4)). To incorporate diverse perspectives, CMPC membership includes representatives from both conservation and forestry organizations, as well as representatives from other state agencies. The CMPC is an advisory committee and not a decision-making body. This committee provides perspective on, input on, and

assistance with the CMP; reviews and informs the development of compliance monitoring projects; and reviews information and monitoring report findings. ODF CMP staff convene the CMPC quarterly and more frequently as needed.

6.3.4 Administration of the Compliance Monitoring Program

ODF staff lead and administer the CMP. Compliance monitoring projects may be carried out by ODF staff, contractors, or both (OAR 629-678-0010(1) and (2)). Formal studies are designed for each study to be conducted by the CMP. For each CMP study, the following framework will be followed. Adjustments to this framework may be made through the CMP's internal review process throughout the HCP permit term. Figure 6-3 depicts the CMP process.

The CMP framework includes the following phases.

- Phase 1: What Will Be Monitored?
- Phase 2: Study Design and Methods
- Phase 3: Site Access and Data Collection for Monitoring
- Phase 4: Data Analysis and Reporting
- Phase 5. Review and Communication of Compliance Monitoring Program Study Results

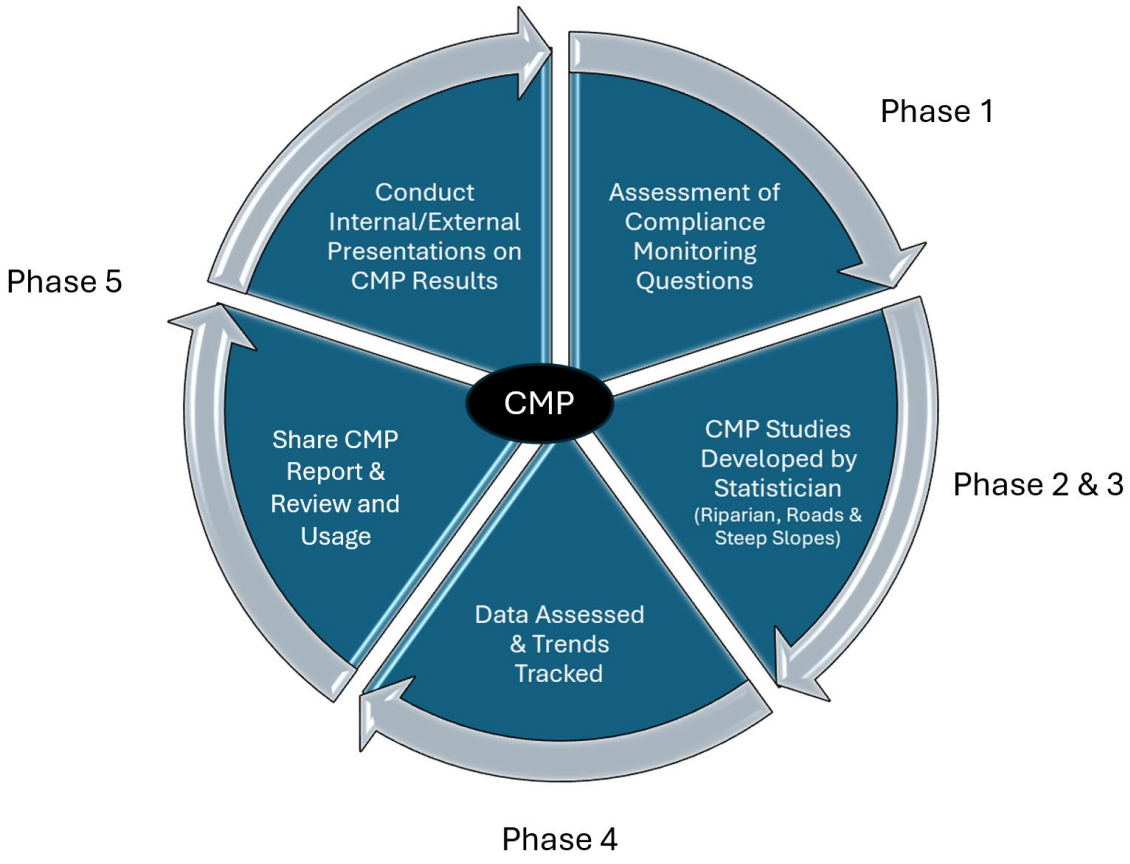

Figure 6-3. Compliance Monitoring Program Process

6.3.5 Compliance Monitoring Program Phase 1: What Will be Monitored?

Under the HCP, and as identified in OFPA rules, the CMP will prioritize monitoring of rules related to biological and aquatic resources (OAR 629-678-0110(1)). The following HCP conservation measures are specifically identified as priorities for initial compliance monitoring work. They reflect OFPA rule divisions that are new or significantly modified under the PFA agreement.

- Conservation Measure 1: Riparian management areas, as implemented by OAR Division 643: Water Protection Rules: Vegetation Along Streams
- Conservation Measure 2: Timber harvest on steep slopes, as implemented by OAR Division 630: Harvesting Rules for Steep Slopes
- Conservation Measure 3: Forest roads, as implemented by OAR Division 625: Forest Road Construction and Maintenance Rules

As a core component of the monitoring framework for this HCP, the CMP will conduct compliance monitoring over the permit term to address implementation of all BGO subobjectives as identified in Chapter 4, Section 4.2, *Biological Goals and Objectives.*

For each prioritized rule division or for new rules directed by the BOF for compliance monitoring, the CMP will use the following process to further evaluate and determine which specific rules will be studied. This is needed because the focus of the CMP is to systematically monitor and track rates of compliance; thus, it is required to determine which rules allow for systematic evaluation versus needing another method of monitoring.

As a part of this process, individual rules are evaluated to determine if compliance can be monitored in a measurable, independent manner, likely by contractor staff, 1 year following completion of the operation. These parameters allow for systematic, independent assessment of compliance. Some rules or components of rules may need to be monitored using varied methods, which will be determined on a case-by-case basis and monitored in different studies. The rule-selection process involves framing each rule as a question. For example, in OAR 629-643-0100(1) and (3a), the rules were converted to "Did the operator retain all trees and vegetation within the distances from the edge of the active channel or the channel migration zone based on stream class (e.g., Type F, Type SSBT, or Type Np no-harvest RMAs)?

Each question developed is then evaluated for suitability to include in a CMP study. The following are examples of the types of parameters considered when assessing a specific rule for suitability of inclusion in a study.

- Is compliance with the rule measurable, either during desktop review or on-the-ground measurements (e.g., review of Forest Road Inventory and Assessment [FRIA] reports or written plans for required content, measurements of riparian management area [RMA] widths)?
- Can compliance be evaluated 1 year after the activity is completed? These will be rules that, once implemented, are not expected to change within the first year post-implementation (e.g., RMA width, stream crossing construction).

- If not, is it a rule more suitable for a field forester to evaluate at the time of activity/operation (e.g., evaluation of disconnection of roads from streams during high flow events, evaluation of wet-weather hauling rules)?
- Has the rule been identified as one with OFPA enforcement issue(s), based on enforcement tracking and reporting under this HCP (Chapter 5, *Implementation*), or based on past trends as determined from civil penalties issued since 1989?
- Is the rule related to the HCP's covered species and BGOs and their subobjectives, as identified in Chapter 4, Section 4.2, *Biological Goals and Objectives.* These criteria are used to identify if the CMP study relates to this HCP and to prioritize study. They do not preclude the CMP from studying other rules not related to the HCP if directed by the BOF.
- How complex is the rule? What is the cost to measure it? These questions are only used to determine which rules, in combination, may be studied in any given rule cycle. Cost is not used to exclude a rule from study.

To address the above parameters, the CMP solicits additional input from ODF subject matter experts and OFPA field coordinators (Chapter 5, Section 5.1*, Implementation Roles and Responsibilities*) and the CMPC. After incorporating this feedback, CMP staff selects the core rules to include in each CMP study cycle. In each subsequent cycle additional rules will be considered for inclusion. Over time, rules showing strong trends of compliance may be rotated out and new rule(s) assessed. Additionally, the CMP may monitor other rules as directed by the BOF (OAR 629-678-0110(2)).

6.3.6 Compliance Monitoring Program Phase 2: Study Design and Methods

As required by rule (OAR 629-678-0100(6)), the CMP develops study designs, including sample selection and evaluation criteria, to ensure a high level of confidence in the statistical analyses and their findings, by taking the following actions.

- Hire or consult an external, qualified statistician to aid in developing sample selection and evaluation criteria to ensure a high level of confidence in reported results.
- Be informed by past BOF and third-party CMP assessments and by similar reviews of other CMPs in nearby states.
- Explicitly define all sampling elements.
- Analyze rates of compliance at the appropriate temporal and spatial scale to reduce autocorrelation, variance, and statistical bias.
- ODF and the statistician work together to develop study designs, field protocols, and data quality control plans for rules under evaluation. A statistician also provides support in data analysis and interpretation of results.

Compliance monitoring studies evaluate compliance with specific rules across multiple operations. The potential sample population for a study consists of completed forestry operation notifications that apply to the specific rule or group of rules identified for monitoring. The intent is that compliance monitoring will only include completed operations. Operators are required to inform ODF when any notified forest activities are completed (see OAR 629-605-0150(10) and Chapter 5, *Implementation*, for a full description of the notification process and requirements for completion

reporting). Landowners use the ODF Forest Activity Electronic Reporting and Notification System (FERNS or e-notification system) to report their completed activities. Notifications of completion must be submitted by the end of the year in which the operation is notified, or if an extension is requested, by the end of the following year (OAR 629-605-0150(10)(a), (b)). ODF draws a sample population for each study from the list of relevant completed notifications. Given the time sensitivity of observing impacts of certain forest activities, only activities completed in the last 12 to 20 months are considered for inclusion. For each study, the statistician determines what sample size is needed to be statistically sufficient for developing statewide or, as appropriate, georegion-specific compliance rates for each rule evaluated. ODF staff reviews the sample population drawn and removes all notifications that do not meet the statistician's defined parameters of the study. The study design(s) developed by the statistician is reviewed by CMP staff and CMPC members.

Once the study design is finalized, CMP staff work with the statistician to develop a field protocol and a quality assurance plan. A pilot study is conducted to test the field protocol and work out logistics before full study implementation. Any suggested adjustments are reviewed by the statistician before incorporation. An example of a pilot study design for rules related to Conservation Measure 1 is included (Mount Hood Environmental 2024: Appendix G).

Following each pilot study, a final study design, field protocol, and data quality control plan is developed for each compliance monitoring study. These documents are used to direct all field data collection and data quality control to be utilized prior to analysis of results (Section 6.3.8, *Compliance Monitoring Program Phase 4: Data Analysis and Reporting*).

6.3.7 Compliance Monitoring Program Phase 3: Site Access and Monitoring

Forestland owners are required to accommodate compliance monitoring by allowing access to an operation site for activities for which they have informed the State Forester of completion, as required in OAR 629-678-0100(7) and 629-605-0150(10). ODF must give notice to the forest landowners before onsite compliance monitoring is conducted to provide the landowner an opportunity to be present during the monitoring. If issues arise with access for purposes of conducting compliance monitoring, the Civil Penalties Administrator, through delegated authority from the State Forester, may petition the circuit court with jurisdiction over the forestland for a warrant authorizing property access to conduct compliance monitoring (OAR 629-678-0100(7) through (9)).

The following are the core activities conducted for each study.

- Contact the forestland owner and secure access.
- Conduct desk reviews for each randomly selected notification and prepare for field data collection. Create field packets for each site.
- Collect field data and upload to ODF secure server.

6.3.8 Compliance Monitoring Program Phase 4: Data Analysis and Reporting

Phase 4 of the CMP involves sending the data to the ODF contract statistician for analysis once desk assessments and field data collection are complete. The statistician analyzes the data and assesses statewide or georegion-specific compliance rates for each rule included in the study. CMP staff reviews the statistician's findings and provides feedback. A final report is prepared and shared with CMPC and AMPC.

As specified in rule, the CMP provides the following information and reports (OAR 629-678-0200).

- Information to support any required reporting to the federal services in support of an HCP.
- Information to support an annual report to the public on the overall HCP performance (see Chapter 5, *Implementation*, for more details on annual reports).
- A report to the BOF every 2 years that summarizes the results of completed compliance studies and provides a progress report of ongoing compliance monitoring efforts as described in OAR 629-678-0100(6)(a) through (d).
- An aggregate cumulative report every 8 years that includes compliance trends since the beginning of the CMP.
- Other reports as directed by the BOF.

The CMP also develops a study-specific communication plan for training purposes (Section 6.3.10, *Compliance Monitoring Program Phase 5: Review and Communication of Compliance Monitoring Program Study Results*).

6.3.9 Timing for Compliance Monitoring Program Projects

Initial monitoring for the CMP began in 2025, after the new and modified rules were in effect for a full year. Initial CMP projects focus on assessing the three prioritized rule divisions. The CMP is conducting pilot studies for the prioritized rule divisions and then will finalize study designs based on information learned during the pilot studies. Full monitoring studies will take place after the pilot studies are complete (Table 6-2). Sampling of rule types will rotate biennially, alternating between riparian rules and steep slopes/roads rules. Continued biennial sampling will allow for monitoring of these specific rule sets during the life of the HCP and the ability to examine trends in compliance over time. Not all rules within each division will be assessed as part of the CMP. The CMP, with the advice of the CMPC, ODF technical experts, and an external statistician, will determine which rules are assessed to conduct compliance monitoring (Table 6-2) based on feasibility, quantitative versus qualitative rule type, and other factors.

As noted in Table 6-2, CMP work is currently focused on Conservation Measure 1: Riparian Study. Work is completed for Phases 1 and 2 for the pilot study; the study plan and protocol is finalized (Mount Hood Environmental 2024: Appendix G). Field sampling for the riparian pilot study is completed, and the pilot study final report will be finalized by spring of 2026. The pilot study final report will inform the full riparian study, which is set to begin in 2027. Field work on the pilot study for Conservation Measures 2 and 3: Steep Slopes and Roads will begin in fall of 2026.

Table 6-2. Timeline for Initial Compliance Monitoring Studies (2025–2030)

Study	Timeframe
CM 1: Riparian Pilot Study	Fall 2025 to spring 2026
CM 2: Steep Slopes and CM 3: Roads Pilot Studies	Fall 2026 to spring 2027
CM 1: Riparian Study	Fall 2027 to spring 2028
CM 2: Steep Slopes and CM 3: Roads Studies	Fall 2028 to spring 2029
CM 1: Riparian Study	Fall 2029 to spring 2030

6.3.10 Compliance Monitoring Program Phase 5: Review and Communication of Compliance Monitoring Program Study Results

CMP study results are used to identify areas of rule compliance that need improvement. ODF examines areas showing a trend of noncompliance over time, identified through external statistician report findings, to determine the need for new training, guidance, rule clarification, or other action (OAR 629-678-0100(10)). The CMP works with ODF's training unit to develop communication plans, update internal processes, and inform internal and external training materials designed to improve compliance rates (see Chapter 5, *Implementation*, for additional information on the training program). CMP staff also communicate study findings internally and externally. CMP outreach includes ODF field foresters, the CMPC, other ODF stakeholder committees, and related external forestry and forestry education organizations.

As CMP reports become available, they will also be shared with AMPC. The reports will include, but not be limited to, annual reports to the public on HCP performance, biannual reports submitted to the BOF, and individual CMP monitoring studies as they are completed. As described further in Section 6.4, *Effectiveness Monitoring and Adaptive Management Program*, AMPC will review reports relating to compliance monitoring as well as HCP reporting relating to enforcement statistics. CMP reports will be important to track effectiveness of Group 1-only BGO subobjectives. All CMP reports will also be included in HCP reporting to the Services, as available, in annual reports as well as 8-year reports (Chapter 5, *Implementation*).

6.4 Effectiveness Monitoring and Adaptive Management Program

6.4.1 Role of Adaptive Management Program in Effectiveness Monitoring

As introduced in Section 6.2, *Monitoring Framework and Biological Goals and Objectives*, effectiveness monitoring is conducted to evaluate whether the HCP is meeting the BGOs. Effectiveness monitoring for this HCP is a key component of the AMP. The AMP relies on an Adaptive Management Program Coordinator (AMP Coordinator), the Adaptive Management Program Committee (AMPC), Independent Research and Science Team (IRST), and the BOF to implement the program. As described in OAR 629-643-0000(1), the intent of the AMP is to provide science-based

recommendations and technical information to assist the BOF in determining when it is necessary or advisable to adjust rules, guidance, and/or training programs to achieve the BGOs in this HCP. Thus, the AMP is tasked with assessing the degree to which the OFPA rules are effective in achieving the BGOs. The AMP will evaluate effectiveness using status and trend monitoring and scientific inquiry through targeted studies to fill knowledge gaps related to BGOs, as well as to test and improve models and methods used to design and implement new forest practice rules, if needed, to meet the BGOs.

6.4.2 Purpose of the Adaptive Management Program

As specified in OAR 629-603-0000(5), the purpose of the AMP is as follows.

- Ensure timely and effective change as needed to meet the BGOs.
- Provide predictability and stability of the process of changing regulation so landowners, regulators, and interested members of the public can understand and anticipate change.
- Apply best available science to decision-making.
- Effectively meet the BGOs with less operationally expensive prescriptions when feasible.

The AMP develops and oversees effectiveness monitoring. The CMP study findings inform AMP effectiveness monitoring for all BGO subobjectives classified as Group 1 only. The AMP is responsible for effectiveness monitoring for all BGO subobjectives classified as Groups 2, 3, and 4 (Table 6-3).

6.4.3 Structure of the Adaptive Management Program

The AMP consists of the AMP Coordinator, AMPC, and IRST. The AMP Coordinator is appointed by the State Forester (OAR 629-603-0500). The AMPC and IRST are established by statute as advisory committees to the BOF and complete work described in OAR Chapter 629, Division 603 and Sections 36 and 38 in Chapter 33, Oregon Laws 2022. The IRST is currently housed at Oregon State University's Institute for Natural Resources, per OAR 629-603-0450(1). The IRST will be tasked with, and adequately funded to oversee, the monitoring projects prioritized by AMPC, and that are approved by the BOF to determine the effectiveness of meeting the stated BGOs of this HCP.

6.4.4 Adaptive Management Program Coordinator

ODF is actively involved with every stage of the AMP. The AMP Coordinator at ODF meets regularly with ODF staff (e.g., rules coordinator, HCP technical staff) to ensure internal alignment and coordination, includes subject matter experts in AMPC and IRST discussions (e.g., roads experts for the hydrologic disconnection study); highlights issues for upper level ODF management to address, leads reporting to the BOF; and maintains a desk manual of operating procedures for this position's work.

The AMP Coordinator works with ODF staff and leadership to accomplish the following.

- Provide both big-picture oversight and detailed assistance with program work.
- Assist with drafting and editing reports for AMPC.
- Coordinate communications between AMPC, IRST, ODF, and the BOF.

- Organize AMPC meetings and set agendas.
- Coordinate assistance from subject matter experts to provide technical and administrative input to AMPC and IRST on the conservation measures outlined in the OFPA.
- Ensure AMP continuity with, and support of, HCP goals and objectives, including following process and timelines.
    - Collaborate with IRST and attend IRST meetings.
    - Develop and manage contract and coordinate regularly with the IRST Housing Agency.
    - Draft budgets and ensure sound fiscal management.
    - Support long range planning and succession management for the AMP Coordinator and AMPC.
    - Ensure AMPC and IRST follow AMP rules and understand the technical details of conservation measures.

6.4.5 Adaptive Management Program Committee and Independent Research and Science Team

Table 6-3 lists the AMPC and IRST roles, responsibilities, and membership.

Table 6-3. Roles, Responsibilities, and Membership of the Adaptive Management Program Committee and the Independent Research and Science Team

Role and Responsibilities	Membership
Adaptive Management Program Committee (OAR 629-603-0300)	
• Set the research agenda, including priorities, for IRST and guide the overall adaptive management process. • Prepare a budget for IRST for BOF's consideration and approval. • Assess the scientific outcomes reported by IRST and prepare a report for the BOF that identifies alternatives that could address the reported outcomes including a no action alternative. • Review the CMP and enforcement reports. • Prepare any recommendations to the BOF for rule guidance, or training. • Submit report to BOF with recommendations (Section 6.4.6, *Adaptive Management Program Reporting Requirements*). • Make major decisions by super-majority vote; include minority reports.	• Industrial forest landowner representative • Timber operator • SFO representative • Conservation landowner nominated • Tribal representative • Conservation community representative • Commercial or recreational angling representative • County government representative • ODFW • Oregon Department of Environmental Quality • ODF (nonvoting member) • National Marine Fisheries Service (nonvoting member) • U.S. Fish and Wildlife Service (nonvoting member)
Independent Research and Science Team (OAR 629-603-0200(4) and 629-603-0400))	
• Refine research questions and develop scoping proposals.	• Initial membership will be determined by AMPC and the BOF, with subsequent nominations coming from IRST.

Role and Responsibilities	Membership
• Oversee implementation of research projects that AMPC prioritizes and delineates. • Determine what constitutes best available science as a guide to effectiveness research and monitoring. • Oversee scientific inquiries through literature review, field monitoring, original research, commissioned studies, and other means of scientific studies. • Prepare reports for the BOF detailing effectiveness monitoring results.	• Members must be qualified in subjects such as forestry, silviculture, ecology, hydrology, wildlife, fisheries, and geology. • There must be at least one representative from each of timber industry, public institution, and non-governmental organizations that promote conservation of freshwater aquatic habitat. • Must be odd number of members ≥ 5.

OAR = Oregon Administrative Rules; IRST = Independent Research and Science Team; BOF = Board of Forestry; CMP = Compliance Monitoring Program; ODFW = Oregon Department of Fish and Wildlife; AMPC = Adaptive Management Program Committee; SFO = small forestland owner; ODF = Oregon Department of Forestry

6.4.6 Adaptive Management Program Reporting Requirements

6.4.6.1 Adaptive Management Program Committee Reporting Requirements

The AMPC is required to submit reports to the BOF in response to IRST reports within 90 days of AMPC receiving both technical and summary IRST reports. AMPC reports must include the following (OAR 629-603-0200(8)).

- Alternative actions, including a no action alternative, to address research findings identified in the IRST reports.
- A recommendation for one or more of the alternatives. If a recommendation is made, it must include the following:
    - The reasoning for the recommendation.
    - If a recommendation for a rule change, a clear description of the proposed rule change.
    - If a recommendation for additional scientific inquiry, a clear description of the preliminary research question to be addressed.
    - If a recommendation for any other policy action, including rule guidance and training, a clear description of the proposed policy action being recommended.
- Minority reports may be included in the AMPC reports to the BOF.

In addition to submitting the report to the BOF, AMPC is also required to present its findings and recommendations to BOF during a BOF meeting. This must occur by the second regular BOF meeting after receipt of the AMPC report. The recommendation is to be presented to the BOF for a vote.

6.4.6.2 Independent Research and Science Team Reporting Requirements

- For finalized research and monitoring projects, IRST will submit a summary report and a final technical report, within 30 days of completion of both reports, to the BOF and AMPC for consideration (OAR 629-603-0200(7)).
- IRST will submit summary reports[1], written for a lay audience and including the following information (as per OAR 629-603-0200(6)(g)):
    - Methods sufficient to allow others to understand what was done and to evaluate the results and conclusions;
    - A detailed description of the results; and
    - Discussion and conclusions about the following:
        - Effectiveness: In studies examining alternative prescriptions, the likely effectiveness of each prescription shall be reported.
        - Causal links: An assessment of how the results of relevant new research findings developed by IRST or through outside research clarify or support causal links between forest practices and aquatic resources, and implications regarding how well forest practice rules or rule sets are likely to address these linkages.
        - Magnitude of impact: An assessment of the magnitude of impact on covered species or BGOs on a sliding scale.
        - Timescale of effects observed, and the immediacy of likely changes in the environment.
        - Scope of inference.
        - Scientific uncertainty versus confidence: an assessment of the scientific uncertainty and confidence in the results.

6.4.7 Adaptive Management Program Administrative Process

The BOF, AMPC, and IRST work together to implement the adaptive management process as specified in OAR 629-603-0200. A flow diagram of the adaptive management administrative process is shown in Figure 6-4 and described in Table 6-4.

The BOF intends to continuously improve the AMP. ODF will conduct performance audits every 6 years per Generally Accepted Government Auditing Standards. The performance audits will evaluate whether the AMP is achieving its purpose as outlined in OAR 629-603-0000(5).

[1] Summary reports may be provided by IRST or by an IRST-approved, third-party servicer contracted through an open, competitive process for research projects in the AMPC-approved research agenda per OAR 629-603-0200(5).

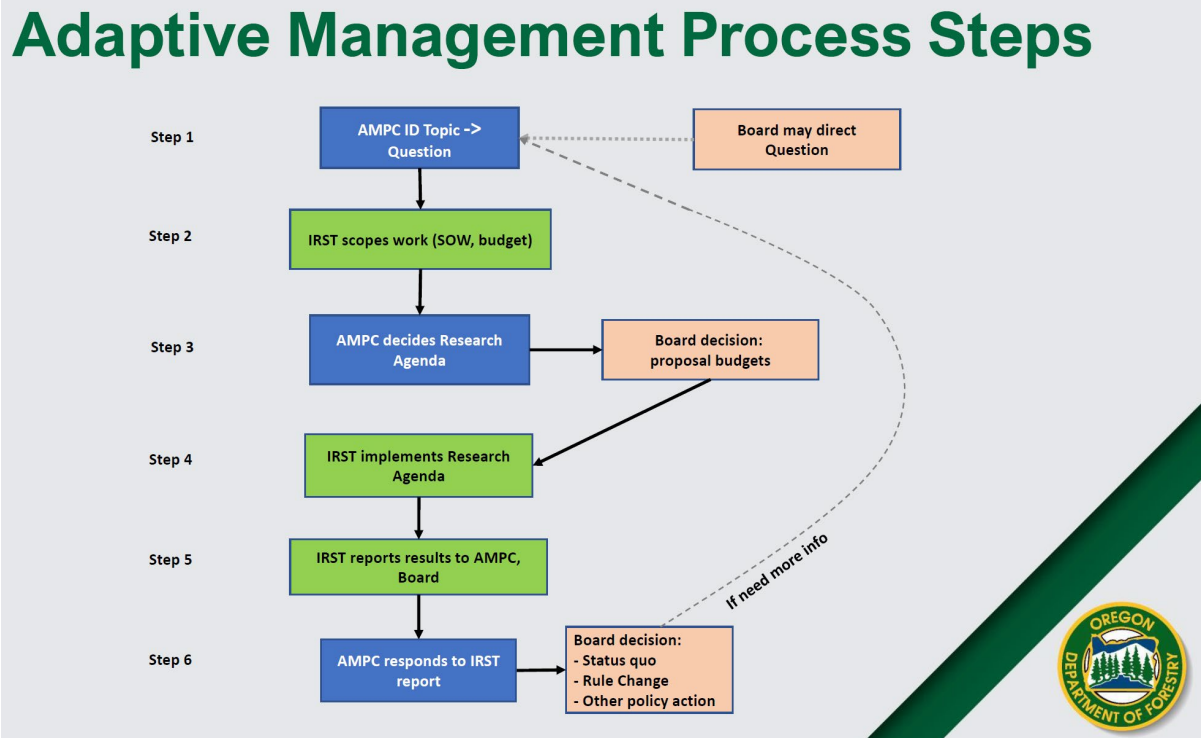

Figure 6-4. Adaptive Management Administrative Process Steps

Table 6-4. Simplified Description of Adaptive Management Plan Administrative Process [a]

Step	Description
1	AMPC develops preliminary research questions and associated contextual information, then sends them to IRST. The BOF may direct AMPC to develop additional preliminary research questions.
2	Within 45 days of receiving AMPC questions, IRST will inform AMPC of the time frame to complete the associated scoping proposal. IRST hones the preliminary research questions into finalized, researchable questions and confirms with AMPC that its intent is maintained. IRST then develops at least one scoping research and monitoring proposal for each question, which it sends to AMPC.
3	AMPC develops a research agenda based on these scoping research proposals, along with key milestones, a budget, and a timeline for each research project. AMPC sends the research agenda's budget to the BOF for their approval by July 15, in odd-numbered years.
3a	The BOF approves budget for AMP research agenda at its September meeting, in odd-numbered years.
4	IRST implements the research agenda with the BOF-approved budget. Findings of these research projects are documented in both a detailed technical report and a summary report.
5	IRST sends these reports to both AMPC and the BOF within 30 days of completion of both reports.
6	AMPC considers these IRST reports in developing an AMPC report to the BOF. AMPC presents its reports to the BOF for its vote within 90 days of receiving the IRST reports.
6a	The BOF makes its decision in response to the AMPC report by the second BOF meeting after receiving the AMPC reports.

[a] As illustrated in Figure 6-4.

Figure 6-4 demonstrates in a flow diagram the normal flow of steps for most AMP work relating to effectiveness monitoring and informing possible BOF actions in response to monitoring. There is flexibility to work outside of the simplified flow chart to address topics that are time sensitive and relate to ODF's ability to administer and remain compliant with the HCP and associated incidental take permits (ITPs). For example, identification and response to changed circumstances as well as IRST work to develop status and trend metrics and targets will both likely require a slightly modified workflow.

6.4.8 Effectiveness Monitoring Strategy

AMPC and IRST will work together to establish the AMP effectiveness monitoring strategy for the HCP, including but not limited to identification of a monitoring framework, prioritization, and timeline to ensure all BGOs will be evaluated over the permit term. As part of strategy development, AMPC will develop and oversee an effectiveness monitoring strategy that encompasses effectiveness monitoring specific to BGO subobjectives in Group 2, Group 3, and Group 4. An initial effectiveness monitoring strategy will be completed by within 1 year of issuance of ITPs.

AMPC and IRST will use the information below regarding monitoring priorities and initial frameworks to inform development of the effectiveness monitoring strategy. Where an initial framework is not provided, AMPC and IRST will work together to develop the framework and will include it in the effectiveness monitoring strategy. The effectiveness monitoring strategy will incorporate work to address both status and trend monitoring (Group 2) and targeted monitoring studies (Group 3 and 4).

6.4.8.1 Initial Adaptive Management Program Monitoring Priorities

OAR 629-603-0100(8) requires the initial phase of the AMP to prioritize the following three research topics.

- Literature review for Eastern Oregon georegion steep slopes.
- Requirements of baseline and trend monitoring of road rules.
- Amphibians.

Work is underway of all three of the initial priority topics. Each topic status and work conducted as of the end of 2025 is summarized below

Eastern Oregon Steep Slopes

The AMPC sent a final research question package to IRST related to the importance of mass-wasting processes for influencing aquatic habitats in the Eastern Oregon georegion in July 2024. IRST finalized its scoping proposal in January 2025. AMPC included its recommendations in the research agenda presented to the BOF in September 2025. The BOF approved the $80,000 requested by AMPC. IRST is currently developing a Request for Proposals and will oversee all phases of the research. The final research questions package and approved research agenda are included in Appendix H, *Adaptive Management Program Initial Research Questions and Research Agenda.* Work conducted under this initial project will be used to inform monitoring of BGO's 8 and 13 (Chapter 4, Section 4.2, Biological Goals and Objectives).

Baseline and Trend Monitoring of Road Rules

AMPC sent a final research question package to IRST related to baseline and trend monitoring of hydrologic connectivity of forest roads in June 2024. IRST finalized its scoping proposal in May 2025. AMPC included its recommendations in the research agenda presented to the BOF in September 2025. Specifically, this approach uses status and trend monitoring to assess the degree of road-stream hydrologic connectivity. Work conducted under this initial project will be used to inform monitoring of BGOs 1 and 8, subobjectives 1.7, 1.8, 1.8, 8.5, 8.6, and 8.7 (Chapter 4, Section 4.2, *Biological Goals and Objectives*). The BOF approved the $5.4 million requested by AMPC to fund the status and trend monitoring study of road-stream hydrologic connectivity. IRST is currently developing a Request for Proposals and will oversee all phases of the research. The final research questions package and approved research agenda are included in Appendix H, *Adaptive Management Program Initial Research Questions and Research Agenda.*

Amphibians

AMPC sent a final research question package to IRST related to amphibians in April 2025. This package included three questions and directed IRST to prioritize one scoping proposal for the first two questions and a separate scoping proposal for the third question. Question 1 included a baseline assessment to identify science gaps regarding the distribution of the covered amphibian species in the plan area and permit area and the factors that control the distribution of each species at smaller spatial scales. Question 2 related to population status and trends for the Columbia torrent salamander (*Rhyacotriton kezeri*) and Southern torrent salamander (*Rhyacotriton variegatus*) and will be used to provide baseline data on these species to inform future status and trend monitoring (Group 2). IRST is preparing a scoping proposal for AMPC that will support an agenda and request for funding to be submitted to the BOF. Question 3 included specific questions relating to how Columbia torrent salamander and Southern torrent salamander habitats are affected by rules related to no-harvest RMAs, Type N streams, and steep slopes. In addition to status and trend monitoring for question 2, the full research question package will inform Group 3 and 4 targeted monitoring studies for Objectives 3, 5, 7, 10, 12, and 14. This question package will inform status and trend monitoring for Objective 3, subobjective 3.2, and targeted monitoring studies to inform Objective 5, subobjective 5.2. The final research questions package for amphibians is included in Appendix H, *Adaptive Management Program Initial Research Questions and Research Agenda.*

6.4.8.2 Status and Trend Monitoring (Group 2 BGO Subobjectives)

Status and Trend Monitoring

As specified above, status and trend monitoring is considered a component of effectiveness monitoring and will be included in the effectiveness monitoring strategy. The following framework is established and will be used by AMP and IRST when developing the effectiveness monitoring strategy component for status and trend monitoring. The effectiveness monitoring strategy will establish a timeline to begin status and trend monitoring along with identification of the metric to be monitored and the associated trend target for each subobjective. These terms are defined as follows for the purpose of this HCP:

- **Metric.** Metric identifies what is to be monitored in assessing progress toward achieving an objective. Metrics must be quantifiable. For example, a metric could be stream temperature expressed in degrees Celsius (°C), the number of pieces of wood of a particular size found in a

particular length of stream, or the number of pools of a particular depth found in a length of stream.

- **Trend target.** Trend target specifies the desired value for a metric. Monitoring data for a metric are considered relative to a trend target to assess progress toward achieving an objective. The salmonid cold water habitat criteria of 16°C (ODEQ 2008) is an example of a trend target. Trend targets will serve as general markers to assist AMPC in determining whether the conservation measures are resulting in trends toward or away from achieving the BGOs. If a trend target cannot be developed by the deadline due to gaps in scientific understanding, then the monitoring plan will describe those gaps and propose studies needed to fill them.

Metrics and Trend Targets for Identified Biological Goal and Objective Subobjectives

For the habitat features identified in the subobjectives (Chapter 4, Section 4.2, *Biological Goals and Objectives* and Table 6-2) listed below, the scientific foundation is thought sufficient at this time to develop or finalize specific metrics and trend targets. Thus, AMPC will direct IRST to refine the following metrics and develop corresponding trend targets.

1. Maintain shade to support the stream temperature needs of covered fish species (Objectives 2 and 9; subobjectives 2.2, 9.1, and 9.2). The metric to be further defined is water temperature in fish-bearing streams and the trend target is the biologically based numeric criteria (OAR 340-041-0028(4)).
2. Minimize sediment delivery to support the needs of the covered species (Objectives 1 and 8; subobjectives 1.7, 1.8, 1.9, 8.5, 8.6, and 8.7). The recommended metric to be further defined is hydrologic disconnection of roads from streams. This is an initial effectiveness monitoring priority, as described in Section 6.4.8.1, *Initial Adaptive Management Program Monitoring Priorities.*
3. Minimize sediment delivery to support the needs of the covered species in eastern Oregon (Objectives 8; subobjective 8.2). The recommended metric to be further defined is fine sediment in riffles.
4. Maintain riparian function and complex habitats to support the needs of covered species (Objectives 6, 7, 13, and 14; subobjectives 6.2, 7.2, 13.1, 13.2, 14.1, and 14.2). The recommended metrics to be further defined is wood in stream channels and in RMAs.
5. Maintain shade for non-fish-bearing perennial streams and within designated debris flow traversal areas (DDFTAs) to support stream temperature needs of covered amphibians (Objective 3; subobjectives 3.2 and 3.4). The recommended metric to be further defined is water temperature.

For fine sediment in riffles and large wood in streams, ODFW has a statistical design and field protocol for status and trend monitoring. These metrics are generally sensitive to forest management, broadly represent conditions of freshwater habitat for the covered salmonid species, and have been reported on over the last 20 years for western Oregon as a component of the *Oregon Plan for Salmon and Watersheds*. The intent is to use these methods and expand sampling into eastern Oregon.

IRST will report its findings to AMPC for the above metrics and trend targets within one year of issuance of ITPs. Within 120 days of receiving the IRST report, AMPC will review and adopt the

initial set of monitoring metrics and trend targets. If IRST is unable to define a metric and/or trend target based on available science, they will not be required to do so. In this event, IRST will outline the work and timeline to collect information necessary to develop an appropriate metric. Initial trend monitoring results for these metrics will be included in the first 8-year comprehensive report to the Services and updated in subsequent annual reports.

If status and trend monitoring indicates a lack of progress toward or a trajectory away from meeting a subobjective, AMPC will determine whether targeted effectiveness monitoring studies are needed and direct IRST pursue those. The targeted monitoring studies will be in addition to those already identified for subobjectives in Group 3 and 4 (Table 6-2). All targeted studies will evaluate the effectiveness of specific rules to support adaptive management decisions.

6.4.8.3 Targeted Monitoring Studies (Group 3) and Post-Triggering Event Analysis (Group 4)

AMPC will determine monitoring priorities for conservation measures and associated BGO subobjectives assigned to Group 3 and Group 4 (Table 6-2) and include them in the effectiveness monitoring strategy. Consistent with its statutory role, AMPC will rely on IRST to develop these studies.

The effectiveness monitoring strategy will include a monitoring framework for the BGO subobjectives identified for targeted monitoring studies (Group 3) and for Post-Triggering Event Analysis (Group 4). AMPC and IRST will work together to develop the monitoring framework.

However, two specific studies are identified in this HCP and in the monitoring framework provided in the following section: steep slopes model performance/validation and effectiveness monitoring for plans for alternate practice (PFAPs). AMPC shall consider steep slopes model performance/validation, along with other topics identified as Group 3 and 4 Monitoring (Table 6-1), when prioritizing their body of status and trend and effectiveness monitoring work (collectively, Groups 2, 3, and 4 BGO subobjectives). Effectiveness monitoring of PFAPs will be identified and included in future monitoring plans if issues are identified through ODF's tracking and reporting that points to trends in use of PFAPs related to specific aspects of one or more of this HCP's conservation measures (Chapter 4, *Conservation Strategy*).

Group 4 - Steep Slopes Model Performance/Validation

The AMP will develop a study for the Western Oregon georegion to determine if the regulatory version of the steep slopes model accurately identifies initiation points for landslides that deliver sediment and wood to fish streams (Group 4). The study will include components that accomplish the following.

- Collect an unbiased landslide inventory. The current state of the science for accomplishing this via remote sensing is differencing of high-resolution digital elevation models obtained from Light Detection and Ranging (LiDAR). The inventory will include a field-based quality assurance/quality control process.
- For high-intensity, low-frequency events, determine a storm threshold that would trigger an inventory.

- For low-intensity and high-frequency events, determine a storm threshold and time period to trigger an inventory.
- Establish a network of in-forest rain gauges in areas prone to landslides.

Following the implementation of the landslide inventory study, the AMP will evaluate the effectiveness of the steep-slope conservation measures (i.e., slope retention areas and DDFTAs) for delivering large wood to fish streams given availability of a sufficient number of landslides and units harvested under the OFPA Regulations for a statistically valid analysis (Group 4).

Group 3 - Effectiveness Monitoring of Plans for Alternate Practice

ODF will track use of PFAPs, and results of PFAP tracking will be included in HCP annual reports (Chapter 5, Section 5.3.1, *Annual Reports*). In the report, ODF will summarize the applicable rules modified by the PFAPs and identify any trends observed that indicate patterns or significant use of PFAPs to modify a particular rule. For rules identified as having significant use of PFAPs, ODF will further evaluate and report on the degree to which approved PFAPs are expected to result in the same effect, meet the same purpose, or provide equal or better results as the practices specified in the statute or rule being applied to the practice (OAR 629-605-0100(1)). If in an annual report ODF identifies a specific category of PFAP (related to one or more of the specific administrative rules that make up the conservation measures of this HCP) that may fail to result in the same effect, meet the same purpose, or provide equal or better results as practices specified in statute or rule, the BOF may direct AMPC to prioritize monitoring that evaluates the effectiveness of that category of PFAP in contributing to meeting the pertinent BGOs.

For a covered activity or conservation measure identified as having significant use of PFAPs, ODF will further evaluate and report on the degree to which approved PFAPs are expected to result in the same effect, meet the same purpose, or provide equal or better results as the practices specified in the statute or rule (covered activity or conservation strategy) being applied to the practice (OAR 629-605-0100(1)). If ODF identifies trends regarding the use of PFAPs to modify a specific rule or the use of PFAPs that fails to result in the same effect, meet the same purpose, or provide equal or better results as practices specified in statute or rule, the agency will specify planned follow-up actions in its annual report to the Services. Planned follow-up actions may include, but are not limited to (1) targeted training of ODF field foresters, (2) development of new technical guidance or revision of existing technical guidance, or (3) identification of the rule or rules associated with the covered activity and/or conservation strategy in a report to be submitted to AMPC and the BOF no later than 30 days after the annual report is submitted, with a recommendation to prioritize monitoring that evaluates the effectiveness of the PFAPs in contributing to meeting the pertinent BGOs.

6.5 Outcomes of Implementation and Effectiveness Monitoring—Mechanisms for Change

A key component of this HCP's monitoring approach is the ability for ODF and the BOF to respond to results from implementation and effectiveness monitoring results and to initiate change, if needed.

6.5.1 Implementation Monitoring

As addressed in Section 6.3.8, *Compliance Monitoring Program Phase 4: Data Analysis and Reporting*, and 6.3.10, *Compliance Monitoring Program Phase 5: Review and Communication of Compliance Monitoring Program Study Results*, reports on implementation monitoring, including compliance monitoring studies will be developed biannually, submitted to AMPC and the BOF, and included in HCP reporting. As recommended by ODF leadership or AMPC, the BOF may direct action be taken based on results from implementation monitoring reports. Actions may include new training, guidance, rule change or clarification, or other actions, with the intended goal of improving implementation and compliance. Immediate action may be initiated by ODF leadership, based on issues identified through implementation monitoring, to initiate new or revised training or landowner/operator education or to develop or modify guidance.

6.5.2 Effectiveness Monitoring

As a part of the adaptive management process (Figure 6-3), the BOF must consider AMPC reports and determine if an action is needed in response to a report. Following each AMPC report and required alternatives presented therein (Figure 6-4, Table 6-4, Step 6), the BOF will vote to select a recommended action or the no action alternative. Actions may include developing a new rule, modifying an existing rule, developing or modifying Forest Practices Technical Guidance, developing or modifying targeted training, further study, or another alternative.

As mentioned in Section 6.4, *Effectiveness Monitoring and Adaptive Management Program*, a subset of the Group 1 BGOs, will only receive implementation monitoring (Group 1 only). The conservation measures associated with these BGO subobjectives are assumed to be effective if implemented as required by the OFPA. Reports on implementation monitoring will be developed biennially and shared with AMPC (Section 6.3.10, *Compliance Monitoring Program Phase 5: Review and Communication of Compliance Monitoring Program Study Results)*. Based on results from implementation monitoring of Group 1 only BGOs, AMPC may also choose to move a Group 1 subobjective to Group 2, 3, or 4, and to direct that additional status and trend or targeted monitoring studies occur.

Groups 2, 3, and 4 BGO subobjectives will be evaluated as part of the AMP with all monitoring and reporting conducted by AMPC and IRST. As mentioned in Section 6.4.2, *Purpose of the Adaptive Management Plan,* AMPC will submit reports to the BOF in response to study outcomes. Each report related to a study will include an action and no action alternative. If BOF votes to modify a rule or develop a new rule in response to the AMPC report, then standard rulemaking procedures and regulations will be applied. The BOF was granted rulemaking authority by the Oregon State Legislature. This authority and its accompanying procedures are codified in Oregon Revised Statute (ORS) 527.714 and included in Appendix D*, Oregon Forest Practices Administrative Rules and the Oregon Forest Practices Act.* If the BOF's selected alternative relates to development or modification of Forest Practices Technical Guidance or targeted training to improve implementation and compliance with a specific rule/conservation measure, ODF will be directed to conduct this work.

6.5.3 Modifications to HCP Conservation Measures in Response to Monitoring

Research and monitoring results from the AMP may result in changes to HCP conservation measures through changes to the OFPA rules. The mechanism for this change is described above and would be triggered by a recommendation from AMPC to the BOF for modifications or additions to the OFPA rules. If the BOF votes to modify a rule or to develop a new rule in response to the AMPC report, then standard rulemaking procedures and regulations will be applied. The BOF's rulemaking authority is established in statute. Oregon Revised Statute (ORS) 527.714 establishes the procedures by which BOF may adopt or modify rules. If BOF votes to initiate rulemaking as a result of an AMPC report, the ORS 527.714 rules provide sideboards to BOF's rulemaking authority. Specifically, the statute states (ORS 527.714(4)):

> If the Board determines that a proposed rule is of the type described in (1)(c) of this section, and the proposed rule would change the standards for forest practices, the Board shall describe in its rule the purpose of the rule and the level of protection that is desired. If the proposed rule would change the standards for forest practices that relate to the protection of aquatic resources, the level of protection that is desired must be consistent with:
>
> (a) Requirements described in the Private Forest Accord Report dated February 2, 2022, and published by the State Forestry Department on February 7, 2022; **or**
>
> (b) If a habitat conservation plan consistent with the Private Forest Accord Report has been approved, the terms of the habitat conservation plan.

The Services have a nonvoting role on AMPC, so both the U.S. Fish and Wildlife Service and National Marine Fisheries Service will be aware of and have opportunity to provide input on content of AMPC and IRST reports prior to submission to the BOF. In addition, ODF will submit copies of AMP reports in HCP annual reports to the Services. If the BOF initiates rulemaking to modify an HCP conservation measure, ODF will communicate early with the Services to evaluate if such a rule change may result in the need to amend the HCP.