



Northern Prairie Wildlife Research Center

[Home](#) [About NPWRC](#) [Our Science](#) [Staff Employment](#) [Contacts](#) [Common Questions](#) [About the Site](#)

Ecological Studies at the Woodworth Study Area

Linking Research with Management: A Historical Perspective

Harvey K. Nelson

First Director, Northern Prairie Wildlife Research Center
U.S. Fish and Wildlife Service - Retired
10515 Kell Ave., South
Bloomington, MN 55437

Introduction

The maintenance of healthy wetland and upland environments for desired populations of waterfowl and other migratory birds depends on increasing sophisticated management programs for public and private lands. Knowledgeable professionals must learn to work together to make such programs successful. New management techniques, properly researched and tested, need to be made available to managers and incorporated into broader programs as quickly as possible. These were some of the basic principles incorporated into the initial program of the Northern Prairie Wildlife Research Center (NPWRC) when established in 1963. My good fortune was to have been involved in the early planning and direction of that program, including the establishment of the Woodworth Field Station (1).

I want to take this opportunity to pay tribute to the early team of researchers and managers that guided the planning and development of the research and monitoring programs conducted there. They were Leo Kirsch (Deceased), Harvey Miller (Retired), Thomas Klett (Retired), Harold Duebbert (Retired), Paul Springer (Retired), Kenneth Higgins, David Trauger, Robert Oetting (Deceased); and during the later years Reid Goforth, Douglas Johnson, and Michael Callow.

Background

During the formative years of the NPWRC program (1963-1966), special emphasis was given to determining the status of ongoing, related research being planned or conducted by other federal, state and provincial agencies, universities and private conservation organizations in the United States and Canada. The objective was to identify priority research needs, where such might best be conducted, and to avoid duplication of effort. These coordination efforts also focused on interdisciplinary cooperation and the need for other scientific support to supplement NPWRC capabilities at that time. Some examples were the use of burning in grassland management, water quality investigations, and the seasonal hydrology of small wetlands.

Other principles of the NPWRC program were to: 1) Plan and conduct a balanced short-term and long-term research program that would address priority issues confronting the management of migratory birds and their habitats in North America. Primary emphasis was on wetland and grassland ecology, waterfowl breeding ecology, and the impacts of agricultural land use practices on waterfowl production in the Prairie Pothole Region (PPR). This was an early approach to ecosystem research and management. 2) Provide timely information to wildlife managers and administrators, other private land managers, farmers and ranchers on best management practices that would maximize benefits to wildlife. 3) Coordinate research efforts with agricultural agencies to identify program activities that offer potential for application of research results to habitat conservation practices. 4) Publish research results and recommendations promptly in peer-reviewed journals and agency report series. At the same time, make periodic progress reports and significant new information available to managers through technical assistance procedures. 5) Whenever possible, encourage the incorporation of improved land and water management practices that would enhance wildlife values in the program criteria for farm programs administered by state departments of agriculture and the U.S. Department of Agriculture (USDA). 6) Give priority to research for current management needs of the U.S. Fish and Wildlife Service (USFWS) and the international migratory bird management program (2, 3, 4).

The Woodworth Study Area (WSA), as referred to in this symposium, was officially designated in 1963 as the Woodworth Field Station (WFS) of the NPWRC then being established at Jamestown, ND. The WSA is a large block of continuous habitat containing about 1070 ha. It was originally purchased as a waterfowl production area (WPA) and expanded to meet research requirements as the NPWRC program evolved. Other WPAs in the immediate area were also made available for special studies under management agreements with regional wetland management officials (5).

The WFS met the program criteria for providing a sizable tract of land in the Missouri Coteau, within 80 km of the Center for conducting long-term research on habitat changes and response by prairie waterfowl. The unit was to be representative of the PPR, in an area of mixed grassland and agriculture, and with a high density of wetlands. The intent was to establish and maintain a long-term study area, where baseline data would serve present and future studies. The primary mission of the WFS was to test specific hypotheses and conduct research concerning the best land and water management practices that would also maximize benefits to wildlife. The primary emphasis was on migratory birds, especially waterfowl production, in keeping with the mission of NPWRC. The impact of land management practices on resident species (sharp-tailed grouse, ring-necked pheasant, white-tailed deer and small mammals) was included in the long-term monitoring program.

It was recognized that a large percentage of wildlife species in the PPR are produced and raised on private land. Thus, it would be essential to analyze land and water management practices that might be modified to increase wildlife benefits, yet be economically feasible and acceptable to land owners. Improved management practices applicable to public land were also included in the early stages of the research and field testing program. The initial studies focused on the response of wildlife to applied treatments of grazing, burning, idling of grassland and crop land, and annual cropping with rotation. Later studies included the development of better monitoring and evaluation techniques, and specialized equipment to facilitate individual research projects. Special studies of critical species were conducted when applicable and compatible with other NPWRC research priorities. Many studies were conducted as graduate student projects.

When one reflects on the research conducted by the Center and the WFS during the past 33 years, it is clear that there have been many changes in emphasis, management philosophies, priorities and scientific capabilities. During recent years, reduced budgets and staff have restricted the scope of the research. In 1994, the NPWRC was transferred from the USFWS to the newly established National Biological Service (NBS) and renamed the Northern Prairie Science Center (NPSC). Long-term monitoring of habitat conditions and waterfowl production was terminated in 1988, but cooperative research efforts with more broadly ecological focus with less emphasis upon waterfowl were continued through 1995.

Overview of Accomplishments

During the past 30 years, the NPWRC (now NPSC) has provided a wealth of published information on prairie wetland and grassland ecosystems, the breeding ecology of waterfowl and other migratory birds, the impact of predation on waterfowl and other ground nesting birds, and the effects of various land use practices on wildlife on public and private lands. The papers in this symposium by Johnson et al. (6) and Johnson (7) contain a partial list of publications emanating from studies conducted by NPWRC scientists and others that involved the WSA. The paper by Higgins and Woodward (8), summarized much of the work conducted there. That paper has an extensive listing of references resulting from research and applied management studies conducted during the 30 year period. Many cooperators were involved over the years. A specific example from the earlier years was the prairie pothole hydrology study conducted in cooperation with the U.S. Geological Survey (USGS) that yielded significant new information on the relationship of surface runoff and groundwater recharge to the annual hydrologic cycle of small wetlands (9).

As noted by other presenters at this symposium, the scientists and managers involved were eminently successful in achieving the research and management objectives assigned. The WFS, hereafter referred to as WSA, developed an international reputation for its work in developing the dense nesting cover concept, maintaining desired native grassland succession through prescribed burning, determining optimum frequency for habitat manipulation, identifying the effects of mammalian predation on nesting ducks and other birds, and for providing a better understanding of the effects of wet and dry cycles on waterfowl production.

Another measure of accomplishment is the application of research results to local, regional, and international problems and programs. The following examples illustrate how the combined efforts of the NPWRC and the WSA have been used in that context.

- Provided new information for wetland hydrology concepts and programs of the USFWS, USGS, Natural Resources Conservation Service (NRCS), and the U.S. Army Corps of Engineers (COE).
- Reinforced knowledge of the values of seasonal wetlands to waterfowl production.
- Identified the true impact of mammalian predation on production by waterfowl and other ground nesting birds, and the role of dense cover in reducing such impacts.
- Developed the dense nesting cover concept that is being applied internationally in wildlife management and land retirement programs.
- Provided new information on the use of prescribed burning to maintain optimum grassland conditions for nesting waterfowl, other migratory species, and resident species.
- Reinforced values of land retirement programs of the U.S. Department of Agriculture (Soil Bank, Water Bank, set aside acres) to wildlife.
- Provided strong scientific and socio-economic support for the 1980 and 1985 Farm Bills with data resulting from studies at WSA and the Mid-Continent Waterfowl Project at Fergus Falls, MN that led to the current Conservation Reserve Program (CRP). Similar information was used in developing programs for wetland restoration on private lands, and the Wetland Reserve Program (WRP).
- Applied pertinent habitat management techniques to Canadian programs through close coordination and interchange of current information with federal and provincial agencies and private natural resource organizations in Canada.
- Provided data bases from 1984-1986 to prepare the North American Waterfowl Management Plan and the 1994 update. This information was also used extensively in the establishment of the Joint Ventures under the plan and development of 15 Joint Venture Management Plans (10, 11, 12).
- Focused new emphasis on the seasonal food requirements of prairie waterfowl and the importance of invertebrates in diets of adults and ducklings through limnological studies.
- Shed new light on the species composition and growth forms of plants preferred by waterfowl and other migratory birds through grassland studies.

Recent Accomplishments Through Interdisciplinary Research

A number of the papers presented in this symposium reflect the value of having a long-term study area available to conduct research and the value of extending the scope of work by involving other interested agencies and disciplines. After reviewing the papers in this category, I selected four examples to emphasize the value of interdisciplinary research and the linkage to management.

1. "Impact of agricultural land-use on prairie wetland ecosystems: experimental design and overview" by R.A. Gleason and N.H. Euliss, Jr., NBS.

This was a cooperative venture between NBS, the U.S. Environmental Protection Agency (EPA), COE, National Research Council (NRC), University of Minnesota and Humboldt State University.

The objective was to determine the effect of sedimentation on water quality, vegetative growth, invertebrates, agricultural chemical content, and waterfowl use. Definitive information on these inter-relationships was not previously available for this area.

The results indicated that soil loss was greatest on land in summer fallow, followed by bufferstrips, CRP and native prairie. No difference in waterfowl use was detected but the new information is important to land managers because it documents accelerated sedimentation that leads to eventual loss of wetland habitat.

2. "Effects of water level changes on prairie pothole vegetation structure and diversity in the Woodworth Study Area" by D.L. Taylor and N.E. Detenbeck, EPA.

Vegetative diversity and community structure were monitored for two years on seasonal wetlands. Observations were made on surrounding land use (tilled, bufferstrips, CRP and native prairie). Changes in vegetative diversity and height, and changes in succession were recorded as water levels increased due to heavy rains.

Changes were measurable and quantified, and tended to support general knowledge of vegetative response to rising water levels. Grasses decreased in abundance and were replaced by sedges. The wet meadow zones supported aquatic species as the vegetative zones changed with rising water levels. Incorporation of expertise in botany and hydrology provided measurable results that were important to wetland managers.

Other papers by Vieux et al. (13;COE), Detenbeck et al. (14;EPA), and Wrubleski (15;NRC) provided additional new information on sedimentation modeling, water quality, and invertebrate production potential of prairie potholes.

3. "Effects of fire retardant chemicals and fire suppressant foam on North Dakota prairie vegetation" by D.L. Larson and W.E. Newton, NBS.

Although fire retardant chemicals and fire suppressant foams are used extensively in wildland fire control and prescribed habitat burns, little is known about the potential effects on terrestrial and aquatic ecosystems. The objective was to examine experimentally the effect of retardant and foam application on vegetation and associated insect populations, alone and in combination with fire.

Although results may be somewhat indefinite because of the wet field seasons during the two-year study, they provided new information to managers. A simple interpretation is that foam (Silv-Ex) had little effect on plant growth, but tended to depress shoot growth. The retardant used (Phos-Chek G75-F) produced a pronounced fertilization effect and an increase in plant growth, but a depression in species richness. From the viewpoint of managers, if the objective is to halt uncontrolled fires, subtle changes caused by either retardant may be of little importance. When used in prescribed burns, however, the potential effect on species richness should be considered by the applicator.

Other papers presented on the effects of fire retardant chemicals on vegetative structure, diversity, invertebrate populations, and small mammals by Poulton (16; NBS) and Vyas et al. (17; NBS) provide additional examples to aid applicators.

4. "Woodworth Data in Planning for the Prairie Pothole Joint Venture." by R.E. Reynolds and M.A. Johnson.

Data from the WSA provided baseline information for developing the Mallard Model and the Multi-Agency Approach to Planning and Evaluation (MAAPE). Both models enable managers to simulate the waterfowl population and production potential of landscapes with various configurations, and to make decisions about the most appropriate treatments. These new tools have been recognized as significant contributions to permit more effective implementation of the North American Waterfowl Management Plan.

The Benefits of Interagency and Interdisciplinary Research and Development

This symposium session has helped focus attention on the many benefits that can be derived from interagency and interdisciplinary cooperation. Although these concepts were incorporated in the early research programs of the NPWRC and the WSA under the USFWS, they offer further opportunities during this new era of ecosystem management, investigation of biological diversity, and partnership arrangements now being promoted to enhance natural resource research and management. These concepts also are in conformance with the guiding principles for the NBS. It is important, however, that such efforts continue to be focused on priority resource management issues. Some of the major benefits are:

- Permits the pooling of knowledge and resources, and broadens the base of interest and support.
 - Helps focus attention on priority issues.
 - Provides an effective mechanism for delivery of short-term and long-term research guidance for specific management needs.
 - Improves cost effectiveness of research effort and translation to management application in a timely manner.
 - Helps build credibility within the scientific community.
 - Enhances research image at administrative and political levels.
-

Future Considerations

Joint ventures, partnerships, and other cooperative arrangements will usually stimulate better systematic planning and more rapid agreement on priorities for important natural resource issues. This, in turn, will permit more effective use of available research funds. When researchers seek the assistance of other disciplines as needed, they enhance their overall scientific capability and should be able to deliver a better product. This may prove to be a vital factor for maintaining a high visibility role for research in the years ahead. This becomes especially significant under restricted agency and university budgets, and attempts to de-emphasize environmental studies.

The delivery of timely information that addresses priority management issues and public concerns is an important tool for increasing public understanding of ecological relationships involved in proper management of the Nation's natural resources.

The importance of long-term studies and designated areas on which to conduct research is well recognized by the scientific community. Unfortunately, this concept appears to be losing support under most of the present political and administrative entities responsible for administering natural resource and environmental programs. It also is unfortunate that during times of restricted budgets for federal

and state agencies, research is usually the first function to be reduced or eliminated. Looking specifically at the WSA, such actions began in 1988, although research still has priority access to the land under an agreement with USFWS and management of the site still emphasizes research priorities. I believe there is a need to maintain the WSA concept here in the Midwest as it applies to the Prairie Pothole Region. I am pleased to learn that negotiations between NPSC and USFWS to continue research activities there have been successful. The new arrangement does not jeopardize the USFWS's needs for its Chase Lake Prairie Project and maintains the integrity of NPSC's research facilities. The agreement between USFWS and NPSC indeed is a model for others to emulate. I also believe that other physiographic regions could be served in a similar manner where there is an established need. The real problem is development of a support base that will provide adequate funding to carry out such interagency and interdisciplinary research and monitoring programs. This may be difficult to achieve under present budget restrictions and changing philosophies. Nevertheless, successful experiences from the past should help guide the future. Again, the WSA is a model worth applying elsewhere.

References

[Return to Contents](#)

U.S. Department of the Interior | U.S. Geological Survey

URL: <http://www.npwrc.usgs.gov/resource/habitat/woodwort/nelson.htm>

Page Contact Information: Webmaster

Page Last Modified: Saturday, 02-Feb-2013 05:00:50 EST

Reston, VA [vaww54]