



Lessons Learned from Seney Refuge

EXPLORING THE BENEFIT OF APPLIED RESEARCH PARTNERSHIPS

By Greg Corace and Mark Vaniman



Courtesy of Greg Corace

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Much like other natural resource management fields, approaches to wildlife habitat management have changed over time. Today, many professionals see the need for understanding ecological patterns and processes at multiple spatial and temporal scales to address issues in a rapidly changing world. Contemporary managers of wildlife may consider habitat in its broadest context and approach applied research needs from a perspective that extends the traditional thought of wildlife habitat beyond merely food, water, and cover.

Last year, the U.S. Fish and Wildlife Service (FWS) published *Conserving the Future: Wildlife Refuges and the Next Generation*—a [report](#) that provided a vision to guide the future management of the National Wildlife Refuge System (NWRS). The report built on the System's 1999 strategic plan, [Fulfilling the Promise](#), which highlighted the value of applied research—the practical application of science—across the NWRS. However, the two documents presented different views on the spatial scope and mechanisms to conduct applied research.

Here's the distinction: *Fulfilling the Promise* focused on the concept of Land Management and Research Demonstration (LMRD) areas, where refuge authorities develop, implement, and showcase novel approaches to land management for the benefit of wildlife. *Conserving the Future* focuses on broader research partnerships to meet the need for applied research across a number of academic disciplines and ownership types. To address climate change issues, for instance, refuges may work with hydrologists, landscape ecologists, or social scientists to better understand ecological processes affecting land, wildlife, and people. Regardless of the approach, funds for applied research are limited in the NWRS, as they are for many agencies and organizations. This forces NWRS—and other managers of public lands—to explore creative strategies and solutions to conduct applied research.

Seney NWR in Michigan's Upper Peninsula offers a prime example of such creative strategies. It has functioned as a de facto LMRD for nearly 75 years,

promoting many of the theories, concepts, and proposed actions discussed in both *Fulfilling the Promise* and *Conserving the Future*. As part of the recent cadre of professionals responsible for continuing this legacy, our efforts, guided by combined experience on Seney of over 15 years and tempered by interactions with others, have resulted in both successes and failures. We hope those wishing to promote applied research may find the lessons that we have learned useful. Our learning continues, however, and nothing discussed below should be construed as applying everywhere, or all the time; just like the natural world, variability exists in how each land unit can most effectively meet its own applied research needs.

Seney's Evolution

Established in 1935, Seney NWR in Michigan's Upper Peninsula comprises approximately 95,000 acres carved from the Great Manistique Swamp. The early years of refuge management consisted of promoting waterfowl habitat—particularly for the Canada goose (*Branta canadensis*)—by manipulating the local hydrology and land base ([Johnson 1947](#)). Back then, applied research focused on the single-species goals and objectives of land management, and research was primarily funded by the refuge and the NWRS.

Although applied research on game species dominated much of the early publication record, over time research at Seney extended to habitat use and autecology of non-game species, such as the yellow rail (*Coturnicops noveboracensis*) and sandhill crane (*Grus canadensis*), then to communities, and more recently to the natural range of variability in ecosystem patterns and processes. These changes in the general focus of applied research have, in many ways, followed changes to refuge management as guided by NWRS policies and in our overall understanding of the natural world.

Today—unlike most refuges in the Lower 48 states—Seney exists within a forested landscape matrix characterized by a low human population density (approximately eight people per square mile) and a high proportion of public land (nearly



Courtesy of Mark Vaniman

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85 percent of the surrounding landscape is in public ownership). Consequently, Seney has a simplified suite of stakeholders, and communication among these parties is relatively straightforward compared to many other NWRS land units. Moreover, because of existing landscape patterns, the conservation scenario at Seney differs from many refuges that have urban sprawl and other anthropogenic cover types at their boundary. The refuge therefore focused its 2009 Comprehensive Conservation Plan (CCP) on meeting the general goals and objectives of the Refuge Improvement Act, which states: “Where appropriate, restore and enhance healthy populations of fish, wildlife, and plants....” Further integrating with the FWS’s [2001 NWRS Biological Integrity Policy](#), the writers of Seney’s CCP argued that existing landscape patterns encouraged the application of ecosystem-based landscape management, with restoration of vegetation and disturbance patterns to historic conditions where and when possible.

Much of the present-day applied research at Seney is therefore focused on ecosystem function and dynamics. Funds to support this research come from mostly non-FWS competitive grant proposals using in-kind support from the refuge, such as staff time, equipment, and housing. Other funding comes from universities offering graduate student stipends and office support, and the non-profit Seney Natural History Association. In the past decade, studies conducted at Seney and involving more than 10 graduate students and more than 19 interns have typically used this approach to funding and combination of partners, with the major institutions involved being the Ohio State University, Wayne State University, Michigan Technological University, and Central Michigan University. Each of these institutions not only brings a different set of professionals to the table, but allows for NWRS staff to interact with a different population of university students. So far, these efforts have yielded 20 peer-reviewed papers and four graduate degrees, with more of both in the works. But what can be learned from these efforts, and how can the myriad mistakes and successes encountered through this process help others?

Growing Applied Research Programs

Many land units in the NWRS can (and do) function as de facto LMRDs. The attempt by Seney to do just that has been successful to a certain degree because staff learned to do the following:

Establish and hold true to a mission. Every program needs a mission statement that must be

vetted and redrafted based on experiences and established goals and objectives. Set up an applied research mission statement with guidance from peers and use it to guide your program.

Broaden partnerships. The U.S. Geological Survey (USGS) is the main research bureau in the U.S. Department of the Interior (DOI) and serves many applied research needs of the FWS, the National Park Service, and other DOI agencies and bureaus. But USGS cannot serve the needs of all land units. As a result, Seney looked to broaden partnerships and search within and outside of government for applied research support. For instance, in the FWS Midwest Region, refuges are broken down into “networks” consisting of different refuges. As part of the 10-unit Great Lakes Biological Network, Seney has benefitted in numerous ways by working with other NWRS colleagues to accomplish a number of multi-refuge projects, including a rapid ecological assessment of forests and non-native earthworm communities (Shartell et al. In Press).

Integrate tasks. Many novel land management actions on public lands provide opportunities for applied studies that integrate land management with monitoring and inventory data. This is especially true if the management actions are designed as far ahead as a year or more and research sampling points are georeferenced. For instance, researchers from the Ohio State University reconstructed the 350-year fire history of the area and related this to changes in forest structure and composition ([Drobyshev et al. 2008a,b](#)). Such work is now guiding



Credit: Seney NWR archive photo



Credit: Seney NWR archive photo

In the 30s, applied research at Seney National Wildlife Refuge focused on management of Canada goose and other waterfowl species. Here, researchers are conducting a “round-up” of molting geese.



restoration efforts, as managers use vegetation plots from the studies to provide a snapshot useful for future monitoring. Similarly, an ongoing USGS-led wetland research project has enhanced the refuge herbarium by providing specimens of plant species

not already represented in the collection.



Credit: Charles Goebel, The Ohio State University

Igor Drobyshev, post-doctoral associate at the Ohio State University, explains fire-scar patterns on an old-growth red pine. Analysis of data taken from such trees helped quantify Seney National Wildlife Refuge's pre-European fire history. Planners and managers use this knowledge for forest conservation and restoration and fire management at the refuge.

Involve students. As stated in *Conserving the Future*, the mission and actions of the NWRS need to be better communicated to the American people. For instance, implementing applied research projects on public lands, with the help of gradu-

ate students, provides a wonderful opportunity to educate not only potential future employees, but future conservation partners as well. At Seney, staff has also been able to help guide tertiary education by drafting syllabi at universities such as Michigan Technological University and teaching classes at Central Michigan University. In this vein, the NWRS has recently established policies that promote interaction with nearby campuses, where communication and interaction with future employees and applied research partners is that much easier.

Be judicious. It takes time to write research grants, conduct studies, and publish papers. Of all the research undertaken at Seney in the past decade, each project has taken approximately two to five years, from start to finish. Because success often depends on staff involvement, consider whether or not this time commitment is justified within the overall context of refuge management. Be willing to say, “No, thank you” to some researchers who may approach you to conduct work on lands you manage. Consider whether or not this research helps extend the mission of the program or the goals and objectives of the land unit via a cost-benefit analysis. Not all research is a priority for a given land unit, and not all managers will want to spend energy on these efforts. In all things, prioritization is key.

Develop thick skin. Nothing any program does will please all the people all the time. Everyone will experience some rejection by editors and reviewers, and doing something novel will always bring out a chorus of naysayers. Moreover, by its very nature, science tends to challenge traditional thinking. Regardless, a standard of scientific conduct in FWS

is to follow the science wherever it leads. A number of research findings and conclusions from studies at Seney have led to heated discussions with conservation partners and stakeholders, especially projects directly or indirectly related to habitat management for the Endangered Kirtland's warbler (*Setophaga kirtlandii*) or population management of double-crested cormorants (*Phalacrocorax auritus*).

Communicate clearly. Be willing to openly and clearly communicate needs and expectations and the purposes and accomplishments of applied research projects. If the land unit values its resources, including staff time, so will others. Further, any changes to how a land unit approaches land management will need to be frequently explained to constituents, be it the public who use the land or other agency partners with different goals and objectives. For example, since the late 1990s the refuge has not been doing much “traditional” game management per se, and constituents who had been promoting land management for the benefit of specific game species—such as ruffed grouse (*Bonasa umbellus*) and white-tailed deer (*Odocoileus virginianus*)—found this change difficult. However, refuge staff successfully described how approaches based on ecosystem patterns and processes, rather than game species populations are guided by the [1997 Refuge Improvement Act](#) and Biological Integrity Policy, noting that much regarding the land and our understanding of the land has changed over 75 years.

Finally, be realistic. Each professional has his or her own expectations of projects—be it the need to acquire funds, generate peer-reviewed publications, produce successful graduate students, or meet habitat or ecosystem conservation and restoration goals and objectives. Be willing to state your needs and expectations. Be willing to make demands, such as requirements for paper submission and data organization. And be willing to communicate even when others may not always be listening.

The NWRS—and other public lands—provide excellent natural laboratories for gaining knowledge and insight into the workings of the natural world. With proper oversight, promotion, and application, the benefits of an applied research program can be great—not only to individual stations but to the overall body of knowledge so useful to managing wild lands and wild things. ■

This article has been reviewed by a subject-matter expert.



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