

**Information and Decisions:
Analyses, Considerations, and Department Options**

1. Introduction

The Board directed the department to provide information to assist their decision on defining one or more monitoring questions focused on riparian rule protections in eastern Oregon and Siskiyou. The Board also requested information on proposed methods and timelines to answer the questions. The department has completed various analyses that provide this information (Table 1).

Table 1. Summary of information and analyses to the Board.

<u>Title</u>	<u>Information type</u>	<u>When presented to Board of Forestry</u>
Survey	Public opinion	July 2017, January 2018
Written comments	Public opinion	January 2018
Geographic Information Systems (GIS)	Landscape	July 2017, January 2018
Voluntary Measures	Land management	July 2017, January 2018
Harvest type	Land management	January 2018
Tally of Existing Science	Science	March 2018
Study Method, Timelines, and Cost	Conceptual review approaches	January 2018
	Estimated timelines and cost by question, method	March 2018

Information in bold is described in more detail in the Sections 2 and 3 of this document.

2. Analyses: Tally of existing scientific data

Methods

To help inform the Board’s decisions regarding selecting a monitoring question and approach, we tallied the number of studies that may be directly relevant to each monitoring topic. By “directly relevant” we mean studies that help to directly answer the monitoring question. This tally provides an understanding of how much information might be useful in either a literature or systematic review, and is useful for comparing across monitoring question alternatives. It is important to note that many studies would be excluded from this tally, yet could still be useful to help refine a field study.

We started the search for these studies by using keywords (e.g., “riparian forest”) to search a database for studies that may be relevant. We also searched through websites (e.g., watershed councils, neighboring states’ monitoring programs), partner agencies’ info (e.g., for Total

Maximum Daily Load (TMDL), reports, aquatic habitat status and trend monitoring reports), and Oregon Watershed Enhancement Board's database of reports from effectiveness monitoring grants. Finally, we looked at information given to us from stakeholders.

To be included in the tally, every study or data set had to meet all 3 of the following criteria:

- **Were there relevant primary data?** The data must assess at least one topic directly linked to both the goals of the Forest Practices Act (FPA) and this scoping of riparian protections to review. These topics include: 1) water quality, 2) large wood recruitment, or, 3) desired future condition (DFC). The studies must have been conducted in a forested setting.
- **Were methods documented?** Information must include a description of methods.
- **Geography?** Data must be gathered in dry forests (e.g., not west of Cascades, other than the Siskiyou geographic region) of the following states: northern California (east of temperate rainforest, and north of the Sierra Nevadas), Oregon, Washington, and Idaho. While there is no sharp line that delineates locations of comparable forests, we selected these areas due to their adjacency to the regions of interest. The data are further divided as relevant to the Siskiyou (including the aforementioned portion of northern California, and the Siskiyou geographic region) or eastern Oregon (which includes eastern Washington and Oregon, Idaho, and the aforementioned portion of northern California).

To assess if a study warranted inclusion in this tally of potentially relevant studies, each one was skimmed starting with the title, then the abstract, and if necessary, the body of the report, and evaluated with respect to the above criteria. Pertinent information (e.g., author, title, date) for each study was entered into a spreadsheet, along with the evaluation results for inclusion or exclusion from the tally. Additionally, other notes (e.g., study location, topics covered) were documented.

Results

Almost 1400 studies were located and assessed for inclusion as potentially relevant to all of the monitoring question alternatives, with 91 studies meeting all the inclusion criteria (Table A.1, Appendix A). Water quality topics had the most potentially-relevant studies (e.g., 29 peer reviewed, versus 13 for that of large wood). Peer reviewed had the most sources (50), with TMDL the fewest (9). Finally, there were three (3) status and trend databases (water quality, fish, and aquatic and terrestrial habitat) that may be useful. The pertinence of this information relative to the monitoring question alternatives is discussed below, in subsection 3.D.2.

3. Board Decisions

3.A Items for Board decisions

The Board directed the department to work with stakeholders to propose one or more questions, and the department began with disentangling various components of the questions about which the Board will decide. These decisions are broken down as follows:

1. What are the topics to address in the monitoring question and why?
2. Where should the monitoring questions focus? The focus includes the following elements:

- a. Stream type(s) – F (Fish-bearing), N (Non-Fish), D (Domestic drinking water)
 - b. Stream size(s) – Small, Medium, Large
 - c. Geographic regions – Siskiyou, Eastern Cascade, Blue Mountains
3. What type of information (e.g., peer-reviewed journal articles, status and trend data) should we use to inform the monitoring questions?
 4. What methods and timelines will be used to answer the monitoring question?

To help the Board understand what these decisions could look like, examples of previous decisions on this list were presented to the Board in July 2017¹.

3.B Monitoring Question Alternatives

For the January 2018 Board meeting, the department developed a matrix to organize the assessment of input (i.e., the survey and written comments) from potentially interested parties. This matrix directly links this assessment to the decisions the Board will make (Appendix A, Table A.2). Staff sought to encompass the range of input from survey and written responses. This range is admittedly subjective but represents a good-faith effort of staff to share the range of public input. The Board may choose to incorporate other input.

The department developed this model monitoring question to organize the assessment of survey responses and written comments:

Conduct a study to assess the effectiveness of FPA streamside protection rule in the _____ geographic region(s) on _____ stream types and _____ stream sizes to meet the _____ purpose or goals relating to _____. Utilize research and monitoring data from _____ to inform the monitoring study.

Below is the range of monitoring questions, developed from the survey and written comments, for the Board to consider, including a no action alternative. The questions are listed in order of increasing complexity and geographic extent.

Monitoring question alternatives:

- 1) **No Action (Implementation Monitoring) Alternative:** Do not conduct a study at this time to assess the effectiveness of FPA streamside protection rules in eastern Oregon or Siskiyou geographic regions.
- 2) **Simple Survey Majority:** Conduct a study to assess the effectiveness of FPA streamside protection rules in the Blue Mountain geographic region on Type F streams and size medium streams to meet the water protection goal relating to stream temperature. Utilize research and monitoring data from peer reviewed research to inform the monitoring study.

¹ Information Analysis: Methods and Preliminary Results. Oregon Board of Forestry. July 25, 2017 Meeting. Agenda Item 7, Attachment 1. 8pp. <http://www.oregon.gov/ODF/Board/Pages/BOFMeetings.aspx>

- 3) **Siskiyou only:** Conduct a study to assess the effectiveness of FPA streamside protection rules in the Siskiyou on Type F streams and small and medium stream sizes to meet the water quality standards relating to stream temperature. Utilize research and monitoring data from peer reviewed research to inform the monitoring study.
- 4) **Domestic Water Protection Focus:** Conduct a study to assess the effectiveness of FPA streamside protection rules in the Siskiyou, East Cascade, and Blue Mountain geographic region(s) on Type Ds and all stream sizes (small, medium, large) to meet the water protection goal relating to state water quality standards. Utilize research and monitoring data from peer reviewed research to inform the monitoring study.
- 5) **Overall Survey Majority:** Conduct a study to assess the effectiveness of FPA streamside protection rules in the Siskiyou, East Cascade, and Blue Mountain geographic region(s) on Type F streams and size medium and small streams to meet the purpose and goal for healthy streamside forests² and water protection relating to stream temperature, shade, large wood recruitment, and active streamside management. Utilize research and monitoring data from peer-reviewed scientific articles, status and trend data on fish populations, streamside and fish habitat data, and voluntary measures on non-federal lands to inform the monitoring study.
- 6) **Holistic Approach:** Conduct a study to assess the effectiveness of FPA streamside protection rules in the Siskiyou, East Cascade, and Blue Mountain geographic region(s) on Type F and Type N streams and all stream sizes (small, medium, large) to meet the purpose and goal relating to water protection and healthy streamside forests relating to stream temperature, shade, large wood recruitment, and active streamside management. The response of beneficial uses (e.g., fish) should also be considered. Utilize research and monitoring data from peer-reviewed scientific articles, status and trend data on fish populations, streamside and fish habitat data, and voluntary measures on non-federal lands to inform the monitoring study.

3.C Tradeoffs for Board considerations

To select a monitoring question and approach, the Board has much information to consider including tradeoffs, and associated questions, posed between these aspects:

- Geographic extent and miles of stream – How much of the landscape does the Board want the department’s study to address?
- Number and type of harvest operations affected – clearcuts and thins likely need to be studied separately since they will affect outcomes differently.
- Number of topics investigated – Does the Board want the department to focus on a singular topic, or be more comprehensive with the analyses?
- The amount and type of evidence available for examining a monitoring question – Does the Board want to set a high standard for the department regarding the quality of the evidence (e.g., peer-reviewed literature), or be more inclusive of quality (which provides more evidence)?

² “Healthy streamside forests” is the lay term that refers to the FPA goal of desired future condition (DFC) for riparian vegetation

- Time and expense of work – the more intensive the study (particularly for field studies), the more topics and geographic regions there are, the longer it takes, the more it costs, and the higher the confidence in the results.

These tradeoffs are considered along with stakeholder input in the formulation of the monitoring question alternatives. Finally, the Board will consider the department’s options in the context of the monitoring question alternatives (see below, Section 4).

3.D Considerations for comparing monitoring question alternatives

The Board received information and updates in July 2017 and January 2018. At these meetings, the Board was provided details of how input from potentially-interested parties was collected through a survey and written comments, and how this input was used to generate a range of monitoring question alternatives. Additionally, the department quantified key forest and resource characteristics of the geographic regions, and then linked the monitoring question alternatives with these characteristics (Appendix A, Table A.3).

The following subsections characterize this information for the monitoring question alternatives. The “No Action” alternative means not conducting a study at this time and has no values in the considerations below. Additionally, these considerations are synthesized below in section 4.B, along with the department’s options discussed in section 4.A.

3.D.1 Consideration: ownership acreages, stream miles, and harvests

In the January 2018 Board material, data from GIS analyses were linked with the monitoring question alternatives (Appendix A, Table A.3). For each alternative, these data help the Board understand the extent of acreage and stream miles for private industrial and nonindustrial landowners, and the associated number and type of harvests (Figure 1).

The alternatives are ordered from left to right in increasing geographic extent and number of topics covered. The Simple Majority and Siskiyou alternatives have a similar geographic extent and topics. Domestic covers more geographic regions, although streams and harvests are essentially zero. Overall Majority and Holistic cover the same geographic regions as Domestic, but have many more streams, harvests, and topics. Holistic has the most stream miles and harvests since it includes Type N streams, and includes fish use.

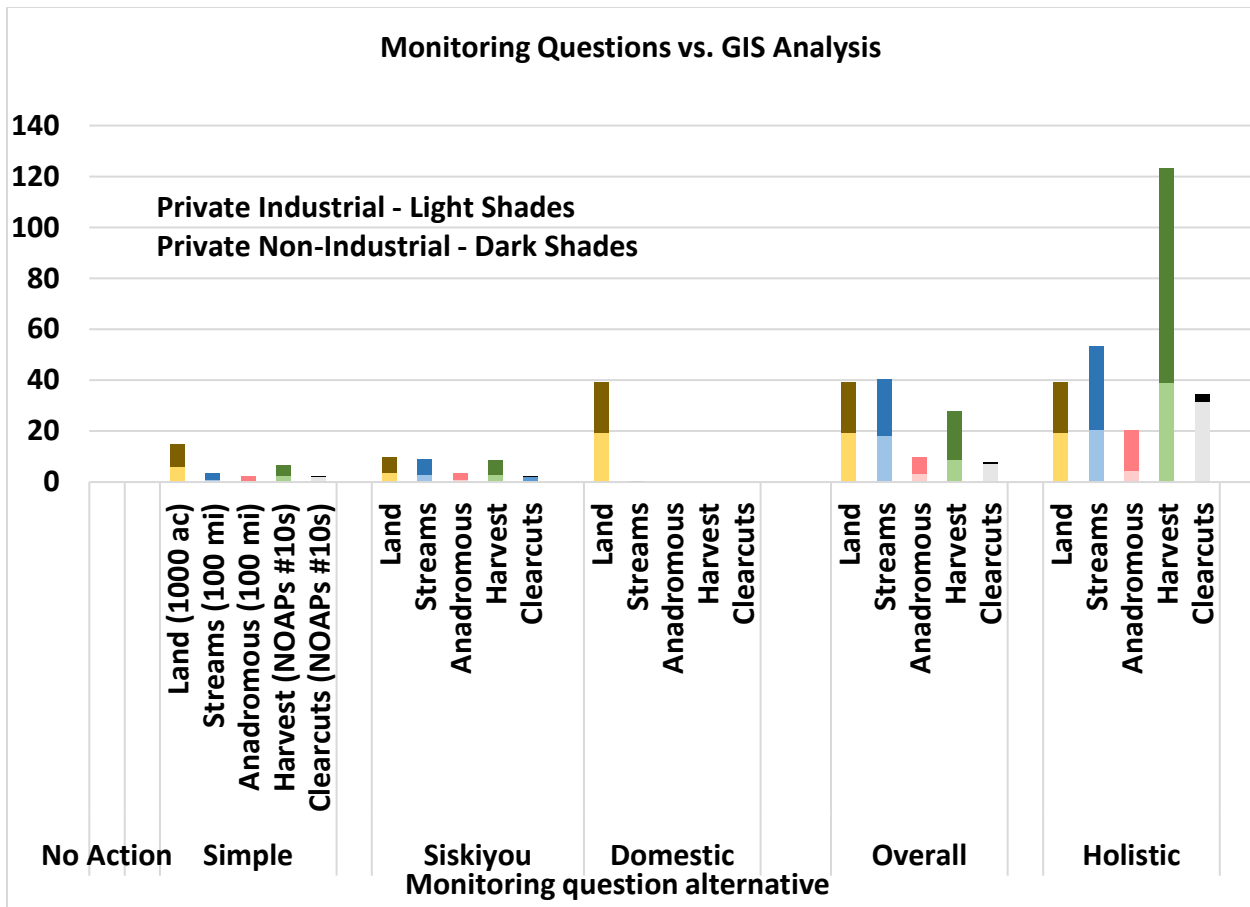


Figure 1. GIS data for the monitoring question alternatives, with the multiplier for all questions listed only under the “Simple” question. “Land” is the acres of ownership in the geographic region(s) for each question; “Streams” and “Anadromous” are the miles of applicable sizes and types of streams and streams with anadromous fish, respectively, by ownership, specific to each question; “Harvest” and “Clearcuts” are the number of each along the applicable streams sizes and types by ownership.

3.D.2 Consideration: amount of potentially-relevant studies

Each of the question alternatives has a particular set of information it suggests using (see above, subsection 3.B). Thus, the data from Table A.1 (Appendix A) are distilled to these themes, and displayed graphically in Figure 2. As with the GIS data related to the questions (Figure 1), the amount of potentially-relevant studies increase with geographic scope and number of monitoring topics (i.e., going from left to right in Figure 2). The exception to this increase is the Siskiyou question, which pulls information from a smaller geography (Siskiyou and a portion of northern California) than that of the Simple Majority since it is in the Blue Mountains (which includes information from a portion of northern California, eastern Washington and Oregon, and Idaho).

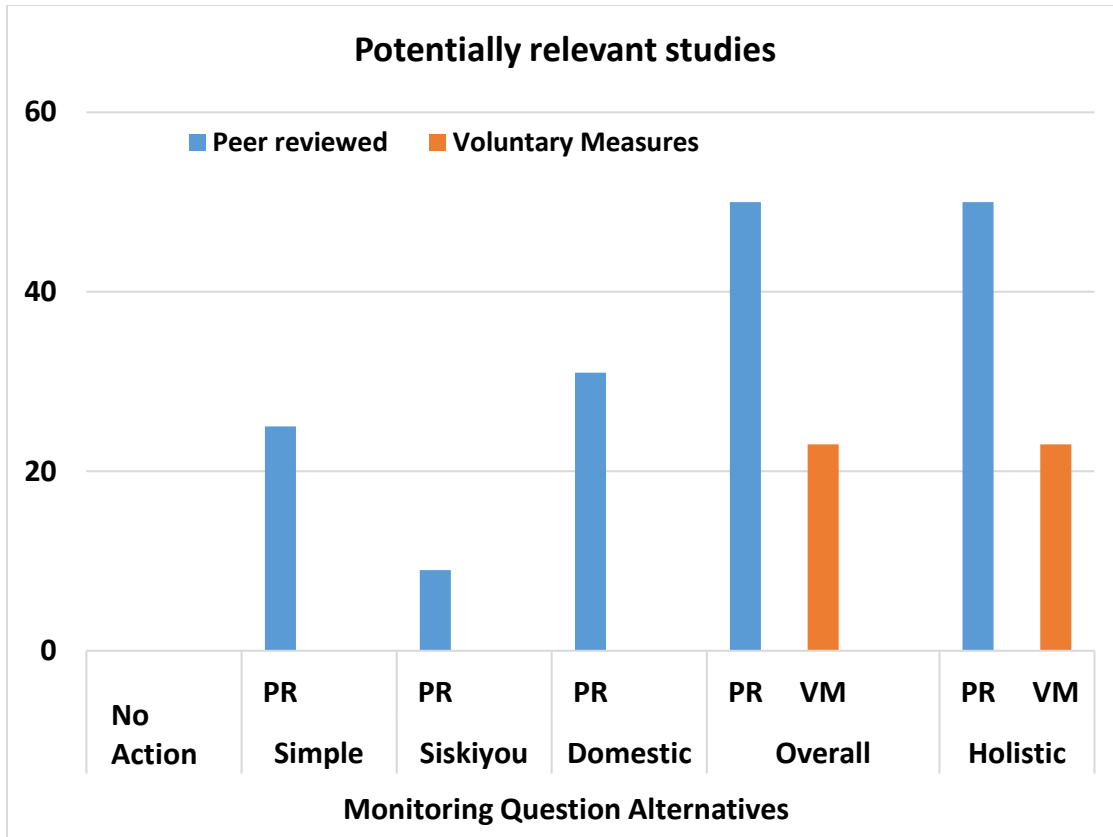


Figure 2. Number of potentially-relevant studies for each question alternative. PR – peer reviewed; VM – voluntary measures.

Based on our experience with the systematic review for the riparian rule analysis, we speculate 10-30% of these studies would provide evidence directly relevant to the respective monitoring questions.

3.D.3 Consideration: study duration and costs

In Table 3 of Attachment 1 of the January 2018 Board material, we made estimates of staff resources and times for various approaches to answering questions. We refined this information for conducting field studies of two intensities (light and intensive) for each question (Figure 3), and added cost estimates. These estimates include doing a literature review since this is an essential part of designing a field study. Staff resources remain at 1-2 full time equivalents (FTE) and 1-4 FTE for light and intensive field studies, respectively.

Increasing geographic scope and number of topics for a question increases the cost and time to complete the study. Light field studies range in cost from \$0.3 million to \$ 0.6 million, requiring an average of two to four and a half years. In contrast, intensive field studies range in cost from \$2 million to \$10 million, requiring an average of 7 to 15 years. More expensive projects would likely require the department to seek additional funding.

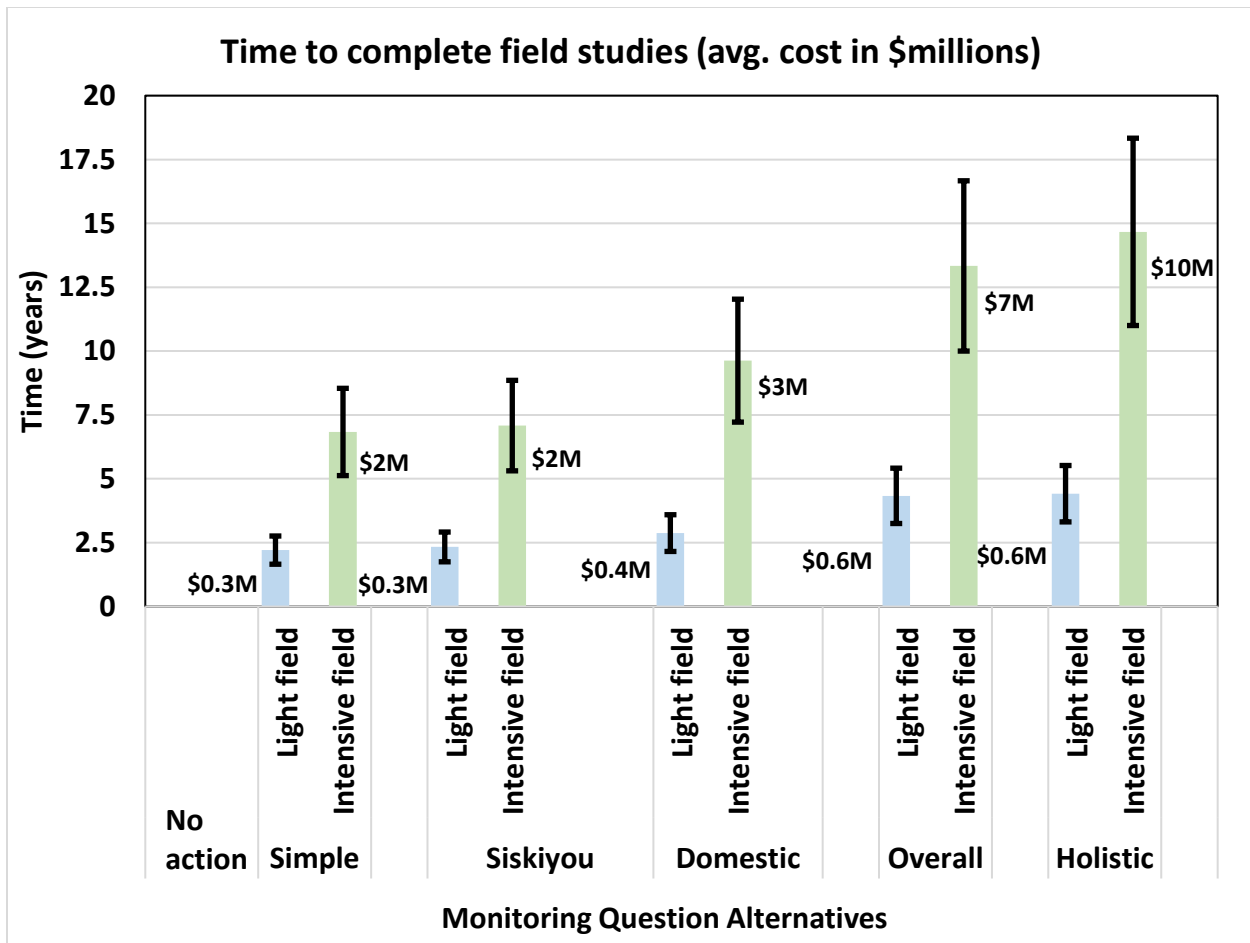


Figure 3. Estimated duration (years) and cost (\$millions) of projects for each question alternative and two different approaches (light and intensive field studies). The bars denote an estimated range of +/- 25% for duration. Estimated average costs (in \$Millions) of projects are listed next to the duration. The duration for each field study includes a literature review.

4. Department Options

The aforementioned considerations focus on monitoring question alternatives presented to the Board at the January 2018 meeting. At that meeting, several Board members requested the department make a recommendation about which course to pursue. Given this request, we used our established methods for deciding on which monitoring question to pursue. First, we used the Monitoring Strategy (approved by the Board in November 2016; ODF, 2016) that forms a central, organizing framework for deciding on the work of the Monitoring Unit (i.e., the group that will implement the Board’s decisions on monitoring of riparian protections). Preference is given to high-priority questions from the Strategy to determine new projects. Another aspect of deciding on new projects is the Unit staff capacity, described in the Strategy, as the ability to undertake one large, or two medium, or three small projects. Finally, we note that the Strategy is a living document that is revisited as new issues arise, with a structured process to consider addressing them (p. 27, Section 4.C of the Strategy). This process resulted in the following options:

Option 1 – Implementation Monitoring Alternative: *Rely on adopted monitoring strategy for prioritizing department monitoring actions. Do not conduct a study to assess the effectiveness of FPA streamside protection rules in the eastern Oregon and Siskiyou geographic region(s) at this time.*

This option is based on the direction in which we were headed in November 2016, and which we communicated to the Board at that time. It represents the right mix of project sizes and complexity relative to available resources. It entails:

- Completing RipStream analyses on large wood and DFC. This project is entering its 15th year of work. Work on stream temperature and shade has been completed. The remaining work on riparian vegetation and large wood recruitment in relation to outcomes described as the Desired Future Condition will take approximately two staff members a year to complete.
- Designing and implementing a significant expansion of the compliance audit on high priority implementation topics from the Strategy. This will take 1-2 staff members approximately 18 months to develop and test a field protocol, and hire a contractor. The current 5-year contract expires in March 2018.
- Continuing the Unit's ongoing, core business (e.g., managing the contract for the existing compliance audit, coordinating monitoring with partner agencies), which requires 1-2 staff members.

After we complete the first two bullet points, we would then implement some form of an eastern Oregon -Siskiyou monitoring study.

Option 2 – Modified Siskiyou Alternative: *Conduct a study to assess the effectiveness of FPA streamside protection rules in the Siskiyou on Type F stream types and size medium and small streams to meet the purpose and goal for healthy streamside forests (desired future condition) and water protection relating to stream temperature and shade. Utilize research and monitoring data from peer-reviewed scientific articles, unpublished “gray” or “white” literature, TMDL analyses by ODEQ, watershed council data or analyses, status and trend data on fish populations, streamside and fish habitat data, and voluntary measures on non-federal lands to inform the monitoring study. Begin with a review of this literature.*

This option strikes a balance between Board direction to monitor the effectiveness of riparian protections in eastern Oregon and Siskiyou, input from stakeholders, and department priorities and resources. Following this option requires us to delay the significant expansion of the compliance audit outlined in Option 1, but accommodates continued workload on RipStream, and a small expansion of the compliance audit (i.e., a small body of rules with a simple or existing field protocol). It also makes efficient use of existing science and monitoring information by starting with a literature review. The literature review (or, systematic review if sufficient, high-quality evidence exists) will inform the direction and scope of any future work. Note that new analysis of raw data sets is out of scope, unless an efficient and relevant analysis could be completed in a timely fashion.

We feel this approach addresses the Board’s concern about making progress on a perceived gap in riparian review work in the geographic regions that were not included in the riparian rule analysis completed in November 2015. Additionally, it addresses most components of this high-priority effectiveness question from the Monitoring Strategy:

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?

This option also addresses key stakeholder concerns about water quality (stream temperature) and healthy forests (i.e., achieving DFC with active management), and contains the context relative to potential impacts to fish. Regarding this last point, implicit in the assumptions of the FPA is that by meeting the goals of water quality, aquatic habitat, and the riparian vegetation desired future condition, fish use will be adequately addressed. We therefore will not directly address the impact of forest practices on fish use. However, we propose to collaborate with appropriate partner agencies (e.g., ODFW) to characterize fish status and trend in the Siskiyou geographic region, and thereby provide the context of fish use.

It would take the department approximately 1 year to complete the literature review. As described in Section 4.B.6 (“Respond to Study Findings”) of the 2016 Monitoring Strategy, the Board would use the results of the review to decide if:

- The FPA or rules are working as designed
- FPA rules may not meet stated objectives
- Additional study is warranted
- No action is needed

4.B Linking the considerations and department options

To aid the Board’s decision-making process, we synthesize the options discussed in the previous section with the considerations (GIS data, the tally of potentially-relevant studies, and time and cost to complete a study) used to compare the monitoring question alternatives, discussed in sections 3.D.1 through 3.D.3 (Figure 4).

Option 1 (Implementation Monitoring) is the lower left hand corner of Figure 4 (i.e., zero for all considerations of conducting an effectiveness monitoring study in eastern Oregon and/or Siskiyou). Staff time under this Option would be re-allocated, and thus would have a similar space on this chart as Option 2.

Option 2 (Modified Siskiyou) is approximately between that of the Siskiyou and Domestic questions. It has the same geographic region, stream miles, and number of harvests as the Siskiyou question. However, this option includes more study types to assess, and it has slightly more potentially relevant studies (19 for stream temperature, 20 for DFC) than Domestic. Finally, since it includes assessing riparian vegetation, its number of topics is more than Siskiyou or Domestic, which also increases its time and expense.

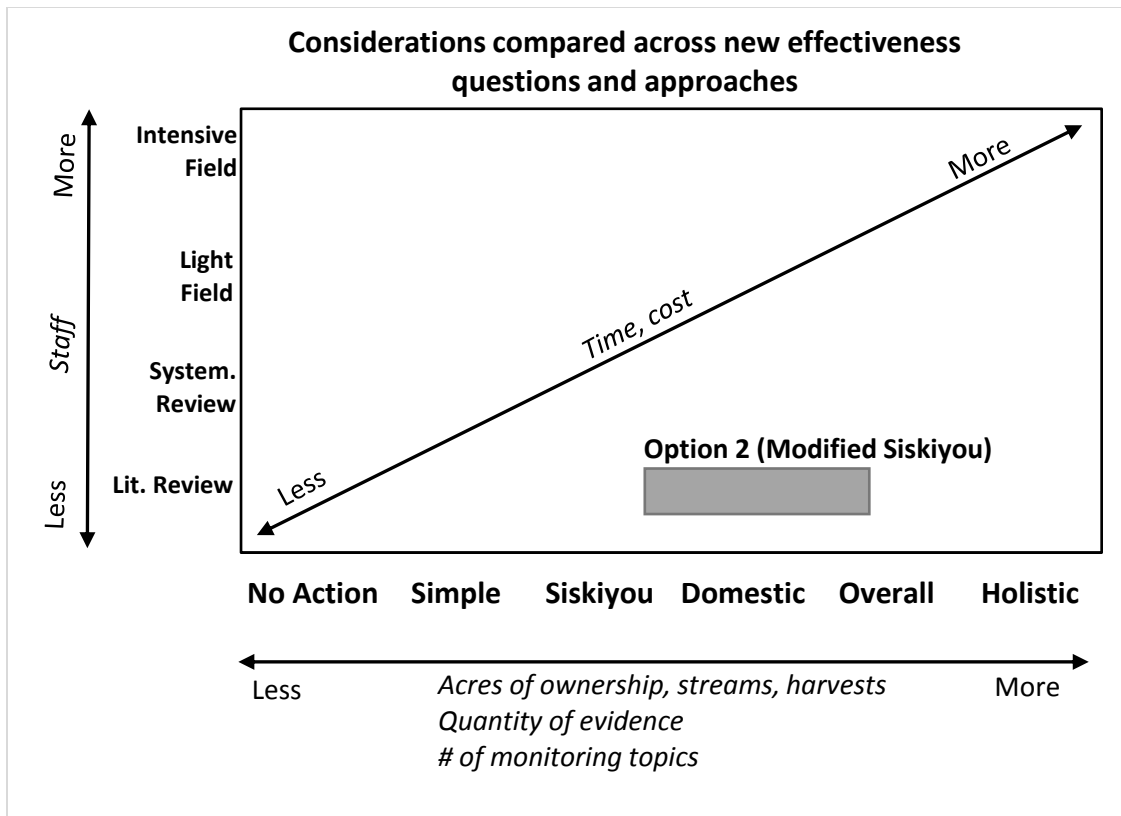


Figure 4. Conceptual comparison of the considerations relative to the Board decisions of study approach (plotted along the y-axis) and monitoring question (plotted along the x-axis). The considerations are: 1) the amount of staff required to do the work (y-axis); 2) GIS data (acres of ownership, stream miles, and number of harvests), quantity of evidence, and number of monitoring topics (x-axis); and, 3) the amount of time and cost for the combination of monitoring question and approach (diagonal arrow within the chart). ODF Option 1 is the Implementation Monitoring in the lower left corner of the chart. Placement of ODF Option 2 is represented by the gray box.

5. Conclusion

This attachment provides the Board with information and considerations to make a decision on which, if any, monitoring question to address in eastern Oregon and/or Siskiyou geographic regions, along with an approach to addressing it. The Board’s decisions are specified in section 3.A, with a set of monitoring question alternatives, developed from input by interested parties, described in section 3.B. Tradeoffs in considering which question to choose are outlined in section 3.C, and in section 3.D the questions are compared through the perspectives of the amount of landscape impacted, the amount of evidence available to inform a question, and the time and expense for completing a study. Finally, the department’s options, and their comparisons with the considerations of monitoring question alternatives, are described in section 4.

6. References

Oregon Department of Forestry. 2016. Update of Private Forests Monitoring Strategy. November, 2016.

Appendix A. Supplemental Information

Table A.1. Tally of scientific information potentially relevant to monitoring questions.

Information type	Included studies				Total number of studies ² (Sisk./E.OR/both ¹)	Total number considered
	Monitoring topic (Sisk./E.OR/both ¹)					
	1. Water quality-Stream temp./Shade	2. Water Quality-Other	3. Large Wood	4. Desired Future Conditions		
Peer-reviewed studies ³	5/21/4	0/5/1	1/9/3	8/13/7	10/30/10	1206
Gray literature ⁴	1/3/1	0/0/0	1/1/1	1/3/1	1/4/1	14
Status and trend databases ⁵	0/0/3	0/0/3	0/0/3	0/0/3	0/0/3	3
TMDL ⁶ analyses by ODEQ	1/8/0	0/5/0	0/0/0	1/6/0	1/8/0	9
Voluntary measures ⁷	7/12/0	7/11/0	2/4/0	2/2/0	7/16/0	138

¹ The first number is the number of studies relevant to Siskiyou only, the second number are those for eastern Oregon only, and the third number applies to both areas.

² Note that many studies addressed more than one monitoring topic.

³ Journal articles and theses

⁴ Unpublished studies and government reports

⁵ Oregon Department of Environmental Quality (ODEQ) water quality monitoring, Oregon Department of Fish and Wildlife (ODFW) aquatic habitat/large wood and fish

⁶ TMDL – Total Maximum Daily Load

⁷ Oregon Watershed Enhancement Board (OWEB) monitoring grants, watershed council data

Table A.2. Proposed decision matrix linking monitoring question elements to a range of public input or responses, a Board decision, and finally the construction of a monitoring question, scientific data sources, and other guiding elements, considerations, or direction.³

Monitoring Question Element	Survey Options/Written Responses	Range of Survey/Written Responses	Board Decision	Model Question <i>Conduct a study to assess the effectiveness of Forest Practice Act streamside protection rules.....</i>
Where (geographic regions)	Siskiyou; Blue Mountains; East Cascades; Other (written)	<ul style="list-style-type: none"> Blue Mountains only (Simple survey majority) Siskiyou and/or East Cascade (2nd survey priorities) All geographic regions 	Select one or more geographic regions	<i>....in the _____ geographic region(s)....</i>
Where (stream type)	Fish Non-fish Domestic	<ul style="list-style-type: none"> Fish streams (1st survey priority) Domestic streams (2nd survey priority) Non-Fish streams (3rd survey priority, Written "Top Down" approach) All Stream Types (Written, "holistic" approach) 	Select one or more stream types	<i>...on _____ stream types....</i>
Where (stream size)	Large Medium Small	<ul style="list-style-type: none"> Medium (1st survey priority, simple survey majority) Medium and/or Small (Top 2 priorities, written "Top Down" approach) Large (3rd survey priority) All stream sizes (Written, "holistic" approach) 	Select one or more stream sizes	<i>....and _____ stream sizes....</i>
What (streamside protection rule purpose, goals)	Water Quality Fish Habitat Wildlife Habitat Healthy Streamside Forests	<ul style="list-style-type: none"> Water quality (Simple survey priority) Water Quality and/or Healthy Streamside Forests (Top 2 survey priorities) Fish Habitat (2nd survey priority) All purposes and goals (Written "holistic" approach) 	Select what to focus on	<i>....to meet the _____ purpose or goals....</i>
Why to focus on the streamside protection rule purpose, goals	Stream Temperature; Other Water Quality Topics; Conifer Retention; Active Streamside Forest Mgt; Other Healthy Forests Topics; Large Wood Recruitment; Shade; Other Fish Habitat Topics; Snags; Maint. Tree Spp. And Sizes; Other Wildlife Habitat Topics; Other Topics (generally)	<ul style="list-style-type: none"> Stream Temperature (Simple survey majority) Stream Temperature and/or Shade (Top 2 survey majorities) Large wood recruitment and/or active streamside management (2nd survey priorities) All (Written "holistic" approach) 	Select why to focus on the above purpose or goals	<i>....relating to _____.</i>
Using what kind of data to inform the study	Published, peer-reviewed; Unpublished (gray/white); Status/trend fish data; TMDLs Riparian/aquatic habitat data; Voluntary measures data; Watershed Council data; Other data	<ul style="list-style-type: none"> Peer-reviewed scientific articles (Simple survey majority) Peer-reviewed scientific articles; status and trend data on fish populations; streamside and fish habitat data; voluntary measures on non-federal lands (Top survey majorities) White/gray papers; Total Maximum Daily Load (TMDL) analyses; watershed council analyses (Second survey majorities) Additional written responses: Soil and Water Conservation District data, Tribal data, federal agency data 	Select the data types to be used as a foundation for a monitoring study	<i>Utilize research and monitoring data from _____ to inform the monitoring study.</i>
Other Decision Elements, Considerations	Open text responses (survey, written input)	<ul style="list-style-type: none"> Conduct a study (field or literature review) that takes a holistic approach, considering beneficial uses and functions across entire watersheds and stream networks Exercise caution in extrapolating research, data between geographic regions Prioritize measurable, water quality objectives over unspecified fish habitat/fish response objectives Prioritize inclusion of fish response and an overall holistic approach across stream types, sizes, and riparian, aquatic functions, over narrow topics and parameters such as water quality and stream temperature Study designs should consider ownership types, ecological, vegetative site productivity, hydrologic, geologic, other land use, land use history variability, rigor in establishing control comparisons Expedite completion of literature review, collection of field data Do not expedite completion of literature review, collection of field data Expedite increasing streamside protection standards in Siskiyou, Eastern Oregon No need to expedite the increase or review stream protection standards in Siskiyou, Eastern Oregon 	Select additional decision elements, considerations	<i>[Make alternate decision, modify monitoring question, or otherwise provide direction to the Department]</i>

³ Information and Decision-support tools. Oregon Board of Forestry. January 3, 2018 Meeting. Agenda Item 9, Attachment 1. 24 pp. <http://www.oregon.gov/ODF/Board/Pages/BOFMeetings.aspx>

Table A.3. Linking monitoring questions with GIS and other information. (NOAPs) Notification of Operation and/or Application for a Permit to use Fire or Power-Drive Machinery – data from 2015 and 2016; Oregon Plan for Salmon and Watersheds Voluntary Measures – data from 1995 through 2014. FPA stream Types and sizes - (S) small, (M) medium, (L) large streams; (F) fish, (N) non-fish, (D) domestic streams; Anadromous – Stream miles with anadromous fish distribution; Industrial, non-industrial, State land ownership; studies – (PR) peer-reviewed, (VM) voluntary measures, (DB) databases [fish population, riparian and aquatic habitat] .

Question Theme	Geographic Region (ac)	Acres in Geographic Region(s) (% Industrial /Non-Industrial/ <i>State</i>)	Voluntary Measures (# reported)	FPA Stream Type(s)/ Stream Size(s), Anadromous	Total Stream Miles (% Industrial /Non-Industrial/ <i>State</i>)	# Harvest NOAPs intersecting applicable stream types and sizes	% of NOAPs that are clearcuts (of clearcuts: % Industrial /Non-Industrial/ <i>State</i>)	Number of potentially-relevant studies PR (VM/DB)
No action	NA	NA	NA	NA	NA	NA	NA	NA
Simple Majority	Blue Mountain	1,499,844 (39 /59/1)	237	F/M Anadromous	346 (27 /71/2) 246 (32 /66/2)	64	36 (97 /3/0)	25
Majority	Blue Mountain East Cascade Siskiyou	3,991,282 (49 /49/2)	782	F/M, S Anadromous	4,087 (44 /54/2) 992 (32 /67/2)	276	28 (92 /7/1)	50 (23/3)
Domestic	Blue Mountain East Cascade Siskiyou	3,991,282 (49 /49/2)	782	D/L, M, S Anadromous	5 (32 /68/0) NA	0	NA	31
Holistic	Blue Mountain East Cascade Siskiyou	3,991,282 (49 /49/2)	782	F/L, M, S N/L, M, S Anadromous	5,434 (38 /60/2) 14,578 (39 /60/2) 2,103 (22 /76/3)	361 872	28 (92 /7/1)	50 (23/3)
Siskiyou	Siskiyou	1,001,491 (39 /61/1)	409	F/M, S Anadromous	872 (32 /68/0) 336 (21 /79/0)	85	29 (93 /7/1)	9