Independent Science Reviews for Natural Resources in the State of Oregon

SB202 Task Force for Independent Science Reviews for Natural Resources
Institute for Natural Resources

FINAL REPORT

for the Oregon State Legislature
SB202 Task Force

15 September 2016

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SB202 Task Force (in alphabetical order)

Allison Aldous, Jennifer Allen, Adell Amos, Barbara Bond, Tim Deboodt, Dan Edge, Linda George, Sara Gray, Michael Harte, Cassandra Moseley, Maryanne Reiter, Mark Sytsma, Jason Younker

Staffed by

Jeff Behan and Sarah Brennan

THE INSTITUTE FOR NATURAL RESOURCES

Created by the Oregon Legislature through the 2001 Oregon Sustainability Act, the Institute for Natural Resources' mission is to provide access to integrated knowledge and information to inform natural resource decision making and develop solutions in the context of sustainability. The Institute for Natural Resources is an Oregon public universities institute located at Oregon State University and Portland State University.

INSTITUTE FOR NATURAL RESOURCES

OREGON STATE UNIVERSITY (headquarters)
234 Strand Hall, Corvallis, Oregon 97331

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For more information about this report please contact the Institute for Natural Resources, lisa.gaines@oregonstate.edu.

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Disclaimer

This final report is submitted to the Oregon State Legislature as a final requirement of Senate Bill 202.

The contents of this report reflect the views of the SB202 Task Force who are solely responsible for the facts and accuracy of the material presented. This report does not constitute a standard, specification, or regulation.

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Abbreviations and Acronyms

IMST	Independent Multidisciplinary Science Team
INR	Institute for Natural Resources
ISAB	Independent Science Advisory Board
ISR	Independent Science Review
NOAA	National Oceanic and Atmospheric Administration
SB202	Senate Bill 202

Executive Summary

Through Senate Bill 202 (SB202), the Oregon Legislature established the Task Force on Independent Scientific Reviews for Natural Resources to evaluate and assess the need for independent science reviews (ISRs) in Oregon and to make recommendations to the Governor and appropriate legislative committees no later than September 15, 2016. SB202 specifically charged the Task Force to: (1) assess the need for ISRs in Oregon; (2) make recommendations on one or more entities that are best situated to conduct or coordinate ISRs, if the Task Force determines that there is a need for ISRs in the state; (3) make recommendations on whether the entities identified would need legislative authority to act as ISR bodies for Oregon; and, (4) make recommendations regarding the structure and function of the process to be used by the recommended entities in the course of the ISRs.

Over a nine-month period the Task Force met six times, with extensive communication between meetings and provided numerous opportunities for public input. To inform discussions of the Task Force, staff from the Institute for Natural Resources were asked to conduct a literature review and conduct interviews with state natural resource agency staff, policy makers, and key stakeholders.

Based on the literature review, interviews, and public comments, the Task Force identified both benefits and risks associated with ISRs. The primary conclusion reached by the Task Force was that Oregon would benefit from ISRs, but in order for the benefits to outweigh the risks, Oregon's ISR process must be properly supported, questions rigorously vetted, review panels carefully selected and a transparent, systematic process for conducting reviews must be followed. Task Force found that:

- Oregon's natural resources agencies, legislators, and the public would benefit from independent science reviews. However, for an ISR to benefit the State the reviews need to be appropriately focused, and carried out in a deliberate, transparent manner consistent with the findings in this report. In short, "how" a review is constructed and conducted is important to achieving the full potential benefit.
- Most single-agency science reviews can be met with existing state, federal, and academic resources, but review practices and capacity for conducting reviews vary considerably among agencies.
- There is a need for independent science review of complex, multi-disciplinary issues in natural resources that span multiple agencies and are relevant to stakeholders and lawmakers, as well as managers. Existing resources are not adequate for these types of reviews.
- Independent science review mechanisms and structures that are being used for natural resources policy in other states and at the federal level can inform a process for independent science reviews in Oregon, but the state's need to reduce the potential risks of ISRs requires a tailored approach that draws on lessons learned from other ISR structures.

Based on these findings, the Task Force offers four recommendations:

- Create a robust, appropriately-resourced ISR process for natural resources in Oregon that focuses on the most urgent need: complex, multi-disciplinary, and controversial issues;
- Create a new entity, the Oregon ISR Board, and ad hoc review-specific science panels, both of which would be supported by an ISR Secretariat hosted in an existing Oregon entity;
- Oregon's ISR process should have legislative authority; and,
- Oregon's ISR process for natural resources should primarily focus on complex, multi-agency, interdisciplinary science issues that are of importance to the State of Oregon. We recommend a cost-effective, useful, and nimble structure that will require sufficient base funding from the State in order to ensure integrity, transparency and inclusiveness.

The Task Force recommends that Oregon's ISR process, detailed in the report, must be adequately funded to minimize/avoid the risks, and maximize the important benefits of ISRs. Adequately funding institutional capacity for ISRs in Oregon would streamline the process and free the legislature and natural resource agencies from having to re-establish this capacity every time ISR is needed. It would help maintain institutional knowledge regarding how to conduct ISR efficiently and effectively, and promote greater consistency in ISR services and products. Experience gained with best practices and maintaining independence in conducting ISRs could also help minimize potential interest group agenda-setting in review processes and outcomes. Independent science panel reviews may be the most visible ISR products, but institutional capacity for ISR in Oregon would also facilitate other ISR services, including informal or formal consultations between agencies or legislative bodies and science experts, workshops, or commissioned knowledge synthesis white papers.

As our state's population and economy expand and diversify, management of Oregon's remarkable endowment of natural resources is becoming increasingly complex and controversial. The Task Force acknowledges that while scientific evidence plays a critical role, it is not the sole factor in natural resource decisions, which also must incorporate practical management considerations and social values. However, the Task Force also believes that social and environmental costs and impacts of poorly-informed natural resource policies can be mitigated by bringing the best available relevant science to bear via rigorous, systematic review and synthesis, and timely presentation of findings in manager-friendly formats. A properly-funded, robust capacity for ISRs in Oregon would play a key role in this. Fiscal information can be found in the report and in the appendices.

Activities of the Task Force were supported by the Institute for Natural Resources at Oregon State University, and a professional facilitator, Jane Barth, who assisted with meeting and task management.

Copies of the report may be obtained by sending an email to lisa.gaines@oregonstate.edu or calling 541.737.9918. An electronic copy is also available at http://inr.oregonstate.edu/sb202/deliverables.

1. Introduction

Through Senate Bill 202 (Appendix A), the Oregon Legislature established the Task Force on Independent Scientific Reviews for Natural Resources to evaluate and assess the need for independent science reviews (ISRs) in Oregon and to make recommendations to the Governor and appropriate legislative committees no later than September 15, 2016. Senate Bill 202 (SB202) specifically charged the Task Force to:

- assess the need for independent science review in Oregon;
- make recommendations on one or more entities that are best situated to conduct or coordinate independent science reviews, if the Task Force determines that there is a need for independent science review in the state;
- make recommendations on whether the entities identified would need legislative authority to act as independent science review bodies for Oregon; and,
- make recommendations regarding the structure and function of the process to be used by the recommended entities in the course of the independent science reviews.

Purpose and Organization of the Report

In fulfillment of SB202, the purpose of this report is to describe and highlight the findings and recommendations of the Task Force. Section 2 provides an overview of the Task Force's approach to accomplishing its work. Section 3 describes the Task Force's findings based on a literature review; interviews and/or online questionnaires with natural resource agencies, policy makers, and key stakeholders; and, the Task Force's deliberations. Recommendations are presented in Section 4. The appendices provide the background documents, making the work of the Task Force more transparent.

2. Approach

Task Force Structure

The Governor, in consultation with the Vice Presidents of Research at Oregon State University, Portland State University, and the University of Oregon (the "Oregon Universities"), appointed Task Force members (Appendix B) in December 2015. The 13-member Task Force represented forestry, agriculture, manufacturing, conservation, academic and research sectors, and the Oregon Universities. One member previously served on the Independent Multidisciplinary Science Team (IMST) and at least two other members have served on other state or federal science review bodies. The Task Force's work was supported by staff from the Institute for Natural Resources, a professional facilitator, and the Governor's Office.

Process

The Task Force conducted its work over six meetings with extensive communication between meetings. Meetings were held in Corvallis and by webinar (December 2015), Portland (February 2016), Salem (March 2016), Eugene (May 2016), Prineville (July 2016), and via webinar (August 2016). Meeting times, locations, and agendas were shared broadly in advance by the Institute for Natural Resources through the Task Force website (http://inr.oregonstate.edu/sb202), the Oregon Public Calendar, and direct email to key stakeholders on the Task Force's outreach contact list. Public comment periods were part of all meetings.

At the February 2016 meeting, the Task Force adopted the *Legislative Task Force Staffing Guide*'s proposed rules with several additions, and developed and adopted a *Task Force Roles and Expectation*s document (Appendix C).

Framing the Work of the Task Force

SB202 defined four areas (goals) of work for the Task Force. The Task Force divided these goals into two phases. The aim of *Phase 1* was to determine whether there is a need for ISRs in Oregon. If the Task Force found that ISRs were needed, then work would proceed through the second phase. In *Phase 2* the Task Force was asked to make recommendations on the entity(ies) best suited to coordinate the ISR process, whether legislative authority would be needed, and how an Oregon ISR should be designed.

Fundamental to the Task Force's work was developing working definitions of key terms and tracking its work. The Task Force developed working definitions (Appendix D) in order to facilitate common understanding. Adapted from the British Science Council, the Task Force defined the most common term, science, as *"the pursuit of knowledge and understanding of the natural and social world following systematic evidence and methodology"* (adapted from the British Science Council, 2016). The Task Force also used a crosswalk (Appendix E) to address and track its work and findings with respect to these phases and the related goals and tasks defined in SB202.

Phase I – Assess need for independent science review. Evaluate and determine:

- whether or not natural resources agencies, legislators and the public would benefit from independent science review;
- whether or not existing resources for conducting reviews are meeting the needs of natural resource agencies and other policymakers; and,
- the mechanisms and structures being used in other states and at the federal level for independent science reviews in natural resources.

If yes, then move to the second phase
Phase II – Recommend:

- the entity or entities best situated to coordinate or conduct independent science reviews;
- the need for legislative authority; and,
- the structure and function of the review process.

Figure 1. Framing the work of the Task Force.

Information Gathering Methods

The Task Force directed staff from the Institute for Natural Resources to help gather information in support of its work through a literature review and through interviews.

Literature Review

The Task Force asked the Institute for Natural Resources to conduct a literature review and report back to the Task Force regarding the potential benefits and risks of ISRs for natural resource issues and policies. The Task Force then reviewed and assessed the results of the literature review as part of its discussions and deliberations regarding its phase one findings. To meet timelines, the review was tightly focused and systematic rather than broad and comprehensive. Review questions, search terms, databases, literature inclusion criteria, and methods for extracting and synthesizing relevant content were documented in a review protocol (Appendix F). "Relevant" content from the literature – defined as explicit discussion of ISRs benefits or risks – was extracted and categorized, with summary descriptions for each category. The terms *independent science review*, *external scientific review*, *independent peer review*, *external peer review*, and *regulatory peer review* were treated as synonymous, as appropriate.

> Science. The pursuit of knowledge and understanding of the natural and social world following systematic evidence and methodology (Adapted from the British Science Council, 2016).

Interviews

Institute for Natural Resources' staff conducted interviews with state natural resource agency directors and/or key staff. The purpose of the state natural resource agency interviews was to understand the agencies' science review processes and their need for ISRs; to learn if and how existing state, federal and academic resources are meeting agencies' science review needs; and, to gain insights about the advantages and disadvantages of ISRs. Agencies were also asked how a potential ISR function, structure, and process should be designed. Similarly, the Institute for Natural Resources was asked to conduct interviews with key stakeholders. To reach more key stakeholders, an online questionnaire was offered in addition to the interviews. Questions asked of key stakeholders were similar to those asked of the state natural resources agencies. Fifty-six organizations (Appendix G) were contacted to participate in the interviews or to complete the online questionnaire. Interviews lasted 45-60 minutes.

Outreach

The Task Force's outreach was conducted to promote awareness of the Task Force's work, and to solicit participation and input. A spreadsheet of Task Force contacts was developed and maintained throughout the project.

Promoting Awareness

Outreach materials were produced including the SB202 Task Force website (http://inr.oregonstate.edu/sb202) and an overview fact sheet. Key stakeholders were contacted via email and phone early in the process to brief them on the Task Force. Briefings were also given to the

Legislative Commission on Indian Services, the House Agriculture and Natural Resources Committee, the State-Tribal Natural Resources Working Group, and the State-Tribal Cultural Resources Cluster.

Soliciting Participation and Input

At least one week in advance of each Task Force meeting, meeting agendas and materials were posted on the Task Force website and on the Oregon Public Calendar. Key stakeholders were also sent email notifications of meetings and given access to meeting materials. Task Force meetings were conducted online and in five locations throughout the state. Public comment periods were scheduled for each meeting. In addition, two webinars were held in August 2016 to solicit input on the draft of this final report.

Through the Task Force's outreach efforts, more than 150 people representing 55 forestry, agriculture, manufacturing, and conservation sectors; tribal governments; state natural resource committees; and state natural resources agencies were made aware of the Task Force, its associated meetings and products, and were solicited for participation and input. Three sets of written comments to the draft final report were received from 13 stakeholder groups and individuals, and were discussed during the final Task Force meeting and incorporated where feasible.

3. Findings

Finding 1. Oregon's natural resources agencies, legislators, and the public would benefit from ISR. However, for an ISR to benefit the state the reviews need to be appropriately focused, and carried out in a deliberate, transparent manner consistent with the findings in this report. In short, "how" a review is constructed and conducted is important to achieving the full potential benefit.

SB202 directed the Task Force to evaluate whether natural resource agencies, state legislators, and the public would benefit from ISRs. The Task Force asked the Institute for Natural Resources to: (1) conduct a literature review and report back to the Task Force regarding the potential benefits and disadvantages of ISRs that have been identified in relevant literature; and, (2) conduct interviews with key stakeholders. The Task Force then reviewed and assessed the findings as part of its deliberations for *Phase 1*.

Literature Review

Through the literature, the benefits and risks of ISRs can be characterized by general categories. The Task Force noted that little of the literature on the subject of scientific reviews is itself evidence based, and therefore did not give more weight to any one category. The main categories of perceived benefits and risks are briefly summarized below. More detail can be found in Appendix H.

Potential Benefits

Science "quality control". ISRs can help ensure that agencies are accurately identifying and using the "best" (most current, complete, agreed upon) scientific knowledge available at the time to inform policy decisions and policy making. This sort of quality control can help identify and mitigate problems such as incomplete presentation of available information, or misinterpretation or misrepresentation of scientific findings. This, in turn, can help foster more effective policy decisions.

Increased credibility and legitimacy. ISRs can increase the credibility and legitimacy of the policy in eyes of the public, lawmakers, stakeholders and courts by helping to ensure that influences of bias or special interests are minimized with respect to questions of science and scientific data in policy making.

Cost reduction and efficiency. ISRs can help reduce costs and increase efficiency in natural resource policy making, particularly by reducing the likelihood and susceptibility of decisions to time-consuming and resource-draining political challenges or litigation.

Clarifying science and policy judgements. ISRs can improve policy by helping to clarify the line between science and policy judgments, by making policy judgments more explicit, and more clearly delineating uncertainties or risks associated with different interpretations of data or alternative management decisions.

Increased transparency. ISRs can help increase the transparency and openness of natural resource policy making by revealing the underlying facts, assumptions, and judgments involved in policy decisions and policy making based on scientific data.

Collaborative learning. Involvement of independent experts through ISR enhances collaborative, social learning about the issues, science, and policy options among agencies, scientists and the public. This collaboration can expose novel policy options, improve policy deliberations and enhance public understanding, participation and support.

Potential Risks or Disadvantages

Costs of ISRs can outweigh their benefits. Inflexibly mandating rigorous ISR could add substantial demands on limited agency staff time and funds, potentially draining resources from other important tasks. Review question(s) and the charge given to an ISR panel must be rigorously vetted, and the benefits of ISR carefully weighed against both the direct cost of doing a review and potential indirect costs to the public in terms of health and environmental effects attributable to diverted agency resources, delayed access to information, and delayed implementation of rules.

ISR procedural hurdles can dis-incentivize agencies from taking action. The prospect of ISR may become a disincentive for an agency contemplating issuing or revising regulations. Some observers call this "paralysis by analysis". If it does not help steer an agency early in the process, ISR may become an ominous hurdle for agencies to surmount, both in terms of the difficulty of undergoing that scrutiny and because of the prospect of court injunctions or decisions triggered by shortcomings or limitations in the science identified by the ISR.

ISRs can impede decision making by fueling unrealistic expectations regarding science. While scientists can and should acknowledge uncertainties where they exist, or present alternate sets of findings in a report, managers and policy makers are often obliged to make decisions in the face of uncertain or incomplete scientific evidence. The "state of the science" may be in flux or there may be knowledge gaps that have not been, or cannot be addressed to rigorous scientific standards. ISRs that simply focus on knowledge gaps without understanding that agencies must proceed with decision making in a less than perfect informational environment distract from the reality of what agency decision makers are mandated to do.

ISRs can facilitate the use of science as a proxy to argue about values. Most natural resource conflicts are caused by disagreements over values and priorities. By focusing attention (and arguments) on the science basis of agency decisions, ISRs can distract stakeholders and the public from the policy rationales and values underlying those decisions, thereby exacerbating conflict rather than alleviating it.

ISR processes may be subject to "capture" by a stakeholder group. Agencies and lawmakers (often influenced by stakeholders) may sometimes misuse ISRs to defer making a decision, to support a decision rather than as a critical outside check, or to manipulate outcomes (e.g., by selecting biased reviewers) to justify decisions that might not withstand legitimate peer scrutiny. In other cases, a stakeholder may push for and use ISR as a means to manufacture or exaggerate uncertainty, to delegitimize the agency and its decision, or fan public distrust.

Interviews and Questionnaires

Responses to the interviews and questionnaires represent 95% of agencies contacted, 25% of Tribes, and 37% of stakeholder entities, which included environmental, industry, and resource use groups. Most agency and stakeholder respondents indicated that ISRs were, or would be beneficial to their agency, and/or to Oregon citizens, but several also said there were some potential risks and drawbacks. Across all respondent groups, most respondents indicated that whether or not the state would benefit depended on the review questions addressed, and the structure and process of the ISR.

Many of the benefits and risks of ISRs noted by the respondents align with those found in the literature review.

Perceived Benefits

Benefits of ISR that were cited by respondents included the following:

Reducing perceptions of bias and improving the quality of science used to inform policy making. Some respondents stated that agency mandates, institutional perspectives, and concerns of their constituent user groups can result in perceptions that the agency's use of science is limited in scope or biased, whereas ISRs are more likely to be perceived as thorough, unbiased and focused on the public good. Respondents mentioned that ISRs can help identify errors, bias, or problems in methodology, and help ensure the use of the best available information and that the product is scientifically accurate. By improving the quality of supporting science, ISR can help an agency build stronger products and make better decisions.

Providing additional transparency, credibility and legitimacy to the policy process and product. ISRs were commonly seen as helping to increase the level of trust in science-based natural resource policies. Agency respondents consistently stated that having their work critiqued/verified via ISR increased their confidence that it was scientifically sound. Some noted that the additional transparency provided by an ISR can be a factor in fostering public support. They also felt that having independent experts review their work increased its credibility and legitimacy in the eyes of the public, legislative committees and commissions associated with their agency. As one respondent put it: *"[ISR] provides an important measure of impartiality needed for policy-makers to secure public support for otherwise divisive policy actions. It is a cornerstone of trust-building."*

Helping agencies stay abreast of current science and build relationships with experts in their field. Benefits resulting from ISR-fostered interactions and partnerships between agencies and independent experts were also consistently cited. These interactions enabled agency staff get updated on the latest and best available science in their field, hear fresh perspectives and learn about novel solutions, and build and maintain relationships with outside experts, which in turn helps agencies understand what is likely to be most effective when shaping natural resource policies.

Fostering a more holistic understanding of natural resource management challenges. Despite the complexity of ecosystems (multiple species and processes interacting at multiple levels) many decision-making natural resource agencies and local governments have a "specialization" focus that does not always (or cannot) factor in broader consequences of actions. Capacity for ISR is one tool for addressing such emerging issues, and helping identify solutions. In the words of one respondent: *"We are coming to realize how complex our natural resource ecosystems are and how limited our understanding is of the consequences of our actions on the resources. The controversies are there for those willing to look. Do we wait for the public to discover these? Or do we take a proactive and rigorous approach to addressing these areas of concern with a professional, scientific and importantly, 'independent' group to help us analyze the difficult choices and decisions we know we will have to make in the future?"*

Perceived Risks and Disadvantages

Overall, respondents were more supportive of ISR than not, but they also mentioned some risks and disadvantages of ISRs:

Impacts on agency resources; potential to delay access to information and getting the decision made. Respondents stated that while agencies tend to operate under relatively short timelines and/or are given short notice to deliver products, ISRs tend to take considerably longer, which can slow down decision making and impede timely public access to important information. Additionally, agencies often do not have the funds to pay for external reviews. Getting a good, well-scoped project and product for the money and having experts available when they are needed is difficult. If the review process is not well planned, it can become a workload issue for agency staff.

Questionable relevance to management and feasibility of recommendations. Some respondents mentioned that while reviews can come back with great recommendations, some may not be practical and/or do not take into account their management implications. Reviews can make recommendations that are beyond an agency's mandate or its capacity in terms of human and financial resources. In some cases, reviews have made recommendations that need legislative approval to implement. Reviews also

have tended to focus strictly on the natural sciences and do not incorporate social science aspects of the policy. Agency policy decisions typically seek to balance competing societal needs and values while incorporating relevant science.

Potential for the review to not be truly independent, or to impede scientifically valid policies. Some respondents expressed skepticism that any review could be completely independent of political influences. One stated that ISRs seemed to mainly serve as political cover for agencies to promulgate unpopular policies. Others expressed concern that some ISRs might be "agenda-driven" by particular interests, with the potential to derail thoughtfully and accurately designed resource management programs. Another noted that *"External science reviews do not always eliminate the dueling science often used by stakeholders to try to sway the public policy decision in their favor. Public policy decisions involve the weighing of values, given scientific information and uncertainty. Stakeholders may use science as a surrogate for value discussions."*

Challenges in finding suitable reviewers and framing the review question(s). Respondents also stated that in some cases, with Oregon's relatively small natural resources community, it can be difficult to find qualified experts who are not already involved with an agency. In other cases, panel members may not always be suited to review the science that is put before them. And, hiring truly independent scientists that have the skill and knowledge to make the recommendations in particular disciplines can be expensive. Additional challenges mentioned by respondents include knowing at what point to bring in an external review, and framing the review question(s) in order to get appropriate feedback relevant to the actual issue at hand.

Independent Science Review (ISR), as defined by the Task Force, is an external assessment of a stated scientific question or issue that:

- produces unbiased conclusions regarding the current understanding ofrelevant information, methodology and assumptions relating to that scientific question or issue;
- includes, as applicable, an assessment of the risks, costs and benefits of potential alternative decisions or policies; and,
- is conducted by reviewers who:
  - have little personal stake in the nature of the outcome of decisionsor policies, in terms of financial gain or loss, career advancement, or personal or professional relationships;
  - can perform the review tasks free of undue influence by others associated with the decision process;
  - have demonstrable competence in the subject as evidenced by formal training and/or experience; and,
  - should be required to disclose any potential personal stake or conflictof interest with respect to the stated question/issue.

Task Force Conclusion for Finding 1

After finding that Oregon natural resources agencies, legislators and the public would benefit from ISR, the Task Force proceeded to the next phase of its work. The Task Force carefully considered various sources of information to determine how best to ensure that Oregon derives the maximum benefits from ISR while minimizing the potential risks. In reaching the following findings and conclusions, the Task Force used information from the literature, from interviews with state agencies and stakeholders, and from benchmarking ISR processes in other states and at the national level.

The Task Force concluded that in order for Oregon to benefit from ISRs, ISRs must be properly supported (including standing bodies that maintain ISR-specific expertise), review questions must be rigorously vetted, review panels must be carefully selected and a transparent, systematic process for conducting reviews must be followed. For ISRs to be useful in decision making, it is essential for those who create and synthesize science knowledge and those who use this knowledge in decision-making to communicate clearly and effectively. Of paramount importance is collaboration between scientists and decision makers at the beginning of the ISR process to carefully articulate questions that can be addressed scientifically, and that will yield information that will be useful. The benefit of ISR to Oregon is highly dependent on how it is structured (see Recommendation 1).

Finding 2. Most single-agency science reviews can be met with existing state, federal, and academic resources, but review practices and capacity for conducting reviews vary among agencies.

All responding natural resource agencies indicated that on some level they engage in internal and/or external science reviews or reviews of their products. Though most indicated that they do not have a formal agency-wide review process in the sense that it is written in policy or statute, a few noted that within certain agency programs written policies about conducting reviews existed. Respondents also discussed their agency's review processes as part of the cultural practice of the agency, and described these reviews as formal in that when they engage in reviews they are conducted as rigorously as possible. The internal review processes (only utilizing staff within the agency) ranged from small groups of staff convening to review the science and/or product to a more distributed process of using qualified experts in other units or regions within the agency to participate in a review. In one case, product reviews were dependent on one person.

All of Oregon's natural resource agencies use external science reviews (engaging with people outside of the agency) as part of their operating procedures, but not all engage in ISRs (as defined in Section 4, Recommendation 1) for many of the reasons noted in the above section. Agencies make use of external or ISR processes for a number of reasons. Some of the most noted reasons include:

- with topics of high controversy, when there is media attention, or when time allows;
- when state of the science synthesis papers are needed;

Examples of complex, multidisciplinary issues addressed by independent science review in other states:

- Washington State Academy of Sciences:
  - Labeling of genetically modified foods
  - Opportunities for Addressing Laminated Root Rot Caused by *Phellinus Sulphurascens* in Washington's Forests
  - Assessment of Puget Sound Partnership progress in implementing its 2020 Action Agenda
- California Council on Science and Technology:
  - Well Stimulation in California
  - Scaling Up Advanced Biofuels
  - Sustainable California Water Future through Innovations in Science and Technology

- to review management strategies;
- for the design, implementation, and analysis of effectiveness and compliance monitoring; and,
- to develop predictive models.

External review practices differ widely among the agencies, and they have varying degrees of independence. In addition, most agencies indicated that while they would like to have more rigorous external reviews, they have limited personnel and funding resources – making it difficult for an agency to gain access to the leading scientific experts for a particular issue, and devote the time needed to the review process.

Finding 3. There is a need for independent science review of complex, multi-disciplinary issues in natural resources that span multiple agencies and are relevant to stakeholders and lawmakers, as well as managers. Existing resources are not adequate for these types of reviews.

Complex issues often involve scientific questions affecting, and in the jurisdiction of, multiple natural resource agencies. It is often difficult for agencies to secure funding to address such questions and to coordinate across multiple agencies. For complicated scientific questions, this can mean that no external review is conducted or that it is only conducted on a discrete component of the science when a broader approach may be more appropriate and helpful to inform important policy making decisions. Agencies may also have editorial control over the review document, have the ability to decide whether or not to publicly release an external review, and are generally under no formal obligation to respond to external reviews. These circumstances may create opportunities for bias and/or conflicts of interest.

Although Oregon has significant state, federal, and academic strength in natural resources, all agencies noted that Oregon's natural resources community is small. All agencies indicated that, in addition to Oregon-based sources of expertise, they routinely try to tap into regional and/or national professional networks. In all cases, agencies noted that while there are existing state, federal, academic, non-governmental, and other professional networks that can meet their needs, the larger issue is whether the person(s) with the needed expertise is available at the time to work on a review. Agencies indicated that their ability to address larger, more complex, multi-agency issues would benefit from ISRs, but that they currently lacked the time, and human and financial resources, to do such work.

Task Force Conclusion for Findings 2 and 3

While all of Oregon's natural resource agencies conduct scientific reviews, they could be strengthened by a well-defined set of best practices for conducting reviews, and for when to seek external assistance. The Task Force found that most agencies do not have the resources to conduct thorough reviews for complex, cross-discipline issues that span the jurisdiction of more than one agency. To provide agencies, legislators and stakeholders with an effective and transparent ISR process the Task Force concluded that an adequately supported, well designed ISR system for Oregon is needed to supplement existing agency review processes.

Finding 4. ISR mechanisms and structures that are being used for natural resources policy in other states and at the federal level can inform a process for ISRs in Oregon, but the state's need to reduce the potential risks of ISRs requires a tailored approach that draws on lessons learned from other ISR structures.

There are various mechanisms for ISRs in other states and at the federal level (Appendix I), with the National Research Council being recognized as the standard against which other ISR systems are compared, and the model upon which state-level ISR entities are often based. They offer valuable insights as Oregon considers how to support ISRs. The Task Force asked the Institute for Natural Resources to consult with leaders and participants of these programs, asking them "if you were to design an ISR process for Oregon, what would you do?" (see Appendices J, K and L). Their responses played a key role in the formulation of the Task Force's recommendations.

Many federal and state entities have employed an ISR structure. Twelve such organizations were researched and contacted to learn about ISR mechanisms and structures currently being used that could help inform or be emulated for the state of Oregon. Through the interviews and research conducted common themes emerged as standards for other ISR programs:

- Establishing and maintaining independence. ISR programs across the country emphasized the importance of creating a system that is independent in its processes and final products. As defined by one interviewee from the National Academy of Sciences, *"Independence is having the process under complete control by the reviewing entity. The statement of task is approved internally"*[1]. Concerns regarding misuse of science and ISR findings, conflicts of interests among reviewers, and interference in panel or board selection processes were identified as risks in the literature and by agencies and stakeholders the Task Force interviewed, highlighting the need for a tailored ISR system designed to mitigate these risks.

- Minimizing bias and increasing transparency. The state of Oregon can emulate practices utilized by many other ISR panels to minimize bias and increase transparency. These organizations follow specific steps to: (1) educate potential panelists on what constitutes bias and conflict of interest; (2) ensure panelists and members understand and agree to terms via a signed conflict of interest agreement; and, (3) provide information to the public to promote transparency. Transparency of the process – e.g., posting meeting minutes; ensuring ample opportunity for public comments – promotes public trust in the reviewing entity. Bias in panel member selection and in interpretation of science were risks identified by agencies and stakeholder in our literature review and interviews. Transparency is a hallmark of Oregon's policy making processes, again suggesting the need for a tailored ISR system.

[1] Personal Communication, actual name of interviewee kept confidential.

- **Diversity in review panel make-up.** Each ISR entity emphasized the importance of diversity in their review panels, not only expertise across scientific disciplines, but also across different sectors of society, i.e. scientists and experts from government, academia, industry and non-governmental organizations. Diversity in perspective, expertise, and different segments of society are also hallmarks of Oregon's policy making processes.

- **Ensuring strong staff support.** Retaining qualified reviewers can be a challenge; using them efficiently is critical to this. The ISR entities interviewed cited the importance of competent, dedicated technical and administrative support in facilitating rigorous and timely reviews by freeing panelists to focus only on their primary deliberations. The support team can also provide consistency and help ensure independence and legitimacy in the process. Adequate support for a tailored Oregon ISR system will be required if the state is to obtain comprehensive reviews involving complex, multidisciplinary issues that span the jurisdiction of multiple agencies.

- **Having a well-defined statement of task and project scope.** Other ISR entities often emphasized the necessity of clearly defining the purpose and scope of the review, expectations of final product, and guidelines on stakeholder engagement. This is particularly important for complex or controversial issues proposed for review. Properly designing the study with a clearly written statement of task protects the reviewing entity, as well as the sponsors, and informs the public of the study's purpose.

Task Force Conclusion for Finding 4

The Task Force concluded that Oregon should create an ISR process that draws on attributes of successful processes from other ISR programs while addressing the considerable body of evidence and information gleaned from our findings (Appendices K and L). A tailored Oregon ISR system that is adequately funded will be necessary to provide comprehensive scientific reviews of complex, multi-disciplinary issues that span the jurisdiction of multiple natural resources agencies. The ISR structure and processes that the Task Force is recommending are also designed to minimize the various risks of ISR that were identified via the literature and agency and stakeholder interviews.

4. Recommendations

Recommendation 1. Create a robust, appropriately-resourced independent science review process for natural resources in Oregon that focuses on the most urgent need: complex, multi-disciplinary, and controversial issues.

After concluding that Oregon can benefit from ISR in important ways, but also that poorly conceived or conducted ISRs can be more costly than beneficial, the Task Force determined that maintaining capacity for ISR in Oregon is the option most likely to produce reliable benefits from it. Robust institutional capacity for ISR would free the legislature and agencies from having to re-establish this capacity every

time an ISR is needed. It would help to build and maintain institutional knowledge regarding how to conduct ISRs efficiently and effectively, and promote greater consistency in ISR services and products. Experience gained with best practices and maintaining independence in conducting ISRs could also help minimize potential interest group agenda-setting in review processes and outcomes.

> Recommendations of this Task Force are not intended to replace internal agency reviews of natural resources policy and program decisions.

After considering evidence from the ISR literature, agency and stakeholder interviews, and ISR structures and processes in use in other states and at the federal level, the Task Force recommends a tailored ISR system to efficiently respond to requests for ISRs and related products and services to address complex (and increasingly common) multidisciplinary science issues in Oregon's natural resource policy making. Based on findings in Section 3, the Task Force determined that to maximize the potential benefits and minimize inherent risks, Oregon's ISR must:

- be a three-component organizational model (Figure 2) that is stable and competent while also being flexible and nimble as needs and resources fluctuate;
- use a funding model that minimizes the potential for bias and conflicts of interest;
- where feasible, leverage existing resources and entities – in Oregon or elsewhere;
- structure criteria for support staff and reviewers to minimize potential for bias and maximize potential for effective contribution to the ISR process;
- allow multiple avenues for questions to be raised for potential ISRs by agencies, the Governor, the legislature, stakeholders, public, etc., and transparent criteria and mechanisms for assessing, selecting and prioritizing issues for conducting ISR;
- focus reviews on high impact questions (given the reality of limited funding regardless of the source of funding), but with flexibility to allow for ISR (of varying scope) for additional questions when funding is available;
- establish mechanisms for crafting clear and appropriately-scoped and science-focused questions for independent science review;
- have the expectation of a quick turnaround on questions, which would increase likelihood that reports will be useful for urgent decision making; and,
- ensure multiple avenues for public involvement.

The Task Force recommends using the following principles to guide the design of an Oregon ISR process:

- Cost effectiveness. While the Task Force concluded that Oregon needs an ISR process, it realizes that no recommendation will be useful unless it is cost effective. Cost effectiveness may be achieved by utilizing existing resources, focusing on high-impact reviews, and establishing efficient procedures. However, cost savings should never be at the expense of integrity, inclusiveness, and transparency. Oregon would be better off with no ISR process than to adopt a process that is deficient in these qualities.

- Integrity. ISR structures and processes must minimize the potential for bias at all stages, including the stage of selecting review topics and questions for review. For this reason, the Task Force advises against an ISR process where entities would pay for reviews of their own selection. This would almost certainly result in bias against reviews of important issues for which there is no financial sponsor. [Note: the National Academy of Sciences uses a review process that relies on external sponsors. However, the size and scope of the NAS allows them to conduct so many reviews that bias in selecting review questions is not an issue]. Likewise, it is of paramount importance that reviewers are highly qualified and carefully vetted for potential conflicts of interest. To ensure that there are qualified reviewers for a wide range of questions, question-specific panels must be selected for each review; for most issues, one or more reviewers may need to be recruited from out-of-state or internationally; and, reviewers must be offered sufficient compensation (in terms of prestige as well as financially) that they are willing to serve.
- Usefulness. To be useful to natural resource agencies, managers and policy-makers and to engender public confidence, science reviews should: (1) be completed in a timely way; (2) address questions that are of critical importance to Oregon; (3) document strong evidence for conclusions; (4) acknowledge areas of uncertainty; (5) be restricted to scientific questions, not policy questions; and, (6) be written for a lay audience.
- Flexibility. Important issues cannot always be anticipated well in advance and are not evenly spaced through time. An ISR structure must be ready to respond nimbly as needs arise, yet small enough that it is still cost-effective.
- Inclusiveness and Transparency. Natural resource issues affect everyone in the state of Oregon. While it is essential to insulate ISR from external pressures and influences, it is equally important to ensure that the ISR process will be available to anyone or any group in the state that raises critical natural resource questions that require multi-disciplinary scientific input to resolve. It is also essential that ISR results be shared broadly, and where possible used as a platform for public education. Scientists who engage in the ISR process should also be selected in an open manner, with consideration to broad representation of disciplines, institutions, and regions of the state as well as ethnicity and gender.

Recommendations of this Task Force are not intended to replace internal agency reviews of natural resources policy and program decisions. Indeed, agencies are encouraged to continue internal review processes with existing resources for questions that are relatively straightforward and pertain only to that agency. However, agencies should strive to maintain best practices in their internal reviews, heeding the research presented in this report on potential limitations of ISRs. The Task Force does not recommend that agencies be required to use an ISR panel as defined in this report. Rather, the process should be available to them as needed for scientific insight into complex, multi-disciplinary questions. Because ISRs may take several forms and likely inform policy for more than one state agency, the Task Force does not recommend a specific form of response by state agencies to an ISR. Nevertheless, the Task Force does recommend that agencies acknowledge they received the report and indicate how they may integrate it into their deliberations and decision making.

Examples of ISRs in Oregon

Oregon has a tradition of formal ISR of natural resource agency policies and plans. Two notable examples are the Independent Multidisciplinary Science Team (IMST) and the Independent Science Advisory Board (ISAB).

The IMST was established in 1997 to advise the State on science related to the recovery of depressed stocks of wild salmonids and enhancing watershed health under the Oregon Plan for Salmon and Watersheds. Under the auspices of the Oregon Legislature and Governor's Office, the IMST helps to: (1) enhance the Oregon Plan's credibility through recognition that actions taken under it are based on best available science; (2) improve the design, implementation, and monitoring of actions by Oregon Plan partners; and, (3) increase the exposure to and understanding of relevant science on the part of salmonid and watershed restoration communities. Funding for the IMST was suspended in the 2015-2017 biennium. It is currently inactive due to the lack of funding and the lack of appointing new IMST members. SB202 repeals the IMST's statutory authority on January 1, 2017.

The ISAB serves the Northwest Fisheries Science Center-National Oceanic and Atmospheric Administration (NOAA) Fisheries, Columbia River Indian Tribes (via the Columbia River InterTribal Fish Commission), and the Northwest Power and Conservation Council by providing independent advice and recommendations regarding scientific issues that relate to the respective agencies' fish and wildlife programs. The ISAB operates in conjunction with the National Marine Fisheries Service and reviews programmatic and scientific issues in the Columbia River Basin, mostly mainstem passage issues for anadromous salmonids but also topics such as fish harvests, potential effects of hatchery supplementation practices, tributary habitat recovery strategies, flow augmentation and mathematical modeling and analytical tools. The ISAB mandate is limited to the fish and wildlife programs of the Northwest Power and Conservation Council, Columbia River Basin Indian Tribes, and NOAA Fisheries.

Oregon, however, does not have a formal ISR program – available to all of Oregon's natural resource agencies, as well as the legislature, stakeholders, and the public – with a mandate to review science-related topics outside of the fisheries and wildlife disciplines with a heavy emphasis on the recovery of salmon stocks.

Recommendation 2. Create a new entity, the Oregon ISR Board, and review-specific science panels that will be supported by an ISR Secretariat – the coordinating arm of the ISR that is hosted in an existing Oregon entity.

In accordance with several other state and federal ISR programs, including the National Academy of Sciences, the Task Force recommends creating an ISR Board to provide scientific leadership and oversight and review-specific science panels (see Recommendation 4 for details).

The Task Force believes there is no strong justification for creating a new entity to host and coordinate the ISR; Oregon has several organizations capable of serving in this role. The Task Force considered several broad options for an entity to host and coordinate an ISR process for natural resources in Oregon.

Options considered included: (1) creating a new entity, such as an Oregon State Academy of Sciences, modeled on the Washington State process; (2) supporting the ISR process from within a non-partisan state legislative entity, for example the tentatively proposed Legislative Policy and Research Office; (3) outsourcing ISRs to an existing ISR entity, for example, through a memorandum of understanding with the Washington State Academy of Science or the California Council on Science and Technology; and, (4) using an existing entity in Oregon to support and coordinate the ISR process.

The Task Force recommends selecting an existing entity to serve as the coordinating arm of the Oregon ISR process (referred to hereafter as the "Secretariat") based on the following criteria:

- extensive experience conducting and/or coordinating science reviews;
- excellent communication and organizational skills;
- flexibility in taking on new, large projects;
- ability to transparently manage any conflicts of interest, including any questions of advocacy roles in separate contexts, if funding or revenue is derived by state agencies or other natural resource stakeholder sectors;
- a track record of completing projects on time and on budget;
- extensive experience and credibility with Oregon's natural resource agencies, the legislature, and the public; and,
- has an advisory board reflecting diverse interests of the natural resources sector.

The Task Force considered several categories of Oregon-based entities against these criteria including:

- professional societies;
- non-partisan non-governmental organizations;
- large natural resource management consultancy companies and law firms; and,
- institutions of higher learning, in general, and Oregon's research-intensive universities, in particular.

The Task Force recommends that the newly-formed ISR Board (see Recommendation 4) be charged with the responsibility of selecting an existing entity to serve as the Secretariat based on the criteria and information provided here as one of its initial responsibilities. In addition, the ISR Board should review the performance of the Secretariat on a regular basis at the discretion of the ISR Board (e.g., every other year), and be empowered to select a new Secretariat if the performance of the existing entity is determined to be deficient. Empowering the ISR Board with oversight over the Secretariat will ensure that the ISR process can function effectively into the future, even as institutions may change their own organizational structures and policies.

Recommendation 3. Oregon's independent science review process should have legislative authority.

The Task Force recommends that Oregon's ISR process be given legislative authority. All other ISR processes reviewed by the Task Force were established with legislative authority (Table 1). Legislative

authority: (1) provides transparency to functions, duties and power of an ISR process and associated institutions; (2) provides necessary authority for the exercise of the functions, duties and powers associated with ISRs, including accountability of agencies to respond to findings and recommendations of independent reviews; (3) contributes to the independence of the ISR process and institution(s) conducting ISRs; (4) provides the gravitas necessary to attract leading experts to participate in ISRs; and, (5) may identify and provide funding to the ISR process and associated institutions.

Table 1. Examples of legislative authority for ISR programs in the U.S.

Entity	Legislative authority	Year	Purpose or mission as written in their charter
National Academy of Sciences	Act to Incorporate the National Academy of Sciences	1863	to investigate, examine, experiment, and report upon any subject of science
Science Advisory Board of the Environmental Protection Agency	Environmental Research, Development, and Demonstration Authorization Act, 42 U.S.C. 4365.	1978	to provide independent advice and peer review to EPA's Administrator on the scientific and technical aspects of environmental issues
California Council on Science and Technology	California Assembly Concurrent Resolution (ACR 162)	1988	to provide objective advice from California's best scientists and research institutions on policy issues involving science
Intergovernmental Panel on Climate Change	United Nations Environment Program (UNEP) and the World Meteorological Organization (WMO)	1988	to provide policymakers with regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation
Independent Scientific Review Panel of the Northwest Power and Conservation Council	Created in response to section 4(h)(10)(D) of the Northwest Power Act as amended in 1996	1996	to provide the Council with independent scientific review of projects funded by the Bonneville Power Administration
Independent Multidisciplinary Science Team (IMST)	Oregon Legislature via Senate Bill 924, signed on 3/25/1997 as ORS 541.914	1997	to review implementation of the Oregon Plan and other programs for achieving healthy streams and serve as an independent scientific peer review panel to the state agencies responsible for developing and implementing the Oregon Plan and other salmon or stream enhancement programs throughout this state
Washington State Academy of Sciences	Washington State Legislature Laws of 2005, chapter 305. In April, 2007, WSAS was constituted by the Secretary of State as a private, independent 501(c)(3).	2005	the provision of scientific analysis and recommendations on questions referred to the academy by the governor, the governor's designee, or the legislature

The Task Force recommends enabling legislative authority designed to allow for flexibility to achieve guiding principles rather than overly detailed and prescriptive authority that may too narrowly confine the options for providing ISRs. ISRs can take many forms and the ISR Board, process and supporting institutions will need flexibility in determining how best to carry out ISRs in individual circumstances to

meet the needs of agencies, policy makers and the public. Without legislative authority, the Task Force believes that any ISR process and associated entities would have to operate in an ad hoc manner and would be unable to sustain the organizational capacity needed to conduct high-quality ISRs. It is also difficult to see how, without legislative authority, ISRs can be truly independent of the agencies or entities seeking independent review and funding of a review.

The Task Force recommends that ISRs be insulated from special legislative oversight to reduce any perception that this overly politicizes or compromises the independence of the ISRs. However, the Task Force recognizes that it would be appropriate for the institution hosting the ISR and receiving public funding to prepare an annual report to the legislature characterizing questions and issues submitted by which entities, how these requests were addressed, which questions were subject of ISR, timelines, budgets, etc., and answer questions as appropriate from House and Senate committees.

Recommendation 4. Oregon's ISR process for natural resources should primarily focus on complex, multi-agency, interdisciplinary science issues that are of importance to the State of Oregon. We recommend a cost-effective, useful, and nimble structure that will require sufficient base funding from the State in order to ensure integrity, transparency and inclusiveness.

Structure and Roles

The Task Force recommends a three-part structure for Oregon's ISR process (Figure 2, Table 2) including: (1) an appointed ISR Board consisting of five to seven highly experienced and qualified science professionals; (2) a Secretariat supporting the operation of the Board and coordinating the ISR process; and, (3) Panels convened by the Board to conduct specific reviews.

ISR Board

The ISR Board (the "Board") provides scientific leadership and oversight, including but not limited to selecting which reviews are undertaken, negotiating the science review questions, and selecting the review-specific ISR panels. The Board shall not independently propose science issues to review.

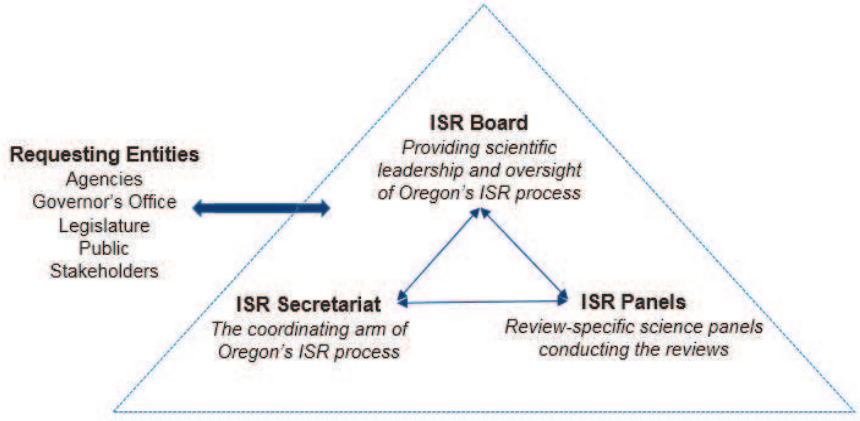

Figure 2. Structure of Oregon's ISR

The Board should be comprised of highly-respected experts with diverse backgrounds, expertise, and perspectives on natural resource issues. Social sciences and law and policy disciplines in addition to natural scientists should be considered to strengthen the linkages between the natural science, legal, and policy arenas. A high level of prestige is also important for maintaining external confidence and respect, and it will also be beneficial in recruiting review-specific panelists (below).

The Board will likely include representatives from all of Oregon's primary research universities (OSU, PSU, and UO) but not necessarily restricted to those universities. Because persons with relevant backgrounds and experience for Board positions may have worked for or have been funded by a governmental, industry or non-governmental entity with interests in outcomes of potential reviews, the Task Force recommends a rigorous and proactive approach to conflicts of interests in selecting Board members in order to maintain impartiality and the perception of independence. Backgrounds and professional activities of all Board members should be publicly disclosed (i.e., posted on website of the coordinating entity) to maintain transparency.

The Board will ensure that the ISR process is as bias-free as possible and that an appropriate range of natural resource disciplines are represented for each particular review.

The Task Force recommends that Board member selection be coordinated by the Governor's Office in a manner consistent with other boards and commissions. Potential Board members may be nominated by the public, non-governmental organizations, professional societies or nominated by universities. University nominations will require commitment by those universities that 0.10 of the FTE of Board members will be committed to their Board responsibilities (part of the faculty member's formal position description).

The Task Force recommends these criteria for selection of the Board:

- scientific and/or technical expertise (including legal and policy experts) relevant to a broad range of natural resource disciplines;
- willingness to engage with stakeholders and to maintain transparency;
- ability to communicate complex technical issues in a straightforward manner;
- ability to extract meaningful, addressable scientific questions from complex natural resource issues;
- objectivity and familiarity with ISR-related processes;
- ability to chair an ISR process receiving input from a large number of experts effectively and efficiently;
- familiarity with Oregon's natural resources and the communities and sectors relying on these resources for their wellbeing; and,
- ability to identify and engage the needed expertise for each issue being addressed.

A Board Chair (Table 2) will be selected annually by the Board, rotating this responsibility among participating universities. Board members shall have 4-year terms and through reappointment may serve a second consecutive term. Board appointments should be staggered to avoid more than two new

members being appointed during any one year. Each Board member is expected to serve as a Panel Manager (Table 2) every one to two years.

ISR Secretariat

The ISR Secretariat (the "Secretariat") is the coordinating arm and backbone of Oregon's ISR process, advising ISR requestors and providing research, technical and administrative support to the Board and the review-specific panels. It supports the functioning of the Board, coordinates the ISR process and the activities of the ISR panels, and serves as a point of entry to the ISR – advising and consulting requestors prior to requests being submitted to the Board, as needed. The Secretariat should be a part of, or at least housed by, an existing entity (see Recommendation 2). The main functions of the Secretariat are to:

- provide administrative and technical support to the Board;
- maintain and manage communications on behalf of the Board, including public involvement efforts;
- in consultation with the Board, work with requestors seeking ISR of the science supporting policy and decisions proposed or made by Oregon's natural resources agencies to identify whether or not ISR is appropriate;
- If the request is deemed appropriate for ISR, begin the process of framing the scientific questions appropriately for subsequent review by the Board, and help identify the most appropriate ISR services and products, e.g. informal or formal consultation, formal review, workshop or symposium, white paper, or some combination of these.
- work with the Board to coordinate the selection and recruitment of ISR panelists to conduct specific ISRs;
- provide research, technical, and administrative support to ISR review panels including technical writing, editing and background research;
- disseminate ISR products and coordinate responses to the ISR products for further consideration by the Board;
- prepare an annual report on Board activities for the Legislature; and,
- connect the review process with legislators, agencies, stakeholders, and the public via direct and online communications

ISR Panels

Review-specific panels are formed once an ISR question has been selected for review by a meeting of the Board, after the Board is satisfied that sufficient resources (staff and financial) are available to complete the review in a timely manner to the standard expected of the ISR. The Board selects and recruits members of the review-specific panels, with assistance from the Secretariat. A new team of panelists should be selected for each review. The number of panelists may vary depending on the scope and complexity of the review question(s). Panelists may be invited to contribute to more than one review, but no panelist should become a routine member of multiple panels.

ISR panels should be comprised of top experts in the field or fields. They should be selected from a national/international pool, with emphasis on talented researchers and scientists within the state of

Oregon. ISR panels should be multidisciplinary (or transdisciplinary) teams that generally include social scientists and legal experts as appropriate, in addition to natural scientists to provide an appropriate range of expertise for the task. Panelists should represent a balance of perspectives and be carefully screened for conflicts of interest.

The Board should determine the panelist selection process. The process, however, must be transparent, publicly disclosed, and consistent through time. The expectation for diversity with respect to expertise, natural resources sector representation, geography, ethnicity, and gender must be explicit.

The qualifications of panelists will vary depending on the nature of the problem or question, and the Board should determine the specific requirements for each review. The Task Force recommends the following general criteria for selecting panelists:

- little personal stake in the nature of the outcome of decisions or policies, in terms of financial gain or loss, career advancement, or personal or professional relationships;
- ability to perform the review tasks free of undue influence by others associated with the decision process;
- demonstrable competence in the subject as evidenced by formal training and/or experience;
- ability to participate on the review panel within the timeframe identified by the Board; and,
- willingness to disclose any potential personal stake or conflict of interest with respect to the stated question/issue.

Table 2. Roles within the Oregon ISR process.				
	Role and Responsibilities	**Selection Process and Criteria**	**Details**	**Compensation**
Board	– Select study topics – Help frame the questions and outline the statement of task – Suggest reviewers – Help recruit and select reviewers for panel – Approve final panel – Assign one member to be Panel Manager for each review	– Board appointed by the Governor's Office – Criteria: leadership, diversity in expertise, sector, and disciplines in addition to gender, ethnic, and geographic diversity	– Small, odd numbered group of – 5 to 7 people – 4-year terms – Limited to two consecutive terms	– None, only per diem, travel and expenses reimbursed consistent with Oregon's Boards and Commissions (except when Board members serve as panel managers)
Board Chair	– To facilitate board meetings – Act as primary communicator with secretariat – ensures rotation of panel managers	– Selected by the board members	– One-year terms	– None, only travel and expenses reimbursed
Panel Manager	– Represents independence of the report and the process – Responsible for maintaining the integrity of the process. – May assume the lead to assemble the final report or draft the final report – Work with Secretariat to schedule meetings, etc.	– Oversee and represent the independence of the report and process and maintain integrity	– Not a subject matter expert – Always a board member	– The same flat rate as panel members but allocated more days or hours based on work needed

Table 2 (continued). Roles within the Oregon ISR process				
	Role and Responsibilities	**Selection Process and Criteria**	**Details**	**Compensation**
Secretariat	– Secretariat would help identify type of review – The secretariat will be the contact entity for the public – Responsible for supervising process to ensure independence – Staff hiring – Drafting budgets for review – Creating and submitting annual reports – Screen reviewer's qualifications (COI/experience, etc.) – Keep an updated list of experts in the field – Help frame and define statement of task and scope with Board. – Decide, with the Board, the days necessary to complete work	– Oregon entity to host the Secretariat will be selected by the Board upon appointment	– Minimum three employees recommended: – Director at .5 FTE, – Program Coordinator at 1.0FTE, and – Research Associate at 1.0FTE	– Salary positions with benefits (2.5 FTE) plus travel and expenses reimbursed
Panel Members	– Attend meetings – Review document – Write sections as needed	– Suggestions of reviewers from the public, state agencies, stakeholders, and Board members sent to Secretariat – Secretariat vets qualifications – Board and Secretariat together create a Panel for the assigned topic acknowledging diversity in expertise, sector, geography, race and gender. – Board approves final panel member list.	– Number of panel members determined by Board and Secretariat depending on study scope and product desired.	– A flat fee, regardless of salary rate

Process

The proposed Oregon ISR process can be categorized in seven major stages (Figure 3).

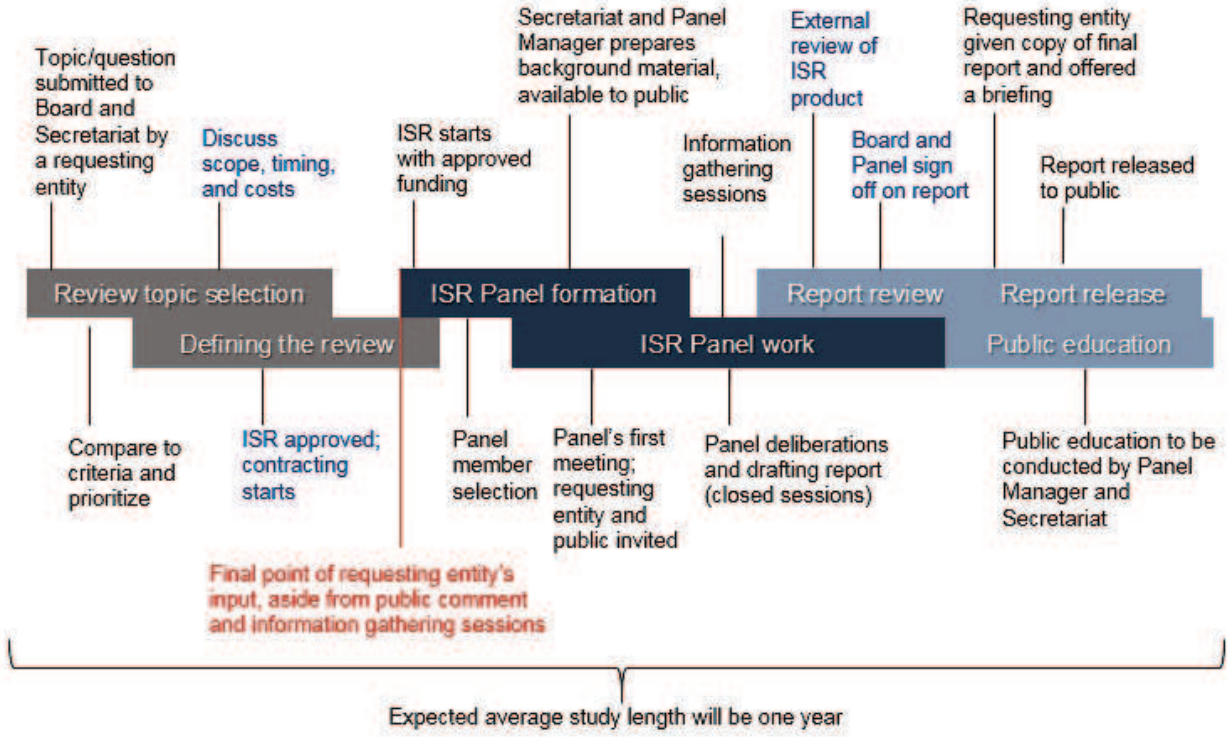

Figure 3. Life-cycle of an independent review within Oregon's ISR (adapted from the National Academies of Science).

Science review topic selection

Questions or topics for scientific reviews may be submitted by agencies, the public, industry, professional societies and non-governmental organizations. Questions or topics for review shall be submitted to the Board through the Secretariat. When a requestor approaches the Board with a potential ISR topic, staff from the Secretariat and requesting organization(s) would work together to provisionally assess whether the topic warrants an ISR, and if so, the type of ISR product or service that might be appropriate. Next, they will draft science questions the study would address (in the event that the ISR Board concurs that the review should proceed) and create a draft "statement of tasks" and work products for review and refinement by the Board. Carefully specifying and refining the limits of proposed information gathering and analysis, and the most appropriate kind of ISR service or product for the question at hand are critical steps to determine the scope and timeline of the ISR and assure effective results. It allows the ISR Board to determine if the project can be successfully undertaken with available resources and to decide if the request is consistent with its independent, objective, non-partisan mission. This initial consultation shall be documented as part of the ISR administrative record and report to the Legislature.

Defining and initiating the review

ISRs can vary in depth, rigor, and comprehensiveness, depending on the complexity and/or level of controversy surrounding the issue; the potential risks or impacts of over- or under-regulation, or how the scientific underpinnings are used; and the timelines and resources available to conduct the review. Rigorously assessing what questions and subjects should be subjected to ISR is critical. The Task Force envisions that this assessment process should be highly selective, and would be a valuable service offered by the ISR Secretariat and Board. Some, and perhaps many, of the proposals the ISR Secretariat and Board receives may be turned away because the questions are not of the highest priority, or there is already general consensus on the science, or the question is really a policy question couched in scientific terms, or for some other reason.

Once a proposed science question or topic is approved for review, the ISR Board must assess and approve the statement of task, work plan, and budget, which may result in changes to any or all of these three project components. This is important to ensure that the ISR process is both cost-effective and inclusive (i.e., operating within a budget while ensuring that questions from poorly-funded groups will not be dominated by those who can afford the review), and maximizes usefulness to the people of the State of Oregon.

In cases where multiple reviews are requested, the Board will prioritize selections with a focus on reviews that are critically important to timely policy decisions. Consistent with available resources, questions selected for review will be scheduled for review with a detailed planning horizon.

One of the roles of the Board should be to develop explicit criteria for selecting and prioritizing ISRs. These criteria should include the following:

- Likelihood that the resulting report will benefit multiple agencies or provide information that will help resolve particularly complex natural resource issues;
- the question has regional or state-wide relevance;
- the question is future-oriented (i.e., addresses emerging issues) rather than past-oriented (i.e., evaluates a past action);
- the question can be parsed to separate scientific from non-scientific components;
- the question can be addressed with existing scientific knowledge - does not require new basic research;
- there is relevant and sufficient scientific information available on the issue to be addressed;
- existing reports, if any, are out of date or inadequate; and,
- sufficient funds are available in the base budget for the reviews (In some cases the requesting entity may provide funds, but in most cases reviews should be funded by the State, either through the existing ISR budget or by a special request from the Board for additional funds; this is important to ensure the ISR process is inclusive and independent of agencies or entities that could sponsor a review).

Once a review is initiated, information about it would be made accessible via an Oregon ISR website.

ISR Panel formation

Selection of appropriate ISR panel members, individually and collectively, is critical to the success of an ISR. All review-specific panel members serve as individual experts, not as representatives of organizations or interest groups. Each member is expected to contribute to the project on the basis of his or her own expertise and good judgment. An ISR panel should not be finally approved until a thorough balance and conflict of interest discussion is held at the first public meeting, and any issues raised in that discussion are investigated and addressed by the Board.

ISR Panel work

Steps of the review process. The steps of the review process will depend on the nature and complexity of the questions, and the Board will need to establish specific approaches as appropriate for each case. In most cases, a review could be completed in less than one year with the following proposed procedures:

1. In consultation with the Panel Manager, the Secretariat should prepare review materials for the review-specific panel. These materials should be sent to the panel well in advance of a face-to-face meeting and, for the sake of transparency, should also be made available to the public. The charge or tasks assigned to the panel should be clearly articulated, and sufficient background material should be provided for a comprehensive review.
2. After panelists have reviewed the background material, they should be convened for a face-to-face meeting. Typically, there should be only one such meeting (more if deemed essential) lasting one to three days. For the meeting to be as efficient and productive as possible, a moderator or facilitator may be asked to participate. The initial meeting will include an overview by agency staff to explain the policy context and implications of the review question(s) so that panelists will have a clear understanding of the potential ramifications of the review. The bulk of the meeting should be open to the public and include public comment.
3. In closed session(s), panelists will form a consensus opinion responding to the original charge. In some cases, the panel may decide that in addition to the consensus opinion, a minority opinion should be represented in the final report.
4. When feasible, panelists will be asked to write preliminary sections of a final report as individuals or small groups.
5. The Panel Manager will be responsible for coordinating the writing of a draft report, with Secretariat support, based on panel opinions and preliminary drafts. The Panel Manager will send the draft report to the panel for review.
6. After the Panel Manager addresses responses from the panel, the report should be shared for review by stakeholders. After a final edit by the Panel Manager, the Secretariat will share the final report publicly.
7. The Panel Manager and the Secretariat should make every effort to use the review process as a tool for public education, engaging civic groups and the media as appropriate during the review process and after the release of the final report.

Information gathering. Panels may gather information through:

- Meetings that are open to the public and announced in advance (primarily, the face-to-face meeting of all panelists);
- Written submission of information by outside interested parties (these submissions should be open to the public);
- Oral and written testimony from invited experts (in a forum that is open to the public); and,
- Reviews of scientific and technical literature by panel members and Secretariat staff (search protocols and outcomes of reviews should be available to the public).

In all instances, efforts should be made to gather information from individuals who have been directly involved in, or who have knowledge of, or are likely to be affected by the natural resource-related topic under consideration.

ISR process considerations. The Task Force anticipates that ISRs will cover a broad range of topics and appear in various forms. Although no rigid set of criteria is likely to be applicable to all ISR products, the Task Force expects that they will conform to the following standards:

- The review or report charge is clearly described in the report;
- all aspects of the charge are addressed fully;
- the authors do not go beyond their charge;
- the conclusions and findings are fully supported by evidence, analysis, and argument;
- uncertainties or incompleteness in the evidence are explicitly acknowledged;
- data and analyses are handled using accepted practices;
- the products are not prescriptive (should not contain recommendations for policies or management actions) but may provide scenarios of likely consequences in response to a set (or alternate sets) of actions;
- conclusions should be clearly connected to data with statistical interpretations that are both scientifically rigorous and communicated clearly for a lay audience;
- may contain, where scientifically valid, alternate sets of findings;
- the review or report's exposition and organization is effective;
- the report is fair and impartial; and,
- the summary and executive summary concisely and accurately describe the key findings and recommendations.

Depending on the complexity, media attention, stakes or controversy surrounding the issue, a "progress check" midway during the review may also be beneficial.

Report review

All ISR products go through a final check for quality and objectivity. This is a rigorous, independent external review conducted by experts whose comments are provided anonymously to the ISR Panel. In addition to looking at quality and neutrality, this process should verify that the ISR product addresses the

approved charge and does not go beyond it, that the findings are supported by the scientific evidence, and that arguments are clearly presented. ISR Panels must respond to, but do not need to agree with, the external reviewer comments in a detailed "response to review" that is maintained as part of the administrative record. The Secretariat will monitor this process.

Report release and public education

The requesting entity will be given a copy of the final report and offered a briefing. The final report will be released to the public, and if indicated in the "statement of task" public education and/or outreach will be conducted.

Services and Products Available through Oregon's ISR Process

Deploying ISRs at different stages of the policy development or rule-making process could necessitate using different ISR products or services at different points – e.g., a consultation at the beginning, a workshop or forum midway through, or a scientific review of the draft final product. The recommended Oregon ISR is flexible in that it can be tailored to different types of issues and circumstances, and offer a range of ISR products or services, including but not limited to:

Services or products would not be initiated by the Board or Secretariat unless requested by the Governor, legislative bodies, natural resource agencies, key stakeholders, or the public.

- *Informal or formal consultations or roundtable discussions* with some combination (depending on the circumstances and issue at hand) of agency staff, independent science experts, stakeholders, and legislators.
- *Formally researched and written reviews or consensus reports* of the scientific underpinnings of a policy or regulation, using a panel of independent experts. The literature suggests that this is the most common type of ISR.
- *Workshops, conferences or symposia* that convene reviewers and, depending on circumstances, agency personnel, legislators, stakeholders, or the public for interchange, debate and social learning regarding scientific evidence.
- *White papers or knowledge syntheses* on issues of particular interest and policy relevance.
- In conjunction with state natural resource agencies, development of *best practices for scientific review in natural resource management* to help standardize such work in cases where a full ISR panel report is not needed.

Service or products would not be initiated by the Board or Secretariat unless requested by the Governor, legislative bodies, natural resource agencies, key stakeholders, or the public.

Funding Oregon's ISR Process

As our state's population and economy expand and diversify, management of Oregon's remarkable endowment of natural resources is becoming increasingly complex and controversial. The Task Force acknowledges that while scientific evidence plays a critical role, it is not the sole factor in natural resource decisions, which also must incorporate practical management considerations and social values. However, the Task Force also believes that social and environmental costs and impacts of poorly-informed natural resource policies can be mitigated by bringing the best available relevant science to bear via rigorous, systematic review and synthesis, and timely presentation of findings in manager-friendly formats. A properly-funded, robust capacity for ISR in Oregon would play a key role in this.

Conclusions from the academic literature, interviews with state agency staff and stakeholders, and personal experiences of some Task Force members with ISR informed the primary Task Force recommendation that robust ISR capacity for Oregon should be maintained and funded on an ongoing basis. Perhaps the most important "lesson learned" from evidence the Task Force reviewed is that weak or poorly conceived and conducted ISRs carry a significant risk of increasing controversy over the policy rather than reducing it, mainly when policy or value disagreements masquerade under a veneer of science – consuming valuable time, money and expertise, and further delaying or forestalling agency policies and actions.

The Task Force recommends that Oregon's ISR process must be adequately funded to minimize/avoid this and other risks, and maximize the important benefits of ISR detailed elsewhere in this report. Adequately funding institutional capacity for ISR in Oregon would streamline the process and free the legislature and agencies from having to re-establish this capacity every time ISR is needed. It would help maintain institutional knowledge regarding how to conduct ISR efficiently and effectively, and promote greater consistency in ISR services and products. Experience gained with best practices and maintaining independence in conducting ISRs could also help minimize potential interest group agenda-setting in review processes and outcomes.

Adequate support includes two fundamental components of Oregon's ISR process: (1) the ISR Secretariat; and, (2) the production of ISR reviews and reports (see Appendix M for budget justification). Roles, responsibilities, and compensation vary among these components (Table 2).

Secretariat

Consistent with other state and federal review programs, base funding for key support staff (the Secretariat) is essential to maintain the capacity and consistency of Oregon's ISR process across state-level ISRs by providing research and administrative support to the ISR Board and to panels for selected state-level ISRs, and helping to produce high quality, timely ISRs. However, its role will be more than that.

The Oregon ISR Secretariat will be the main point of contact for agencies, legislative bodies and stakeholders regarding all facets of ISR, including the vetting of potential review questions, assessing the availability of science information, discussing the most suitable ISR products and services for a given issue, and serving as a repository of ISR reports and associated materials. Independent science panel reviews

may be the most visible ISR activities and products, but the Secretariat would also facilitate a range of other ISR services and products, including informal or formal consultations between agencies or legislative bodies and science experts, workshops, or commissioned knowledge synthesis white papers.

Since the process of scientific discovery is not linear, the Secretariat would be in ongoing communications with agencies and stakeholders around important science questions. These activities may have as much benefit to the state as the ISRs, and will benefit a range of stakeholders. By its very existence, the Secretariat will become an important resource for Oregon's natural resource agencies and stakeholders grappling with major scientific issues. The Secretariat should be directly funded by the legislature, including support for a part-time Executive Director, a full-time ISR research associate, and a full-time ISR program coordinator. This amounts to approximately 2.5 FTEs plus administrative overhead. Funding the Secretariat represents approximately 75 percent of the proposed budget.

Production of ISR reviews and reports

The Task Force recommends that the activities of the ISR panels and associated costs of producing an ISR product be funded separately from the Secretariat, noting that Secretariat's work for each state-level ISR is accounted for in the base funding.

ISR Board. The Task Force recommends that ISR Board be compensated for their time in a manner consistent with other Governor- or legislatively-appointed boards and commissions in Oregon. Board members will be paid an approved per diem, and reimbursed for travel and other expenses as appropriate for attending Board meetings. When Board members serve as a panel manager for a review, they will be compensated as if they were panelists, but will receive additional compensation for extra time required to oversee the ISR process (see below). The Task Force recognizes that few professionals whether in academia, government, not for profit or the private sector have sufficient time available to effectively participate in ISRs unless they or their employer is compensated for the time invested in the process.

ISR Panelists and ISR Panel Manager. ISR panelists and the Panel Manager (see Table 2) should be compensated similar to the way the federal government (e.g., National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), Environmental Protection Agency (EPA)) compensates panelists for service on national scientific review panels (Appendix N). This should include a flat per diem rate for work before, during and after meetings plus travel expenses. Congruent with NSF rates for panelists, the daily honoraria for Oregon's ISR panelists and the Panel Manager should be capped at $480, but indexed to rates paid by federal panels. As noted in the literature and in the interviews, securing the time of qualified experts to participate in external and independent reviews is difficult. Compensating reviewers for their time will enhance not only the involvement of Oregon public university faculty in the ISR process, but also the involvement of other qualified experts. The Task Force recognizes that some salaried ISR panelists and Panel Managers may be unable to accept financial compensation for their services, given the rules of their employing organizations. If ISR panelists are not financially compensated, the pool of potential participants will be much reduced in both number and diversity, and potentially in expertise as well.

Based upon personal experience and consultation with other ISR entities, the Task Force concluded that an average review product might require five panelists and that each panelist might require 10 days of compensation. The budget we proposed assumes three review products per year, but in selecting review questions, the Board will have the flexibility to opt for fewer, more complex ISRs that might require more panelists, and/or more time per panelist.

The Collaboration for Environmental Evidence estimates that conducting one review can cost between $30,000 and $300,000, depending on the complexity of the question(s), how highly focused the question is, and the searching requirements, particularly for grey literature (CEE, 2013). The estimated annual cost to adequately fund Oregon's ISR is $449,500. The Task Force estimated the proposed budget, assuming three state-level reviews per year, but in selecting review questions, the Board will have the flexibility to opt for fewer more complex ISRs that might require more panelists and/or more time per panelist, or more ISRs – depending on the complexity of the review questions. Not including the research and administrative support of the Secretariat, the Task Force estimates that the average direct cost for one ISR is $41,000.

In funding Oregon's ISR, the Task Force recommends a direct appropriation of funds to the hosting entity. Providing funds through an inter-governmental agreement would require adding the state negotiated indirect rate of 26 percent.

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Appendix A

SB202 Enrolled

https://olis.leg.state.or.us/liz/2015R1/Downloads/MeasureDocument/SB202/Enrolled

78th OREGON LEGISLATIVE ASSEMBLY--2015 Regular Session

Enrolled

Senate Bill 202

Printed pursuant to Senate Interim Rule 213.28 by order of the President of the Senate in conformance with presession filing rules, indicating neither advocacy nor opposition on the part of the President (at the request of Governor John A. Kitzhaber, M.D.)

CHAPTER .....

AN ACT

Relating to independent scientific review; creating new provisions; amending ORS 352.239, 541.890 and 541.898; repealing ORS 541.914; and declaring an emergency.

Whereas the Legislative Assembly seeks recommendations regarding independent scientific re- view of a broad range of natural resources issues; now, therefore,

Be It Enacted by the People of the State of Oregon:

TASK FORCE ON INDEPENDENT SCIENTIFIC REVIEW FOR NATURAL RESOURCES

SECTION 1. The Legislative Assembly finds and declares that:

(1) Policy and program decisions made by natural resources agencies, boards and com- missions can benefit from independent scientific review that:

(a) Reflects a balance of representation from various research sectors, academic and nonacademic, public and private;

(b) Is performed by distinguished scientists from a range of disciplines; and

(c) Is clearly communicated to the public and state and local officials.

(2) Oregon is home to many highly qualified scientists with recognized expertise in a variety of disciplines who are willing to contribute their time and knowledge to scientific re- views to inform the decisions made regarding state and local natural resources policies and programs.

SECTION 2. (1) The Task Force on Independent Scientific Review for Natural Resources is established, consisting of up to 15 members.

(2) Members of the task force shall by appointed by the Governor in consultation with the Vice Presidents of Research, or their designees, at Oregon State University, the University of Oregon and Portland State University.

(3)(a) The task force shall consist of members from the forestry, agriculture, manufacturing, conservation, academic and research sectors, and representatives of Oregon State University, the University of Oregon and Portland State University.

(b) At least one member of the task force shall have previously served on the Independent Multidisciplinary Science Team created under ORS 541.914, as in effect prior to the operative date specified in section 9 of this 2015 Act, or on another state or federal scientific review body, such as the National Academy of Sciences.

(c) Representatives from state natural resources agencies may participate as nonvoting members.

(4) The task force shall evaluate and assess the need for independent scientific review in Oregon and make appropriate recommendations. In developing its recommendations, the task force shall:

(a) Proceed with the understanding that:

(A) Independent scientific reviews are not intended to replace internal agency reviews of natural resources policy and program decisions; and

(B) Agencies are not required to use an independent scientific review panel as recommended by the task force;

(b) Evaluate whether natural resources agencies, legislators and the public would benefit from the incorporation of independent scientific review in the making of policy decisions;

(c) Evaluate whether existing state, federal and academic resources for conducting independent scientific review are meeting the needs of natural resources agencies and other policymakers; and

(d) Evaluate the mechanisms and structures that are in place in other states and at the federal level for independent scientific review related to natural resources policy.

(5)(a) If the task force determines there is a need for independent scientific review in Oregon, the task force shall make recommendations on one or more entities, which may include existing scientific entities in Oregon or a new independent scientific review entity, that are best situated to conduct or coordinate independent scientific review and whether the entities identified would need legislative authority to act as independent scientific review bodies for Oregon.

(b) If the task force recommends use of a particular existing scientific entity, the task force shall make any recommendations regarding necessary changes to the entity based on the evaluation and assessment undertaken pursuant to subsection (4) of this section. If the task force recommends the development of a new independent scientific review entity, the task force shall make recommendations regarding how to structure a new independent scientific entity.

(6) In making recommendations under subsection (5) of this section, to ensure that an entity will provide scientific review that is independent, the task force shall consider:

(a) Whether the entity should provide reports to the Legislative Assembly or otherwise be subject to special legislative oversight;

(b) Whether organizational safeguards must be established or changed within the entity to ensure that the entity is free from bias and that a wide variety of natural resources disciplines and interests are represented;

(c) How to develop or change the structure or processes of the entity's advisory board or other governing body in order to support the independence of scientific review panels convened by the entity, which shall include consideration of the entity's advisory board or other governing body directing or participating in the scientific analysis and review conducted or coordinated by the entity;

(d) How the entity's funding structure should be created, altered or supplemented to ensure that there is no perception of bias in the funding of independent scientific review panels and to ensure that adequate funds are available to convene such panels;

(e) How to develop processes for conducting or coordinating independent scientific review in order to encourage balanced, broad and diverse participation among the scientific disciplines that may be called upon in the course of independent scientific review; and

(f) How to develop procedures for the selection and deliberation of scientific experts to participate in independent scientific reviews, taking into consideration lessons learned from the processes used by the former Independent Multidisciplinary Science Team and other processes for independent scientific reviews.

(7) The task force also shall make recommendations regarding the structure and function of the process to be used by the recommended entities in the course of independent scientific reviews. In making recommendations under this subsection, the task force shall consider:

(a) Whether the entity should respond to inquiries from the Governor's office or the Legislative Assembly, the citizen boards of natural resources agencies or from other appropriate parties;

(b) Whether the entity should independently select science issues to review;

(c) Whether a state agency should be required to respond in writing to a report issued by an independent scientific review panel, explaining how the agency intends to implement the panel's suggestions or why the agency does not plan to implement the suggestions;

(d) How to enhance involvement of the University of Oregon, Oregon State University, Portland State University and other universities in the independent scientific review process; and

(e) How to provide a scientific review process that is open to the public and that inspires public confidence in, and understanding of, the review process without compromising the independence of the review.

(8) A majority of the voting members of the task force constitutes a quorum for the transaction of business.

(9) Official action by the task force requires the approval of a majority of the voting members of the task force.

(10) The task force shall elect one of the voting members to serve as chairperson.

(11) If there is a vacancy for any cause, the Governor shall, in consultation with the Vice Presidents of Research, or their designees, at Oregon State University, the University of Oregon and Portland State University, make an appointment to become immediately effective.

(12) The task force shall meet at times and places specified by a majority of the voting members of the task force.

(13) The task force may adopt rules necessary for the operation of the task force.

(14) The task force shall have its first meeting on or before January 1, 2016.

(15) The task force shall submit a report of its findings and recommendations to the Governor and to an appropriate committee of the Legislative Assembly in the manner pro- vided in ORS 192.245 no later than September 15, 2016.

(16) The Institute for Natural Resources shall provide staff support to the task force.

(17) Members of the task force are not entitled to compensation, but may be reimbursed for actual and necessary travel and other expenses incurred by them in the performance of their official duties in the manner and amounts provided for in ORS 292.495. Claims for expenses shall be paid out of funds appropriated to the Institute for Natural Resources for purposes of the task force.

(18) All agencies of state government, as defined in ORS 174.111, are directed to assist the task force in the performance of its duties and, to the extent permitted by laws relating to

confidentiality, to furnish such information and advice as the members of the task force consider necessary to perform their duties.

SECTION 3. Sections 1 and 2 of this 2015 Act are repealed on January 2, 2019.

INSTITUTE FOR NATURAL RESOURCES

SECTION 4. ORS 352.239 is amended to read:

352.239. [*(1) There is created within the Oregon University System the Institute for Natural Resources. The Institute for Natural Resources shall be administered by Oregon State University and other institutions in the Oregon University System.*]

(1) The Institute for Natural Resources is established at Oregon State University. In administering the institute, Oregon State University may seek the cooperation of other public universities listed in ORS 352.002.

(2) The Institute for Natural Resources shall serve the following purposes:

(a) Serve as a clearinghouse for scientifically based natural resources information.

(b) Provide scientifically based natural resources information to the public in integrated and accessible formats.

(c) Coordinate efforts with other state agencies and bodies to provide natural resources information to the public in a comprehensive manner.

(d) Facilitate and conduct research.

(e) Provide information and technical tools to assist decision-making on natural resources issues.

(f) Assist the State Parks and Recreation Commission in carrying out the Natural Areas Program by maintaining a data bank that contains a classification of natural heritage resources and an inventory of the locations of the resources. At a minimum, the institute shall record in the data bank the location of state natural areas, the natural heritage resources in those areas, sites that are inhabited by rare species, and lists that rank by rarity species, plant communities and ecosystem types. The institute shall make the information included in the data bank available to private land- owners, researchers and local, state and federal agencies.

(g) Assist the State Parks and Recreation Department in carrying out the Natural Areas Program by reviewing and providing recommendations on proposals for registration and dedication of natural areas.

(3) When making observations on private land, an employee of [*an institution in the Oregon University System*] **a public university listed in ORS 352.002** who is compiling information for the Natural Areas Program pursuant to subsection (2)(f) of this section must obtain permission from the landowner before **entering private land, collecting information or** entering the information into the data bank.

(4) Using existing resources, state agencies designated by the Governor shall enter into a memorandum of understanding, or other agreement deemed appropriate by the Governor, with the institute that defines and clarifies the roles and responsibilities of the agencies in order to prevent duplication of effort and to ensure that agency resources are used efficiently.

(5) State agencies may contract with the institute to fulfill agency needs regarding the collection, storage, integration, analysis, dissemination and monitoring of natural resources information and natural resources research and training.

SECTION 4a. If Senate Bill 80 becomes law, section 4 of this 2015 Act (amending ORS 352.239) is repealed and ORS 352.239, as amended by section 155, chapter, Oregon Laws 2015 (Enrolled Senate Bill 80), is amended to read:

352.239. (1) The Institute for Natural Resources is established at Oregon State University. In administering the institute, Oregon State University may seek the cooperation of other public universities listed in ORS 352.002.

(2) The Institute for Natural Resources shall serve the following purposes:

(a) Serve as a clearinghouse for scientifically based natural resources information.

(b) Provide scientifically based natural resources information to the public in integrated and accessible formats.

(c) Coordinate efforts with other state agencies and bodies to provide natural resources information to the public in a comprehensive manner.

(d) Facilitate and conduct research.

(e) Provide information and technical tools to assist decision-making on natural resources issues.

(f) Assist the State Parks and Recreation Commission in carrying out the Natural Areas Pro- gram by maintaining a data bank that contains a classification of natural heritage resources and an inventory of the locations of the resources. At a minimum, the institute shall record in the data bank the location of state natural areas, the natural heritage resources in those areas, sites that are inhabited by rare species, and lists that rank by rarity species, plant communities and ecosystem types. The institute shall make the information included in the data bank available to private land- owners, researchers and local, state and federal agencies.

(g) Assist the State Parks and Recreation Department in carrying out the Natural Areas Pro- gram by reviewing and providing recommendations on proposals for registration and dedication of natural areas.

(3) When making observations on private land, an employee of Oregon State University**,** or an- other public university listed in ORS 352.002 that is providing administrative support**,** [*and*] who is compiling information for the Natural Areas Program pursuant to subsection (2)(f) of this section must obtain permission from the landowner before **entering private land, collecting information or** entering the information into the data bank.

(4) Using existing resources, state agencies designated by the Governor shall enter into a memorandum of understanding, or other agreement deemed appropriate by the Governor, with the institute that defines and clarifies the roles and responsibilities of the agencies in order to prevent duplication of effort and to ensure that agency resources are used efficiently.

(5) State agencies may contract with the institute to fulfill agency needs regarding the collection, storage, integration, analysis, dissemination and monitoring of natural resources information and natural resources research and training.

INDEPENDENT MULTIDISCIPLINARY SCIENCE TEAM ABOLISHED

SECTION 5. The Independent Multidisciplinary Science Team is abolished. SECTION 6. ORS 541.914 is repealed.

SECTION 7. ORS 541.890 is amended to read: 541.890.

As used in ORS 541.890 to 541.969:

(1) "Adaptive management" means applying management or practices over time and across the

landscape to achieve site specific resource goals using an integrated and science-based approach that results in changes over time in response to feedback or monitoring.

(2) "Associated uplands" includes those lands of a watershed that are critical to the functioning and protection of a riparian area.

(3) "Board" means the Oregon Watershed Enhancement Board created under ORS 541.900.

[*(4) "Independent Multidisciplinary Science Team" means the scientific team of recognized experts in fisheries, artificial propagation, stream ecology, forestry, range, watershed and agricultural management created under ORS 541.914.*]

[*(5)*] **(4)** "Native" means indigenous to Oregon and not introduced.

[*(6)*] **(5)** "Oregon Conservation Strategy" means the comprehensive wildlife conservation strategy for this state adopted by the State Fish and Wildlife Commission.

[*(7)*] **(6)** "Oregon Plan" means the guidance statement and framework described in ORS 541.898.

[*(8)*] **(7)** "Protect" or "protection" means to minimize or mitigate adverse effects on native fish or wildlife habitat to the maximum extent practicable given the anticipated duration, geographic scope and primary purpose of proposed activities.

[*(9)*] **(8)** "Restore" or "restoration" means to take actions likely to achieve sustainable population levels of native fish or wildlife and their habitats.

[*(10)*] **(9)** "Riparian area" means a zone of transition from an aquatic ecosystem to a terrestrial ecosystem, dependent upon surface or subsurface water, that reveals through the zone's existing or potential soil-vegetation complex the influence of such surface or subsurface water. A riparian area may be located adjacent to a lake, reservoir, estuary, pothole, spring, bog, wet meadow, muskeg or ephemeral, intermittent or perennial stream.

[*(11)*] **(10)** "Soil and water conservation district" means a political subdivision of the state as described in ORS 568.550.

[*(12)*] **(11)** "Stewardship" means the careful and responsible management of the environment. [*(13)*] **(12)** "Tribe" means a federally recognized Indian tribe in Oregon.

[*(14)*] **(13)** "Watershed" means the entire land area drained by a stream or system of connected streams such that all streamflow originating in the area is discharged through a single outlet.

[*(15)*] **(14)** "Watershed council" means a voluntary local organization, designated by a local government group convened by a county governing body, to address the goal of sustaining natural resource and watershed protection, restoration and enhancement within a watershed.

SECTION 8. ORS 541.898 is amended to read:

541.898. (1) As used in this section when referring to salmonid recovery:

(a) "Listed unit" means one population or a group of populations of a species, such as an evolutionarily significant unit, that has been listed as threatened or endangered under the federal Endangered Species Act of 1973 (P.L. 93-205), as amended, or under ORS 496.171 to 496.192.

(b) "Native fish" means a fish indigenous to Oregon and not introduced. Naturally produced fish and hatchery produced fish are both native fish if the fish are indigenous to Oregon and not introduced.

(c) "Naturally produced" means a fish that reproduces and completes its full life cycle in its natural habitat. Naturally produced progeny of hatchery fish are naturally produced.

(d) "Population" means a group of fish that:

(A) Originates and reproduces in a particular area at a particular time;

(B) Does not interbreed to any substantial degree with any other group reproducing in a different area or in the same area at a different time; and

(C) Is composed of naturally produced fish, hatchery produced fish or a combination of both.

(e) "Recovery" means that a proportion of the constituent populations of naturally produced native fish belonging to a listed unit are sufficiently abundant, productive and diverse in life histories and distribution such that the listed unit as a whole is likely to be self-sustaining into the foreseeable future.

(f) "Self-sustaining" means having a sufficient proportion and distribution of constituent populations:

(A) Likely to survive prolonged periods of habitat, oceanic, climatic and environmental conditions that are detrimental to a population; and

(B) Having habitat of sufficient quality and quantity likely to provide survival rates adequate to maintain associated ecological, cultural and economic benefits.

(2) The Legislative Assembly finds that the efforts of many Oregonians have resulted in the creation of the Oregon Plan, and recognizes that the Oregon Plan is guided by the following mission and goals:

(a) The mission of the Oregon Plan is to restore the watersheds of Oregon and to recover the fish and wildlife populations of those watersheds to productive and sustainable levels in a manner that provides substantial ecological, cultural and economic benefits.

(b) The goals of the Oregon Plan that guide the citizens of Oregon in achieving the mission of the Oregon Plan are the:

(A) Establishment and maintenance of an infrastructure that provides long-term continuity in leadership, direction and oversight of watershed restoration and species recovery.

(B) Continued opportunity for a wide range of natural resource uses that are consistent with watershed restoration and species recovery.

(C) Implementation of existing laws and environmental regulations to achieve the mission before enacting new laws and environmental regulations.

(D) Development and maintenance of funding for programs to protect and restore watersheds.

(E) Development of expectations for the sustainability of interrelated natural resources that accurately reflect a scientific understanding of the physical and biological constraints of the ecosystem.

(F) Enhancement of habitat available to support healthy populations of fish and wildlife throughout the state.

(G) Production of populations of threatened or endangered species to achieve levels of natural production consistent with overall restoration goals.

(H) Establishment of a science-based system that supports evaluation of the Oregon Plan and provides a basis for making appropriate future changes to management programs.

(I) Coordination of activities and programs among federal, state and local governments and other entities.

(J) Use of voluntary and collaborative processes to achieve the mission of the Oregon Plan whenever possible.

(3) The Oregon Plan is a comprehensive program for the protection and recovery of species and for the restoration of watersheds throughout this state. The Oregon Plan combines the regulatory and other actions of state and federal agencies and local governments with voluntary watershed restoration by private landowners and others. The Oregon Plan includes, but is not limited to:

(a) Programs and policies found in the following statutes:

(A) ORS 196.600 to 196.905;

(B) ORS chapter 197;

(C) ORS chapter 274;

(D) ORS chapter 366;
(E) ORS chapter 390;
(F) ORS chapters 465, 466, 468 and 468B;
(G) ORS 469.300 to 469.563, 469.590 to 469.619, 469.930 and 469.992;

(H) ORS chapter 477;

(I) ORS chapters 496, 497, 498, 501, 506, 507, 508, 509 and 511;

(J) ORS 517.702 to 517.989;

(K) ORS 527.310 to 527.370, 527.610 to 527.770, 527.990 (1) and 527.992;

(L) ORS chapter 530;
(M) ORS chapters 536 to 543A;
(N) ORS 543A.005 to 543A.415; and

(O) ORS 568.210 to 568.808 and 568.900 to 568.933;

(b) Commitments of state agencies in the form of measures;
(c) Actions of local governments and federal agencies taken in coordination with the state and consistent with the purposes of the Oregon Plan;
(d) Voluntary activities undertaken by watershed councils, soil and water conservation districts, landowners and other entities and consistent with the purposes of the Oregon Plan;
(e) Scientific review by [*the Independent Multidisciplinary Science Team*] **independent scientific review panels**, and others, of the activities performed under the Oregon Plan;
(f) Programs and activities identified to address a coordinated approach for the recovery of native salmonid populations within Oregon;
(g) The guidance statement and framework provided by the healthy streams partnership developed to provide cooperative solutions and voluntary approaches to improving the water quality of streams and to achieve healthy streams throughout Oregon; and
(h) Programs for the restoration and enhancement of multiple species and of the habitat of those species.
(4) The Oregon Plan is subject to modification and alteration to enhance program efforts consistent with appropriate guidance principles developed by the Legislative Assembly.
(5) The purpose of the Oregon Plan is to enhance, restore and protect Oregon's native salmonid populations, watersheds, fish and wildlife habitat and water quality, while sustaining a healthy economy.
(6) The Oregon Plan shall:
(a) Provide for coordination of local, state, federal and tribal agency responsibilities and authorities for native salmonid, watershed and habitat restoration throughout Oregon.
(b) Rely on watershed councils and soil and water conservation districts, which are directed to cooperate in the development of local watershed plans that assess watershed conditions and create watershed action plans and strategies for the implementation of the local watershed action plans.

(c) Focus state policies and resources on achieving native salmonid recovery and watershed restoration while sustaining a healthy economy and environment.
(7) The Oregon Plan shall focus on aiding the recovery of species listed as threatened or endangered under the federal Endangered Species Act or under ORS 496.171 to 496.192 until such time as recovery is achieved. Once recovery has been achieved for any species listed as threatened or endangered under ORS 496.171 to 496.192, the Governor shall direct the State Fish and Wildlife Commission to begin

rulemaking, as provided in ORS 496.176, to remove the species from the list created pursuant to ORS 496.172. Upon recovery, adequate measures pursuant to the Oregon Plan shall remain in place, as necessary, to help a species avoid a return to threatened or endangered status.

(8)(a) The Governor, or the Governor's designee, shall negotiate with federal officials to obtain assurances to the effect that compliance with the Oregon Plan and the programs and policies found in the statutes listed in subsection (3) of this section and implementation of related state programs and policies will satisfy federal requirements imposed by the federal Endangered Species Act. Specifically, the Governor, or the Governor's designee, shall seek an exemption to the requirements of 16 U.S.C. 1533(d), shall seek to enter into a cooperative agreement pursuant to 16 U.S.C. 1535(c) or shall seek to obtain a permit that allows the incidental taking of species under 16 U.S.C. 1539(a).

(b) State agencies responsible for implementing the programs and policies found in the statutes listed in subsection (3) of this section shall work with the Governor, or the Governor's designee, and with federal officials to provide the information necessary to obtain the exemptions, agreement or permit specified in paragraph (a) of this subsection.

SECTION 9. Section 5 of this 2015 Act, the amendments to ORS 541.890 and 541.898 by sections 7 and 8 of this 2015 Act and the repeal of ORS 541.914 by section 6 of this 2015 Act become operative on January 1, 2017.

MISCELLANEOUS

SECTION 10. The unit captions used in this 2015 Act are provided only for the convenience of the reader and do not become part of the statutory law of this state or express any legislative intent in the enactment of this 2015 Act.

SECTION 11. There is appropriated to the Higher Education Coordinating Commission, for the biennium beginning July 1, 2015, out of the General Fund, the amount of $108,907 to be distributed to Oregon State University to be used for the purposes of the Institute for Natural Resources.

SECTION 12. This 2015 Act being necessary for the immediate preservation of the public peace, health and safety, an emergency is declared to exist, and this 2015 Act takes effect on its passage.

Appendix B

List of Task Force Members

Allison Aldous
Freshwater Scientist
The Nature Conservancy

Jennifer Allen
Associate Professor, Hatfield School of Government and Senior Fellow, Institute for Sustainable Solutions
Portland State University

Adell Amos
Clayton R. Hess Professor of Law and Associate Dean for Academic Affairs
School of Law
University of Oregon

Barbara Bond
Emeritus Professor
College of Forestry
Oregon State University

Tim Deboodt
Associate Professor
College of Agricultural Sciences
Oregon State University Extension

Dan Edge
Associate Dean
College of Agricultural Sciences
and Professor of Wildlife Ecology
Oregon State University

Linda George
Professor of Environmental Sciences and Management
College of Liberal Arts and Sciences
School of the Environment
Portland State University

Sara Gray
Senior Corporate Counsel
Precision Castparts

Michael Harte
Professor
College of Earth, Ocean and Atmospheric Sciences
Oregon State University

Cassandra Moseley
Associate Vice President for Research
Research Professor and Director, Institute for a Sustainable Environment
University of Oregon

Maryanne Reiter
Hydrologist
Environmental Forestry Research Group
Weyerhaeuser Company

Mark Sytsma
Professor and Director, Center for Lakes and Reservoirs
Portland State University

Jason Younker
Assistant Vice President and
Advisor to the President on Sovereignty and Government-to-Government Relations
University of Oregon

Appendix C

Task Force Decision Making and Governance

Decision making

Adopted (February 2016) the "Proposed Rules" as outlined in the Legislative Task Force Staff Guide (p.6), with the following additions:

- Minor decisions can be made by a quorum.
- Defined supra majority: 9 of the 13 voting Task Force members.
- Major determinations: supra majority is needed to move forward for major determinations. At any time a voting Task Force member can call an issue to be a major determination, and if a vote is needed, supra majority is also needed.
- Decisions needed by email: the email will come from the co-chairs; Task Force members will be given at least 2 working days to respond; no response is considered consent.
- For final recommendations to the legislature: Supra majority is needed, minority reports can be done

Proposed Rules

Meetings will operate in accordance with the Oregon Constitution, applicable statutory provisions and general parliamentary law.

1. In the absence of a Chair being selected by the appointing authority as set forth in statute, a majority of the appointed members of the (name of Task Force) shall elect a Chair.
2. Rules may be amended by affirmative vote of the majority of members, but at least one day's notice shall be given in writing to each Task Force member.
3. No seconds are required to a motion.
4. A quorum shall be comprised of a majority of the appointed members. In the absence of a quorum, the Chair may assign fewer members to receive public testimony.
5. The Chair shall call meetings, set agendas and cause notice of the time and place of meetings.
6. All meetings are open and shall comply with public meetings law.
7. Upon request of one member, a roll call vote shall be taken and recorded on any question placed before the Task Force.
8. A majority of the appointed members shall be required to approve recommendations.
9. (*optional rule for discussion*)
   Votes will be allowed from members attending the Task Force via phone.

Governance

Adopted (February 2016) the "Task Force Roles and Expectations" (See below)), with the following additions:

- "Chair" be changed to "Co-Chair"

Expectations

- Prepare for and attend all scheduled meetings.
- Be timely and responsive with Task Force communications.
- Be actively engaged in ensuring the fairness and transparency of the process.
- Actively participate in productive exchanges.
- Work collegially to produce quality deliverables.
- Openly acknowledge any potential conflict of interest.

Roles

Task Force Members

- Submit a report of findings and recommendations to the Governor and appropriate committee of the Legislative Assembly no later than September 15, 2016.
- The Task Force shall elect one of the voting members to serve as chair.
- The Task Force may adopt rules necessary for the operation of the Task Force.
- The Task Force shall meet at times and places specified by a majority of the voting members of the Task Force. The first meeting shall occur on or before January 1, 2016.
- A majority of the voting members of the Task Force constitutes a quorum for the transaction of business. Official action by the Task Force requires the approval of a majority of the voting members of the Task Force.

Task Force Co-Chairs

- Serve as the primary liaison for the Task Force with the Governor's Office, the Institute for Natural Resources, and the facilitator
- Work with the facilitator, Governor's Office, and the Institute for Natural Resources' Director to design Task Force meetings.
- Take the lead in resolving disagreements and seeking consensus among Task Force members on substantive issues.
- Take the lead in enforcing timelines for Task Force deliverables.
- Take the lead in reporting to the Governor and/or Legislative Assembly, as necessary.
- Serve as the point of contact, with the Institute for Natural Resources' Director, regarding stakeholder interactions and communications.

State Agency Representatives (Nonvoting)

- Attend Task Force meetings.
- Participate in Task Force discussions.
- Respond to Task Force requests for information.

Governor's Office Representative

- Appointment of Task Force members, including any vacancies.
- Attend Task Force meetings.
- As needed, work with the chair, Task Force members, the Institute for Natural Resources' Director, and the Institute for Natural Resources' staff.

Institute for Natural Resources Director

- Attend Task Force meetings.
- Oversee Task Force process, communications, and development of products.
- Hire and work with Task Force facilitator.
- Provide guidance to Task Force staff in their logistical, research, and product delivery tasks.
- Work with the chair, Task Force members and Governor's Office to help resolve any issues that may arise in the implementation of the project.
- Serve as the point of contact, with the Task Force chair, regarding stakeholder interactions and communications.

Institute for Natural Resources Task Force Staff

- Support for Task Force (scheduling meetings, meeting notes, other).
- Support Task Force communications including website, meeting notices, announcements, etc.
- Conduct research, information gathering, and documentation of Task Force findings.
- Work with Task Force members and Chair to help produce intermediate and final products including writing and editing the final report to the Legislature.

Facilitator

- Work with the Task Force chair, Governor's Office and the Institute for Natural Resources' Director to design Task Force meetings.
- Design processes that will achieve the group's goals and provide fairness and transparency for the process.
- Use group facilitation competencies to add value to the Task Force's work – use time and space intentionally, evoke participation and creativity.
- Facilitate all Task Force meetings.
- Responsible for the stewardship of the process and assuring impartial content.
- Report directly to the Institute for Natural Resources' Director.
- Maintain confidentiality of information.

Appendix D

Definitions of Terms

Independent Science Review (ISR). An external assessment of a stated scientific question or issue that:

- produces unbiased conclusions regarding the current understanding ofrelevant information, methodology and assumptions relating to that scientific question or issue;
- includes, as applicable, an assessment of the risks, costs and benefits of potential alternative decisions or policies;
- is conducted by reviewers who:
  - have little personal stake in the nature of the outcome of decisionsor policies, in terms of financial gain or loss, career advancement, orpersonal or professional relationships;
  - can perform the review tasks free of undue influence by otherssassociated with the decision process;
  - have demonstrable competence in the subject as evidenced byformal training and/or experience; and
  - should be required to disclose any potential personal stake or conflictof interest with respect to the stated question/issue.

Science. The pursuit of knowledge and understanding of the natural and social world following systematic evidence and methodology. (Adapted from BSC)

Appendix E

Crosswalk Checklist of the Legislation with the Task Force's Work

Goals

- ✓ Goal 1: Assess the need (and capacity) for independent science review in Oregon.
  - ✓ *Objective 1.1*: Evaluate whether natural resources agencies, legislators and the public would benefit from the incorporation of independent science review in the making of policy decisions.
  - ✓ *Objective 1.2*: Evaluate whether existing state, federal and academic resources for conducting independent science review are meeting the needs of natural resources agencies and other policymakers.
  - ✓ *Objective 1.3*: Evaluate the mechanisms and structures that are in place in other states and at the federal level for independent science review related to natural resources policy.

- ✓ Goal 2: Make recommendations on one or more entities that are best situated to conduct or coordinate an ISR process, if the Task Force determines that there is a need for independent science review in the state.
  - ✓ *Objective 2.1*: Identify and review/assess the candidate existing scientific entities.
  - ✓ *Objective 2.2*: Make any recommendations regarding necessary changes to the entity, if a particular existing scientific entity is recommended.
  - ✓ *Objective 2.3*: If developing a new independent science review entity is suggested, the Task Force shall make recommendations regarding how to structure this new independent scientific entity.

Tasks

- ✓ Task 2.1. Consider whether the entity should provide reports to the Legislative Assembly or otherwise be subject to special legislative oversight.
- ✓ Task 2.2. Consider whether organizational safeguards must be established or changed within the entity to ensure that the entity is free from bias and that a wide variety of natural resource disciplines and interests are represented.
- ✓ Task 2.3. Consider how to develop or change the structure or processes of the entity's advisory board or other governing body in order to support the independence of scientific review panels convened by the entity, which shall include consideration of the entity's advisory board or other governing body directing or participating in the scientific analysis and review conducted or coordinated by the entity.
- ✓ Task 2.4. Consider how the entity's funding structure should be created, altered or supplemented to ensure that there is no perception of bias in the funding of the ISR and to ensure that adequate funds are available to conduct robust reviews.

- ✓ Task 2.5. Consider how to develop processes for conducting or coordinating independent scientific review in order to encourage balanced, broad and diverse participation among the scientific disciplines that may be called upon in the course of independent scientific review.
- ✓ Task 2.6. Consider how to develop procedures for the selection and deliberation of scientific experts to participate in ISRs, taking into consideration lessons learned from the processes used by the former Independent Multidisciplinary Science Team and other processes for ISRs.

✓ Goal 3: Make recommendations on whether the entities identified would need legislative authority to act as independent scientific review bodies for Oregon.

✓ Goal 4: Make recommendations regarding the structure and function of the process to be used by the recommended entities in the course of ISRs.

Tasks

- ✓ Task 4.1. Consider whether the entity should respond to inquiries from the Governor's office or the Legislative Assembly, the citizen boards of natural resources agencies or from other appropriate parties.
- ✓ Task 4.2. Consider whether the entity should independently select science issues to review.
- ✓ Task 4.3. Consider whether a state agency should be required to respond in writing to a report issued by an independent scientific review panel, explaining how the agency intends to implement the panel's suggestions or why the agency does not plan to implement the suggestions.
- ✓ Task 4.4. Consider how to enhance involvement of the University of Oregon, Oregon State University, Portland State University and other universities in the independent scientific review process.
- ✓ Task 4.5. Consider how to provide a scientific review process that is open to the public and that inspires public confidence in, and understanding of, the review process without compromising the independence of the review.

Appendix F

Literature Search Protocol

Benefits of Independent Science Review in Natural Resource Management and Policy Making

1. Background and introduction

In 2015, the Oregon Legislature passed Senate Bill 202 regarding independent scientific review of natural resources issues and policies in Oregon. As directed by SB 202, the Oregon Governor's Office appointed a Task Force of experts to examine the state's need, capacity and options for independent science review and to make recommendations to the Legislature.

Among other tasks, SB202 directs the Task Force to "*Evaluate whether natural resource agencies, legislators, and the public would benefit from the incorporation of independent scientific review in the making of [natural resource] policy decisions."* To help make this evaluation, the Task Force directed the Institute for Natural Resources (INR) to review literature on the benefits of independent science review of natural resource issues and policies.

The INR utilizes systematic review methods in work of this type. Systematic review is an objective, rigorous and transparent framework for finding and assessing published information on specific science and policy questions. Originally developed to assess evidence on the effectiveness of clinical medicine practices, systematic review methods are increasingly being adapted for use in other fields, including natural resources. One such method is a review *protocol* that explicitly lays out the review's purpose and procedures, e.g. the review question(s), search strategy, literature inclusion criteria, and how results are presented. The final protocol often reflects refinements that were made as the review progressed (e.g. search terms added based on initial search results) and a more complete explanation of the process that is possible after the fact.

What follows is the final protocol for the literature review INR conducted on independent science review for the SB202 Task Force between February 8 and March 28, 2016. This was a very compressed timeline compared to that which is typically allocated for a systematic review. Thus, rather than a comprehensive examination - the goal of "traditional" systematic reviews - INR aimed to provide a representative (but still transparent and objective) review. The INR believes that goal was achieved.

2. Review questions

Primary questions: *Do natural resource agencies, legislators and the public benefit from the incorporation of independent science review in the making of [natural resource] policy decisions? If so, what are these benefits?*

Secondary questions: *Are there disadvantages, downsides or drawbacks to natural resource agencies, legislators and the public from the incorporation of independent science review in the making of [natural resource] policy decisions? If so, what are these disadvantages, downsides or drawbacks?*

3. Methods

3.1 Scope; specific content that was sought

This review was focused primarily on peer-reviewed literature with substantive discussion of the benefits and/or disadvantages of independent science review (ISR) in natural resource policymaking and implementation, especially any concrete statement of a discrete benefit or drawback of an ISR process.

Most relevant: Literature published in refereed journals focused on the topic listed above.

Relevant: Non-refereed reports, policy papers, conference proceedings, etc. from state, federal and tribal land and natural resource agencies focused on the topic listed above. Literature that discusses rationales for ISR. Literature that discusses lessons learned; improvements or ways to conduct effective ISRs.

Less relevant: Literature with substantive discussion of benefits of ISR in fields other than natural resources. Literature that focuses primarily on the process and mechanics of transferring science into policy, rather than the benefits of monitoring this process via scientific review.

3.2 Search strategy: databases and keyword search strings

The following databases and keywords were used in the search:

- 1Search - "external peer review"
- 1Search - "external scientific review"
- 1Search - "external scientific review" AND benefits (no filters)
- 1Search - "independent scientific review" AND benefits
- 1Search - "independent scientific review" (no filters)
- Academic Search Premier - "independent scientific review" and benefit OR benefits
- Academic Search Premier - "independent scientific review" and natural resources
- Academic Search Premier - "external scientific review" AND benefits
- Academic Search Premier - "independent peer review" AND natural resources
- Academic Search Premier - "independent scientific review"
- Academic Search Premier - "independent scientific review" AND natural resources
- Web Of Science - "independent peer review" (topic)
- Web Of Science - "independent scientific review" AND benefits (topic)
- Web Of Science - "independent scientific review" (title, topic)
- Web Of Science - "external peer review" (title, topic)
- Web Of Science - "external scientific review" (title, topic)
- Web Of Science - "scientific review" AND "natural resources" (topic)
- Google Scholar - "independent scientific review" AND benefits
- Google Scholar - "independent scientific review" AND "natural resources"
- Google Scholar - "external peer review" AND "natural resources"
- Google Scholar - "external scientific review" AND benefits
- Google Scholar - "external scientific review" AND "natural resources"
- Google Scholar - "regulatory peer review" AND "natural resources"

3.3 Literature “filtering” process

The searches listed above returned a total of 525 “hits”. In the “coarse filter” phase, all 525 references identified by database searches were scanned for evidence of potentially relevant content. Occasionally, this could be

ascertained simply by reading the title. But in most cases it required reading the abstract and it was often necessary to read the introduction, results/discussion, conclusions, or skim the entire reference to make a coarse filter determination.

There did not appear to be a universally agreed upon, precise definition of independent scientific review in the literature on this topic. For the purposes of determining relevance and inclusion in this review, the terms *independent scientific review, external scientific review, independent peer review, external peer review,* and *regulatory peer review* were treated as synonymous if the context for their use indicated that was appropriate. The common thread was review of scientific information used in natural resource policy-making by subject matter experts who were not involved in writing the document or using the information, and without a vested interest in the review outcome. For consistency and brevity, those terms were changed to the acronym "ISR" in subsequent synthesis work.

After removal of duplicates returned by more than one search, twenty-six peer-reviewed papers passed the coarse filter phase and were then analyzed in depth to identify relevant content. Of these, fourteen papers were focused primarily on the *results* of ISRs of particular policies (e.g. management plans for the Florida Everglades, or Tongass National Forest), or discussed these results as part of a broader analysis of policy generation and implementation, and did not include explicit or substantive content on the benefits or drawbacks of the ISR process itself.

This filtering process ultimately identified eleven peer-reviewed papers and one conference proceedings paper that included substantive, detailed discussion of the benefits and drawbacks of ISR. Full citations for these references appear at the end of this protocol.

3.4 Extraction, synthesis and presentation of relevant content

Once filtering was completed, an Excel spreadsheet was created with fields for:

(1) source of referenced document (e.g. name of database) and date found,
(2) keywords used to locate reference or other source of reference,
(3) rationale for inclusion,
(4) full citation,
(5) type of reference (peer reviewed, GTR, planning document, proceedings, book chapter, etc.),
(6) publication date,
(7) stated aim of study or paper (usually the abstract, or text from introduction),
(8) comments (e.g. particularly relevant discussion, argument, evidence or points made),
(9) cited benefits, positive outcomes, advantages, rationales, purposes, goals for ISR,
(10) cited drawbacks, disadvantages, disbenefits, limitations, problems, costs of ISR,
(11) lessons learned; cautions in use of ISR; advice for implementing or improving ISR.

Text from each reference that described a discrete benefit or drawback was cited as directly as possible for inclusion in the appropriate field in the spreadsheet. Every effort was made to retain the author's original intent when paraphrasing or synthesis of similar statements that appeared in more than one place. In some cases, the benefit or drawback was submitted and defended as such by the author. In other cases, it was "purported by advocates" or cited from other literature. The most relevant references were qualitative analyses from the legal and political science fields. No references were found in which benefits or drawbacks had been quantified. One author noted that, to date, the challenges of identifying and comparing two policymaking processes, one "with" and one "without" ISR, seemed to have precluded such studies.

Text that discussed lessons learned, cautions or advice for maximizing the effectiveness and utility of ISR was also compiled in the appropriate field for each reference. For most references, some fields were left blank because no relevant text for that field could be discerned.

After extraction of relevant content, benefits and drawbacks were grouped into categories, and summary statements capturing the theme of each category were generated, along with lists of each cited benefit that seemed to fit in that category. This involved some repetition, since it was common for more than one author to recognize a similar type of benefit or drawback.

Placing benefits and drawbacks into discrete categories was deemed useful for synthesis and discussion purposes, but it did involve some degree of judgment and there is some overlap among the categories. Also, it was more difficult to discern discrete categories for drawbacks than it was for benefits. This resulted in a range of various drawbacks being placed into a fairly diverse category entitled "politicization of the ISR process."

Categories of benefits and drawbacks, along with supporting statements from the included references, are shown in Appendix H.

4. Potential Conflicts of Interest and Sources of Support

The Institute for Natural Resources' (INR) mission is to provide access to integrated knowledge and information to inform natural resource decision making and develop solutions in the context of sustainability. The INR provides this access through a variety of means, including science synthesis and independent science reviews. Thus, it is possible that INR could be seen as predisposed to emphasize the benefits of ISR, and de-emphasize the disadvantages.

INR realizes that a credible review hinges on avoiding this perception and on filtering literature and presenting findings objectively. Also, an accurate and clear-eyed synthesis of knowledge on the pros and cons of independent science review can inform INR's work.

At the direction of the SB202 Task Force, INR staff is helping to engage in this review, which is funded the Oregon Legislature.

5. Review limitations

This review was limited by the short timeline available to complete it. Our ability to find highly relevant, focused literature explicitly describing and accounting for the benefits and drawbacks of ISR may have also been limited because there simply isn't much of it, or because there seems to be little agreement on keywords.

There is likely a larger volume of tangentially relevant literature on the use and application of science in natural resource policymaking that might shed additional light on the topic of ISR benefits and drawbacks. To the degree that term is synonymous with ISR, there may also be more relevant literature *regulatory peer review* that could be uncovered via more extensive searching of law and political science databases (this review focused primarily on databases oriented more generally, or toward the natural sciences.)

Regardless of these limitations, the INR submits this review as an objectively gathered and reasonably representative sample of the available literature.

6. References included and reviewed

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Appendix G

List of Stakeholder Organizations

Oregon State Natural Resources Agencies

Columbia River Gorge Commission
Department of Environmental Quality
Department of Geology and Mineral Industries
Department of Land Conservation and Development
Department of State Lands
Marine Board
Oregon Department of Agriculture
Oregon Department of Energy
Oregon Department of Fish and Wildlife
Oregon Department of Forestry
Oregon Watershed Enhancement Board
Water Resources Department
Governor's Natural Resource Office

Other Oregon State Agencies

Oregon Department of Transportation

Natural Resources-related Legislative Committees

House Committee on Agriculture and Natural Resources
House Committee on Energy and Environment
House Committee on Rural Communities, Land Use and Water
Senate Committee on Environment and Natural Resources

Oregon Tribes and Associated Working Groups

Burns Paiute
Confederated Tribes of Coos, Lower Umpqua, and Siuslaw
Confederated Tribes of Grand Ronde
Confederated Tribes of Siletz Indians
Confederated Tribes of the Umatilla Indian Reservation
Confederated Tribes of the Warm Springs Reservation of Oregon
Coquille Indian Tribe
Cow Creek Band of Umpqua Tribe of Indians
Klamath Tribes
Legislative Commission on Indian Services

State-Tribal Natural Resources Working Group
State-Tribal Cultural Resources Cluster

Agriculture, Conservation, Forestry, Manufacturing, and other Key Stakeholders

City of Portland
Clackamas Soil and Water Conservation District
The Freshwater Trust
Hampton Affiliates
Independent Multidisciplinary Science Team
League of Conservation Voters
Native Fish Society
Oregon Cattlemen's Association
Oregon Conservation Network
Oregon Farm Bureau
Oregon Forest Industries Council
Oregon Invasive Species Council
Oregon Small Woodlands Association
Oregon Watershed Councils
Oregonians for Food and Shelter
Portland Metro
Stoel Rives
The Nature Conservancy
The Willamette Partnership
Tonkon Torp LLP
Trout Unlimited
Urban League
West Linn Paper
Weyerhaeuser

Appendix H

Benefits and Disadvantages of Independent Scientific Review: Themes from the Literature

Objective 1.1 is to evaluate whether natural resource agencies, state legislators, and the public would benefit from independent scientific reviews.

Introduction

A literature search was conducted on the benefits and disadvantages of independent scientific review (ISR). The search was systematic (e.g. search terms, databases and search results documented) but not comprehensive. Databases and search strings searched:

1Search - "external peer review"
1Search - "external scientific review"
1Search - "external scientific review" AND benefits (no filters)
1Search - "independent scientific review" AND benefits
1Search - "independent scientific review" (no filters)
Academic Search Premier - "independent scientific review" and benefit OR benefits
Academic Search Premier - "independent scientific review" and natural resources
Academic Search Premier - "external scientific review" AND benefits
Academic Search Premier - "independent peer review" AND natural resources
Academic Search Premier - "independent scientific review"
Academic Search Premier - "independent scientific review" AND natural resources
Web Of Science - "independent peer review" (topic)
Web Of Science - "independent scientific review" AND benefits (topic)
Web Of Science - "independent scientific review" (title, topic)
Web Of Science - "external peer review" (title, topic)
Web Of Science - "external scientific review" (title, topic)
Web Of Science - "scientific review" AND "natural resources" (topic)
Google Scholar - "independent scientific review" AND benefits
Google Scholar - "independent scientific review" AND "natural resources"
Google Scholar - "external peer review" AND "natural resources"
Google Scholar - "external scientific review" AND benefits
Google Scholar - "external scientific review" AND "natural resources"
Google Scholar - "regulatory peer review" AND "natural resources"

Initial search results were “coarse filtered” for relevance, i.e. titles and/or abstracts scanned. Promising documents were then analyzed in more depth to ascertain relevance and extract relevant content- roughly defined as any concrete statement of a discrete benefit or drawback of an independent scientific review process. The terms *external scientific review*, *independent peer review, external peer review,* and *regulatory peer review* were treated as synonymous if the context for their use indicated that was appropriate. For consistency and brevity, those terms were changed to the acronym “ISR” in this summary

Categories of benefits and disadvantages of independent scientific review identified by this process are listed below, along with examples from relevant documents (paraphrased in most cases). In some cases, the benefits and disadvantages were submitted and defended as such by authors. In other cases, they were "purported by advocates" or cited from other literature.

Following the list of benefits and disadvantages, a few of the most useful and insightful references on the topic of independent scientific review are listed in a short annotated bibliography.

Perceived BENEFITS of independent scientific review

1. Science "quality control"- ISR can help ensure that agencies are using the "best" (most complete, up-to-date, agreed upon) science in support of their policies and regulations.

ISR can help ensure that environmental decisions and policy making reflect the best scientific knowledge of the day.

ISR can help ensure that best available scientific knowledge is brought into the decision or policy-making process.

ISR can help establish general acceptance or consensus on science basis, and expose flaws in scientific evidence on which an agency relied.

ISR, if rigorously applied, could detect cases in which an agency attempted to oversell what its scientific case supports, and thus would be likely to encourage agencies to be more careful in their search for, selection, and interpretation of scientific data and research.

ISR can serve as an important source of scientific information and as a quality assurance mechanism.

ISR can help avoid errors in science synthesis and use, including 1) incomplete presentation of available information and conclusions that would not be drawn if the complete information base had been considered, 2) misinterpretation of scientific findings,3) misrepresentation of scientific findings, 4) inappropriate emphasis e.g. on particular mitigation strategies that are not supported by scientific findings.

To the degree that ISR produces better quality information upon which agencies base their decisions, ISR also improves the quality (or correctness) of those decisions.

ISR improves the quality of reasoning employed by the agency to make these decisions by detecting holes and flaws in the data intended to support regulatory action, which should ultimately lead to a more complete and well-reasoned [administrative] record that acknowledges flaws and uncertainties inherent in the data.

ISR can help ensure that all relevant information is considered and evaluated, and that all conclusions drawn are consistent with the available scientific information.

Because of resource constraints, agencies may do an inadequate job of addressing complex scientific information on their own. ISR may help counteract such agency tendencies toward superficiality.

2. ISR can increase the credibility and legitimacy of the policy in eyes of public, lawmakers, stakeholders and courts

ISR can raise the level of public trust in the process, alleviating fears that industries, environmental protection organizations, or government agencies are simply promoting their own interests or moving ahead without benefit of relevant scientific information.

ISR can lend additional legitimacy to agency decisions by holding agency scientists accountable to external peers.

ISR can help ensure that influences of bias and special interests are minimized in environmentally relevant decisions or policy making

By improving the scientific quality of risk assessments, ISR can provide a scientific "seal of approval". This is sometimes seen as an effective shield to deflect criticisms from adversaries of the policy, e.g. industry or environmental groups.

ISR can serve as a source of scientific credibility and legitimacy for decision making.

Wisely designed ISR can lead to greater legitimacy of agency decisions in the eyes of the public, legislatures, and the courts.

ISR processes are designed to add to the credibility of the information being applied in policy-making and contribute to the legitimacy of the overall decision-making process.

3. ISR can help reduce costs, and increase efficiency in natural resource policy making, particularly by reducing the likelihood and susceptibility of the decision to legal challenge.

The additional time and effort associated with ISR early in the policy making process may provide later dividends if the review reduces the likelihood of successful judicial challenges.

The additional legitimacy ISR can lend to agency decisions can help make these decisions more resistant to legal challenge and thus reduce costs of controversy.

By improving the quality, reasoning, and transparency of policy making, ISR will make policies more likely to withstand judicial scrutiny and ultimately reduce the costs imposed by judicial review. This is especially true for policies that involve complex scientific issues because courts tend to defer to agency expertise on scientific matters.

Extra effort invested in ISR early in the process is likely to provide a net benefit by reducing the prospect of challenges to a regulation that later may trigger time-consuming and resource-draining litigation.

4. ISR can improve policy by helping to clarify the line between science and policy judgments, by making policy judgments more explicit, and more clearly delineating risks and uncertainties

One benefit - perhaps the chief benefit - that could reasonably be expected to derive from the use of ISR is that it would encourage agencies to provide sharper delineations between scientific and policy bases for decisions.

ISR can help decision makers focus on the objective, scientific variables apart from economic, historical, or cultural factors

ISR can help ensure that risks associated with different interpretations of data or alternative management decisions are articulated

To the degree that ISR improves the quality of agencies' use of science, it should also improve agencies' policy deliberations by providing more confidence in the scientific input and more explicit delineation between science and policy in the justification the agency presents for its final decision.

ISR can help inform the public about where an agency's use of science in support of a proposed decision ends and where its use of professional judgment and normative policy choices begins.

5. ISR can help increase the transparency and openness of natural resource policy making to public, administrative and legal oversight.

ISR can improve oversight of agencies by providing increased transparency for lawmakers, administration officials, courts and constituent groups.

ISR can help ensure that decisions or policies are achieved in an open and transparent manner.

ISR can help ensure that assumptions are made explicit.

ISR increases the transparency of agency reasoning by revealing the underlying facts, assumptions, and judgments that combine in every policy based on scientific data.

ISR, when properly conducted, is a critical component of the objectivity, transparency, and openness desired to instill public confidence in regulatory decisions.

ISR can also increase transparency by pointing out limitations in the data, unconventional scientific judgments, or places where policy judgments must have been made.

Wisely designed ISR can lead to greater transparency in agency decision processes.

6. Involvement of independent experts enhances collaborative, social learning about the issues, science, and policy options among agencies, scientists, and the public. This collaboration can expose novel policy options and enhance public participation.

ISR can facilitate learning and help improve public understanding, and thus deliberation and political participation on an issue.

ISR can improve policy deliberations by creating opportunities for collaboration and dialogue with other experts.

ISR can uncover alternative approaches or solutions to policy problems and provide new information to guide future agency decision making and research.

Because authority is highly decentralized in the legislative, judicial and executive branches, examining science and technology issues in a single ISR process can help bridge mandates and responsibilities.

Regulatory agencies can benefit from ISR if non-agency scientists can bring additional expertise and perspectives to the table, especially in cases where advances in science outpace the training of agency specialists.

ISR entities can help build trust in groups of technical experts from different agencies by keeping debates scientifically grounded and ensuring that arguments over analyses and results are based on facts, not agency positions, and serving as arbiter of alternative hypotheses put forward by different scientists.

Public comments on proposed regulations rarely come from truly independent parties because the time investment is only worthwhile for those with a stake in the outcome. In contrast, ISR allows agencies to hear collaborative criticism from independent experts, a process that is more likely to actually help the agency improve its understanding and use of science.

ISR can function as a forum for sharing and collaborative learning about science information in environmental governance groups, e.g. the NWPCC. Scholars of adaptive management have long argued that such "learning organizations" are critical for resource managers to learn which types of management strategies work best. The NWPCC use of its ISAB to review plans and the state of knowledge on fish and wildlife management in the basin supports this process.

Periodic ISR of ongoing (multi-year) natural resource management programs provides critical assessment of progress and potential for success, and concomitantly, it can be used to build program support. By addressing barriers to success identified during follow-up ISRs, managers can improve the probability of success directly through targeted changes, and indirectly through renewed interest and support generated by responding to ISR recommendations.

Perceived DISADVANTAGES or DRAWBACKS of independent scientific review

1. Disincentives to ISR use- financial and human resource costs, distraction of agency resources from other work, procedural hurdles, and delays in getting policies implemented.

Increased use of ISR will undeniably impose costs on agencies.

ISR can slow the agency process to the point of frustrating agencies' missions to protect the public welfare.

Inflexibly mandating rigorous ISR can add substantial demands on agency resources, potentially draining resources from other decision making components and, in many cases, impeding decision making altogether.

If ISR were to significantly lengthen the decision process, it is possible in some cases that an agency would be unable to act before it is too late, e.g., allowing an endangered species to move ever closer to extinction while the agencies engage in further process.

Potential for ISR procedural hurdles can be a disincentive for agencies to promulgate new policy.

Overuse of ISR can delay or even destroy decision processes and needlessly use up limited staff time and funds.

The prospect of ISR may be a disincentive for an agency contemplating issuing or revising regulations. Some observers call this "paralysis by analysis".

If it does not help steer an agency early in the process, ISR may become an ominous hurdle for agencies to surmount, both in terms of the difficulty of undergoing that scrutiny and because of the prospect of judicial invalidation triggered by the inevitable criticisms from ISR.

There is a real risk that benefits of ISR are not be worth the cost to the public in terms of health and environmental effects attributable to diverted agency resources, delayed access to information, and delayed implementation of rules.

2. Misuse of ISR by stakeholders, "politicization" of the ISR process, using it as a stalling tactic, to manufacture or exaggerate uncertainty, to delegitimize the agency and its decision, fan public distrust.

ISR can further politicize the decision making process.

Sometimes regulated entities will persuade lawmakers to convene an ISR as a way of delaying agency action.

ISR in natural resource and environmental policy arenas inevitably exposes data/knowledge gaps and uncertainties, which regulatory opponents may manipulate for political reasons [especially in post-hoc reviews].

In some recent cases, ISRs [NRC] have ultimately, but unwittingly, served as political tools wielded by influential lawmakers to delegitimize environmental decisions on behalf of agricultural interests.

ISR in natural resource and environmental policy arenas inevitably exposes data/knowledge gaps and uncertainties, which regulatory opponents may exploit for political reasons in efforts to delegitimize agency decisions and erode public support for them.

Post-hoc ISR may function more as a "science court" brought in to try to resolve conflicting positions on issues that transcend science. This may serve mainly to promote conflict rather than resolve it.

Unnecessary calls for ISR could be used to mire regulatory agencies in a host of new procedural requirements that would make the task of promulgating regulations even more difficult, sidetrack policy, or stall decisions.

Rather than make technical corrections to science information, industry groups often misuse ISR to attack policy judgments and delay information dissemination.

"Paralysis by analysis" describes the ability of a well-financed regulated industry to fight new regulations at every step of the process, delaying potentially costly regulations for years through the use of every procedural tool a small army of attorneys can find. ISR can serve as one such procedural tool.

ISR is often used as a back door tool for disputing assumptions about acting in the face of uncertainty and challenging unfavorable policy judgments and decisions made pursuant to environmental, health, and safety statutes.

Most natural resource conflicts boil down to disagreements over values and priorities. By focusing attention (and encouraging arguments) on the science basis of agency decisions, ISR can distract stakeholders and the public from the policy rationales and values underlying those decisions, thereby exacerbating conflict rather than alleviating it.

The "sound science" argument is born of the understanding that it is much easier to oppose a regulation for being based on faulty science than it is to oppose it based simply on costs to regulated industries and the public. Avoidance of responsibility by questioning the validity of data is a classic tactic of industries whose activities may be causing harm. Attacking the information that an agency intends to rely upon in policy or rulemaking can be an effective way to prevent or delay regulation, and ISR may potentially be an effective antiregulatory tool.

Rather than genuine concerns about the quality of science used, proponents of ISR may actually be more concerned with the "presumption of protection" built into environmental regulations. ISR is not the appropriate means to address disputes over the proper level of regulation.

3. Misuse of ISR by agencies, lawmakers or reviewers; tendency of agencies to ignore unfavorable recommendations.

Agencies may sometimes invite ISR in order to defer making a decision.

There is the potential that ISR, rather than eliminating bias from agency decisions, will actually exacerbate these concerns by allowing agencies to mask their biases with the veneer of science.

In some cases, agencies may use ISR to support their decisions rather than as a critical outside check on the accuracy of their decisions. In worst cases, ISR can become a cynical exercise, allowing agencies to manipulate the process and rig outcomes (e.g. by cherry-picking reviewers) to justify agency decisions that might not withstand legitimate peer scrutiny.

Relying too heavily on ISR to render judgments that inherently involve policy choices can result in shifting problems rather than solving them and reducing agency accountability by abdicating policy formulation to unaccountable outside experts.

ISR panels may implicitly invoke the higher evidentiary standards used in research settings rather than the more deferent "arbitrary and capricious" standards typically afforded agencies in legal settings. This shift upward in evidentiary standards and burden of proof can reduce the ability of agency policy actions to withstand legal challenges.

One hazard of making ISR comments part of the administrative record is the tendency to focus on the inevitable, usually constructive, criticisms found in any ISR peer review report and take them out of context.

Policymakers sometimes conflate ISR with science itself, which in turn may lead them to exaggerate the possible utility of ISR in decisions based on science. Ultimately ISR cannot and should not displace the broader deliberative process about hard policy questions that science cannot answer.

Without a clearly defined role for the ISR, recommendations that are not well-received by public officials and agencies are often ignored or have a small role in the final decision-making.

Appendix I

Examples of Other State and Federal Independent Scientific Review Programs

The National Academies of Sciences

"The nation's pre-eminent source of high-quality, objective advice on science, engineering, and health matters."

QUICK FACTS

Date Started: 1863. Charter: To meet the government's urgent need for an independent adviser on scientific matters, President Lincoln signed a congressional charter forming the National Academy of Sciences in 1863 to "investigate, examine, experiment, and report upon any subject of science."

Products/Deliverables: Consensus Reports, Journals, Periodicals, Education Outreach Programs.

MISSION

The National Academies of Sciences (NAS), Engineering, and Medicine are trusted and valuable resources for independent, expert advice -- not only for Congress and the federal government, but also for state and local government agencies, nonprofit institutions and foundations, and others. Those who request a study depend upon our reputation for independence and unique ability to bring together leading experts, weigh the evidence, and produce reports that inform sound policies and educate the public.

SUBJECT AREAS

Most work is conducted through 7 major programs:

- Behavioral and Social Sciences and Education
- Earth and Life Studies
- Engineering and Physical Sciences
- Institute of Medicine
- Policy and Global Affairs
- Transportation Research Board
- NAS Gulf Research Program

A relevant consensus report example is the Independent Scientific Review of the Everglades Restoration Progress.

Products/Services/Deliverables

- The NAS is best known for *consensus studies*, but sponsors may choose to support other products or activities to suit their needs, including
- Workshops that bring together leading experts and interested parties;
- In-depth roundtables and standing committees that meet regularly and provide ongoing guidance on particular subjects;
- Cooperative research programs, through which government agencies and other potential users of research have a direct role in the types of projects selected for study; and,
- Fellowship programs, and awards to recognize outstanding achievement in science, engineering, and medicine.

BENEFITS AND USES OF FINDINGS

Government agencies may need independent reviews of their programs or guidance on future research efforts. Congress or the administration may want an assessment of the latest scientific evidence before making policy decisions. Nongovernmental organizations or nonprofits may want to raise awareness about the science behind certain issues. Other sponsors provide fundamental support for activities.

COMMITTEE

All committee members serve as individual experts, not as representatives of organizations or interest groups. Each member is expected to contribute to the project on the basis of his or her own expertise and good judgment. A committee is not finally approved until a thorough balance and conflict-of-interest discussion is held at the first meeting, and any issues raised in that discussion or by the public are investigated and addressed. Staff select members in order to form a committee that has (1) an appropriate range of expertise for the task; (2) a balance of perspectives; and, (3) screened for conflicts of interest.

Specific steps in the committee selection and approval process are as follows:

- Staff solicit suggestions for potential committee members then recommend a slate of nominees.
- Nominees are reviewed and approved at several levels within the Academies; a provisional slate is then approved by the president of the National Academy of Sciences.
- The provisional committee list is posted for public comment.
- The provisional committee members complete background information and conflict-of-interest disclosure forms.
- Any conflicts of interest or issues of committee balance and expertise are investigated; changes to the committee are proposed and finalized.

OVERSIGHT

Each committee is overseen by Board staff. As a final check on the quality and objectivity of the study, all Academies reports whether products of studies, summaries of workshop proceedings, or other documents must undergo a rigorous, independent external review by experts whose comments are provided anonymously to the committee members. The Academies recruit independent experts with a range of views and perspectives to

review and comment on the draft report prepared by the committee. The review process is structured to ensure that each report addresses its approved study charge and does not go beyond it, that the findings are supported by the scientific evidence and arguments presented, that the exposition and organization are effective, and that the report is impartial and objective. Each committee must respond to, but need not agree with, reviewer comments that are examined by report review "monitors" responsible for ensuring that the report review criteria have been satisfied. Sponsors are not given an opportunity to suggest changes in reports.

FUNDING SOURCES

Several funding options are available to sponsors. These include contracts, grants, cooperative agreements, and purchase orders. A project may have one or several sponsors. Federal sponsors interested in having the Academies conduct a study can obtain their services on a sole source basis because of their unique origins and status. The Academies do not compete for federal contracts. Grants, contracts, and gifts from states, foundations, individuals, and other sources also enable us to address critical issues on behalf of the nation.

Q: how long does it take a consensus report to be completed?
A: A typical timeline is 18 months to 2 years for a consensus report.

Washington State Academy of Sciences

QUICK FACTS

Date Started: 2005. Washington State Academy of Sciences (WSAS) was formed in response to authorizing legislation signed by Washington's governor. In April, 2007, WSAS was constituted by the Secretary of State as a private, independent 501(c)(3). (See Senate Bill ESB6381.)

MISSION

The WSAS provides expert scientific and engineering analysis to inform public policy-making, and works to increase the role and visibility of science in the State of Washington. Formed as a working academy, not an honorary society, WSAS is modeled on the National Research Council. Its most important early work is aimed at securing the kinds of commissioned studies that are WSAS's primary mission—definitive analyses of the best scientific knowledge available on sharply defined scientific questions.

SUBJECT AREAS

Current projects include: 1) Opportunities for Addressing Laminated Root Rot Caused by *Phellinus Sulphurascens* in Washington's Forests, 2) Initiative 522-Addressing the labeling of genetically modified foods; and 3) the Puget Sound Partnership effort.

Products/Services/Deliverables:

- Study Committee Reports
- Summary of Proceedings
- White Papers

BENEFITS AND USES OF FINDINGS

The WSAS was established to provide authoritative scientific and technical analyses to the State of Washington on a host of challenging public issues, including health and health care, transportation, agriculture, energy, biodiversity preservation, biotechnology, climate change, and education. Its reports, which provide reliable, non-partisan, scientific analyses, enable decision makers to make their decisions using the best possible scientific and technical information, analyses, and interpretations. The WSAS does not recommend public policy. It does not accept commissions for studies designed to advocate particular legislation. Rather, its study committees analyze and interpret the available scientific information relevant to important public policy issues. Its peer-reviewed and board-approved reports provide the basis for informed public discussion and decision-making but the appropriate public servants make the final policy decisions. Because carrying out a thorough WSAS study requires substantial time, the WSAS has its greatest value in facilitating advance thinking and preparation so that decision-makers can anticipate problems and develop appropriate response capabilities before challenges become critical.

COMMITTEE

Members of the Washington State Academy of Sciences come from academic research, government, and industry, and represent a broad range of scientific, technical, and engineering fields. All members are residents of Washington State and U.S. citizens or legal permanent residents. The Founding Class of WSAS members was constituted by invitation. All Washington scientists, engineers, and other researchers who have been elected to the National Academy of Sciences, the National Academy of Engineering, or the Institute of Medicine were offered the opportunity to join WSAS. Of the 156 who were invited, 105 agreed to join and participate in the scientific advisory work that is the organization's mission. New members of WSAS will be elected annually by a process developed by the Nominations Committee and in accord with WSAS bylaws. Study committee members serve without compensation.

THE STUDY PROCESS

Typically, studies move through four phases:

- statement of task;
- committee formation;
- analysis and report preparation; and,
- report review, approval, and publication.

Each of the phases is designed to ensure that the analyses and evaluations of information provided to sponsors are of the highest quality.

OVERSIGHT

It does not accept commissions for studies designed to advocate particular legislation. Its studies and resultant peer-reviewed and board-approved reports provide the basis for informed public discussion and decision. The management of all the affairs, property, and interests of the Academy shall be vested in a Board of Directors

consisting of 12 members in addition to the President, President Elect, Past President, Secretary, and Treasurer. The Board is responsible for governing the WSAS affairs in accordance with its bylaws. The Executive Director position is Ex. Officio non-voting. Reports are vetted by the WSAS review process and approved for publication by the Board of Directors.

FUNDING SOURCES

Several funding options are available to sponsors. These include contracts, grants, cooperative agreements, and purchase orders. A project may have one or several sponsors. Federal sponsors interested in having the Academies conduct a study can obtain their services on a sole source basis because of their unique origins and status. The Academies do not compete for federal contracts. Grants, contracts, and gifts from states, foundations, individuals, and other sources also enable us to address critical issues on behalf of the nation.

Q: What are the criteria for undertaking a study?

- There is relevant and sufficient scientific information available on the issue to be addressed.
- Existing reports, if any, are out of date or inadequate.
- Sufficient funds are provided by the sponsor to cover study expenses, staff costs, and study-related overhead.

Independent Multidisciplinary Science Team

QUICK FACTS

Date Started: 1997. Legislation: Senate Bill 924, signed on 3/25/1997 as ORS 541.914. Formed in conjunction with the Oregon Plan for Salmon and Watersheds (Oregon Plan).

MISSION

The IMST is an impartial scientific review panel charged with advising the State on matters of science related to fish recovery, water quality improvements, and enhancing watershed health. The IMST provides independent, scientific analysis and evaluation of state actions and policies under the Oregon Plan. The Legislature and Governor's Office charged the Team to scientifically evaluate the Oregon Plan's contributions to species recovery and watershed rehabilitation.

SUBJECT AREAS

Science related to fisheries, fish recovery, artificial salmonid propagation, stream ecology, water quality improvements, enhancing watershed health, forestry, range, and agricultural management.

Products/Services/Deliverables:

- Formally requested reviews by Oregon Plan partners
- Independent reviews initiated by IMST
- Independent technical/scientific syntheses (projects)
- Recommendations requiring formal responses
- Technical workshops and workshop reports on topical issues

- Advice/clarification on technical issues (primarily written) on matters relevant to Oregon Plan
- Briefings to Governor's Office and state legislative committees
- Scientific literature/publication database

BENEFITS AND USES OF FINDINGS

Enhanced credibility of the Oregon Plan through recognition that actions taken under it are based on best available science. Improved design, implementation, and monitoring of actions by Oregon Plan partners to achieve specific outcomes related to Plan goals. Increased exposure to and understanding of relevant science on the part of salmonid and watershed restoration communities. State agencies are expected to respond to IMST recommendations within 6 months after a report is issued. If the IMST submits suggestions to an agency responsible for implementing a portion of the Oregon Plan, the agency shall respond to the Team explaining how it intends to implement the suggestion or why it does not. The IMST reviews the scientific adequacy of responses and whether further action by the agency is warranted. The IMST's review of responses are forwarded to the Governor and State Legislature.

COMMITTEE

The seven members of the IMST are scientists from universities, federal agencies, or the private sector. The Governor, Senate President, and House Speaker (appointing authority) jointly appoint IMST members for 4-year terms under provisions of ORS 541.914. The appointing authority must unanimously agree on each appointment. Subsequent legislation, SB 945 (2002), established a system for staggered reappointments and new appointments. IMST members serve until completion of their terms unless they resign or are removed by the appointing authority.

All real and potential conflicts of interest regarding an IMST project must be declared by respective IMST members. The IMST Charter stipulates that the IMST could recommend removal of a member for cause. This requires a majority vote taken at a meeting of the IMST. Cause for recommending removal is for extraordinary reasons, e.g. unwillingness or inability to function with the IMST, conduct that seriously detracted from the Team's ability to fulfill its responsibilities, or a continuing conflict of interest. In the event that the IMST recommends removal of a member, the Chair would also request that the appointing authority name a replacement.

OVERSIGHT

ORS 541.409 states that the IMST is to be "governed by generally accepted guidelines and practices governing the activities of independent science boards such as the National Academy of Sciences" (NAS). The IMST adopted many but not all NAS practices. Like the NAS, the IMST does not release draft documents until they are finalized so that: 1) facts are current and accurately represented; 2) the IMST agrees on the content including minority opinions; and 3) draft language is not misinterpreted. Unlike the NAS, the IMST discusses its work in public meetings rather than in private.

A subcommittee is formed with one IMST member assigned lead responsibility for management of each product selected for consideration. This includes development and implementation of a plan for completing the product and reporting progress at IMST meetings. Members of the public may attend all public IMST meetings and workshops, and may comment orally at the meetings during designated times or in writing anytime to the IMST. All IMST products are available to the public.

The IMST maintains a Memorandum of Agreement with the host institution (OSU) to provide institutional space and computer support for the Team's technical and administrative support staff.

FUNDING SOURCES

Oregon State Legislature appropriation, renewed biannually

Q: What "triggers" a review?

A: Independent products on the scientific basis for management of resources relative to the Oregon Plan are identified and initiated by the IMST itself. Review products are initiated when the IMST agrees to review the science of ongoing or proposed programs and activities that could influence accomplishing the Oregon Plan mission. The Governor's Office, state legislature and agencies regularly make requests for IMST review of draft documents and the technical/ scientific basis for proposed policies. Other groups (e.g., watershed councils, natural resource organizations) may also request IMST reviews.

Q: How long does it take a product to be completed?

A: Timelines vary according to the product and agreement with review or product requestor.

Appendix J

Input about ISR structures and processes

General Input about an Oregon ISR

Below is a table of generalized statements from the state natural resources agencies, the Tribes, Legislative Committees, and various stakeholders groups. We contacted 14 state agencies, 12 people from 9 tribes, Legislative Committees, and 30 stakeholders. We received feedback from 13 state agencies, 3 tribes, one legislative committee during the Legislative Days and 12 stakeholder groups/individuals. Their comments have been parsed out below. Collated responses of all information collected is available at your request.

Program/System	Themes and representative responses identified from all input
Structure	
Legislative authority	– Possible legislative authority needed depending on funding source. – Perhaps coming out of the Governor's Natural Resources Cabinet or the legislature. – State-Governor's office needs to be supportive of independent science review team decisions so that bad agency management plans are not allowed to move forward if science review shows the science of plan to be faulty or biased. – If not mandatory for agencies to undergo, how enforceable are the recommendations? Will there be a repeal process? Can an agency refuse to do a review if it is requested? – Where will the money come from?
Charter	– Clear charter with different tracks for different areas of research.
Organizational structure or design	– A multidisciplinary standing body of scientists; a balanced and broad standing group. – A Body/Board that would identify the experts for individual topics and create a subcommittee per topic such as a review entity with sub-workgroups for specific topics. "Review process may include multiple review sub panels. For example there could be an at-large group of scientists who would be assigned to multiple Science Discipline panels for each natural resource broad category or specific need (terrestrial wildlife, forestry, fisheries, water, and air etc.). These panel would each have a Chair position who would in-turn sit on the At-Large Panel that would convene as a Science Review Panel for larger, multi-disciplinary topics." – Team of reviewers would need to be fluid, allowing different experts to come in and out, because the topics will change. – A template or internal review process should be standard for more run of the mill reviews.

	– Create a collaborative system between agencies which will reduce the likelihood of "dueling science". – Whatever is chosen, it must have transparency such as let it be known if the reviewers are being paid. – Must have public support. Will/should the process provide guaranteed credibility to the agency/study? – Should be facilitator and staff supported. – Should improve the process and keep aspects of the IMST that were helpful. "I think it's worth mentioning that while the IMST was filled with very stellar and brilliant folks, its structure was too hierarchical and difficult to access based on its location in Salem and its pre-ordained focus on the "Salmon Plan" and state agencies."
Reviewers	– Cadre of identified experts in a diversity field; Well-credentialed people/expert; Folks who can speak to a number of disciplines; the reviewing team should be multidisciplinary. – A database of reviewers willing to participate should be web-accessible. – Oregon-only specialists are not adequate, the pool is too limited. The circle from which you draw could be broad (even outside the state of Oregon or outside the region). – Tribal experts should be included. – Reviewers should be 3rd Party. – A review needs not just natural resources scientists but also need someone that is verse in public communications. – A reviewer can be from within the agency conducting the science. – Strong Chair – accessible to the public. "The independent scientific review Task Force needs to have an impartial chairperson that is available to the public to raise issues to be considered by the Task Force" – Appointed and confirmed by Senate. – Scientists unafraid to challenge state NR agency decisions.
Function	
Focus areas	– On initiatives that are cross cutting. – Big inter-agencies issues. – Provide technical guidance and prioritization to state agencies. – Flexible review group with variety of subject matters. – Focus on how these additional resources will add value to the government/work.
Mission	Three options: – Here are the problems, what is the right approach? – Here is what (approach) we've done, did we get it right? – Tomato vs. "to-mah-to": decide what is right.
Process	
Who initiates?	– The sponsor/ the reviewing entity.

	– Any agency or state entity: "Do not think that groups or organizations should be able to make use of an independent scientific review process - my recollection from SB 202 was that it was supposed to explore whether the STATE had a need." – Executive branch, elected officials, and Legislative Committees. – Anyone proposing new policy or regulations. – Two way agreement between reviewing board and agency. "For an independent science review to be initiated, effected stakeholders and resource managers should be organized into a collaborative or quasi-collaborative group where the majority explicitly agrees to request a third party, independent science review. In other words, formulating a formal science review team should not just happen in a vacuum as a sort of due diligence commissioned by an agency or non-profit. To the contrary, a third party review should require a request from some sort of formal collaborative structure for a given issue. Having a group of otherwise opposing stakeholder group agreeing to disagree, but also agreeing to consider a third party expert is an important foundation from which to initiate a science review." – Whistle blowers and public request. "More folks need access to this type of review body such as local governments and quasi-governments."
At what point is it initiated?	– Before; at the beginning, before a study is conducted. – During, with continual monitoring.
What triggers a review?	– Agencies would have an option of requesting an independent science review when there is disagreement about the methods or quality of the science. – Where there are common issues and questions, there are also opportunities for natural resource agencies to collaborate on science synthesis or reviews and when there is a question around the science of the issue, but a robust dataset of research exist. – Conflicts related to an activity or permit – where we may need a review to delve a little deeper, to understand the issue better. – Highly controversial issues; controversial issues or issues generating media attention because of public interest or studies that the agencies need support for (to gain credibility or remove perception of bias). – A review of current practices or anytime there is a potential conflict in the management scheme. – To make better decision regarding livability on both an individual and group basis and to better manage the landscape for future generations without the industry or environmental organization biases. – Under any circumstance where an independent review body is felt to be needed for a future final decisions. – When the study will cause a big change in management or policy; concerning major policy items or changes. Any time there is a state agency management plan or science study released or when making policy that affects land use, treatment of physical or mental health conditions, instructional practices used in public funding schools. – Always or anytime.
Process Characteristics	– ISR for the state should be a resource – but should not be bureaucratic: "One caution is the workload – it can bog down policy development and can take too long or used as a tool to stall policy development." – A nimble or flexible system to respond to changing solid funding source and a timeframe flexible to study needs (not rigid).

	– When considering a study the Tribes should be consulted. – It must be practical in its design – timely and responsive and maintain scientific integrity. – Entity for the structuring and organization of those reviews with a staff: (1) Need someone (an entity) to herd cats, plan meetings, and do mediation, (2) Someone to help understand what the need is and what the product would be. – System of experts "waiting in the wings" without funding. – Transparent and Open, but not open to manipulation – Engagement with stakeholders: Must have public meetings and open for participation/comment. – Clear definition of tasks and products review with recommendations that state what you should listen to and something that you can safely ignore. – Roles, responsibilities, and authorities of each party must be clearly established. What are the limits? What if every agency wants a review for every study?
Negotiating question, framing, and scope	– Would need to frame around what the customer (sponsor) wants/needs. – An established process is needed to decide what is reviewed. – Questions must be scoped and phrased just right as a very specific question to get an answer or feedback that is applicable. – Scope should be multi-agency: "we already have a ton of inter-agency data and science sharing possibilities. We need something slightly less rigorous." – We need good science to be out to be used and not held to a purity standard. "The pursuit of the perfect gets in the way of the application of the good". – Need to consider what went well and what did not go well with the IMST. – What will the timeframe be?
Products/Deliverables	
Recommendations/ findings	– Sometimes the recommendations are impractical (outside of scope, science, or budget). – The final recommendations should include strategies for adaptive management. – "I would want the scientists in the state agency to bless the process and the outcome. I have no time to evaluate the science and want to trust what they say".
Education/outreach	– Public outreach of conclusions/Shared results with public: "There is a tremendous education component missing from other reviews; there should be an educational/outreach component of any review conducted." – Education materials should be created as part of the process: "The group that I'm associated with would make use of information put out by the review process to make decisions on what practices to fund and direct our education outreach, and what organizations to form partnerships".
Implementation of findings	– "The importance of the scientific review doesn't end with the writing of the report and making recommendations – that's only 75% of the way there. We need to be working hand in hand with the scientists, working with communities regarding the findings and the implementation process. The legislative members, too, should go and work with the community to understand the boundaries – work with people and the community."

	– "It is not enough to have an independent scientific Task Force if the agencies are unwilling to implement recommendations of the Task Force. The Task Force not only needs to address the scientific competence of an agency action, policy or proposal, it needs to be able to cause institutional change. It is customary for independent scientific Task Forces to be treated by the agency as advisory making the work of the Task Force a waste of time and money. Institutional change in the management of natural resources is political and if the Task Force lacks the political and funding support of the agencies, the governor, and the legislature, institutional change cannot happen".

Stakeholder Input: Step-by-step ISR process

One perspective on a necessary process before committing to a review:

1. Issues arise because there is some compelling concern to deal with it, when these issues arise the state agency should go to the community of interest to talk to people to find out what the controversy really is – most often rising out of mistrust.
2. If we had the ability to go out and have an education process built in – it could attenuate the level of controversy.
3. Do scientific investigations.
4. Report back to state agency and legislative committees. This gives the politicians a "heads up" on the synthesized results and issues between the people and suggest scientific review.
5. The chair should talk with agencies to understand the process and ask whether they (the agency) could solve the problem or not.
6. Decide whether to move forward with a scientific review – can it be done?"

Suggestion A

1. Approach the Independent Science Review Team (ISRT) for permission to access their process. Submit the topic areas and draft questions as part of the application request.
2. An ISRT representative should query other ISRT members to determine if they would like to pursue this topic area and if so, a meeting with the applicant should be arranged to give an opportunity for both groups to answer questions about the proposal.
3. If it is agreed that the topic area is one that the ISRT members agree to take on, the ISRT members should follow a pre-arranged process for addressing the topic area both individually and as a group.
4. The applicant should submit the questions/topic area to members of the ISRT that are pre-selected to compile and distribute to ISRT members.
5. A period of time should be determined for each individual ISRT member to review and draft a response.

6. When the pre-determined time has been met, the ISRT should meet on 2 to 3 consecutive days to synthesize their individual comments into single draft group document.
7. A Draft synthesis document should be created and distributed to the ISRT group for review.
8. After a pre-determined length of time, the ISRT should meet to discuss and agree to a final synthesis document (2-3 days).
9. Final draft created and sent to the full ISRT group for review.
10. Select a "Last opportunity" date for ISRT members to suggest changes.
11. ISRT comments should be finalized and sent to the Applicant.
12. ISRT should meet with Applicant (and possibly others) to present findings and recommendations.

Suggestion B

1. The Task Force can respond to an agency for a scientific review of a policy or management plan prior to it being adopted through a public process.
2. The Task Force can initiate its own review of issues independently whether the agency agrees or does not.
3. The Task Force is able to address not only the scientific and factual merits of an issue it can recommend policy changes for the agency to address in its management or proposed plan.
4. The Task Force would divide the issue up for review by relevant expertise on the Task Force and in the event that the Task Force is in need of additional expertise to invite participation from scientists to serve on the task with force with full participation.
5. The conclusion of the Task Force review and recommendations should be made available to the public as well as dissenting comments.

Suggestion C

1. Request comes from legislature, executive, or agency.
2. Group evaluates whether or not there is capacity to meet the request and if there is a demonstrated need.
3. Group chooses to take it on or not. / Group crafts work plan, with a lead member appointed.
4. Work is completed and then the rest of the group does some sort of peer review.
5. Report is adopted and returned to the requestor and made public.

Suggestion D

Review by all parties, list of objectives, then a SWOT or priority setting process, review results, re-define priorities, get more data, review the data, re-visit priorities to see if data provides a clear answer, action plans developed, reviewed, prioritized and then agreed to.

Suggestion E

We recognize there are experts in the social dynamics of natural resource decision-making processes and would provide suggestions here with that in mind. Based on the successes of forest collaboratives in Oregon, it may be wise to require that a science review be initiated by a natural resource stakeholder group who formed a collaborative or quasi-collaborative entity. They would request a science review on a subject of which there is disagreement within their group. By requiring an otherwise opposing stakeholder groups to form such a group shows a prospective science review panel that relevant parties are acting in good faith and have the capacity to move forward based on a third-party science advise.

The review could include the following steps:

1. Request for a review from stakeholder group
2. Inquiry and decision to initiate a science review
3. Formation of a sub-panel of relevant scientists to the discipline(s) in question
4. Sub-panel meets with stakeholders together
5. Science review panel compiles and considers facts etc.
6. Science review panel produces a compilation paper & presents findings to stakeholder group "pub talk" form.
7. Science review panel submits findings to legislature, Governor's Office, or other entities.

Suggestion F

1. Chair breaks management plan or scientific study to review team for
2. Individual study of plan/report
3. Discussion by the whole review team.
4. Open public comment.
5. Final decision on review.
6. Written report on review decision made available to agency concerned and to the public. 6.
7. If the review is negative, the agency concerned has opportunity to response or change plan.

Appendix K

Lessons Learned from the Literature about Designing an Independent Scientific Review Process

Independent Scientific Review in Natural Resource Management *Gary K. Meffe, P. Dee Boersma, Dennis D. Murphy, Barry R. Noon, H. Ronald Pulliam, Michael E. Soulé and Donald M. Waller. Conservation Biology Volume 12, Issue 2, pages 268–270, April 1998*

- An effective ISR should ensure that high-quality scientific input informs government decision makers without creating another bureaucratic, expensive process that delays decisions and drains away limited resources from agencies.
- ISR should be employed principally when an agency decision rests on scientific judgments or management actions that are controversial, seriously disputed, or arguably insufficient, especially when the decision carries the risk of creating lasting negative effects on environmental quality, the economy, or communities.
- An ISR should be employed in a flexible manner appropriate to each situation; a prescribed, centralized, "one-size-fits-all" approach is unlikely to improve decision making and may in fact hinder it.
- Budgets for environmental projects should include funds for ISR. The costs would be marginal, particularly when considering the value gained for agencies by efficient and expert review, and they could prevent larger agency costs later in the process.
- The depth of ISR will differ among issues and at different stages of each issue. Possible formats range from informal "checks" with established authorities on particular points in question (which should be formally recorded as having occurred), to independent and formal commentary on proposals or other documents by reviewers, to major workshops that convene reviewers for interchange and debate.
- Most environmental planning already occurs under a suite of laws designed to allow public access to information and input at particular stages of planning and implementation. We recommend inserting ISR into these existing processes at three distinct points: 1) informal or formal review of early ideas and initial (pre-release) draft plans; 2) formal written review once official draft plans or policies are released to the public; and 3) formal final review once final plans are released.
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Scientific 'Republicanism': Expert Peer Review and the Quest for Regulatory Deliberation. *Noah, Lars. Emory Law Journal, Vol. 49, 2000. Available at SSRN: http://ssrn.com/abstract=266963*

- ISR is best understood as a supplement to, not a substitute for, existing forms of external scrutiny, i.e. public notice-and-comment procedures or judicial review of a regulation. Instead, by offering agencies a preview of likely objections, ISR can help them anticipate and hopefully minimize weaknesses in a new policy or regulation.
- If conducted early in an agency's risk assessment, ISR can provide valuable expertise and diverse perspectives, and focus attention on at least some of the data gaps in time for corrections. Early ISR may

also minimize the temptation for scientists to become distracted with the opportunity to offer advice on questions of policy more properly left in the agency's domain.

- So long as its role is not exaggerated, independent expert scrutiny early in the rulemaking process may facilitate rather than displace public and judicial review of agency action.
- ISR undoubtedly will promote greater care and reflection, and may help steer agencies clear of embarrassing and costly mistakes. But ultimately ISR cannot and should not displace the broader deliberative process about hard policy questions that science cannot answer.

How peer review of agency science can help rulemaking: enhancing judicial deference at the frontiers of knowledge. *Fuller, Patrick A. George Washington Law Review, June, 2007, Vol. 75(4), p.931-969*

- The benefits of ISR should be carefully weighed against the immediate, direct costs of doing it, and potential indirect costs to the public in terms of health and environmental effects attributable to diverted agency resources, delayed access to information, and delayed implementation of rules.
- Compared to research science, regulatory science involves more knowledge synthesis and prediction of likely outcomes, which involves more uncertainty and discretionary judgment. Regulatory science generally has a lower burden of proof for validity due to this uncertainty. *Regulatory science operates at the margins of existing knowledge, with fewer settled questions and basic assumptions still open to debate.* Guidelines for evaluating regulatory science are thus fluid, controversial, and arguably more politically motivated than those for evaluating research science. ISR of regulatory science must take these differing goals and guidelines into account when evaluating the quality of scientific studies. The need to cope with uncertainty and the role of policy judgments in the choice of standards and norms for regulatory science must be acknowledged and accommodated in any ISR process.
- Early ISR allows potential flaws, weaknesses, and uncertainties to be identified and dealt with before the agency invests significant time and resources in drafting a proposed regulation, rather than waiting until after the regulation is proposed to open it for public comment on the underlying science.
- Regulatory science that deals with uncertainty is easily turned into a target for political actors and litigants to attack as "bad science." To the degree that it can help distinguish between uncertainty, policy judgment, and fact, ISR can help agencies counteract this misleading and counterproductive criticism and focus debate on the proper assumptions and policy judgments to be made, considering the facts and uncertainties surrounding the proposed regulation.

Good Science in the Public Interest: A Neutral Source of Friendly Facts *Hastings W.-North West Journal of Environmental Law and Policy 3 (2000-2001)*

- In order to be most effective, science panels also should understand the context of their decision-making. Bruce Smith believes, for example, that the Science Advisory Board (SAB) at the United States EPA only became a truly useful body to the agency after developing an expertise in regulatory science.
- Participants on science panels must do more than provide cosmetic balance. Institutional representation does not always equal contribution. While many working models of science review strike a delicate balance of expertise and affiliation, it is expertise and the ability to contribute meaningfully to the final product that must dominate in selection.

- Bureaucracies are not places that encourage the risk-taking, creativity or "give and take" atmosphere that are the hallmarks of the ISR process. The flip side of this coin is that the agencies sometimes attempt to change recommendations. Recommendations must not be subject to change by the staff if the credibility of the scientific enterprise is to be maintained.
- The job of science advisor is very specialized. It is important to have scientists on the panels with an interdisciplinary bent who understand the administrative process. Several scientific respondents indicated that they have many more invitations to participate on panels then they can reasonably accept. For this reason, scholars recommend that scientific panels be used sparingly (and only for the most important issues) to avoid draining scientific resources or creating another layer of bureaucracy that delays decisions.
- To streamline the process and avoid irregularities, [science] question development should follow several guidelines. First, questions should be asked at the earliest stage of a problem to allow scientists to offer guidance well in advance of actual decision-making. Second, questions should be dealt with when there is sufficient information to evaluate the technical merits of an issue based on standards of scientific proof. Third, questions should be addressed of the utmost importance to the agency such as when a decision carries a high risk of lasting harm to environmental quality, nature, the economy and communities. Fourth, questions should be asked when science is controversial, in dispute or inadequate. Finally, the actual format of the questions is significant. Questions should be formulated in small sets of very focused scientific questions that are answerable in a reasonable time-frame.

Reassessing the Role of the National Research Council: Peer Review, Political Tool, or Science Court? *Fein, Ian. California Law Review. Apr2011, Vol. 99 Issue 2, p465-555. 91p.*

- Because study sponsors reveal an inherent bias in choosing when they favor peer review, the power to empanel an ISR should be spread among multiple interests, and certainly not held by a single lawmaker.
- When fielding congressional requests, the decision to conduct an ISR should require a threshold number of bipartisan legislators to ensure the review would serve multiple constituencies, instead of a single lawmaker's desired political goals.
- Requests for ISR could be vetted for anticipated effectiveness and benefits by policymakers and scientists who are insulated from any vested interest in receiving funding to conduct such reviews.
- Regardless of the criteria used to decide whether to proceed with a review – e.g. the importance and timeliness of the question, the level of controversy, the likely impact of the report, whether there is an adequate scientific evidence base to support a review – this decision process should transparent and documented to the degree possible.

Can Peer Review Help Resolve Natural Resource Conflicts? *Brosnan, Deborah M. Issues in Science and Technology 16, no. 3 (Spring 2000). http://issues.org/16-3/p_brosnan/*

- To design effective ISR procedures, it is necessary to understand the major differences between academic and management science, including:
    - Final decisions. Scientists are trained to be critical and cautious and to make only statements that are well supported. Managers must make decisions with whatever information is available. Scientists usually send incomplete work back for further study; managers typically cannot.

Managers must also weigh legal concerns, public interest, economics, and other factors that may have little basis in hard data.

- "Best available" science. Managers are instructed to use the best available science. Scientists may regard such data as incomplete or inadequate. Reviewers' statements that the evidence in hand does not meet normal scientific standards will be irrelevant to a decision maker who lacks alternatives and must by law make a decision.
- Competing ideas. In pure science, two competing theories may be equally supported by data, and both may produce publishable work. Management needs to know which is best to apply to the issue in question.
- Reviewers as advocates. In academia, it is assumed that a reviewer is impartial and sets aside any personal biases. In management situations, it is assumed that reviews solicited from environmental advocates or development interests will reflect those points of view.
- Speed. Academic reviews are completed at a leisurely pace. This is not acceptable in management situations.
- Anonymity and retaliation. Academic reviews are typically anonymous to encourage frankness and discourage professional retaliation. Reviews in management situations usually must be open to promote dialogue. Some scientists will be reluctant to make strong statements if they are subject to public scrutiny.
- "Qualified" versus "independent." Often the scientists best qualified to be reviewers of a natural resource issue are already involved in it. Finding qualified reviewers who understand the rationale and context of issues at hand may require balancing demonstrable independence and depth of understanding.
- Language. Managers and decision makers may not be familiar with the language of science. Statistical issues are particularly likely to cause confusion.
- Reward structure. In academic science, reviews are performed free of charge for the common good and to add to scientific discourse. Hence they are typically given a low priority. In management situations, this will not work. Rewards–financial and otherwise–are necessary for timeliness and simply to encourage reviewers' interest in the first place.

– The following principles provide a starting point for effective ISR: 1) The goals of peer review in each case must be clearly stated; 2) Clear roles for reviewers must be spelled out; 3) Impartiality must be maintained to establish credibility; 4) A balance must be sought between independence and expertise of reviewers; 5) Training of reviewers may be necessary; 6) A reward structure must be specified; 6) Early involvement of scientists will give better results than will post-hoc evaluations.

Appendix L

Resources for Designing an Independent Scientific Review Process

The National Academies of Science, Engineering, and Health, and their operational arm the National Research Council (NRC) are the most commonly-used models for state-level academies of science and other ISR entities. Below are categories of web-based resources derived primarily from the National Academies and NRC, (but also other ISR entities) that can inform development of an ISR process for Oregon.

Organizational structure

A. National Research Council *Articles of Organization*: http://www.nationalacademies.org/nrc/na_070358.html

Review processes

A. *National Research Council Study Process* (PDF, 4p brochure): http://www.nationalacademies.org/site_assets/groups/nasite/documents/webpage/na_069618.pdf

B. *Working with the National Academies: A Guide for Prospective Study Sponsors* (PDF, 4p brochure): http://www.nationalacademies.org/site_assets/groups/nasite/documents/webpage/na_069619.pdf

C. *California EPA External Scientific Peer Review Guidelines:* http://www.swrcb.ca.gov/water_issues/programs/peer_review/docs/exhibit_f.pdf

D. *Navigating the California EPA External Scientific Peer Review Process:* http://www.swrcb.ca.gov/water_issues/programs/peer_review/docs/process_guidlines_2013_external_scientific_peer_review_final.docx

Guidance for selecting reviewers, identifying conflicts of interest, maintaining independence.

The ISR literature notes that the goal is achieving a balance between *expertise* and *impartiality.* This can be challenging because scientists best qualified to be reviewers of a natural resource issue are often already involved in it.

A. National Academies policy for *Committee Composition and Balance and Conflicts of Interest for Committees* (PDF, 11p):

http://www.nationalacademies.org/site_assets/groups/nasite/documents/webpage/na_069688.pdf

B. National Academies policy on conflict of interest: http://www.nationalacademies.org/coi/

C. National Academies *Background Information/Conflict of Interest* (BI/COI) form: www.nationalacademies.org/coi/bi-coi_form-3.doc

NAS process for selecting ISR committee members: Staff solicits extensive suggestions for potential committee members from a wide range of sources, and then recommends a slate of nominees. Nominees are reviewed and approved at several levels within NAS; a provisional slate is then approved by NAS president, who also chairs NRC. Provisional committee list is posted for public comment on Web. Provisional committee members complete background information and conflict-of-interest disclosure forms. Committee balance and conflict-of-interest discussion is held at 1st committee meeting. Any conflicts of interest or issues of committee balance and expertise are investigated; changes to committee are proposed and finalized. Committee is formally approved. Committee members continue to be screened for conflict of interest throughout life of committee.

D. *Serving on the Environmental Protection Agency Science Advisory Board (SAB):* https://yosemite.epa.gov/sab/sabproduct.nsf/Web/Serving%20on%20the%20EPA%20Science%20Advisory%20Board:%20A%20Handbook%20for%20Members%20and%20Consultants/$File/Serving%20on%20the%20EPA%20Science%20Advisory%20Board%20SABSO-12-001.pdf

Appendix M

Budget and Budget Justification

Detailed Budget	Units		Cost per Unit		# of Units or (% FTE)	ANNUAL BASE BUDGET # of reviews	ANNUAL BASE BUDGET cost
A. SALARY							
ISR Secretariat Director	12.00	mo.	$10,500	/mo	0.50		$63,000
Program Coordinator	12.00	mo.	$5,500	/mo	1.00		$66,000
Research Associate	12.00	mo.	$5,500	/mo	1.00		$66,000
Panel Manager	20.00	days	$480	/da	1.00	3.00	$28,800
ISR Panelists	10.00	days	$480	/da	1.00	3.00	$72,000
Total Salary							**$295,800**
B. OPE							
ISR Secretariat Director			62%				$39,060
Program Associate			62%				$40,920
Research Associate			62%				$40,920
Total OPE							**$120,900**
SALARY & OPE COSTS							**$416,700**
C. EQUIPMENT & SUPPLIES							
Materials and supplies							$2,000
Phone and fax							$0
Total Supplies							**$2,000**
D. TRAVEL							
Travel (Secretariat)			$3,500		1.00		$3,500
Travel to Board meetings (ISR Board)			$5,000		1.00		$5,000
In-state travel (Panelists) pe rdiem	1.75	2-day mtg	$215	/da	1.00	3.00	$6,773
Travel mileage reimburse (car and air) (Panelists)			$3,000	/review	1.00	3.00	$9,000
Total Travel Costs							**$24,273**
E. PUBLICATION COSTS							
Photocopies							
Printing final report						3.00	$1,800
Total Publication Costs							**$1,800**
G. OTHER COSTS							
ISR panel meetings	1	mtg	$1,500	mtg		3.00	$4,800
Total Other Costs							**$4,800**
OTHER DIRECT COSTS							**$32,873**
TOTAL DIRECT COSTS							**$449,573**

Fringe benefits are calculated at the standard and current Oregon State University rates based on salary.

There is a fiscal impact of the Task Force's recommendation to create an Oregon ISR process. There is an annual cost of approximately $449,500 to create and maintain the recommended state-level Oregon ISR process through two fundamental components: (1) the ISR Secretariat, approximately 73% of the budget; and, (2) the production of state-level ISRs and reports.

The Collaboration for Environmental Evidence estimates that conducting one review can cost between $30,000 and $300,000, depending on the complexity of the question(s), how highly focused the question is, and the searching requirements, particularly for grey literature (CEE, 2013). Not including the research, technical, and administrative support of the Secretariat, the Task Force estimates that the average direct cost for one ISR is $41,000.

In funding Oregon's ISR, the Task Force recommends a direct appropriation of funds to the hosting entity. Providing funds through an inter-governmental agreement would require adding the state negotiated indirect rate of 26 percent.

Cost of the Secretariat includes a half-time *Executive Director* who will be responsible for the administration and conducting the business affairs of Oregon's ISR, and working with the ISR Board. A full-time *Research Associate* will work with the Executive Director and the ISR Board to establish the technical aspects of the ISR review standards, protocols, and the review-specific protocols; work closely with the Panel Manager and reviewers on designated reviews (assist with project scoping and the search strategy, help conduct the literature search, compile and document the scientific evidence, and help produce the final products). A full-time *Program Coordinator* will work with the Secretariat Director to help coordinate all administrative, logistical, and outreach efforts for Oregon's ISR overall and for the specific reviews; help the Executive Director to produce and review annual reports and reports to the legislature; help to co-manage specific reviews with the Panel Manager, including coordinating all major meetings and helping to produce review-specific reports, among other responsibilities. *Other direct costs* also include materials; meeting costs such as telecom and video conferencing expenses; and, travel, per diem, and other incidental reimbursable expenses of the Secretariat and ISR Board members.

Cost of producing state-level ISRs and reports includes review-specific *Panel Managers* (selected from the membership of the ISR Board). Based on National Science Foundation rates, the Panel Manager will be paid $480 per day. This is the same rate as the ISR panelists. This rate is not meant to replace salary. It is estimated that the Panel Manager will spend about 20 days on a specific review; however, the time commitment required will depend on the scope and nature of the review. Responsibilities of the Panel Manager are highlighted in Table 2 of the report. *ISR Panelists* will be paid based on National Science Foundation rates. The daily honorarium for panelists is $480. This rate is not meant to replace salary. It is estimated that each reviewer will spend approximately 10 days on each review; however, the time commitment required of each ISR panelist will depend on the scope and nature of the review. Responsibilities of the panelists are highlighted in Table 2 of the report. Research, technical, and administrative support costs for each ISR are included in the cost of the Secretariat. *Other direct costs* also include travel, per diem, and other incidental reimbursable expenses for ISR panels to attend review-specific, two-day meetings; meeting costs such as room rental, telecom and video conference expenses.

Appendix N

Compensation Rates of Other Review Bodies

Review Organization	Compensation Rate
American Association of the Advancement of Science (AAAS)	Pay: Flat stipend of $610 per day for up to 5 days of work (including a 1.5 day meeting plus report writing). Travel & per diem: Compensated.
Environmental Protection Agency Science Advisory Board	Pay: Hourly intended as honorarium, not salary replacement. Two-week pay periods when advisory group is active. Parameters are given around workload. Travel & per diem: Compensated.
National Academies of Science	Pay: No compensation. Travel & per diem: Compensated
National Institute of Health	Reimbursement: $300 for local reviewer ($200 honorarium, $100 for miscellaneous expenses). Travel and per diem: Compensated ($80 for meals and travel)
National Science Foundation	Pay: For out-of-area (flat stipend of $480 per day of meetings, $280 per day of travel); local (flat stipend of $280 per day); virtual meeting day ($200 per day). Travel & per diem: Compensated, limited to one day of travel.
Washington State Academy of Sciences	Pay: No compensation Travel & per diem: Compensated.

Appendix O

Written Comments Received about the Courtesy Draft Report

Comments 1 (Date received: 8/23/16)

Hello Task Force Members,

Having listened to the representation on at your first meeting and on August 18 and read the draft recommendations, I would like to support the recommendations in the draft report.

One issue occurring in Oregon that could use this type of scrutiny is the management of our upland areas in relation to water availability (drought relief). The type of information received from an Independent Science Review could be used to better manage our forest and upland areas in relation to surface groundwater infiltration and ultimately water quantity and quality.

This type of information could be used by agencies such as the SWCD to prioritize conservation work on a short and long term basis.

Thank you for your attention.

Clair Klock

Comments 2 (Date received: 8/25/16)

Jeff

Thank-you very much for the opportunity to review the "courtesy draft" of the SB202 committee report. The report is well written and does a good job of reflecting our agency's input as well as the discussions I heard during Task Force meetings. The utility and importance of science reviews was well researched and looks to me like it has been incorporated into the Task Force report.

I really only have a few overarching concepts for the Task Force's consideration.

1. Role of Science and Values in Policy Decisions: Policy decisions can be described as the arbitration of values in a public setting. This process ideally results in definitive direction to an agency. Scientific processes rarely result in finite results and in fact the work often leads to more inquiries. Thus, scientific findings must be considered in the context of agency values. The Task Force might consider incorporating a concept to identify where the science-driven conversation leaves off and the value-driven conversation begins.
2. Intersection between Science Review and Agency Policy Questions: Consider allocating a "startup" period in which the panel can visit with agency and stakeholder representatives to gain context and understanding of the policies in question and identify related science questions that will be pursued.

3. Indeterminate or Incomplete Science: The report did a good job of characterizing the potential for incomplete, indeterminate, or lack of science on any give topic. It also supports the notion that an agency will have to make a policy decision in the face of incomplete knowledge. The report also states that minority reports are allowable. The Task Force may consider the affect a minority report may have on the "dueling" science issue and how an agency may handle this situation.

4. Subject Matter Experts: The report does a good job of describing that the process relies on subject matter experts yet they will face challenges when asked to examine what may be their own work and the work of their colleagues. This is particularly true for topics for which there is a limited amount of research and a small cadre of researchers. If the options for scientists are limited, the panel may need to defer the review request or clearly characterize the outcomes as limited by these circumstances.

5. Key Stakeholders (Page 51): Is this list representing stakeholders that were engaged in the Task Force exercise or is it meant to identify a range of stakeholder groups? If it is the latter, there are several important forestry-related organizations engaged in our policy debates. These include but are not limited to: Association of Oregon Loggers, Council of Forest Trust Land Counties, Small Woodlands Association, Northwest State Forests Coalition, Wild Salmon Center, Sierra Club, League of Women Voters, etc.

6. Systematic Evidence Reviews: We have found "*Systematic Evidence Reviews*" (SRs) to be the most useful approach for assessing scientific studies. SR processes provide a transparent, rigorous, and repeatable review of relevant literature. The systematic review revolves around a focused question, a structured search for studies, clearly defined criteria for which studies to include in the review, and a method to extract information from the studies. In our experiences public, stakeholder, and other agencies had an opportunity to review and provide input at all steps in the process. This information is then synthesized into a narrative report. We encourage science panels to conduct an SR-type model.

Thanks again for the opportunity to review the courtesy document. I appreciate the quality of this report and the willingness of Task Force members to consider our input and to participate in this important work. I am happy to clarify these points or answer any questions you may have.

Sincerely

Liz

Liz Dent

Division Chief

Comments 3 (Date received: 8/29/16)

August 29, 2016

Jeff Behan
Science Policy Research Analyst
INR-Corvallis
Oregon State University
234 Strand Agriculture Hall
jeff.behan@oregonstate.edu

Re: Comments on SB 202 Task Force Draft Recommendations

Dear Mr. Behan,

Thank you for the opportunity to comment on the proposed recommendations of the SB 202 Task Force. These comments are submitted on behalf of the Oregon Farm Bureau, Oregonians for Food and Shelter, Associated Oregon Industries, Oregon Forest & Industries Council, Oregon Dairy Farmers Association, Oregon Seed Council, and the Oregon Small Woodlands Association.

Thank you for the opportunity to comment on the proposed recommendations of the SB 202 Task Force. These comments are submitted on behalf of the Oregon Farm Bureau, Oregonians for Food and Shelter, Associated Oregon Industries, Oregon Forest & Industries Council, Oregon Dairy Farmers Association, Oregon Seed Council, and the Oregon Small Woodlands Association.

We appreciate the Task Force's work over the last several months. It is obvious a tremendous amount of thought and effort went into drafting the recommendations. As outlined, the Task Force recommends creation of an Independent Scientific Review (ISR) process in Oregon. This process would be authorized by legislation and would consist of a three tier process for independent scientific review. This process includes a scientific review board, program support, and technical panels convened to review a specific question.

While we appreciate the Task Force's effort to design an independent and unbiased scientific review process for Oregon, given the extraordinary difficulty of eliminating perceived bias, we are highly skeptical that this process will produce any kind of consensus around answers to politically charged "high impact" questions. For this reason, and for the reasons explained below, we encourage the Task Force to recommend against the creation of an ISR process at this time.

Alternatively, if the Task Force decides to move forward with its existing recommendations, we recommend ensuring that the board and panel processes acknowledge the likelihood that any person with relevant expertise is also going to have worked for or been funded by a governmental, industry or non-governmental (NGO) entity at some point, and ensure that a balance of scientific, legal and policy backgrounds is mandated to be represented in the process.

Comments on Findings

The benefits and risks of ISR outlined by the Task Force in Finding 1 appear to be comprehensive and are generally consistent with our experience with ISR, particularly the concerns about bias and risk of potential "capture" of the process by a stakeholder group or agency. We view this risk as significant. In our experience, ISR processes often fail to balance and effectively leverage diverse expertise on the issues they are convened to resolve. To this end, we are concerned with the definition of "Independent Scientific Review" on page 7. The definition contemplates only engaging reviewers who have little stake in the outcomes and decisions. While this would be ideal, in our experience it is impossible to actually achieve if one seeks to engage most subject matter experts on particular issues. For example, scientists often work for or are funded by interests that are connected to the scientific work they are researching, whether from the industry or NGO perspective. Eliminating experts who have worked for or have done projects funded by agencies, industry or NGOs may eliminate the entire field of experts on the issue the Board is seeking to resolve. While this may help achieve the goal of striking and "independent" review board, it would come at the expense of a deficient report.

Similarly, in Finding 3, the Task Force notes that one of the common themes in other state and federal ISR programs has been the diversity of the review panel make-up (pg. 10). This diversity includes diversity in the expertise of scientific expertise, but also diversity across sectors of society. We believe that this approach of acknowledging the potential for some level of bias or interest in a subject matter and ensuring to seek a balanced perspective across all those engaged as part of a review panel is the more appropriate approach to managing potential conflict concerns and ensuring balanced and unbiased work products. To ensure these interests are appropriately identified, we wholeheartedly concur with your recommendations to require all those affiliated with an ISR process to disclose and acknowledge all potential conflicts or other interests in the subject matter. We believe this has to include the funding source for any projects they have or are currently working on.

In addition, noticeably absent from the findings are any reference to state budget constraints. The Oregon natural resource agencies have received noticeable budget cuts over the last decade. In some cases, those budget cuts happened even as state revenues increased. Any discussion about the need for new or increased level of scientific review and analysis should also acknowledge the lack of state investment into programs, universities, and agencies that are charged with providing the "independent" scientific review.

Comments on Recommendations

As part of the recommendations, the Task Force recommends allowing governmental interests and other outside stakeholders to recommend projects for review (pg. 12, 22). Given that the Task Force

proposes not to allow the Board to accept outside funding, we are concerned with how the Task Force would fund this review. Perhaps more importantly, we are concerned that allowing for outside groups to submit proposals for review could breed the impression of bias within the Board depending on which group's proposals are selected and the Board's track record over time. We recommend against allowing outside groups to submit questions for review.

Regarding the recommendation to use an existing entity to coordinate the Oregon ISR process (pg. 14), we recommend that the Task Force also include as one of the criterion for this position that the entity selected to coordinate have a neutral governing board with no members who have ties or receive funding from governmental, state, industry or NGO entities. Alternatively, if such a mandate is impossible to achieve, the board must have equal representation from those interests.

Recommendation 3 – recommending new legislative authority – raises a number of concerns. First, recommendation (2) provides that the legislature ensure that state agencies are accountable to ISR findings and recommendations. Most natural resource agencies have a board or commission that oversee the agency and adding another board – the ISR – to provide direction to agencies will only complicate the state's ability to serve the public. Not to mention, this seems to go far beyond the intended scope of the ISR.

Second, recommendation (5) provides that the legislature may identify and provide funding to the ISR process and associated institutions. As highlighted above, funding is a key component to ensuring independent reviews can be achieved. It is critically important that the ISR's authority to receive funding be narrowly tailored, including funding avenues controlled by politics.

And third, the Task Force also recommends that the ISR be independent of special legislative oversight (pg. 16). We disagree, in part, with this recommendation. While we agree true independent scientific review should not be influenced by politics, it is unwise to completely remove legislative oversight if the legislature is responsible for funding the agency. Moreover, legislative oversight can help ensure that ISR is remaining neutral and meeting its core functions without having to resort to the extraordinary steps of removing funding or removing authorization for the ISR.

In Recommendation 4, the Task Force recommends creating an "independent scientific review board" that will be appointment by the governor and may include experts in the field of science, social science, law and policy (pg. 17). We do not believe this approach will facilitate a balanced or independent scientific review process. Appointments by the governor's office can be quite political and controversial, particularly when it comes to natural resource issues. Given this reality, it is difficult to ensure a balanced set of appointments for any board or commission. Appointees are rarely without some ties to a particular interest, whether governmental, academic, industry or NGO. Given that the board is charged with selecting which reviews are taken and generating research questions, the potential for significant bias in these appointments is concerning. If the Task Force decides to move forward with the three tier process for running the ISR, we recommend that the authorizing legislation for the ISR contain a set of interests that must be represented on the ISR board, then use the selection criteria to evaluate applications from each sector.

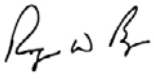
In deciding whether to review a question, the Task Force recommends selecting "high impact" questions that may affect multiple agencies or provide information that will help resolve particularly complex natural resource issues (pg. 23). While we agree that the Board should prioritize natural resource issues and select the most important, the high "impact questions" are often the most political. As stated above, we are apprehensive about whether such questions can ever be approached in an unbiased way.

We agree that good policy requires good science, and to that end, we support healthy investments in natural resource scientific inquiry. However, we are not in agreement that the process suggested by the Task Force will produce any better outcome than the procedures already in place. Generally speaking, the broad, multi-disciplinary, "high impact" questions proposed for study are inextricably linked to controversial policy issues and, in our experience, are not generally conducive to independent scientific review. But even if they were, we are not convinced that the process outlined in the Task Force report would produce truly unbiased independent scientific review. Rather, it threatens to be an additional expensive layer of review that, in the end, produces little in the way of consensus.

Thank you for the opportunity to provide comments on the draft recommendations of the Task Force. Please do not hesitate to contact any of the below signatories with any questions or concerns.

Respectfully,

Mary Anne Nash,
Public Policy Counsel, Oregon Farm Bureau
maryanne@oregonfb.org
541-740-4062



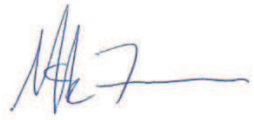
Roger Beyer, Executive Director
Oregon Seed Council
roger@rwbeyer.com

Jim James, Executive Director
Oregon Small Woodland Association
jimjamesoswa@yahoo.com

Tammy L. Dennee, Legislative Director
Oregon Dairy Farmers Association
Tammy.dennee@oregondairyfarmers.org

Katie Fast, Executive Director
Oregonians for Food & Shelter
Katie@ofsonline.org

Heath Curtiss, General Counsel
Oregon Forest & Industries Council
heath@ofic.com



Mike Freese, Vice President
Associated Oregon Industries
mikefreese@aoi.org

Jerome Rosa, Executive Director
Oregon Cattlemen's Association
Jerome.rosa@orcattle.com