RESPONSE
Using Ecological Forestry to Reconcile Spotted Owl Conservation and Forest Management

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In their opinion article, DellaSala et al. (2013) identify the potential shortcomings of Franklin and Johnson's (2012) ecological forestry (EF) management principles. DellaSala et al. also criticize the incorporation of some of these principles into the recently completed northern spotted owl (Strix occidentalis caurina) (NSO) revised recovery plan (USDI Fish & Wildlife Service 2011) and revised critical habitat (CH) designation (50 CFR 17; 77 FR 71875). Although we agree with several of their points, we think components of their criticisms and recommendations mischaracterize our application of EF principles. DellaSala et al. also understate the risk of climate change and associated disruptions in forest ecosystem disturbance processes, whereas they overstate the potential impacts of certain EF management prescriptions on those same ecosystems. We focus below on their comments concerning NSO conservation and its relationship to climate change, active forest management, and the Northwest Forest Plan (NWFP) (USDA Forest Service/US Department of Interior Bureau of Land Management 1994).

Many of the recommendations made by DellaSala et al. (2013) are sound and were originally included in the NSO recovery plan and CH. The recovery plan takes an ecosystem approach. It encourages managers to (1) conserve older forests and manage them for resilience, (2) restore fire and other natural disturbance processes where they have been suppressed or altered, (3) conserve legacy habitat elements in postfire landscapes, (4) design and implement restoration treatments at the landscape scale, and (5) reconcile any short-term impacts of this management with long-term NSO conservation. Areas of disagreement with DellaSala et al. are mostly a matter of degree and risk tolerance. What are the risks of taking management action versus inaction? And what are the respective tradeoffs between near-term impacts to NSO for longer-term gains for forest health, other wildlife species, and other societal values (Ager et al. 2007, Gaines et al. 2010a)?

DellaSala et al. (2013) seem to question most active management within NSO habitat because they believe that (1) current and projected patterns of wildfire occurrence in much of the NSO range are acceptable and within historical bounds, (2) the related California spotted owl (Strix occidentalis occidentalis) evolved with fire and use burned areas (therefore, fire may have a mostly positive impact on the NSO), (3) management is risky or counterproductive and should not be taken until some (unspecified) level of certainty or risk tolerance is reached, and (4) political and economic interests, rather than science, are driving EF management recommendations. Each of these positions deserves careful consideration.

We believe the preponderance of scientific evidence suggests that climate change and past management practices are intensifying disturbances in western forest ecosystems, including wildfire, disease, and insect outbreaks. Wildfire size and total burn area have been increasing in the dry, fire-prone forests of the western United States (Westerling et al. 2006, Littell et al. 2009, Chmura et al. 2011) and are projected to increase significantly during the next century (Marlon et al. 2012, Vose et al. 2012, Yue et al. 2013). Larger wildfires west of the Cascade Mountains are also more likely (Littell et al. 2010, Rogers et al. 2011), including all major forest types in Oregon (Shafer et al. 2010) and in northwestern California (Miller et al. 2012). Davis et al. (2011) found a marked increase in large wildfires in the NSO range in the last 30 years.

The overriding management issues are the following: how “departed” are these disturbance processes and vegetation patterns from both retrospective baselines and reasonable estimates of likely future conditions, and what, if anything, should land managers do to influence these patterns in the face of climate change? DellaSala et al. (2013) generally downplay the challenges that climate change has brought to forest management decisions, suggesting that ecological departure in northwest forests is low and uncertainty in localized predictions means that managers should defer taking most management action if there are short-term adverse effects of NSO or associated wildlife species. We disagree with both their interpretation of climate science and their advocacy of a passive approach. Rather, we believe it is necessary to weigh the relative risks of action and inaction and make timely management decisions that take into account broader, longer-term goals for wildlife and ecosystem conservation (Agee 2002, Carey 2006, North et al. 2010). The Endangered Species Act of 1973 directs us to “conserve the ecosystems” on which listed species depend (Endangered Species Act, Section 2), and NSO conservation is consistent with and, in fact, relies on these broader ecosystem conservation objectives.

Our perspectives also diverge from those of DellaSala et al. (2013) regarding the relative risks to the NSO from wildfire, and their conclusions discounting the potential impacts of fire on spotted owl populations and habitat rangewide are premature (Kennedy and Wimberly 2009, Halofsky et al. 2013). Wildfire is now the leading cause of NSO habitat loss on federal lands (Davis et al. 2011), and Clark et al. (2013) found that NSO site occupancy of nesting territories declined after wildfire. The NSO recovery plan describes how individual spotted owls use burned areas to varying...

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degrees, and we agree that pre- and postfire management intervention is not warranted or would be counterproductive in many areas (USDI Fish & Wildlife Service 2011, p. III-30). We also agree that there is tremendous variation in disturbance processes and vegetation patterns due to ecological complexity (Hessburg et al. 2007) and that high-severity fire is an appropriate and desirable component of natural fire regimes in some areas (Stephens et al. 2012). However, valuable and rare (in absolute and historical terms) older forests in the range of the NSO are being removed by fire (Spies et al. 2006, Davis et al. 2011), and these losses will probably increase in the future (Healey et al. 2008). DellaSala et al. acknowledge that “mature forests are in short supply regionally” and should be conserved, and they advocate adherence to the NWFP guidelines, but they disregard the NWFP direction to conserve these forests from catastrophic disturbance (USDA Forest Service/US Department of Interior Bureau of Land Management 1994, p. B-5, C-12). Their general conclusions that large areas of these older forests, including areas in the eastern Cascade Mountains of Washington (Lehmkuhl et al. 2007, Haugo et al. 2010) and Oregon (Kennedy and Wimberly 2009, Spies et al. 2010), in southwest Oregon (Perry et al. 2011, Hagmann et al. 2013), and in northern California (Miller et al. 2012), are at low risk of loss or ecological conversion are at odds with those of many other scientists.

The NSO recovery plan seeks an appropriate balance between action and inaction in view of disturbance risk and past management practices. It recommends little or no management intervention in areas of high-quality NSO habitat or where disturbance risk is relatively low or acceptable (e.g., older moist forest). However, in other areas, especially drier forests, it recommends that land managers consider intervention based on careful planning at the appropriate landscape level (Roloff et al. 2012, Safford et al. 2012, Halofsky et al. 2013). Much of this science is focused on explicitly weighing the tradeoffs between single species conservation and broader ecosystem goals (e.g., White et al. 2013a). DellaSala et al. call for more research before management actions are taken, but there is already much specific guidance on how to minimize risk and impacts to NSO and other wildlife when implementing appropriate management (e.g., Lehmkuhl et al. 2007, Buchanan 2009, Spies et al. 2012). Although there is still much unknown about these ecosystems and no decision is risk-free, there is solid scientific insight that enables informed management decisions to move forward. Applying EF principles is not a “one size fits all” approach, and we support monitoring and incorporating those results into subsequent decisions as part of an adaptive management process. Good examples of landscape strategies that apply EF and adaptive principles within the NSO range include Gaines et al. (2010a), Smith et al. (2011), Davis et al. (2012), North et al. (2013), and Hessburg et al. (2013).

Similar to their generalizations concerning wildfire, DellaSala et al. (2013) oversimplify how various types of vegetation management might negatively affect NSO populations or other wildlife, but they do not provide the same level of speculation on how inaction might negatively affect the NSO or other species. Our approach is based on considerations of both action and inaction. In reality, these management decisions are quite complex and context- and taxa-specific. Wildfire, prescribed fire, and vegetation management affect species in many different ways—positively and negatively—over space and time, and there are ecological tradeoffs for many species and values (e.g., Forsman et al. 2010, Fontaine and Kennedy 2012). Many other scientists recommend active management of various types to help conserve forest wildlife due to threats of uncharacteristic disturbance (e.g., Gaines et al. 2010b, Kalies et al. 2010, Stephens and Alexander 2011). For example, high fuel loading and ladder fuels can reduce foraging or nesting habitat quality for California spotted owls in Sierra Nevada forests (Roberts and North 2012, Keane 2013). A vegetation treatment may accelerate the development of NSO nesting habitat (Wimberly et al. 2004) or reduce the risk of high-severity fire for forest birds (White et al. 2013b), even if it temporarily degrades existing habitat and “takes” owls in the near term (Franklin et al. 2006). Forest management projects may adversely affect and take NSOs, but these projects might still be compatible with NSO recovery and CH if the overall magnitude of the impacts is limited in scope temporally and geographically, especially where the primary intent of the project is long-term restoration (Gaines et al. 2010a). Scheller et al. (2011) described similar tradeoffs for the fisher (Martes pennanti) in the Sierra Nevada. The NSO recovery plan recommends that these tradeoffs be carefully evaluated on a case-by-case basis at the appropriate landscape scale, with a joint goal of restoring or emulating natural disturbance processes and recovering NSOs.

DellaSala et al. (2013) criticize these projects for having an impact on the NSO. They do not acknowledge, however, the possibility that the known adverse effects associated with a well-crafted project may be preferable to potential adverse effects associated with doing nothing in highly departed landscapes (North et al. 2010). We appreciate the many sources of uncertainty that impinge on such a choice, but as we described above, tools and techniques are available to create detailed, site-specific, risk assessments to inform these difficult management decisions. We recommend ongoing research and monitoring to better understand the effects of forest restoration treatments on the NSO and other plant and animal species (USDI Fish & Wildlife Service 2011, p. III-35).

DellaSala et al. (2013) suggest that application of Franklin and Johnson’s (2012) EF principles or the NSO recovery plan might result in a decrease in protections provided by the NWFP or other environmental safeguards. We believe the opposite is more likely. Each of the pilot projects they criticize (DellaSala et al. 2013, Table 1) not only are consistent with the requirements of the NWFP but also are more restrictive than what the NWFP otherwise permits. They leave more downed wood and more standing trees than the NWFP requires, they incorporate natural disturbance processes into management decisions, and the prescriptions do a better job addressing broader wildlife goals than traditional silviculture. The approach is a marked improvement over previous types of permitted federal timber harvest, including what is allowed on “matrix” lands under the NWFP.

On a broader level, DellaSala et al. (2013) discourage active forest management because of the risk of unintentionally creating “novel” ecosystems. Yet the majority of researchers (Hagmann et al. 2013, Lydersen et al. 2013, Sensenig et al. 2013, and others) agree that the cumulative effects of fire suppression and past timber harvest have already created novel conditions across large
areas, particularly within the eastern Cascades and diverse Klamath-Siskiyou forest ecosystems. Are these changes to forest structure and function, taken separately from wildfire risk, assumed by DellaSala et al. to be neutral or beneficial to the NSO and other wildlife, now and in the long term? We agree that caution is always warranted when one takes any habitat-altering action. But what of the potential for novel conditions to be created or perpetuated as a consequence of management inaction? Many scientists are concerned about climate-driven disturbances speeding up ecological conversions among forest types and recommend research and intervention (e.g., Collins et al. 2011, Perry et al. 2011, Davis et al. 2012). Given the tremendous landscape scale of climate-driven changes, we suggest that this is a much more serious conservation challenge for northwest forests (Millar et al. 2007, Vose et al. 2012). We have structured NSO recovery to fit within science-based landscape strategies that address this challenge and to work closely with our land management partners such as the USDA Forest Service (Tidwell 2012) and other landowners.

In conclusion, the EF principles such as those articulated by Franklin and Johnson (2012) and many others (e.g., Franklin et al. 2002, 2007, Drever et al. 2006, North and Keeton 2008, Long 2009, others) should be applied to forest management where appropriate. They provide an important foundation for restoring natural ecological processes, and if also applied to commercial timber harvest, they are likely to result in a net conservation improvement compared with what is currently permitted on many federal, state, and private lands. DellaSala et al. (2013) acknowledge this potential, saying that “some aspects of ecological forestry may improve on current management,” but this endorsement is overshadowed by their suggestion that the EF principles place economic and political interests above ecological concerns. Viewed from a historical perspective and in the face of climate change, the emergence of EF principles during the last decade—and their growing acceptance by both forestland managers and practical conservationists—is a positive incremental step in reconciling forest management goals with wildlife conservation and other socioeconomic values. This reconciliation is essential to building the trust that allows sustainable policy decisions, especially those related to conservation of endangered species and at-risk ecosystems, to be carried out with broader public support.

Literature Cited


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