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Memorandum

To: Oregon Fish and Wildlife Office (OFWO) Employees
Bend Field Office Employees
La Grande Field Office Employees
Newport Field Office Employees
Roseburg Field Office Employees

From: State Supervisor, Oregon Fish and Wildlife Office
Portland, Oregon

Subject: Implementing Secretarial Order 3289 in Oregon – Mitigating Climate Change with Carbon Sequestration

One of the Service's top priorities – perhaps our greatest priority – is mitigating the impacts of climate change. On March 13, 2009, in our OFWO "Setting Priorities" memorandum, I encouraged you to factor climate change predictions into our landscape planning, permitting, and funding decisions. Later that year, on September 14, 2009, the Secretary of the Interior issued Order No. 3289: *Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources.* This Order established a Department-wide approach to addressing climate change and its related impacts on Service trust resources. The Order touches on many issues of concern to the Service, including renewable energy development, invasive species, water management, and conservation of listed species. Most recently, on April 28, 2010, the Service's Acting Director transmitted to the Service Directorate our agency's Climate Change Action Priorities (CCAP) for FY2010-11.

The purpose of today's memorandum is to provide practical direction to OFWO staff on incorporating climate science into our work while focusing on one specific aspect of the Order, carbon sequestration. Specifically, the Order directs us to begin quantifying the amount of carbon stored in our forests, wetlands, and grasslands, and to analyze potential climate change impacts when undertaking long-range planning exercises, developing multi-year management plans, and making major decisions regarding potential use of resources under the Service's purview.

The OFWO works closely with Federal, State, and private land managers to plan and permit various activities on Oregon lands. For example, we help develop Habitat Conservation Plans (HCPs) and write biological opinions for management of forest lands. We lead recovery planning for prairie grassland species. We comment on sage grouse management strategies and work with private landowners in eastern Oregon rangelands. And we work with agencies and private developers to avoid wetland impacts and create conservation banking opportunities.

In short, we have many opportunities to positively influence how Oregon lands are managed for a variety of trust resources and align these activities with reducing climate change impacts. Of course, this priority is very broad and potentially overwhelming in its complexity and scope. But there are specific things we can do immediately. This memorandum provides you with insight regarding one important topic from the Order: how to incorporate carbon sequestration into your landscape-level planning and permitting activities in the forest, wetland, and rangeland/grassland environments, and it lays the groundwork for continuous education in our office on this critical issue.

Forests

Oregon forests will likely play an important role in mitigating climate change impacts. Forests can be proactively managed to mitigate climate change through carbon sequestration (Bonan 2008). The highest densities of forest biomass carbon storage in North America occur in the coniferous forests of the Pacific Northwest (Sundquist et al. 2009, Keith et al. 2010), making Oregon especially important in this role. The addition of carbon sequestration to the list of potential forest management objectives places an additional demand on forests and provides additional opportunities to landowners and managers (Galik and Jackson 2009). Older growth forests with longer rotations may be more effective at sequestering carbon than younger, more intensively-managed tree plantations (Schulze et al. 2000, Luyssaert 2008), but all forest lands may have value for this purpose. Some researchers have estimated that the economic value of sequestered carbon on timber lands could be substantial relative to timber harvest revenues (Depro et al. 2008). Landowners and policy makers are aligning this potential value with other "co-benefits" provided by forests, such as water quality, fish and wildlife habitat, and recreation, when making decisions about forest management objectives (Candell and Raupch 2008).

Managing for carbon sequestration means it is also necessary to manage forest biomass and the risks of catastrophic fire (Canadell and Raupach 2008). Some researchers suggest that thinning forests is a necessary climate mitigation activity. Although thinning removes carbon from the forest system in the short term, it often reduces the risk of a subsequent catastrophic carbon release through fire or disease outbreak, and it also encourages the concentration of carbon in fewer, larger trees that approximate the old-growth structure of pre-fire suppression forests (Hurteau et al. 2008).

It is extremely important that OFWO employees working on forest issues be current on the scientific and policy issues involving forests and climate change. We are proceeding with several carbon-related projects in Oregon, such as the OFWO/Ecotrust carbon analysis of the Elliott State Forest, and I expect we will do more in the near future. Although the science is still emerging, we have tremendous opportunities to influence land management decisions in a manner that meets the intent of the Secretarial Order and the mission of the Service.

Grasslands and Rangelands

There is a growing body of scientific literature exploring the economic opportunities and policy implications of carbon sequestration on rangelands. Although the issue has not received as much attention as it has on Oregon's forest lands, Oregon's grassland and rangeland environments can also be managed to include carbon sequestration as a priority (Svejcar et al. 2008). Semiarid rangelands may accumulate carbon at low rates relative to forest lands, but the cost of sequestration is also sometimes quite low, thus making sequestration a potentially viable management choice for ranchers (de Schumann et al. 2002, Steiguer 2008, Follett and Reed 2010).

For this reason, State and Federal agencies in Oregon are exploring carbon sequestration on Oregon rangelands, with the hope of overlaying carbon goals with issues such as cattle grazing, sage grouse conservation, juniper management, drought response, and improving economic potential on private rangelands.

The sale of carbon credits could provide attractive new economic opportunities for rangeland managers while also meeting conservation goals shared by the Service and other agencies such as the Natural Resource Conservation Service (Campbell et al. 2004, de Steiguer 2008). Farm Bill programs also provide some opportunities (Follett and Reed 2010). In fact, the Chicago Climate Exchange (CCX) manages a rangeland soil carbon offset program. Both non-degraded and previously degraded rangelands are eligible to be considered for carbon sequestration projects using improved grazing management practices, such as light to moderate stocking rates, appropriate distribution, proper season of use, and rapid drought response (de Steiguer et al. 2008, Follett and Reed 2010).

There are many research and measurement challenges involving rangeland carbon (Brown et al. 2010), but there is a strong potential that carbon sequestration on rangelands will be an important tool in mitigating climate change impacts in the near future (de Steiguer et al. 2008). This habitat type occurs throughout much of eastern Oregon across vast areas, and Service employees will need to be conversant in this area if we are to have a positive impact on both climate change and sagebrush conservation.

Wetlands

The OFWO is currently working in a wide variety of wetland environments, both freshwater and estuarine. It is a more complex challenge to proactively manage carbon and mitigate climate change impacts in wetland environments. Wetlands can provide a potential sink for atmospheric carbon (Kusler 2010), but they can also be a source of greenhouse gases under different management regimes that may offset their carbon sequestration benefit (Brigham et al. 2006, Adhikari et al. 2009, Morgan et al. 2010). This concern is reduced substantially with estuarine wetlands, and such wetlands sequester carbon at a rate 10 times higher on an area basis compared to other wetland ecosystems due to high sedimentation rates, high soil carbon content, and constant burial due to sea level rise (Brigham et al. 2006).

However, regardless of wetland type, there are management practices that can be applied to reduce the potential for carbon loss and increase the potential for carbon sequestration, such as reduced dewatering, managing fire, and encouraging natural revegetation (Kusler 2010). We need to identify those management practices specific to our Oregon wetlands that meet the goals of the Secretarial Order while also advancing our other conservation goals, and then apply these measures to our mitigation banking decisions, Clean Water Act activities, and restoration efforts.

Actions for Oregon

The following are actions we will be taking immediately to make sure all employees are able to apply the best available science on climate change and carbon sequestration to their work.

1. Get current on the science - This memorandum purposely includes a list of recent scientific publications to illustrate the availability and quality of the research and policy discourse on this topic. These documents will be scanned and placed on the "O" drive in the Climate Change folder. This is not an exhaustive inventory of relevant information, but rather it is a primer on what is emerging in this field. Make it a regular part of your work plan and behavior to become educated on these issues.

2. Identify training opportunities - NCTC and other organizations have hosted trainings or workshops on climate change. Prioritize this area in your Individual Development Plan. As many of you know, the Regional Office has set up the new office of Science and Policy Applications; this office should be an excellent resource for information as it gets up and running. See also the CCAP for discussion of opportunities

3. Participate - In the Pacific Northwest there are local, regional, and State working groups on issues relating to climate change; our participation in Landscape Conservation Cooperatives (LCCs) will likewise bring many different people together. Look for opportunities to join and participate with partners in these efforts. If workload conflicts arise, check in with your supervisor to assess priorities.

4. Apply climate science to your day-to-day work - I recognize the difficulty in applying emerging science into your ongoing duties. However, as you implement items 1 through 3 above, you should see opportunities to apply what you are learning to your projects. I an doing this as well. As you are developing or completing your assignments, ask yourself, "How can I improve this (BiOp, Recovery Plan, restoration project, HCP, SHA, etc.) to also mitigate climate change impacts?"

5. OFWO Workshops on Applying Climate Science - To further advance items 1 through 4 above, I am initiating a series of ongoing, informal workshops or "continuous learning" sessions where we bring outside climate scientists and practitioners to the OFWO to help us identify real-time opportunities to apply climate science to our current duties. These workshops will include some "climate change 101" lessons as well as sessions that address how can we apply our authorities and expertise to mitigate climate change impacts in Oregon. I would like the first workshop to occur this June, and I am soliciting volunteers to organize it. I am also talking to two local private organizations that specializing in climate science and carbon markets. If you, like me, have found yourself struggling with how best to incorporate climate change into our

"traditional" goals and duties, then you should help to kickoff this exercise. Funds will be made available to underwrite this effort.

Conclusion

As I stated in the introduction to this memorandum, the challenge of climate change seems overwhelming and intimidating. The Secretarial Order is clear, but where do we begin addressing such a challenge in our day-to-day work and still accomplish all the myriad tasks expected of us? The CCAP provides some guidance, and I want us to build on that for on-the-ground implementation. Applying the concept of carbon sequestration into much of what we are already doing is a straightforward opportunity to make a difference, and it seems a solid place to start. In many places in Oregon the issue overlays cleanly with much of what we are already trying to accomplish, such as spotted owl recovery and sage grouse conservation. The main challenge now is to make sure that we are fully informed and creative, and to look for opportunities to apply climate science to our traditional conservation mission.

Please feel free to see me if you have any questions about this direction. Thank you.

Literature Cited

Adhikari, S., et al. 2009. A review of carbon dynamics and sequestration in wetlands. Wetlands Ecology 2: 42-46.

Bonan, G.B. 2008. Forests and climate change: Forcings, feedbacks, and the climate benefits of forests. Science 320: 1444-1449.

Brigham, S.D., et al. 2006. The carbon balance of North American wetlands. Wetlands 26: 889-916.

Brown, J. et al. 2010. Improving estimates of rangeland carbon sequestration potential in the U.S. Southwest. Rangeland Ecology and Management 63(1): 147-154.

Campbell, S., et al. 2004. Can ranchers slow climate change? Rangelands 26(4): 16-22.

Candell, J.G., and M.R. Raupch. 2008. Managing forests for climate change mitigation. Science 320: 1456-1457.

Depro, N.M. et al. 2008. Public land, timber harvests, and climate mitigation: Quantifying carbon sequestration potential on U.S. public timberlands. Forest Ecology and Management 255: 1122-1134.

de Steiguer, J.E. 2008. Semi-arid rangelands and carbon offset markets: a look at the economic prospects. Rangelands (April 2008): 27-32.

de Steiguer, J.E., et al. 2008. Contributing to the mitigation of climate change using rangeland management. Rangelands (June 2008): 7-11.

Follett, R.F., and D.A. Reed. 2010. Soil carbon sequestration in grazing lands: societal benefits and policy implications. Rangeland Ecology and Management 63(1):4-15.

Galik, C.S., and R.B. Jackson. 2009. Risks to forest carbon offset projects in a changing climate. Forest Ecology and Management 257: 2209-2216.

Hurteau, M.D. et al. 2008. Carbon protection and fire risk reduction: toward a full accounting of forest carbon offsets. Frontiers in Ecology and the Environment. 6(9): 493-498.

Keith, H. et al. 2010. Re-evaluation of forest biomass carbon stocks and lessons form the world's most carbon-dense forests. Proceedings of the National Academy of Science (www.pnas.org/cgi/doi/10.1073/pnas.0901970106).

Kusler, J. 2010. Common questions: wetland, climate change, and carbon sequestering. Association of State Wetland Managers. 27 pp. (http://www.aswm.org/brochure/carbon.pdf).

Luyssaert, S. et al. 2008. Old-growth forests as global carbon sinks. Nature 455:213-215.

Morgan, J.A., et al. 2010. Carbon sequestration in agricultural lands of the United States. Journal of Soil and Water Conservation 65(1):6A-13A.

Schulze, E. et al. 2000. Managing forests after Kyoto. Science 289: 2058-2059.

Schumann, G.E., et al. 2002. Soil carbon dynamics and potential carbon sequestration by rangelands. Environmental Pollution 116: 391-396.

Sundquist, E.T. et al. 2009. Rapid assessment of U.S. forest and soil organic carbon storage and forest biomass carbon sequestration capacity. Open-file Report 2009-1283, U.S. Geological Survey.

Svejcar, T. et al. 2008. Carbon fluxes on North American rangelands. Rangeland Ecology and Management 61(5):465-474.