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Update of Private Forests Monitoring Strategy: Final draft

Oregon Department of Forestry

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Executive Summary

Background

The Board of Forestry (“Board”) continually assesses the adequacy of the Forest Practice Act (FPA) based on an adaptive approach to forest management. This approach is designed to lead to sound forest management that considers the best available information to guide management decisions (Oregon Board of Forestry, 2011).

Monitoring is an important component of the adaptive management process. The Private Forests Division Monitoring Unit is responsible for monitoring the implementation and effectiveness of the forest practice rules, other statutory requirements, and voluntary measures. The Monitoring Unit reports monitoring outcomes to the Board for their consideration in the adaptive management cycle. Monitoring results also help guide training efforts, administration of the FPA, outreach and education efforts, and delivery of other related programs.

Historically, the Monitoring Unit’s work has been directed by a Monitoring Strategy. This Strategy describes the Unit’s monitoring approach, and articulates a list of prioritized monitoring questions. The current Monitoring Strategy was developed in 2002; those top priority questions have been addressed or are close to completion (Oregon Department of Forestry, 2002). The Strategy also provides both the opportunity for input from stakeholders and decision-makers, and a rational framework for re-evaluating priorities in the face of new and potentially urgent monitoring needs. This 2016 Strategy reflects current needs and priorities to guide our upcoming work.

Updating the Strategy: Process

This 2016 Strategy followed a three-phase process:

- (1) **Monitoring question list development and organization.** This first list was based on three sources of information: Stakeholder input, the 2002 Monitoring Strategy, and Oregon Department of Forestry (ODF) internal discussions. Questions were grouped based on their type and theme. Two monitoring question types were considered in this process: effectiveness¹ and implementation².
- (2) **Preliminary prioritization of questions.** Questions were sent to stakeholders, and we requested that they prioritize the highest priority questions, rather than prioritizing all questions in the list.
- (3) **Strategy development.** Based on stakeholder prioritizations of questions, a draft Strategy with question priorities was written, then sent to Stakeholders for their review. After addressing Stakeholder input, this final draft strategy is delivered to the Board.

¹ Effectiveness monitoring: the process of evaluating whether voluntary measures and legal obligations (i.e., FPA and other requirements), when implemented as intended, achieve the desired goals for resource protection.

² Implementation monitoring: the process of evaluating whether voluntary or regulatory measures were implemented as intended. Compliance monitoring is a subset of implementation monitoring related to regulatory measures.

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Question Priorities

Considering all stages of developing the Strategy, we received input from:

- 13 individuals (e.g., from landowners, conservation community, industry), including one person representing a Tribe
- 5 staff members of other agencies
- 17 ODF staff

There were 58 effectiveness questions and 38 implementation questions (including 11 questions that were similar on both lists) to prioritize (Appendix sections D.2 and D.3, respectively). Additionally, there were 40 questions on which the Monitoring Unit could play a supportive role yet were not prioritized (Figure D.2, Bin B; Appendix D.4), and 25 questions that were out of scope of the Unit's work (Figure D.2, Bin C, Appendix D.5).

The high priority implementation and effectiveness monitoring questions are provided below³.

High priority implementation questions

- What are compliance rates with rules for riparian areas in forest operations?
- What are the compliance rates with the water protection rules?
- What are compliance rates of riparian buffer requirements designed to prevent or minimize stream sedimentation and/or meet water quality standards and TMDL load allocations in Type F streams?
- What are the compliance rates for rules designed to protect significant and other wetlands?
- What are the compliance rates for rules designed to protect threatened and endangered fish and wildlife species that use resource sites on forestlands (i.e., northern spotted owl nesting sites, bald eagle⁴ nesting sites, bald eagle roosting sites, and bald eagle foraging perches)?
- What are the compliance rates with juvenile fish passage requirements and guidelines?
- What are the compliance rates with BMP requirements for roads, skid trails, and high risk sites?
- What fraction of culverts in forest operation areas currently meet FPA standards? For the fraction that does not meet standards, what are the causes (e.g., legacy, recent storms, insufficient FPA compliance)?
- Are pesticide rules being followed?
- How consistently are streams typed using the applicable physical criteria?

High priority effectiveness questions

- When implemented, how effective are (new) riparian prescriptions (voluntary or regulatory) at protecting water quality, providing large wood recruitment and attaining desired future conditions?
- What fraction of riparian areas in forest operation areas are currently on track to meet FPA riparian "desired future condition" targets? For the fraction that is not on this track, what are

³ Medium and low priority questions are listed in Appendix F.

⁴ Note: On August 9, 2007, the bald eagle was removed from the federal list of threatened and endangered species. On July 20, 2016, the Board directed the department to modify the Bald Eagle Nesting Sites rules (OAR 629-665-0100), and rescind FPA rules for Bald Eagle Roosting Sites (OAR 629-665-0230) and Bald Eagle Foraging Perches (OAR 629-665-0240).

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the causes (e.g., due to legacy, blow-down, lack of hardwood-to-conifer conversion, insufficient FPA compliance)? Do DFC targets translate into mature forest conditions that meet water quality standards and other goals?

- Are forest practice rules effectively protecting headwater (small Type N) streams such that local and downstream beneficial uses are protected? Key issues include effects on stream temperature, large wood recruitment, stream flow, sediment delivery, mass wasting initiation and debris torrent processes, macroinvertebrates, and how those effects are translated downstream.
- How effective are leave tree requirements (ORS 527.676) at overall maintenance of wildlife, nutrient cycling, moisture retention and other resource benefits of retained wood? Is there a difference in effectiveness of clumped vs. scattered patterns?
- Are forest practices, including roads, under current rules effective in meeting all applicable water quality criteria established by DEQ, including those established by TMDLs, for water quality parameters affected by forest practices on fish and non-fish bearing water bodies?
- Are culvert replacement projects effective in restoring conditions beneficial to fish? What factors such as upstream habitat length and conditions, channel gradient, culvert design, etc. correlate with effectiveness?

Future updates to the Monitoring Strategy

This Strategy, while designed to guide the Unit's work over the next decade, will need to be revisited as new issues and questions arise. We envision such mid-stream assessment(s) will be a much less involved process than this update, and likely be tied directly with the Division's fiscal year operating plans and/or Board workplan. At a minimum, the update will involve a decision as to whether a given monitoring question warrants immediate action of the Monitoring Unit or re-evaluation and placement of the question within the current list of prioritized monitoring questions. A full update of the Monitoring Strategy is anticipated in approximately a decade, with the process details to be determined at that time.

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1. Background

1.A Adaptive management: context for monitoring

The Board continually assesses the adequacy of the FPA based on an adaptive approach to forest management. This approach is designed to lead to sound forest management that considers the best available information to guide management decisions (Oregon Board of Forestry, 2011).

Adaptive management is a system of making, implementing, and evaluating decisions. This system acknowledges uncertainty about the outcome of management activities, and that ecosystems and social values are always changing. It can be defined as a scientifically-based, systematically-structured approach that tests and monitors management plans, assumptions, predictions and actions, and then uses the resulting information to improve management plans, policies, or practices. The Monitoring Unit is an important component of the adaptive management process, and is responsible for monitoring the implementation and effectiveness of the forest practice rules, other statutory requirements, and voluntary measures. After completing monitoring studies, the Unit reports those findings to the Board. The Board considers the findings and associated recommendations, and takes appropriate action.

The success of the adaptive management process depends on:

- Commitment to a long-term process
- Deliberate, scientifically-sound monitoring designs that test policies and practices, and track indicators at multiple spatial and temporal scales
- Careful implementation of policies and plans
- Analysis of outcomes that consider study objectives and predictions
- Incorporation of findings from monitoring studies into future decisions, policies, and practices

While adaptive management must be flexible to accommodate change, monitoring data and efforts will be of the greatest value if there is a structured approach to managing such change. One approach is to develop a plan for rule evaluation/revision that aligns with the prioritization of monitoring issues. For example, if, through the internal and public review process it is determined that small Type N (i.e., non-fish bearing) stream questions are the highest priorities and spotted owl studies are the lowest priority, then the rules designed to protect small Type N streams should be evaluated by the Board of Forestry prior to those rules that are designed to protect owl habitat and productivity.

1.B Monitoring Program

1.B.1 Monitoring Program Background

The Monitoring Unit of ODF's Private Forests Division conducts monitoring to assess the effectiveness and implementation of rules promulgated under the Forest Practices Act (FPA) to protect natural resources, and other related programs (e.g., Oregon Plan Voluntary Measures). This monitoring is mandated in statute (e.g., OAR 527.710(7)) and supported by policy (Oregon Board of Forestry, 2011). The Unit has completed numerous monitoring studies (see Appendix Section A.1 for more information on completed projects and responses to their findings).

1.B.2 Monitoring Unit goals

The goals of the Monitoring Unit are to:

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- Provide the Board, legislature, and other stakeholders timely, pertinent, and sound information at multiple temporal and spatial scales regarding the effectiveness, implementation and assumptions associated with forest practices rules and best management practices, and outcomes on the ground;
- Coordinate with other monitoring and research efforts to ensure efficient use of state resources and contribute to enterprise, integrated monitoring at the state level;
- Determine if rules, regulations or other programs are being implemented in accordance with expectations and whether they are effective in meeting resource protection goals;
- Address highest priority FPA monitoring questions for the Private Forests Division;
- Work collaboratively with technical experts and stakeholders to produce high quality, transparent monitoring results; and
- Provide technical advice and support to other natural resource agencies engaged in baseline monitoring efforts (e.g., forest and stream conditions).

The mission, vision, and values of the Monitoring Unit are detailed in Appendix B.

1.C Monitoring Strategy

1.C.1 Background of the Monitoring Strategy

Historically, the Monitoring Unit's agenda has been directed by a Monitoring Strategy. This Strategy provides a description of the Unit's monitoring approach, and articulates a prioritized list of monitoring questions. The Strategy is vital to the Monitoring Unit's mission because it addresses monitoring questions in a methodical and rational process with understanding, acceptance, and support by stakeholders and decision-makers. Results of monitoring efforts are taken to the Oregon Board of Forestry (Board) as part of the aforementioned adaptive management approach to forest practices rules. Monitoring results also help guide training efforts, administration of the FPA, outreach and education efforts, and delivery of other related programs.

The Unit developed the previous Strategy in 2002 (Oregon Department of Forestry, 2002). Since 2002, the Monitoring Unit has addressed the Strategy's top priority questions (see Appendix section A.2). The Board also completed a new strategic plan for the Department, the Forestry Program for Oregon (Oregon Board of Forestry, 2011). The 2016 Strategy reflects current needs and priorities to guide upcoming work. Additionally, the Strategy provides a framework within which to consider topics that may rise to the top of the Unit's priorities.

1.C.2 History of the Monitoring Strategy

The Monitoring Program and its Monitoring Strategy both started in 1988. The 1988 Strategy addressed issues in four areas (resource protection, interagency coordination, program administration, and economic effects)⁵ with eleven questions. The 1994 update, developed upon passage of new stream protection rules, only focused on resource protection (21 questions) and program administration. The 1998 Strategy (developed after the Oregon Legislature passed into law the Governor's Oregon Plan for Salmon and Watersheds) had minor revisions to the 1994 Strategy. The 2002 Strategy was a more significant update, with a re-designed monitoring approach, and prioritizing the questions to address, with the number of monitoring questions

⁵ Only the first area is still addressed in the Monitoring Strategy

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growing from 34 to 89.

1.C.3 Objectives of the Monitoring Strategy

The goals of this Strategy are to:

- Develop a high quality, well-prioritized list of monitoring questions
- Conduct an inclusive and transparent process for developing the Strategy
- Integrate the Strategy with enterprise monitoring efforts
- Ensure the Strategy is up to date and we are addressing the correct priorities
- Provide a framework within which to consider new monitoring issues (e.g., crises) that emerge

2. Methods for developing this Monitoring Strategy

To guide the work of updating this Strategy, staff developed a charter work plan that the Board approved in January, 2015 (Appendix C). This charter describes the following elements:

- The context of the Monitoring Strategy within the Monitoring Unit's work
- The purpose of this update of the Strategy
- The objectives of the Strategy and criteria for determining success
- The scope of the update
- Assumptions and constraints for doing the update
- The types of stakeholders that are interested in the update and why they are interested
- Other projects and documents that are related to this update
- ODF staff on the project team, and their roles
- A communication plan

To implement this charter, we designed a structured process to follow (Figure 1.1). In the first phase of the project, monitoring questions were developed, based on three sources of information: Stakeholder input (from individuals, tribes, and staff from other agencies and ODF), the 2002 Monitoring Strategy, and ODF internal discussions. In the second phase, these questions were divided into easier to comprehend groups based on the type of question, and monitoring question types were clearly defined. These re-organized questions were then sent to Stakeholders (including individuals, interest groups, state and federal agencies, and ODF staff) for them to determine their highest priority questions for us to address. Their input was analyzed to determine question priorities. The third phase of this update began with writing a draft Strategy, then sending it to Stakeholders for their input. After addressing Stakeholder input, this final draft strategy is delivered to the Board. See Appendix D for more information on the process for updating this Strategy.

3. Prioritized monitoring questions and stakeholder input

Considering all stages of developing this Monitoring Strategy, we received input from:

- 13 individuals and organizations (e.g., landowners, conservation community, industry), including one person representing a Tribe
- 5 staff members of other agencies
- 17 ODF staff

There were 58 effectiveness questions and 38 implementation questions to consider for prioritization (Appendix sections D.2 and D.3, respectively). Additionally, there were 40

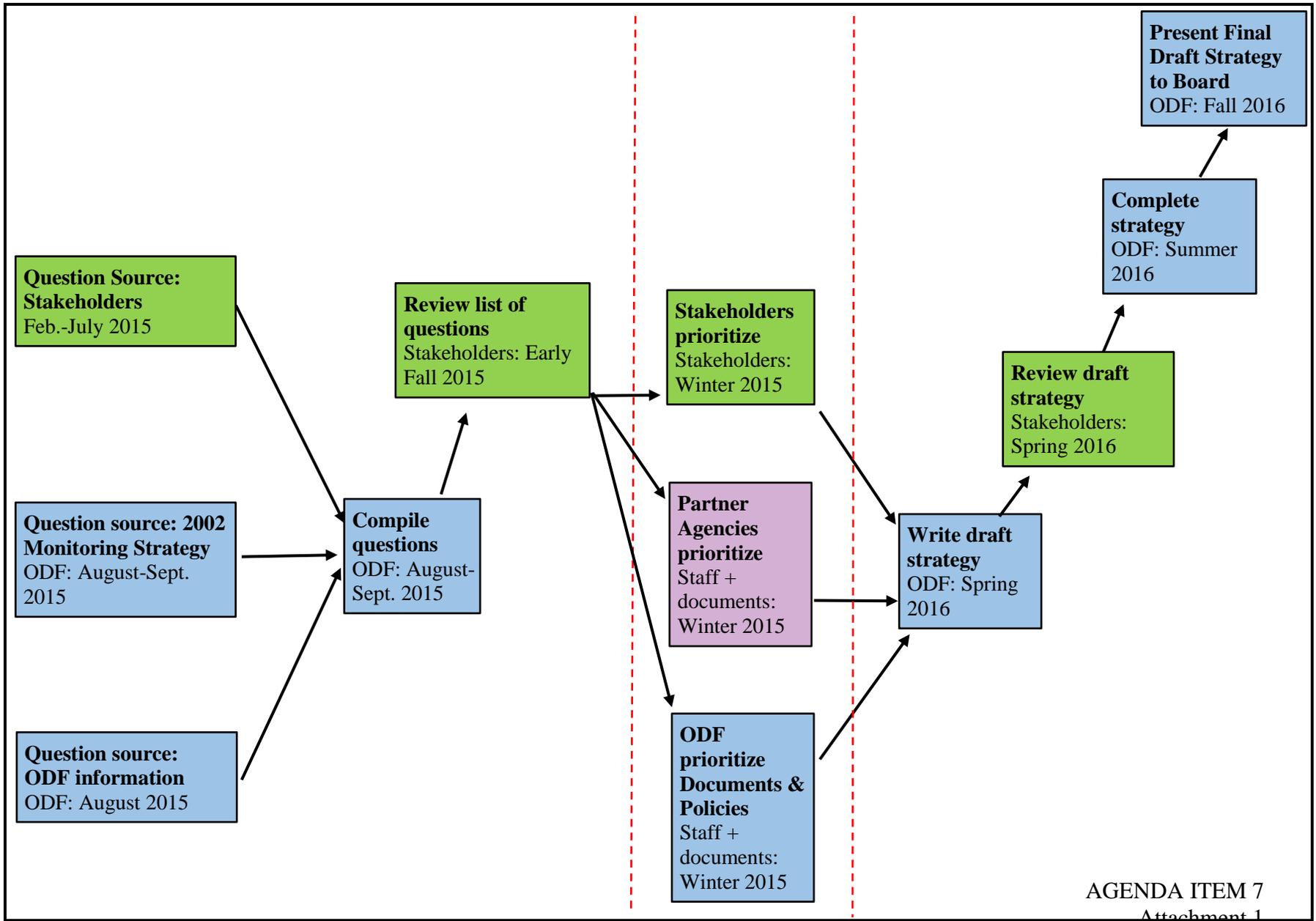


Figure 1.1: Process for updating Private Forests Monitoring Strategy. Green boxes represent work of Stakeholders, blue represent ODF staff work, and violet is from partner agencies documents

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questions on which the Monitoring Unit could play a supportive role yet were not prioritized (Figure D.2, Bin B; Appendix D.4), and 25 questions that were out of scope of the Unit’s work (Figure D.2, Bin C; Appendix D.5).

Some submissions from stakeholders contained elements of both implementation and effectiveness monitoring questions and were accommodated in both lists by rewording questions to clearly fall into one or the other (see Appendix F, Table F.3 for details). Table 3.1 describes the number of questions in each priority type and those which were removed for lack of votes. Both implementation and effectiveness question types had the same highest priority themes (Riparian Structure and Function) and lowest priority themes (Wetlands and Other Waters; Table 3.2).

Table 3.1 Number of questions in each priority for each question type.

<u>Priority</u>	<u>Implementation Questions (n=38)</u>	<u>Effectiveness Questions (N=58)</u>
High	5	6
Medium	12	9
Low	12	17
Remove*	9	26

* These questions did not receive votes from any of the groups, and thus are removed from the Strategy.

Table 3.2. Highest and lowest priority theme for each question type.

Based on total number of votes in each theme.

Implementation		Effectiveness	
<u>Highest priority</u>	<u>Lowest priority</u>	<u>Highest priority</u>	<u>Lowest priority</u>
Riparian function and structure	Wetlands and Other Waters	Riparian function and structure	Wetlands and Other Waters

The number of questions that received votes by more than one group is indicative of degree of similarity of priorities between the respective groups (Table 3.3). Groups tended to have more questions in common for the implementation questions (average of 3.3 questions in common between two groups) when compared with effectiveness questions (average of 2.2 questions in common between two groups). For the former question list, five group-pairs (out of 21 possibilities) had at least five questions in common, compared with one (out of 15 possibilities) for the latter list. In contrast, the implementation list had fewer questions (average of 1.7 questions per group) for which a group was the only vote than for the effectiveness list (average of 2.8 questions per group).

Table 3.3 Number of questions for which specific pairs of groups voted.

	A. OFIC	B. OSPC	C. Ind.	D. ODF	E. Agencies	F. Tribes	G. CAERT	Stand alone ²
<u>Implementation questions</u>								
A. OFIC	NA	2	2	2	2	0	4	3
B. OSPC		NA	4	7	4	3	6	1
C. Ind.			NA	5	3	1	8	0
D. ODF				NA	2	3	6	2
E. Agencies					NA	0	4	4
F. Tribe						NA	1	2
G. CAERT							NA	0
<u>Effectiveness questions</u>								
A. OFIC	NA	0	2	2	1	2	NA	5
B. OSPC		NA	3	4	4	0	NA	3
C. Ind.			NA	5	4	1	NA	2
D. ODF				NA	4	0	NA	2
E. Agencies					NA	1	NA	3
F. Tribe						NA	NA	2

¹A=OFIC (Oregon Forest and Industries Council); B=OSPC (Oregon Stream Protection Coalition); C=Individuals; D=ODF (Oregon Department of Forestry); E= Agencies (federal and state agencies, other than ODF); F = Tribes; G = CAERT (Compliance Audit External Review Team)

²The number of questions for which the group was the sole voter.

3.A. Priorities for implementation questions

Following are the implementation questions grouped into high, medium, and low priorities (more details on the priorities can be found in Appendix F, Section 1). Of the 38 implementation questions, 29 received votes and were thus prioritized, with the remaining 9 to be removed from the Strategy.

3.A.1 High priority implementation questions⁶

- I1. What are compliance rates with rules for riparian areas in forest operations?
- I10. What are compliance rates of riparian buffer requirements designed to prevent or minimize stream sedimentation and/or meet water quality standards and TMDL load

⁶ Note: preceding each question is I(#), which stands for “implementation question number”, used in appendices D and F.

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allocations in Type F streams?

I21. What are the compliance rates with BMP requirements for roads, skid trails, and high risk sites?

I22. What fraction of culverts in forest operation areas currently meet FPA standards? For the fraction that does not meet standards, what are the causes (e.g., legacy, recent storms, insufficient FPA compliance)?

I29. Are pesticide rules being followed?

3.A.2 Medium priority implementation questions

I9. What are the compliance rates with the water protection rules?

I11. What are the implementation rates of limited RMAs on small Type N streams?

I12. What are the compliance rates for rules designed to protect significant and other wetlands?

I14. Are wildlife tree retention rules implemented as intended?

I16. What are the compliance rates for rules designed to protect threatened and endangered fish and wildlife species that use resource sites on forestlands (i.e., northern spotted owl nesting sites, bald eagle⁷ nesting sites, bald eagle roosting sites, and bald eagle foraging perches)?

I19. What are the compliance rates with juvenile fish passage requirements and guidelines?

I28. Are high-risk sites consistently identified during the forest practices notification process?

I30. Does compliance with reforestation requirements vary with site preparation methods?

I31. What is the level of compliance with reforestation rules?

I32. What are the compliance rates with rules that are designed to maintain soil productivity?

I33. Are we getting accurate assessments of compliance with rules by private non-industrial owners?

I37. How consistently are streams typed using the applicable physical criteria?

3.A.3 Low priority implementation questions

I2. What are the compliance rates with felling conifers away from small Type N streams?

I3. How frequently are large wood recruitment incentives (OPSW activity 4.5) implemented?

I4. Are the rules and guidance for the placement of large wood in streams implemented correctly?

I5. What is the implementation rate of the current voluntary program for placement of large wood structures in streams? Are these structures implemented correctly?

I6. What is the implementation rate of no-harvest riparian areas in support of the Oregon Plan

⁷ Note: On August 9, 2007, the bald eagle was removed from the federal list of threatened and endangered species. On July 20, 2016, the Board directed the department to modify the Bald Eagle Nesting Sites rules (OAR 629-665-0100), and rescind FPA rules for Bald Eagle Roosting Sites (OAR 629-665-0230) and Bald Eagle Foraging Perches (OAR 629-665-0240).

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for Salmon and Watersheds (OPSW) or for other reasons? Where are these areas (geographically and by landownership type) and how much in excess of minimum requirements are the retained buffers?

I8. How frequently are landowners leaving 25% of in-unit leave tree and additional voluntary retention along Type F streams? (OPSW 3.6))

I13. What are the compliance rates for the water protection rules for lakes?

I15. What are the compliance rates with retention of wildlife trees and downed wood?

I18. What are the compliance rates for rules designed to protect sensitive bird nesting, roosting, and watering sites (i.e., osprey nesting sites, great blue heron nesting sites)?

I27. What are compliance rates with High landslide hazard location rules?

I36. Are Stewardship Plans being implemented in accordance with the agreements?

I38. How can ODF better ensure landowners are complying with State Cultural Resource Law given that ODF is not regulating these resources?

Finally, we note that stakeholders expressed that some of the implementation questions, as worded, could be interpreted as effectiveness questions (and vice versa). We therefore reworded some questions so they were clearly implementation questions (and vice versa), while retaining the original wording in Appendices D and F. We acknowledge stakeholders might have selected a different priority had the questions originally been in their current format.

3.B. Priorities for effectiveness questions

Following are the effectiveness questions grouped into high, medium, and low priorities (more details on the priorities can be found in Appendix F, Section 2). Of the 58 effectiveness questions, 32 received votes and were thus prioritized, with the remaining 26 to be removed from the Strategy.

3.B.1 High priority effectiveness questions⁸

E1. When implemented, how effective are (new) riparian prescriptions (voluntary or regulatory) at protecting water quality, providing large wood recruitment and attaining desired future conditions?

E4. What fraction of riparian areas in forest operation areas are currently on track to meet FPA riparian "desired future condition" targets? For the fraction that is not on this track, what are the causes (e.g., due to legacy, blow-down, lack of hardwood-to-conifer conversion, insufficient FPA compliance)? Do DFC targets translate into mature forest conditions that meet water quality standards and other goals?

E5. Are forest practice rules effectively protecting headwater (small Type N) streams such that local and downstream beneficial uses are protected? Key issues include effects on stream temperature, large wood recruitment, stream flow, sediment delivery, mass wasting initiation and debris torrent processes, macroinvertebrates, and how those effects are translated

⁸ Note: preceding each question is E(#), which stands for "effectiveness question number", used in appendices D and F.

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downstream.

E20. How effective are leave tree requirements (ORS 527.676) at overall maintenance of wildlife, nutrient cycling, moisture retention and other resource benefits of retained wood? Is there a difference in effectiveness of clumped vs. scattered patterns?

E30. Are forest practices, including roads, under current rules effective in meeting all applicable water quality criteria established by DEQ, including those established by TMDLs, for water quality parameters affected by forest practices on fish and non-fish bearing water bodies?

E42. Are culvert replacement projects effective in restoring conditions beneficial to fish? What factors such as upstream habitat length and conditions, channel gradient, culvert design, etc. correlate with effectiveness?

3.B.2 Medium priority effectiveness questions

E12. When landowners leave 25% of in-unit leave tree and additional voluntary retention along Type F streams, is this effectively meeting resource protection goals? (OPSW 3.6)

E14. Are riparian buffer requirements effective at preventing or minimizing stream sedimentation and/or meeting water quality standards and TMDL load allocations in Type F streams? ?

E29. Which species of predicted early seral and cavity dependent wildlife (e.g. western bluebird, house wren) are currently found as viable reproductive species post-logging? How effective are wildlife tree retention rules for producing habitat? In what proportion of harvest units do they occur?

E37. When implemented, how effective are road rules at controlling erosion and preventing delivery of sediment to streams?

E45. Do current harvest practices, implemented in accordance with the FPA, contribute to an increased rate or magnitude of shallow rapid or deep-seated landslides that deliver sediment to waters of the state (and thereby impair water quality) and/or which threaten public safety?

E48. Is water quality, including the integrity of aquatic communities and public health, being effectively protected when herbicides or insecticides are applied near streams as stipulated in rules and statutes?

E51. What concentrations of chemicals are found in streams when runoff events occur after the initial forest application of chemicals (in accordance with rules and statutes) near streams? Do these concentrations threaten water quality, aquatic biota, or public health, either locally or downstream?

E53. Is reforestation after fire-related salvage logging successful in Eastern Oregon?

E55. How effective are ODF outreach efforts on cultural resource issues?

3.B.3 Low priority effectiveness questions

E2. Do the riparian rules promote streamside forest stand structure and large wood recruitment levels that mimic mature riparian stand conditions?

E3. Do current riparian management rules and voluntary implementation supply large wood to higher order streams (including non-wadeable streams and estuary habitats) at rates

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sufficient to maintain or restore habitat complexity? If not, how long will this process take?

E9. When implemented, is the current voluntary program for placement of large wood structures in streams effective enough to address the need for large wood in streams?

E10. When implemented, do the current management practices for the riparian zone, which were designed to create a "desired future condition" some time from now, provide enough shade now to protect threatened and endangered salmonids?

E11. How effective is large wood placement at enhancing fish habitat?

E13. How effective are alternate buffer prescriptions (e.g., leave more on south-side, no large trees on small streams (?)) at achieving water quality, large wood recruitment, and desired future conditions goals?

E16. In hardwood-dominated riparian stands, are silvicultural approaches effective at increasing conifer establishment?

E17. When implemented, do the vegetation retention standards for significant and other wetlands protect wildlife habitat and hydrologic functions?

E22. How effective is downed wood at protecting wildlife (e.g., amphibians, reptiles, birds, and mammals)?

E35. Do crossings installed under current guidance provide juvenile and adult fish passage over time?

E39. Are forest practice erosion-related BMPs required by rules dealing with road construction, maintenance, and harvest activities, effective at preventing and limiting surface erosion and landslides and sediment delivery to waters of the state?

E44. Are High landslide hazard location rules effective at protecting human life and property?

E50. Is water quality, including the integrity of aquatic communities and public health, being effectively protected when forest management chemicals are applied (in accordance with rules and statutes) near small Type N streams? What are the downstream effects on water quality, aquatic biota, and human health if contamination does occur on small Type N streams?

E52. Are the reforestation rules, when implemented, resulting in productive forests with characteristic growth and stocking potentials for the site and species?

E54. Are FPA-related BMPs minimizing soil disturbance and compaction and maintaining long-term forest site productivity?

E56. Are volunteer OPSW activities effective at achieving the salmon protection and restoration goals? The multiple resources imbedded in this question are addressed through specific questions above.

E58. How can ODF better help protect cultural resources, given that ODF doesn't regulate cultural resources? How can ODF better ensure landowners are complying with State Cultural Resource Law given that ODF is not regulating these resources?

3.C. Priority Question Comparisons

To gain perspective on these priority questions, it helps to consider them against the 2002

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Strategy (note: that Strategy had four classes of priorities: Top, High, Moderate, and Low). There is no consistent pattern of priorities between the 2002 and 2016 Strategies (Tables 3.4 and 3.5). Only one effectiveness question aligned with the top and high priorities in 2002, slightly more alignment with medium priority questions (5 and 2 for implementation and effectiveness respectively), and few again for low priority questions (1 and 2 questions).

Table 3.4 2016 implementation question priorities compared with their priorities in 2002.

2016 Implementation question priorities	2002 question priorities					Total
	Top	High	Medium	Low	Non-existent ¹	
High	0	0	1	0	4	5
Medium	2	2	3	1	4	12
Low	2	1	5	1	3	12
Remove	1	2	1	1	4	9
Total	5	5	10	3	15	38

¹ Indicates question did not exist in the 2002 Monitoring Strategy.

Table 3.5 2016 effectiveness question priorities compared with their priorities in 2002.

2016 Effectiveness question priorities	2002 question priorities					Total
	Top	High	Medium	Low	Non-existent ¹	
High	1	0	0	0	5	6
Medium	0	0	2	1	6	9
Low	3	3	2	2	7	17
Remove	5	8	5	1	7	26
Total	9	11	9	4	25	58

¹ Indicates question did not exist in the 2002 Monitoring Strategy.

Finally, to help inform the prioritization, we considered priorities in light of the 2015 Forest Values & Beliefs Survey Summary Document (Oregon Forest Resources Institute [OFRI], 2015). Over 75% of Oregonians are aware of laws protecting fish, wildlife, and water sources, and requiring reforestation; the largest number of questions related to the fish and wildlife habitat portion, with the fewest number of prioritized questions relating to replanting of trees (Tables 3.6 and 3.7). Oregonians reluctantly support clearcutting as a silvicultural prescription, although the strongest reasons for this support are their understanding of laws to: 1) reduce environmental impact via cable logging; 2) leave certain areas untouched; and 3) replant after clearcut; zero prioritized questions related to the cable logging aspect, and five questions related to leaving areas untouched or replanting. Oregonians were even more skeptical of the use of pesticides

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(which related to two implementation and three effectiveness questions), although expressed guarded support if rules were followed to protect fish and minimized drift to neighboring properties. Finally, three implementation and four effectiveness questions did not relate to that summary document.

Table 3.6 Relationships between 2016 implementation question priorities and the 2015 Forest Values and Beliefs Survey Summary Document⁹.

Element of Forest Values Summary Document	2016 Implementation question priority		
	<u>High</u>	<u>Medium</u>	<u>Low</u>
Fish and wildlife habitat	I1, I10, I21, I22	I9, I11, I12, I14, I16, I19, I33, I37	I3, I4, I5, I6, I8, I13, I15, I18
Replant trees	<i>None</i>	I30, I31, I33	<i>None</i>
Protect streams & water sources¹	I1, I10, I21, I22	I9, I11, I33, I37	I2, I13
Leave areas untouched and replant clearcuts	I1	I14, I28, I30, I31, I33	I6, I8, I15, I27
Herbicide use	I29	I33	<i>None</i>
None of the above	<i>None</i>	I32	I36, I38

¹ Interpreted as focusing on water quality and drinking water protection

Table 3.7 Relationships between 2016 effectiveness question priorities and the 2015 Forest Values and Beliefs Survey Summary Document.

Element of Forest Values Summary Document	2016 Effectiveness question priority		
	<u>High</u>	<u>Medium</u>	<u>Low</u>
Fish and wildlife habitat	E1, E4, E5, E20, E42	E12, E14, E29, E37, E45	E2, E3, E9, E10, E11, E13, E17, E21, E22, E35, E39, E56
Replant trees	<i>None</i>	E53	E16, E52
Protect streams & water sources¹	E1, E5, E30	E14, E37, E45, E48, E51	E13, E39, E50
Leave areas untouched and replant clearcuts	E20	E12, E53	E16, E52
Herbicide use	<i>None</i>	E48, E51	E50
None of the above	<i>None</i>	E55	E44, E54, E58

¹ Interpreted as focusing on water quality and drinking water protection

⁹ Note: some prioritized questions address more than one element of the Summary Document.

4. Elements of Implementing this Monitoring Strategy

4.A. Monitoring coordination and collaboration

4.A.1 Importance of coordination and collaboration

External and internal partners are essential to success of projects, and participate in phases of projects to varying degrees. These partners provide important feedback on what is important to their goals, and is based in part on their working knowledge of Oregon's forested landscapes. External partners¹⁰ play numerous important roles in this monitoring process, including:

- Provide input on study design, implementation, and analysis
- Represent perspectives (of e.g., landowners, operators, conservation community)
- Conduct outreach & education on findings
- Use findings for land management decisions and training
- Provide access to study sites

Internal partners include field staff and their supervisors, and State Forests.

4.A.2 Review committees: purpose and governance

An evaluation of monitoring approaches and reports by peers from the research and practicing communities is an important component of promoting a scientifically credible, socially-acceptable program that produces meaningful results for adaptive management processes. Peer review is currently sought on a project-by-project basis. This process will be formalized within each project's charter work plan (as deemed necessary).

Details of governance for a review committee for any given monitoring question will depend on that particular question and the suite of stakeholders involved. We intend for the work of a committee to be appropriate for the question being addressed: some questions likely will warrant an external review team, whereas others might require only some input on study design, or input might not be warranted.

For any ODF Monitoring project warranting a team charter, this charter may involve many of the following elements (the specifics of which would be determined by ODF, in consultation with team members):

- Define the purpose of the team in relation to the goals of the study
- Describe who is on the review team and whom they represent, including technical experts and stakeholders
- Establish a set of guiding principles, including:
 - The roles and responsibilities of all parties involved
 - Who completes project tasks
 - How concerns and grievances will be addressed
- Outline a communication plan: frequency of updates and meetings; whether or not notes are kept, or at least summarized
- Delineate potential project outcomes: training, modifications in policy or rule, outreach and education, voluntary measures, further monitoring & research

¹⁰ See Appendix C for a list of types of interests that may be involved in ODF's monitoring

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- Specify a timeline for the team's work

Some elements that would be consistent between projects is that the review committee meetings would not normally be formal public meetings, and the committee would not operate on consensus. Final decisions on committee composition, study questions, methods and analyses on projects for which ODF is the lead investigator would remain with ODF. However, we recognize that decisions that would undermine project support and limit access to project sites are not likely to be in the best interest of the Department. In contrast, study-related decisions (e.g., study questions, methods and analyses) for projects on which ODF is not in a lead role would be determined by that project's governance structure.

4.A.3 Coordination with Enterprise Monitoring efforts

There are numerous monitoring efforts going on in Oregon, and it is essential that ODF coordinates, and when possible, collaborates with this monitoring work. As of 2016, key monitoring efforts include:

- Stream Team (a standing committee focused on coordinating inter-agency, water quality and quantity monitoring within Oregon)
- Oregon State University Watersheds Research Cooperative
- Water Quality Pesticide Management Team
- DEQ Pesticide Stewardship Partnerships
- Oregon Plan for Salmon and Watersheds

4.B Process for addressing questions

The purpose of this document is to articulate, then prioritize, key monitoring questions. However, detailed field methods and protocols are developed on a project-by-project basis for each question, with appropriate assistance from experts and input from various interested parties. The steps to addressing a question in the framework of adaptive management include (Figure 4.1; subsections 4.B.1 through 4.B.6):

- Plan:
 - Select question to address
 - Refine the question
 - Assess the state of information
 - Develop the study plan
- Do: Implement the study plan
- Check: Respond to study findings

While these steps appear orderly, they are often iterative. For example, assessing the state of information may lead to additional refining of the study question. Although the description of addressing questions is generic enough to apply to both implementation and effectiveness questions, these question types have significant differences. For instance, assessing the state of the information in compliance monitoring could be based on internal databases (e.g., Forest Activity Electronic Reporting and Notification System [FERNS]) and anecdotal evidence from e.g., field staff, private foresters. In contrast, assessing the state of information for effectiveness monitoring focuses on information from scientific and monitoring studies that have either been completed or are in progress.

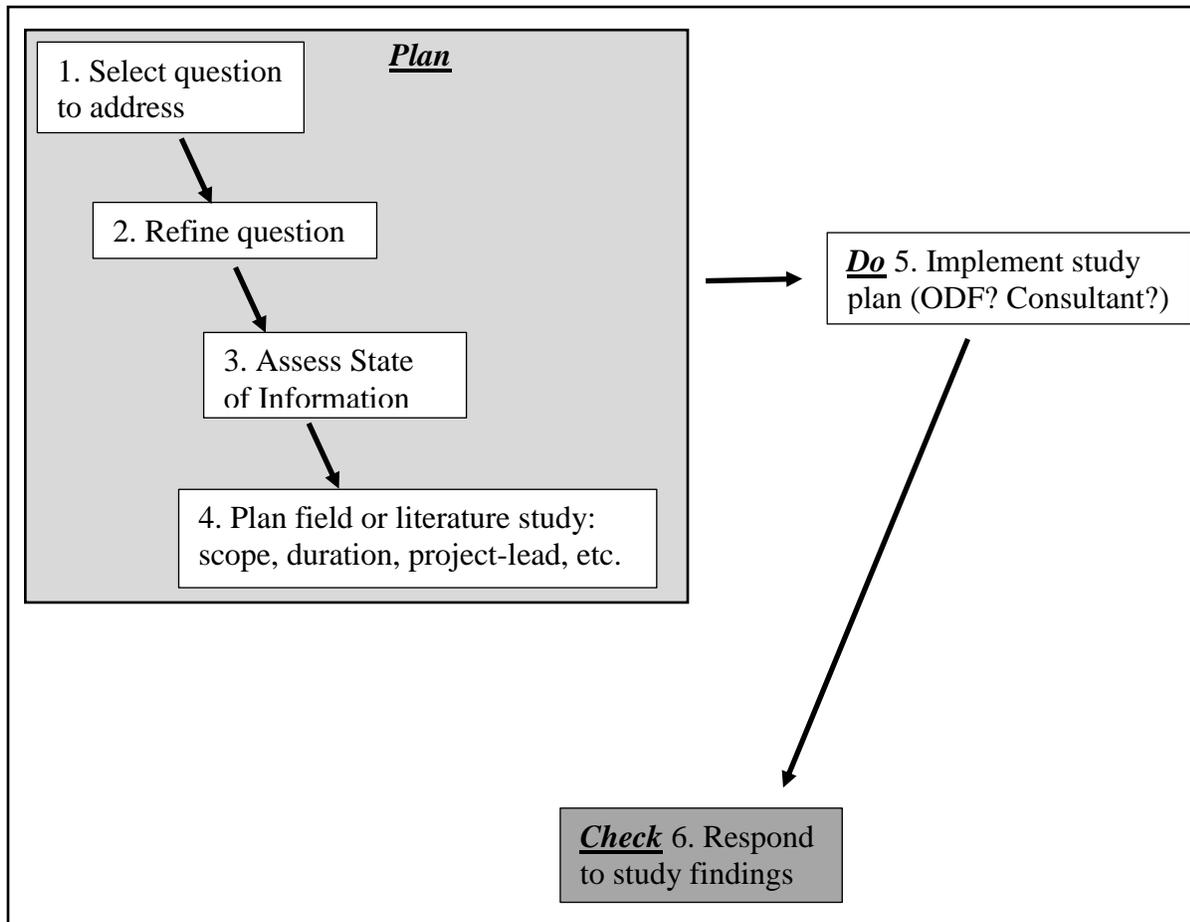


Figure 4.1 Fate of monitoring questions.

4.B.1 Plan: Select monitoring question to address

The Monitoring Program, as part of the Private Forests Division, relies on work prioritization efforts conducted through the Fiscal Year Annual Operation Plan (FYOP) process. This process is intended to describe how the Private Forest Division will meet the objectives of the Oregon Department of Forestry by ensuring alignment with the overall agency strategic work and focusing on agency initiatives and projects for the upcoming fiscal year. The FYOP is reviewed and updated on an as-needed basis with an annual review of fiscal year priorities by central office and field staff, leadership, and key stakeholders.

The FYOP identifies three main bodies of work for the Division: Ongoing or recurring work (core business functions), Priority 1 projects, and Priority 2 projects.

Criteria for establishing FYOP Priority I Projects:

- a. Legislative or Governor – Current legislative work session, support of biennial processes, bill analyses, testimony, Ways & Means Committee presentations, budget note implementation, Executive Order implementation
- b. Board of Forestry – Division/Program and Emerging Issues Work Plans
- c. Legal – Current litigation, DOJ interpretation, implications

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- d. ODF Executive Team/Leadership Team Initiatives – Internal and external; clear direction and timelines
- e. Audit or audit response – Work to support an active audit, or to respond to critical problems identified in an audit
- f. Project that is essential to carrying out an ODF core business function or that of a cooperating state agency
- g. Project that is essential to implementation of core business function at the field level, or critical to maintaining cooperator and stakeholder relationships.

FYOP Priority 2 projects are those that can be supported in addition to Priority 1 along with ongoing core business functions.

Questions within the Monitoring Strategy would be considered against the criteria above, in addition to the priorities already identified in the Strategy. Monitoring questions in the Strategy would normally fall within criteria (f) or (g) for Priority 1 projects, and the Division would select high priority questions first, resources allowing. A monitoring question raised under other Priority 1 criteria, such as the Governor's office or Board of Forestry, may take priority over existing questions in the Strategy (see Section 4.C for process of considering new questions).

The FYOP makes a number of assumptions, including:

- Current service levels are supported by legislatively-allocated and other funds (federal, harvest tax, etc.)
- Ongoing or new litigation does not require significant staff time or changes in program delivery
- Cooperating agencies maintain active roles in identified projects where partnership is key
- Board of Forestry approves proposed Private Forests Division work plans
- Landowner community continues to support and participate in monitoring and other cooperative projects

If any of these assumptions fail to be true, implementation of prioritized work may not occur, may need to be implemented through different means, or priorities may need to be adjusted.

It is important to note that while the Monitoring Program will seek to implement high priority questions in the Strategy first, these decisions must be weighed against existing workload and resources. For example, if the Monitoring Program is already implementing a complex, multi-year study of a high priority monitoring question there may only be remaining capacity to implement a study in response to a simpler, low priority question (see Section 4.C for information on staff capacity). Unique opportunities to collaborate on answers to medium- or low-priority questions may also effect the order in which projects are completed.

4.B.2 Plan: Refine monitoring question

For questions in the Monitoring Strategy to be addressed in an effective and efficient manner, they need refinement before they can be addressed via a study. The decision to include questions needing refinement was based in part on recognition that refining a question involves much work, the preponderance of which is outside the scope of this Strategy. Additionally, we chose to leave the questions as they are since they may encapsulate several important ideas that need to be disentangled, which also requires work outside the scope of this Strategy. Finally, we wanted to honor the work of the stakeholders who submitted the questions.

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The work of refining a question may include any of the following steps:

- Ensuring the question is clearly defined, both so that it can be addressed in a study or literature review, and so that it properly reflects the concern that needs to be addressed. For example, a question's direct link to policy, statute, and/or rule may need to be clearly embodied in the question.
- Consultation with disciplinary experts who can provide insight on both the state of the information (particularly for studies in progress) related to a question, and what aspects of a question can be studied given existing knowledge and technology.
- Reviewing relevant literature to assess the state of the information.

4.B.3 Plan: Assess state of information

The state of the information refers to what has been studied or is known about a particular question. Assessing this state is a key step in addressing a question since this information helps to outline gaps in our knowledge, and may be helpful in refining a question. This process includes considering studies in progress and reading publications from relevant studies. Note that reviewing studies may require various intensities of assessment depending on the nature of the question. For example, if there is deemed to be a sufficient body of science based on an initial assessment of relevant literature, a systematic review (SR; i.e., an intensive, rigorous, inclusive literature review technique) may be used to answer the question. An SR could thereby obviate the need for a field study, and ODF could choose how to act on its findings (see subsection 4.B.6). Or, a less rigorous assessment may be used to guide development of a study plan.

4.B.4 Plan: Develop study plan

A study plan is necessary to guide study implementation, and applies to both field studies and systematic reviews. It incorporates many elements, including:

- Objectives of the study and the monitoring question to be addressed
- Clarification of the policy and scientific context, including appropriate metrics of either effectiveness (e.g., compared with reference sites or regulatory standards) or implementation (e.g., compliance rates on a rule or unit basis)
- Information on study sites
- Study design
- Methods for collecting and analyzing data, quality assurance/quality control
- Data storage, security, public access to results, and project documentation
- Budget
- Timelines, products, reports

The monitoring program draws on established field measurement techniques and the systematic review method. Appropriate monitoring parameters must be selected in order to evaluate effectiveness and implementation of management strategies in protecting resources. However, selecting the correct monitoring parameter is challenging. A given parameter may be affected by multiple activities and a given resource is affected by multiple parameters. Therefore, it is important to select monitoring parameters that have a strong link to management, are sensitive to change, and are directly related to the resource in question. Examples of recently used protocols (e.g. stream temperature, shade, riparian structure, landslides monitoring protocols) are available from the department on request.

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Another aspect of developing a study plan is determining the level of effort required. For effectiveness questions, if there are sufficient, relevant scientific analyses, an SR may be warranted. SRs require a detailed protocol for how to conduct the review. For perspective, the riparian SR (Czarnomski *et al.*, 2013) entailed approximately 10 months from refining the question to completing the paper.

Alternately, a field study may be warranted. Such studies can have vastly different intensities of study design, data collection, and analysis. On one extreme, the Riparian Function and Stream Temperature project (RipStream) was started in 2002, and although data collection ended in 2010, analyses are ongoing as of fall 2016. To date, we have over 10 analyses either completed or underway from this study, a number of which are published journal articles. On the other extreme are projects such as the leave tree pilot study (Weikel and Kraemer, 2006). It entailed approximately 1 season of field work at 5 harvest units, and had 1 technical report. A monitoring project of moderate complexity would roughly entail six months to a year to plan, 1-2 field seasons to complete, and six months to a year for analysis with an end product being a department technical report.

4.B.5 **Do:** *Implement study plan*

The Department's role in completing a study spans a range of possibilities. At one end of this range, ODF hires an external group to design, implement and analyze a study (e.g., Plissner *et al.*, 2015). This effort requires ODF to dedicate time to creating and managing the contract to ensure our needs are met. Another possibility is that ODF performs much of the work and hires out a portion of it (e.g., Czarnomski *et al.*, 2013). For example, ODF designed the study methods and analyses for the annual compliance audit, yet hired external contractors to collect the data (Clements *et al.*, 2014). In another example, ODF plays a cooperating role in study design and implementation on a large, multi-disciplinary project, with most of the work left to collaborators (e.g., Trask Paired Watershed Study). Finally, ODF can perform all the steps from study design to report writing (e.g., Weikel and Kraemer, 2006). The decisions of how a study is implemented, and by whom, rests with Private Forests management, in consultation with the Monitoring Unit, ODF Executive staff, stakeholders, and the Board. In some cases, it may be directed by the Legislature, as was the case with the use of contractors in the ODF compliance audit.

4.B.6 **Check:** *Respond to study findings*

Responses to study findings by the Department and the Board vary widely, and can focus on different organizational functions. In the policy realm, findings might indicate:

- The Forest Practices Act (FPA) or rules are working as designed
- There is opportunity to relax or rescind FPA rules
- FPA rules may not meet stated objectives

Rule change decisions are ultimately the purview of the Board of Forestry and must follow the procedures and evidentiary criteria as established under statute (ORS 527.714). These same findings could also lead to an effort to address an issue via voluntary measures and an associated outreach and education campaign. No action may be necessary as well: the ODF Compliance Audit (Clements *et al.*, 2014) illustrates high compliance with many rules examined. The Audit also illuminates several rules for which there is low compliance. In response to this latter finding,

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ODF and its partners have designed training programs to increase compliance. ODF is also assessing implementation of voluntary measures, which might lead to an outreach and education program. Finally, it may be possible that study results are inconclusive, or the Board may find these results lack sufficient rigor, and therefore additional study is warranted.

4.C Staff capacity and maintaining focus on priority projects

Part of the intent of this strategy is to have a framework within which to consider new monitoring questions that arise. Sometimes, when new information arises, resources (both staff time and funding for external partners) flow towards them, and existing work gets delayed. While this may be an appropriate decision, it does not necessarily consider ramifications of altering work plans. Since the Monitoring Strategy is designed to be considered in light of the Private Forests Division fiscal year operating plans (FYOPs; Section 4.B.1), changes to the Strategy priorities will in turn affect FYOPs and other Division work priorities.

To address new monitoring questions or to change question priorities, it is recommended that the Board or other decision maker follow a structured process (Figure 4.2). They will first assess if the question is already included within the Strategy and whether it is within scope if not (see Appendix D, Figure D.2 for details). The decision maker will assess the need to immediately update the Strategy and assign a priority as needed. If the Strategy is updated, the need for immediate action and alteration of the fiscal year operating plan or Board workplan will be assessed relative to existing workload.

To help consider the workload capacity of the Monitoring Unit, it helps to understand its composition and associated capacity. As of the report publication date, the Unit has the following positions:

- Two Forest Management Technicians - 1.8 full time equivalents (FTE)
- Two Monitoring Specialists (Natural Resources Specialists 2 (NRS2)) - 2 FTEs
- One Monitoring Specialist (NRS3) - 1 FTE
- One Monitoring Coordinator (NRS4) - 1 FTE

It is important to note that the Monitoring Unit has a standing commitment to provide support to the Private Forests' annual compliance audit. This commitment may involve all or some of the following: completing audit sampling designs and selection draws (from E-Notification or other databases), assisting or leading in the development of field protocols, assisting or leading quality

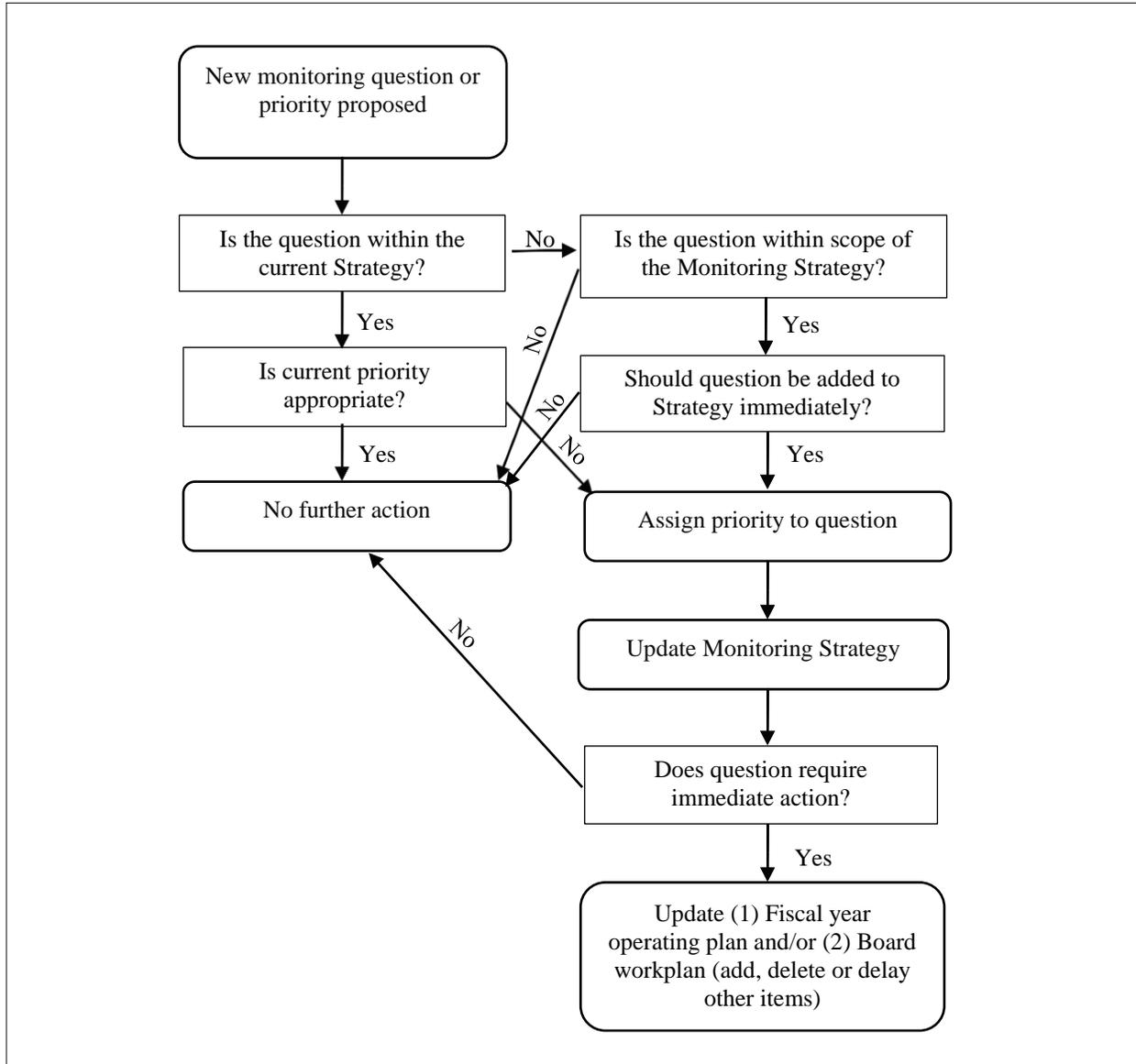


Figure 4.2 Addressing new topics in context of the Monitoring Strategy

assurance/quality control field checks, audit data analysis and report development. Considering this ongoing workload and past monitoring projects and staffing levels, it is estimated that the monitoring team could accommodate the following additional workload without more resources:

- One (1) large project (e.g., Multi-year, multi-question effectiveness study with a complex field protocol, multiple field crews, a large sample size and complex analysis and report writing)
- Up to two (2) medium projects (e.g., 1-2 year, effectiveness or implementation study with targeted questions, one or more field crews, a moderate sample size, and a simple to moderate level of analysis and report writing)
- Up to three (3) small projects (e.g., 1 year implementation or effectiveness study with a targeted question, using existing ODF personnel or one field crew, small to moderate

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sample size, and a simple level of analysis and report writing)

Work capacity may temporarily be expanded through collaborative efforts, grants, out-sourcing, special funding, or other means.

These estimates must be tempered against other commitments in the Division FYOP. For example, in summer 2016 the monitoring unit was engaged in: completing analysis planning and implementation on one large project; implementing a survey, data analysis and reporting for one medium project; completing the update of the Monitoring Strategy (this document); and providing support to the Riparian Rule Advisory Committee. This is in addition to normal workload including but not limited to supporting the annual Compliance Audit, support of the Oregon State University Watershed Research Cooperative and the interagency Stream Team.

4.D Communicating Monitoring results

An important component of this monitoring program is the exchange of information, both internally and externally, about the Monitoring Strategy, study approaches, and study findings. This communication relies on multiple avenues of soliciting input and reporting results within our department, and to the Board, stakeholders, the public, the research community, special interest groups, and other agencies. These avenues include:

- Soliciting feedback from field staff on the Monitoring Strategy and projects, and informing them about findings.
- Engaging with stakeholders and other agencies to achieve understanding, acceptance and support of the Monitoring Strategy and program generally.
- Participating and supporting education and training programs.
- Utilizing review committees, when appropriate, to give input on various phases of monitoring studies.
- Crafting and sharing project publications or results in appropriate forms and media to maximize sharing of information with target audiences
- Updating the Board during their public meetings about studies and findings.

5. Process for Revisiting the Monitoring Strategy

This Strategy is designed to guide the Unit's work over approximately the next decade but will need to be revisited as new issues and questions arise. Mid-course corrections are anticipated to follow the process laid out in section 4.C. A full update is anticipated in approximately a decade, with the process details to be determined at that time. Such a process, however, should seek to include a wide range of internal and external sources of input and maximize transparency.

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Appendices

See Attachment 2 for the appendices (available upon request).

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