

## **Wolves Will Not Provide Small-Scale Ecological Restoration**

Authors: Belant, Jerrold L., and Adams, Layne G.

Source: BioScience, 60(7) : 485

Published By: American Institute of Biological Sciences

URL: <https://doi.org/10.1525/bio.2010.60.7.18>

---

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at [www.bioone.org/terms-of-use](http://www.bioone.org/terms-of-use).

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

---

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

## Wolves Will Not Provide Small-scale Ecological Restoration

Licht and colleagues (*BioScience* 60: 147–153) proposed a paradigm shift in wolf management to include the introductions of small, highly manipulated groups of wolves (*Canis lupus*) to confined natural areas to facilitate ecosystem recovery. Certainly, reductions or losses of apex predators from many regions worldwide have had profound effects on ecosystem characteristics (Soulé et al. 2003). Numerous efforts to restore or enhance predator populations through policy change or reintroductions have occurred, often with the intent to restore ecosystem function (Breitenmoser et al. 2001). However, in addition to the gargantuan technological and political challenges inherent in Licht and colleagues' proposal, we contend that intensively managed wolves will not restore natural ecosystem processes given the disparity in scale between these proposed actions and the ecosystem processes that wolves foster. Further, we note that predator-prey relationships are more complex than Licht suggested.

Licht and colleagues described using "a functioning wolf pack" as the basic unit for small-scale introductions (p. 149), but wolf packs function naturally only in the context of a wolf population applying social and demographic forces on wolves at the pack level (Mech and Boitani 2003). Further, recruitment of young into a wolf population is a primary role for a wolf pack; this function must be removed or closely controlled under Licht's scenario. Consequently, wolves introduced to small fenced areas would not be expected to behave naturally or impart natural processes on degraded ecosystems. Viable free-ranging wolf populations generally function at numeric and spatial scales much greater than the pack level. Thus, the goal of using wolves for "restoring naturally functioning ecosystems within natural areas" (Licht et al. 2010, p. 151) is not tenable at the spatial extent proposed.

The introduction of wolves may not have the population-level effects on ungulates or ecosystem recovery desired by Licht and colleagues, either.

For example, on Isle Royale, in spite of decades of wolf predation, the moose (*Alces alces*) population there has generally existed at very high densities (Messier 1994), and the primary winter forage for moose, balsam fir (*Abies balsamea*), is declining across the island (McLaren and Peterson 1994). At Yellowstone, elk numbers have declined on the northern range, but those declines have been driven predominantly by hunter harvest and severe weather events (Vucetich et al. 2005, White and Garrott 2005). Further, Yellowstone wolf recovery has occurred with extant populations of other large predators; combined effects of more than one large predator species are much more likely to limit ungulate densities (Mech and Peterson 2003). Thus, introducing wolves into small natural areas with overabundant ungulate populations would not guarantee marked reductions in ungulate populations and associated improvements in ecosystem health.

The goal of ecological restoration is to reestablish structure and function to degraded ecosystems (Society for Ecological Restoration International 2008), necessitating that species and associated processes occur at appropriate ecological scales. Although small-scale introductions of wolves in natural areas to reduce ungulate populations may cause ecological change, such change does not necessarily constitute ecosystem recovery to a more natural state.

JERROLD L. BELANT  
LAYNE G. ADAMS

*Jerrold L. Belant (jbelant@cfr.msstate.edu) is with the Carnivore Ecology Laboratory Forest, and Wildlife Research Center at Mississippi State University. Layne G. Adams (ladams@usgs.gov) is with the US Geological Survey Alaska Science Center in Anchorage.*

## References cited

- Breitenmoser U, Breitenmoser-Würsten C, Carbyn LN, Funk SM. 2001. Assessment of carnivore reintroductions. Pages 241–281 in Gittleman JL, Funk SM, Macdonald D, Wayne RK, eds. *Carnivore Conservation*. Cambridge University Press.
- Licht DS, Millspaugh JJ, Kunkel KE, Kochanny CO, Peterson RO. 2010. Using small populations of

- wolves for ecosystem restoration and stewardship. *BioScience* 60: 147–153.
- McLaren BE, Peterson RO. 1994. Wolves, moose, and tree rings on Isle Royale. *Science* 266: 1555–1558.
- Mech LD, Boitani L, eds. 2003. *Wolves: Behavior, Ecology, and Conservation*. University of Chicago Press.
- Mech LD, Peterson RO. 2003. Wolf-prey relations. Pages 131–160 in Mech LD, Boitani L, eds. *Wolves: Behavior, Ecology, and Conservation*. University of Chicago Press.
- Messier F. 1994. Ungulate population models with predation: A case study with the North American moose. *Ecology* 75: 478–488.
- Society for Ecological Restoration International. 2008. *Opportunities for Integrating Ecological Restoration and Biological Conservation within the Ecosystem Approach*. Briefing Note, Society for Ecological Restoration International, Tuscon, Arizona.
- Soulé ME, Estes JA, Berger J, Martinez del Rio M. 2003. Ecological effectiveness: Conservation goals for interactive species. *Conservation Biology* 17: 1238–1250.
- Vucetich JA, Smith DW, Stahlner DR. 2005. Influence of harvest, climate and wolf predation on Yellowstone elk, 1961–2004. *Oikos* 111: 259–270.
- White PJ, Garrott RA. 2005. Northern Yellowstone elk after wolf restoration. *Wildlife Society Bulletin* 33: 942–955.

doi:10.1525/bio.2010.60.7.18

## Restricting Wolves Risks Escapes

Implementing the proposal set forth by Licht and colleagues (*BioScience* 60: 147–153) requires restricting wolves to tiny "islands," areas that are magnitudes smaller than the ranges of most wolf populations. Wolves naturally have large ranges; restricting their spatial needs increases the risk of wolves escaping, exacerbating public relations and political and legal problems.

These problems would not be solved by (a) scaring back straying radioed wolves; (b) controlling reproduction; or (c) the use of physical, virtual, or biological barriers. The problem is not wolves breeding; it is wolves killing livestock and pets, or at least people fearing they will. Standard wolf-proof barriers are 10-foot-high, chain-link fences with a 4-foot apron buried 2-feet below ground. Virtual fences, shock-collars with electrodes continually touching the skin, and frequent battery replacement are all problematic, even for captive wolves (Shivik et al. 2002). Scent-marking and howling, controls suggested by Licht and colleagues, can affect wolf movements,