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To: House Committee on Agriculture & Natural Resources
Subject: HB-2386, Creates Oregon Independent Science Review Board (ISRB)
From: Robert M. Hughes, Courtesy Associate Professor

I strongly support the general intent of HB-2386. Science-based decision making and management are critically important in natural resource management because that management must often incorporate multiple collaborating natural- and social-science disciplines. As a 2004-2016 member of Oregon's Independent Multidisciplinary Science Team (IMST), I believe that our recommendations to State agencies were typically appreciated and acted upon in a positive manner.

However, in the later years of my appointment the effectiveness of the IMST became diluted for several possible reasons. Therefore, I have the following 8 recommendations, based on those that IMST sent to Governor Brown in 2016.

1. The ISRB operating process should be modelled after the National Academy of Sciences (NAS). Because it is essential for Oregon to have a sound system for review of science underpinning state agency policies and actions, I recommend that the proposed legislation create a process that is:

- **Independent.** The ISRB must be (1) free from conflicts of interest (of direct benefit, monetarily or otherwise, to a team member) and from a perception of bias as much as possible, (2) free to decide if requested reviews from state agencies, the Governor's Natural Resource Office (GNRO), and/or the State Legislature are appropriate for review or not, and (3) free to conduct reviews deemed appropriate by the ISRB.

- **Multidisciplinary.** The ISRB must be capable of reviewing information from diverse scientific disciplines, including both natural and social sciences, relevant to the State's natural resource issues. Given that the State's natural resource issues change through time, the expertise represented by the review team must be capable of changing as appropriate.

- **Meaningful.** The ISRB must be created such that findings of the review process will be considered and, if called for by the outcome of the review, responded to in writing by State governmental bodies in a timely fashion. Costs associated with an ignored review are effectively a misallocation of State resources.

2. The GNRO and Legislature should establish an ISRB consisting of a standing board of a minimum of five (5) members of appropriate expertise. *Ad hoc* members can be added as more diversity in expertise is needed on a case-by-case basis.

- There is agreement amongst scientists that have served on both standing and *ad hoc* review boards that standing boards function better than *ad hoc* boards (which may function well for specific short-term issues) because of a lack of institutional memory and of consistency of review processes. Because it is impossible for a standing board to have all expertise that could be needed in the future, it is important that the board have the flexibility to add outside reviewers on a case by case basis. In many situations it would be desirable for the board to work closely with other Oregon entities such as the Institute of Natural Resources (INR) and potentially contract with those entities for some services.

3. The ISRB should ***not*** be housed within any standing State agency or university to preserve its true independence, both in terms of administrative control and financial independence.

- It is critical that the ISRB be independent for scientifically valid reviews and projects. Whereas ISRB funding may need to pass through an appropriate State agency, university, or the GNRO, the appropriation of funding should not be tied to, or apparently tied to, the function of that State institution. Similarly, operation of the ISRB should not depend on a 'pay for service' approach. Therefore, it is inappropriate to house the ISRB within the INR, or alternatively the INR within the ISRB, for example. Administrative oversight of the ISRB should rest with the GNRO, not with any other State institution. This condition helps ensure against any actual or apparent conflicts of interest.

4. ISRB reviews should be meaningfully considered by the receiving agency or body by requiring a timely response in writing to the GNRO and to the ISRB.

- To ensure that independent science reviews serve a purpose other than review for reviews sake and are taken seriously for the purpose for which they are intended, some form of accountability is needed. This is to ensure that State agencies or bodies meet their objectives in the most scientifically defensible manner possible. It also is important that the expenditure of State resources for reviews actually do some good and that there is genuine and good-faith communication between the ISRB and the State institution. For example, if the recommendation is that a response is needed from the GNRO, it is expected that the GNRO will respond to the ISRB in writing as well.

5. A pool of candidates for ISRB membership should first be vetted by the State's natural resources agencies, a scientific body such as the NAS, and/or other appropriate professional scientific societies to ensure that the most highly qualified scientists possible participate.

- Occasionally over my IMST tenure, its functions and operations were fundamentally hampered by poorly qualified or inappropriate members. This led to substantial wastes of time and resources. It is important that such roadblocks to high quality scientific review be precluded in the selection process.

- A detailed process for implementing an effective selection process can be established by the past IMST members or the GNRO, but it should involve an open call for applications (cover letter, resume, biases, and potential conflicts of interest) to professional scientific societies, with those applications being forwarded to the NAS and other scientific professional organizations for screening of scientific credentials if they have a mechanism to accommodate such assistance. A ranked list of perhaps 10 to 20 finalists could then be submitted to the GNRO and Legislature for final vetting and selection (similar to the hiring process of university professors or of senior agency personnel). Subsequent recommendations regarding those applicants by State natural resource agencies could add insights for the GNRO and Legislature.

6. ISRB members should be appointed by the Governor, the President of the Senate, and the Speaker of the House (collectively, Appointing Authorities). Any member of the Appointing Authorities should be able to accept or reject an applicant. Furthermore, if a scientist has been nominated for appointment and if there is no rejection of that nomination within 45 days after nomination, then that person becomes appointed. Also, if an ISRB vacancy has not been filled by the Appointing Authorities within 90 days of the beginning of the vacancy, then the vacancy shall be filled by the ISRB directly. Members should serve four-year terms, with time of appointment being staggered after the original board has been formed.

- The function and operation of the IMST was hampered greatly by the previous appointment processes. Vacancies were left unfilled for years. It was even difficult to reappoint existing IMST members. Those vacancies and the uncertainty created by not having a clear reappointment process hindered completion of projects and planning for future reviews and projects. This was a substantial disservice to the science needs of State government and also contributed to fiscal inefficiencies. Nonetheless, it is important that State governmental leaders be vested in the scientific review process by being involved in the final selection of ISRB scientists.

7. Initial funding for the ISRB should be appropriated in the amount or $605,000 per biennium initially and increased appropriately with inflation and as additional expertise becomes needed for reviews and projects not yet anticipated.

- Appropriate funding is necessary because completely voluntary review systems work poorly and inefficiently. Funding is also necessary to cover ISRB costs for staff and operations. Based on over 30 years of collective experience with IMST and other review panels, I believe that $605,000 per biennium, plus future COLA adjustments to account for inflation, is sufficient to allow for a fully functioning team of five plus costs for outside reviews, staff, administrative overhead, and operating expenses. If the expertise needed to review future subjects broadens in the future, then additional funds may need to be added.

8. Lastly, I recommend that the Governor reestablish a Natural Resources Core Team following the model developed by Governor Kitzhaber during his first term in office. Further, there needs to be a Natural Resources Core Team Coordinator.

- There are inherent conflicts within and among State agencies regarding resource management, and there is a tendency for compartmentalizing or siloing of management issues, versus viewing human, resource, and watershed management as a complex interacting whole. In particular, adaptive management and standard methods of monitoring, data management, and public reporting of key ecological indicators are needed. The loss of an effective Natural Resources Core Team hindered rational, ecologically effective, and fiscally responsible natural resources management—as well as effective IMST interactions and scientific progress. Reestablishment of a Natural Resources Core Team together with an ISRB would indicate that the GNRO and Legislature are truly concerned about conserving Oregon's natural resources in a sustainable manner. Additionally, members of the ISRB should be invited to participate in Core Team meetings at least twice a year to help ensure that the relevancy of the review process remains sufficiently connected to the natural resources policy needs and priorities of the Executive and the Legislature. To provide a broader view of issues in Oregon, the Natural Resources Core Team could include representatives from federal and tribal natural resource agencies.

Hughes received his Ph.D. from Oregon State University and his M.Sc. and A.B. from the University of Michigan. Bob's research focuses on biological assessments of surface waters in the USA, Europe, Brazil, and China. Hughes is a Past-President of the American Fisheries Society (AFS, 2013-2014), an AFS and Society for Freshwater Science Fellow, and a Fulbright Scholar (2010, 2007). He has authored or coauthored 240 peer reviewed publications and given 80 invited international presentations on 5 continents in 15 nations. Hughes chairs the Advisory Committee of the FLUVIO River Restoration and Management Program at the Technical University of Lisbon (2014-2021) and serves on the Fish Technical Advisory Committee of the National Ecological Observatory Network (2015-2021). He has acted as an expert panelist for Biological Condition Gradient Modeling (2019-2021), Austrian Climate & Energy Fund (2019-2021), Qatar National Research Fund (2013-2021), Oregon's Independent Multidisciplinary Science Team (2004-2016), Rio Grande Silvery Minnow Monitoring (2015), USEPA Biological Monitoring (1988-2012), Klamath River Chinook Salmon (2011), European Union Fish Index (2007-2009), and Great Lakes Environmental Indicators (2001-2005). Dr. Hughes received the 2017 Lifetime Achievement Award and the 2011 Fisheries Worker of the Year Award from the AFS Oregon Chapter. He is a best paper of the year awardee for Transactions of the American Fisheries Society (2008) and Lake & Reservoir Management (2014).