

# Contributors

## Planning Team

This plan is the result of the extensive, collaborative, and enthusiastic efforts by members of the planning team for the Kirwin National Wildlife Refuge. Many others contributed insight and support. The draft Comprehensive Conservation Plan and Environmental Assessment were written by refuge staff and the refuge planner, with input from other team members.

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# Appendix A. Glossary

**adaptive management**—The rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities; a process that uses feedback from research, monitoring, and evaluation of management actions to support or modify objectives and strategies at all planning levels; a process in which policy decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in management plan. Analysis of results helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.

**alternative**—A reasonable way to solve an identified problem or satisfy the stated need (40 CFR 1500.2); one of several different means of accomplishing refuge purposes and goals and contributing to the Refuge System mission (Draft Service Manual 602 FW 1.5).

**amphibian**—A class of cold-blooded vertebrates including frogs, toads or salamanders.

**baseline**—A set of critical observations, data, or information used for comparison or a control.

**biological control**—The use of organisms or viruses to control invasive plants or other pests.

**biological diversity, also biodiversity**—The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (Service Manual 052 FW 1.12B). The National Wildlife Refuge System's focus is on indigenous species, biotic communities, and ecological processes.

**biomass**—The total amount of living material, plants and animals, above and below the ground in a particular habitat or area.

**biotic**—Pertaining to life or living organisms; caused, produced by, or comprising living organisms.

**Birds of Conservation Concern**—The Birds of Conservation Concern is the most recent effort to satisfy the 1988 amendment to the Fish and Wildlife Conservation Act, which mandates the Service to “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973” (Service 2002).

**boat closure**—Closed to all flotation devices.

**canopy**—A layer of foliage, generally the uppermost layer, in a vegetative stand; midlevel or understory vegetation in multilayered stands. Canopy closure (*also* canopy cover) is an estimate of the amount of overhead vegetative cover.

**CCP**—*See* comprehensive conservation plan.

**CFR**—*See* Code of Federal Regulations.

**Code of Federal Regulations (CFR)**—The codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. Each volume of the CFR is updated once each calendar year.

**compatible use**—A wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the director of the U.S. Fish and Wildlife Service, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge (Draft Service Manual 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identified stipulations or limits necessary to ensure compatibility.

**comprehensive conservation plan (CCP)**—A document that describes the desired future conditions of the refuge and provides long-range guidance and management direction for the refuge manager to accomplish the purposes of the refuge, contribute to the mission of the Refuge System,

and to meet other relevant mandates (Draft Service Manual 602 FW 1.5).

**concern**—*See* issue.

**cool-season grasses**—Grasses that begin growth earlier in the season and often become dormant in the summer. These grasses will germinate at lower temperatures. Examples of cool-season grasses at the refuge are western wheatgrass, needle and thread, and green needlegrass.

**cover, also cover type, canopy cover**—Present vegetation of an area.

**cultural resources**—The remains of sites, structures, or objects used by people in the past.

**cultural resource inventory**—A professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined geographic area. Inventories may involve various levels including background literature search, comprehensive field examination to identify all exposed physical manifestations of cultural resources, or sample inventory to project site distribution and density over a larger area. Evaluation of identified cultural resources to determine eligibility for the National Register follows the criteria found in 36 CFR 60.4 (Service Manual 614 FW 1.7).

**cultural resource overview**—A comprehensive document prepared for a field office that discusses, among other things, its prehistory and cultural history, the nature and extent of known cultural resources, previous research, management objectives, resource management conflicts or issues, and a general statement on how program objectives should be met and conflicts resolved. An overview should reference or incorporate information from a field office background or literature search described in Section VIII of the Cultural Resource Management Handbook (Service Manual 614 FW 1.7).

**dense nesting cover (DNC)**—is a mixture of cool-season grasses and legumes, like alfalfa and yellow sweetclover. Some wildlife species, like pheasant, use it for nesting, rearing their broods, roosting and loafing. DNC is high quality nesting cover designed to maximize nesting activity and reproductive success. Many Conservation Reserve Program lands are established with a DNC mixture.

**depredation**—Destruction or consumption of eggs, broods, or individual wildlife due to a predatory animal; damage inflicted on agricultural crops or ornamental plants by wildlife.

**DNC**—*See* dense nesting cover.

**drawdown**—The act of manipulating water levels in an impoundment to allow for the natural drying-out cycle of a wetland.

**EA**—*See* environmental assessment.

**ecological diversity**—The variety of life and its processes including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (Service Manual 052 FW 1.12B).

**ecosystem**—A dynamic and interrelating complex of plant and animal communities and their associated nonliving environment (climate, water, rocks, nonliving components); a biological community, together with its environment, functioning as a unit. For administrative purposes, the Service has designated 53 ecosystems covering the United States and its possessions. These ecosystems generally correspond with watershed boundaries and their sizes and ecological complexity vary.

**emergent**—A plant rooted in shallow water and having most of the vegetative growth above water such as cattail and hardstem bulrush.

**endangered species, federal**—A plant or animal species listed under the Endangered Species Act of 1973, as amended, that is in danger of extinction throughout all or a significant portion of its range.

**endangered species, state**—A plant or animal species in danger of becoming extinct or extirpated in a particular state within the near future if factors contributing to its decline continue. Populations of these species are at critically low levels or their habitats have been degraded or depleted to a significant degree.

**environmental assessment (EA)**—A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action and alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

**EPA**—Environmental Protection Agency.

**fauna**—All the vertebrate and invertebrate animals of an area.

**federal trust resources**—a resource managed by one entity for another who holds the ownership. The Service holds in trust many natural resources for the people of the United States of America as a result of federal acts and treaties. Examples are species listed under the Endangered Species Act, migratory birds protected by international treaties, anadromous fish once they enter inland U.S. waterways, and native plant and wildlife species found on a national wildlife refuge.

**federal trust species**—all species where the federal government has primary jurisdiction, including federally endangered or threatened species, migratory birds, anadromous fish, and certain marine mammals.

**flora**—All the plant species of an area.

**FONSI**—finding of no significant impact.

**forb**—A broad-leaved, herbaceous plant; a seed-producing annual, biennial, or perennial plant that does not develop persistent woody tissue but dies down at the end of the growing season.

**fragmentation**—The alteration of a large block of habitat that creates isolated patches of the original habitat that are interspersed with a variety of other habitat types (Koford et al. 1994); the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.

**FWS**—*See* U.S. Fish and Wildlife Service.

**geographic information system (GIS)**—A computer system capable of storing and manipulating spatial data; a set of computer hardware and software for analyzing and displaying spatially referenced features (e.g., points, lines and polygons) with nongeographic attributes such as species and age (Koford et al. 1994).

**GIBA**—Globally Important Bird Area, as designated by the American Bird Conservancy.

**GIS**—*See* geographic information system.

**goal**—Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define

measurable units (Draft Service Manual 620 FW 1.5).

**GPS**—*See* global positioning system.

**habitat**—Suite of existing environmental conditions required by an organism for survival and reproduction; the place where an organism typically lives and grows.

**habitat disturbance**—Significant alteration of habitat structure or composition; may be natural (e.g., wildland fire) or human-caused events (e.g., timber harvest and disking).

**habitat type, also vegetation type, cover type**—A land classification system based on the concept of distinct plant associations.

**impoundment**—A body of water created by collection and confinement within a series of levees or dikes, creating separate management units although not always independent of one another.

**integrated pest management (IPM)**—Methods of managing undesirable species such as invasive plants; education, prevention, physical or mechanical methods of control, biological control, responsible chemical use, and cultural methods.

**invasive plant, also noxious weed**—A species that is nonnative to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health.

**IPM**—*See* integrated pest management.

**issue**—Any unsettled matter that requires a management decision (e.g., a Service initiative, opportunity, resource management problem, a threat to the resources of the unit, conflict in uses, public concern, or the presence of an undesirable resource condition) (Draft Service Manual 602 FW 1.5).

**maintenance management system (MMS)**—A national database which contains the unfunded maintenance needs of each refuge; projects include those required to maintain existing equipment and buildings, correct safety deficiencies for the implementation of approved plans, and meet goals, objectives, and legal mandates.

**management alternative**—*See* alternative.

**migration**—Regular extensive, seasonal movements of birds between their breeding regions and their wintering regions (Koford et al. 1994); to

pass usually periodically from one region or climate to another for feeding or breeding.

**migratory birds**—Birds which follow a seasonal movement from their breeding grounds to their wintering grounds. Waterfowl, shorebirds, raptors, and songbirds are all migratory birds.

**mission**—Succinct statement of purpose and/or reason for being.

**mitigation**—Measure designed to counteract an environmental impact or to make an impact less severe.

**mixed-grass prairie**—A transition zone between the tall-grass prairie and the short-grass prairie dominated by grasses of medium height that are approximately 2–4 feet tall. Soils are not as rich as the tall-grass prairie and moisture levels are less.

**MMS**—*See* maintenance management system.

**monitoring**—The process of collecting information to track changes of selected parameters over time.

**National Wildlife Refuge**—A designated area of land, water, or an interest in land or water within the National Wildlife Refuge System, but does not include coordination areas; a complete listing of all units of the Refuge System is in the current “Annual Report of Lands Under Control of the U.S. Fish and Wildlife Service.”

**National Wildlife Refuge System (Refuge System)**—Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife including species threatened with extinction, all lands, waters, and interests therein administered by the Secretary as wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas.

**National Wildlife Refuge System Improvement Act of 1997**—Sets the mission and the administrative policy for all refuges in the National Wildlife Refuge System; defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation); establishes a formal process for determining

appropriateness and compatibility; establish the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; requires a comprehensive conservation plan for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

**native species**—A species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

**NAWMP**—North American Waterfowl Management Plan.

**Neotropical migrant**—A bird species that breeds north of the United States and Mexican border and winters primarily south of this border.

**NEPA**—National Environmental Policy Act.

**non-wildlife-dependent recreation uses**—Use of a refuge that does not depend on the presence of wildlife (e.g., water and jet skiing, personal water craft, camping, swimming, horseback riding, volleyball, basketball, tournament fishing, power and speed boating).

**noxious weed, also invasive plant**—Any living stage (including seeds and reproductive parts) of a parasitic or other plant of a kind that is of foreign origin (new to or not widely prevalent in the U.S.) and can directly or indirectly injure crops, other useful plants, livestock, poultry, other interests of agriculture, including irrigation, navigation, fish and wildlife resources, or public health. According to the Federal Noxious Weed Act (PL 93-639), a noxious weed (i.e., invasive plant) is one that causes disease or has adverse effects on humans or the human environment and, therefore, is detrimental to the agriculture and commerce of the U.S. and to public health.

**NWR**—National Wildlife Refuge.

**objective**—An objective is a concise target statement of what will be achieved, how much will be achieved, when and where it will be achieved, and who is responsible for the work; derived from goals and provide the basis for determining management strategies. Objectives should be attainable and time-specific and should be stated quantitatively to the extent possible. If objectives cannot be stated quantitatively, they may be stated qualitatively (Draft Service Manual 602 FW 1.5).

**palustrine**—“Palustrine” comes from the Latin word “palus” or marsh. Wetlands within this category include inland marshes and swamps as well as bogs, fens, tundra, and flood plains.

Palustrine systems include any inland wetland which lacks flowing water and contains ocean derived salts in concentrations of less than .05 percent.

**Partners in Flight (PIF)**—A Western Hemisphere program designed to conserve Neotropical migratory birds and officially endorsed by numerous federal and state agencies and nongovernmental organizations; also known as the Neotropical Migratory Bird Conservation Program (Koford et al. 1994).

**patch**—An area distinct from that around it; an area distinguished from its surroundings by environmental conditions.

**perennial**—Lasting or active through the year or through many years; a plant species that has a life span of more than 2 years.

**pergola**—an arbor formed of horizontal trelliswork supported on columns or posts, over which vines or other plants are trained. A colonnade having the form of such an arbor.

**PIF**—*See* Partners in Flight.

**plant community**—An assemblage of plant species unique in its composition; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soil, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax plant community (e.g., ponderosa pine or bunchgrass).

**prescribed fire**—The skillful application of fire to natural fuels under conditions such as weather, fuel moisture, and soil moisture that allow confinement of the fire to a predetermined area and produces the intensity of heat and rate of spread to accomplish planned benefits to one or more objectives of habitat management, wildlife management, or hazard reduction.

**priority public use**—One of six uses authorized by the National Wildlife Refuge System Improvement Act of 1997 to have priority if found to be compatible with a refuge's purposes. This includes hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation.

**proposed action**—The alternative proposed to best achieve the purpose, vision, and goals of a refuge (contributes to the Refuge System mission, addresses the significant issues, and is

consistent with principles of sound fish and wildlife management).

**public**—Individuals, organizations, and groups; officials of federal, state, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in Service issues and those who do or do not realize that Service decisions may affect them.

**public involvement**—A process that offers affected and interested individuals and organizations an opportunity to become informed about, and to express their opinions on, Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.

**purpose of the refuge**—The purpose of a refuge is specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing authorization or expanding a refuge, refuge unit, or refuge subunit (Draft Service Manual 602 FW 1.5).

**raptor**—A carnivorous bird such as a hawk, a falcon, or a vulture that feeds wholly or chiefly on meat taken by hunting or on carrion (dead carcasses).

**refuge operations needs system (RONS)**—A national database that contains the unfunded operational needs of each refuge. Projects included are those required to implement approved plans and meet goals, objectives, and legal mandates.

**refuge purpose**—*See* purpose of the refuge.

**Refuge System**—*See* National Wildlife Refuge System.

**refuge use**—Any activity on a refuge, except administrative or law enforcement activity, carried out by or under the direction of an authorized Service employee.

**resident species**—A species inhabiting a given locality throughout the year; nonmigratory species.

**restoration**—Management emphasis designed to move ecosystems to desired conditions and processes (e.g., healthy upland habitats and aquatic systems).

**riparian area or riparian zone**—An area or habitat that is transitional from terrestrial to aquatic ecosystems including streams, lakes, wet areas, and

adjacent plant communities and their associated soils that have free water at or near the surface; an area whose components are directly or indirectly attributed to the influence of water; or of relating to a river; specifically applied to ecology, “riparian” describes the land immediately adjoining and directly influenced by streams. For example, riparian vegetation includes all plant life growing on the land adjoining a stream and directly influenced by the stream.

**RONs**—*See* refuge operations needs system.

**SAV**—*See* submerged aquatic vegetation.

**scoping**—The process of obtaining information from the public for input into the planning process.

**SDGFP**—South Dakota Department of Game, Fish and Parks.

**seasonal boat closure**—Closed to all flotation devices.

**sediment**—Material deposited by water, wind, and glaciers.

**Service**—*See* U.S. Fish and Wildlife Service.

**shelterbelts**—Single to multiple rows of trees and shrubs planted around cropland or buildings to block or slow down the wind.

**shorebird**—Any of a suborder (Charadrii) of birds such as a plover or a snipe that frequent the seashore or mud flat areas.

**six shell area**—A maximum of six shotgun shells per person per day is permitted during all dark goose seasons.

**spatial**—Relating to, occupying, or having the character of space.

**special-use permit**—A permit for special authorization from the refuge manager required for any refuge service, facility, privilege, or product of the soil provided at refuge expense and not usually available to the general public through authorizations in Title 50 CFR or other public regulations (Refuge Manual 5 RM 17.6).

**species of concern**—Those plant and animal species, while not falling under the definition of special-status species, that are of management interest by virtue of being federal trust species such as migratory birds, important game species, or significant keystone species; species

that have documented or apparent populations declines, small or restricted populations, or dependence on restricted or vulnerable habitats.

**step-down management plan**—A plan that provides the details necessary to implement management strategies identified in the comprehensive conservation plan (Draft Service Manual 602 FW 1.5).

**strategy**—A specific action, tool, or technique or combination of actions, tools, and techniques used to meet unit objectives (Draft Service Manual 602 FW 1.5).

**submerged aquatic vegetation (SAV)**—A vascular or nonvascular hydrophyte, either rooted or nonrooted, that lies entirely beneath the water surface, except for flowering parts in some species.

**threatened species, federal**—Species listed under the Endangered Species Act of 1973, as amended, that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

**threatened species, state**—A plant or animal species likely to become endangered in a particular state within the near future if factors contributing to population decline or habitat degradation or loss continue.

**trust species**—*See* federal trust species.

**U.S. Fish and Wildlife Service (Service, USFWS, FWS)**—The principal federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The Service manages the 93-million-acre National Wildlife Refuge System comprised of more than 530 National Wildlife Refuges and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological service field stations, the agency enforces federal wildlife laws, manages migratory bird populations, restores national significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the federal aid program that distributes millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

**USFWS**—*See* U.S. Fish and Wildlife Service.

**U.S. Geological Survey (USGS)**—A federal agency whose mission is to provide reliable scientific information to describe and understand the earth; minimize loss of life and property from



natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

**USGS**—*See* U.S. Geological Survey.

**vision statement**—A concise statement of the desired future condition of the planning unit, based primarily on the Refuge System mission, specific refuge purposes, and other relevant mandates (Draft Service Manual 602 FW 1.5).

**visual obstruction**—Pertaining to the density of a plant community; the height of vegetation that blocks the view of predators and conspecifics to a nest.

**visual obstruction reading (VOR)**—A method of visually quantifying vegetative structure and composition.

**VOR**—*See* visual obstruction reading.

**wading birds**—Birds having long legs that enable them to wade in shallow water including egrets, great blue herons, black-crowned night-herons, and bitterns.

**warm-season grasses**—Grasses that begin growth later in the season (early June). These grasses require warmer soil temperatures to germinate and actively grow when temperatures are warmer. Examples of warm-

season grasses are Indiangrass, switchgrass, and big bluestem.

**waterfowl**—A category of birds that includes ducks, geese, and swans.

**watershed**—The region draining into a river, a river system, or a body of water.

**wetland management district (WMD)**—a feral administrative unit that is charged with acquiring, overseeing, and managing the waterfowl production areas and easements within a specified group of counties. Most districts are large, covering several counties.

**wildlife-dependent recreational use**—Use of a refuge that is dependent on the presence of wildlife (e.g., involving hunting, fishing, wildlife observation, wildlife photography, environmental education, or interpretation). The National Wildlife Refuge System Improvement Act of 1997 specifies that these are the six priority general public uses of the Refuge System.

**WMD**—*See* wetland management district.

**woodland**—Open stands of trees with crowns not usually touching, generally forming 25–60 percent cover.

**WPA**—waterfowl production area.





# **Appendix B. Public Involvement**

Planning team response to public comments will be completed prior to final approval of the plan.



# Appendix C. Key Legislation and Policies

**American Indian Religious Freedom Act (1978):** Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

**American Conservation and Youth Service Corps:** Offers an opportunity for young adults between the ages of 16-25, or in the case of summer programs, 15-21, to engage in approved human and natural resources projects which benefit the public or are carried out on federal or Indian lands. To be eligible for assistance, natural resources programs will focus on improvement of wildlife habitat and recreational areas, fish culture, fishery assistance, erosion, wetlands protection, pollution control and similar projects.

**Americans With Disabilities Act (1992):** Prohibits discrimination in public accommodations and services.

**Antiquities Act (1906):** Authorizes the scientific investigation of antiquities on federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

**Archaeological and Historic Preservation Act (1974):** Directs the preservation of historic and archaeological data in federal construction projects.

**Archaeological Resources Protection Act (1979) As Amended:** Protects materials of archaeological interest from unauthorized removal or destruction and requires federal managers to develop plans and schedules to locate archaeological resources.

**Architectural Barriers Act (1968):** Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

**Bald and Golden Eagle Protection Act (1940):** Prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions.

**Clean Air Act (1977) As Amended:** Establishes federal standards for various pollutants from both stationary and mobile sources and to provide for the regulation of polluting emissions via state implementation plans. In addition, and of special interest for National Wildlife Refuges, some amendments are designed to prevent significant deterioration in certain areas where air quality exceeds national standards, and to provide for improved air quality in areas which do not meet federal standards ("nonattainment" areas). Federal facilities are required to comply with air quality standards to the same extent as nongovernmental entities (42 U.S.C. 7418).

**Clean Water Act (1977):** Requires consultation with the U.S. Army Corps of Engineers for major wetland modifications.

**Emergency Wetland Resources Act (1986):** Authorizes the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. The Act also requires the Secretary to establish a National Wetlands Priority Conservation Plan, requires the States to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers to the Migratory Bird Conservation Fund amount equal to import duties on arms and ammunition.

**Endangered Species Act (1973):** Requires all federal agencies to carry out programs for the conservation of endangered and threatened species.

**Environmental Education Act (1990):** Establishes the Office of Environmental Education within the Environmental Protection Agency to develop and administer a federal environmental education program. The Office is required to develop and support environmental programs in consultation with other federal natural resource management agencies, including the Fish and Wildlife Service.

**Executive Order No. 11593, Protection and Enhancement of the Cultural Environment (1971):** Consults with federal and state historic preservation officers to comply with Section 106 of the National Historic Preservation Act of 1966, as amended, if the Service proposes any development activities that would affect the archaeological or historical sites.

**Executive Order No. 11987, Exotic Organisms (1977):** Requires federal agencies, to the extent permitted by law, to: restrict the introduction of exotic species into the natural ecosystems on lands and waters owned or leased by the United States; encourage States, local governments, and private citizens to prevent the introduction of exotic species into natural ecosystems of the U.S.; restrict the importation and introduction of exotic species into any natural U.S. ecosystems as a result of activities they undertake, fund, or authorize; and restrict the use of federal funds, programs, or authorities to export native species for introduction into ecosystems outside the U.S. where they do not occur naturally.

**Executive Order No. 11988, Flood plain Management (1977):** Provides leadership and take action to reduce the risk of flood loss and minimize the impact of floods on human safety, and preserve the natural and beneficial values served by flood plains.

**Executive Order No. 11990, Protection of Wetlands (1977):** Directs all federal agencies to avoid, if possible, adverse impacts to wetlands and to preserve and enhance the natural and beneficial values of wetlands. Each agency shall avoid undertaking or assisting in wetland construction projects unless the head of the agency determines that there is no practicable alternative to such construction and that the proposed action includes measures to minimize harm. Also, agencies shall provide opportunity for early public review of proposals for construction in wetlands, including those projects not requiring an EIS.

**Executive Order No. 12898, Environmental Justice (1994):** Requires minority and low-income populations an opportunity to comment on the development and design of Reclamation activities. Federal agencies shall make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

**Executive Order No. 12996, Management and General Public Use of the National Wildlife Refuge System (1996):** Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the Refuge System.

**Executive Order No. 13007, Indian Sacred Sites (1996):** Directs federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

**Executive Order No. 13084, Consultation and Coordination with Indian Tribal Governments (1998):** Maintains a unique legal relationship with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, Executive Orders, and court decisions. Since the formation of the Union, the United States has recognized Indian tribes as domestic dependent nations under its protection. In treaties, our Nation has guaranteed the right of Indian tribes to self-government. As domestic dependent nations, Indian tribes exercise inherent sovereign powers over their members and territory. The United States continues to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, trust resources, and Indian tribal treaty and other rights.

**Federal Aid in Wildlife Restoration Act (1937) As Amended:** Provides funding to States for game and nongame wildlife restoration work. This Act, commonly referred to as the “Pittman-Robertson Act,” funds from an excise tax on sporting arms and ammunition are appropriated to the Secretary of the Interior annually and apportioned to States on a formula basis for approved land acquisition, research, development and management projects and hunter safety programs.

**Federal Noxious Weed Act (1990):** Requires the use of integrated management systems to control or contain undesirable plant species; and an interdisciplinary approach with the cooperation of other federal and state agencies.

**Fish and Wildlife Act (1956):** Establishes a comprehensive national fish and wildlife policy and broadened the authority for acquisition and development of refuges.

**Fish and Wildlife Conservation Act (1980):** Creates a mechanism for federal matching funding of the development of state conservation plans for nongame fish and wildlife. Subsequent amendments to this law require that the Secretary monitor and assess migratory nongame birds, determine the effects of environmental changes and human activities, identify birds likely to be candidates for endangered species listing, and identify conservation actions that would prevent this from being necessary. In 1989, Congress also directed

the Secretary to identify lands and waters in the Western Hemisphere, the protection, management or acquisition of which would foster conservation of migratory nongame birds. These activities are intended to assist the Secretary in fulfilling the Secretary's responsibilities under the Migratory Bird Treaty Act and the Migratory Bird Conservation Act, and provisions of the Endangered Species Act implementing the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere.

**Fish and Wildlife Coordination Act (1934):**

Authorizes the Secretary of the Interior to assist federal, state and other agencies in development, protection, rearing and stocking fish and wildlife on federal lands, and to study effects of pollution on fish and wildlife. The Act also requires consultation with the Fish and Wildlife Service and the wildlife agency of any State wherein the waters of any stream or other water body are proposed to be impounded, diverted, channelized or otherwise controlled or modified by any federal agency, or any private agency under federal permit or license, with a view to preventing loss of, or damage to, wildlife resources in connection with such water resource projects. The Act further authorizes federal water resource agencies to acquire lands or interests in connection with water use projects specifically for mitigation and enhancement of fish and wildlife.

**Fish and Wildlife Coordination Act (1958):**

Allows the Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

**Food Security Act (1985) As Amended:**

Authorizes acquisition of easements in real property for a term of not less than 50 years for conservation, recreation, and wildlife purposes.

**Historic Sites, Buildings and Antiquities Act**

**(1935):** Declares a national policy to preserve historic sites and objects of national significance, including those located on refuges. This Act popularly known as the Historic Sites Act, among other things, designates National Historic and Natural Landmarks under authority of this Act. As of January 1989, 31 National Wildlife Refuges contained such sites.

**Land and Water Conservation Fund Act**

**(1965):** Uses the receipts from the sale of surplus federal land, outer continental shelf oil and gas sales, and other sources for land acquisition under several authorities.

**Migratory Bird Conservation Act (1929):**

Establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Migratory Bird Conservation Commission.

**Migratory Bird Hunting and Conservation**

**Stamp Act (1934) As Amended:** Requires each waterfowl hunter 16 years of age or older to possess a valid federal hunting stamp. The "Duck Stamp Act," as this authority is commonly called, requires receipts from the sale of the stamp are deposited in a special treasury account known as the Migratory Bird Conservation Fund.

**Migratory Bird Treaty Act (1918):**

Designates the protection of migratory birds as a federal responsibility. This Act enables the setting of seasons, and other regulations including the closing of areas, federal or nonfederal, to the hunting of migratory birds.

**National Community Service Act (1990):**

Authorizes several programs to engage citizens of the U.S. in full- and/or part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. Several provisions are of particular interest to the U.S. Fish and Wildlife Service.

**National Environmental Policy Act (1969) As**

**Amended:** Requires all federal agencies to examine the impacts upon the environment that their actions might have, to incorporate the best available environmental information, and the use of public participation in the planning and implementation of all actions. All federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documentation to facilitate sound environmental decision-making. NEPA requires the disclosure of the environmental impacts of any major federal action that affects in a significant way the quality of the human environment.

**National Historic Preservation Act (1966) As**

**Amended:** Establishes as policy that the federal government is to provide leadership in the preservation of the nation's prehistoric and historic resources. As of January, 1989, 91 historic sites on National Wildlife Refuges have been placed on the National Register.

**National Wildlife Refuge System Administration**

**Act (1966):** Authorizes the Secretary of the Interior to "permit the use of any area within the Refuge System for any purpose including, but not limited to, hunting, fishing, public recreation and accommodations, and access whenever he determines that such uses are compatible with the major purposes for which such areas were established." Consolidates authorities for the

various categories of areas previously established that are administered by the Secretary of the Interior for conservation of fish and wildlife, including species that are threatened with extinction, all lands, waters, and interests therein administered by the Secretary as wildlife refuges, etc., which are hereby designated as the National Wildlife Refuge System. Provides that the Secretary may authorize hunting and fishing to the extent practicable and consistent with state fish and wildlife laws and regulations.

#### **National Wildlife Refuge System**

**Improvement Act (1997):** Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System. Clearly defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of six priority public uses (hunting, fishing, wildlife observation and photography, environmental education and interpretation); establishes a formal process for determining compatibility; establishes the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; and requires a Comprehensive Conservation Plan for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

**North American Wetlands Conservation Act (1968):** Provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, U.S. and Mexico. The Act converts the Pittman-Robertson account into a trust fund, with the interest available without appropriation through the year 2006 to carry out the programs authorized by the Act, along with an authorization for annual appropriation of \$15 million plus an amount equal to the fines and forfeitures collected under the Migratory Bird Treaty Act.

Available funds may be expended, upon approval of the Migratory Bird Conservation Commission, for payment of not to exceed 50 percent of the United States share of the cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100 percent of the cost of projects on federal lands). At least 50 percent and no more than 70 percent of the funds received are to go to Canada and Mexico each year.

**Refuge Recreation Act (1962):** Allows the use of refuges for recreation when such uses are compatible with the refuge's primary purposes

and when sufficient funds are available to manage the uses.

#### **Refuge Revenue Sharing Act (1935) As**

**Amended:** Provides for payments to counties in lieu of taxes, using revenues derived from the sale of products from refuges. Public Law 88-523 (1964) revised this Act and required that all revenues received from refuge products, such as animals, timber and minerals, or from leases or other privileges, be deposited in a special treasury account and net receipts distributed to counties for public schools and roads. Payments to counties were established as: 1) on acquired land, the greatest amount calculated on the basis of 75 cents per acre, three-fourths of one percent of the appraised value, or 25 percent of the net receipts produced from the land; and 2) on land withdrawn from the public domain, 25 percent of net receipts and basic payments under Public Law 94-565 (31 U.S.C. 1601-1607, 90 Stat. 2662), payment in lieu of taxes on public lands.

**Refuge Trespass Act (1906):** Provides first federal protection for wildlife on National Wildlife Refuges. This Act made it unlawful to hunt, trap, capture, willfully disturb, or kill any bird or wild animal, or take or destroy the eggs of any such birds, on any lands of the United States set apart or reserved as refuges or breeding grounds for such birds or animals by any law, proclamation, or executive order, except under rules and regulations of the Secretary. The Act also protects government property on such lands.

**Rehabilitation Act (1973):** Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the federal government to ensure that anybody can participate in any program.

**Transfer of Certain Real Property for Wildlife Conservation Purposes Act (1948):** Provides that upon determination by the Administrator of the General Services Administration, real property no longer needed by a federal agency can be transferred, without reimbursement, to the Secretary of the Interior if the land has particular value for migratory birds, or to a state agency for other wildlife conservation purposes.

**Wilderness Act (1964):** Directs the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 or more acres and every roadless island (regardless of size) within National Wildlife Refuge and National Park Systems for inclusion in the National Wilderness Preservation System.



# Appendix D. Divestiture Consideration

## Introduction

During the Comprehensive Conservation Plan (CCP) process, Kirwin National Wildlife Refuge (Kirwin NWR) was identified as a candidate for divestiture from the National Wildlife Refuge System (Refuge System). The refuge was analyzed by the planning team, Regional Office, and the refuge manager to determine if it warranted status as a national wildlife refuge. Following the analysis, a decision was made by the Regional Office to retain Kirwin in the Refuge System.

This document utilizes region 6's newly developed divestiture model to articulate why Kirwin NWR was not recommended for divestiture.

The divestiture model represents a set of criteria for measuring the value of a refuge. Designed as a preplanning tool, the model allows planners and refuge managers to determine if a refuge or easement refuge should be considered for divestiture. If the model indicates that a refuge should be considered for divestiture, the process and consequences of divestiture will be studied further during the CCP process. In the case of Kirwin, the model proved that the refuge was not a candidate for divestiture.

## The Divestiture Model—Criteria and Rules

Region 6's divestiture model was developed during a two-day workshop held December 14–15, 2004, at the U.S. Fish and Wildlife Service Regional Office in Denver. The purpose of the workshop was to standardize policy in region 6 for identifying which refuges to consider for divestiture. At this time, the model is still being tested and has not been finalized.

The model consists of a set of eight questions that must be addressed when considering a refuge for divestiture. The questions were prioritized as primary and secondary criteria for evaluation.

## Primary Criteria

### 1. Does the refuge achieve one or more of the NWRS goals?

*Explanation:* Look beyond the purpose to see if the refuge is meeting NWRS goals. refuge purpose is forever, but may become obsolete over time (e.g., recovery of threatened and endangered species). Obsolete purpose does not necessarily mean divestiture of the refuge should be pursued.

### 2. Does the refuge meet its purpose (fulfill the refuge's intent and statutory purpose)?

*Explanation:* Try to understand the intent of decision makers at the time the refuge was established.

### 3. Does the refuge provide substantial support for migratory bird species, provide important sheltering habitat for threatened and endangered species, or support species identified in authorizing legislation?

*Explanation:* The planning team that answers this question must define "substantial." Refuge context is the key consideration. Substantial is relative to species, location, and region.

*Example:* Flocks of migratory birds (thousands) would be considered substantial.

### 4A. Does the refuge have biological integrity? If not, is it feasible to restore the biological integrity of the converted or degraded habitat?

To answer "yes" on biological integrity, the answer on both 4A and 4B should be yes.

*Explanation:* The presence of native habitat is not enough to meet Refuge System standards; the Service is not trying to save every remnant species. Identify what has changed from presettlement habitat conditions and consider the contribution to regional biodiversity.

### 4B. Does the Service have or can it reasonably acquire the right to restore the habitat?

*Biological integrity* = Native habitat and contribution to regional biodiversity.

*Degraded* = Native vegetation exists but the value has been reduced due to nonnatives and loss of ecological functions.

5. Does the refuge contribute to landscape conservation, provide a stepping stone for migratory birds, or serve as a unique habitat patch important to the conservation of a trust species?

### Secondary Criteria

6. Politics/Community—Is there such significant community interest in and support for the refuge that divestiture would result in unacceptable long-term public relations?

*Explanation:* Environmental education is a means to an end, not a purpose in itself; conservation must be broader than the refuge. Public use should be considered as criteria only when public use is legislated in the purpose.

7. Jurisdiction—Do we have or can we acquire the jurisdiction to meet the refuge’s purpose, Refuge System mission and goals, and prevent incompatible uses?

8. Other Land Manager—Can another agency or organization achieve most or all of the purposes of the refuge without the Service having to incur costs?

Only ask this question if the answer to questions 1 and 2 are “no.”

### Additional Considerations

9. Cost/Liability—Cost will never be a primary or secondary factor for divesting a refuge; cost (in itself) should not be a criterion for divesting land.
- If cost is a consideration for divestiture, it is because some other factor is driving the decision.
  - Cost is a piece of information that can be used to justify decision.
  - Liability is an additive to a decision to either keep or divest a refuge, but it is not a primary or secondary decision-making criteria.

### Rules

The following five rules organize the responses to the above criteria questions and determine whether to consider a refuge for divestiture.

**Rule 1:** IF the refuge cannot meet one or more Refuge System goals, THEN it should be considered for divestiture.

**Rule 2:** IF the answers to questions 1 through 4 are as follows:

1. Yes — Meets a Refuge System goal, but only the education goal
2. No — Does not meet refuge purpose
3. No — Does not substantially support trust species
4. No — Does not possess biological integrity

THEN the refuge should be considered for divestiture.

**Rule 3:** IF the answers to questions 1 through 5 are as follows:

1. Yes — Meets a Refuge System goal, but only the education goal
2. Yes — Purpose
3. No — Trust Species
4. No — Biological Integrity
5. No — Connectivity

THEN the refuge should be considered for divestiture.

**Rule 4:** IF the answers to questions 1 through 6 are as follows:

1. Yes — Goal
2. Maybe — Purpose
3. No — Trust Species
4. Yes — Biological Integrity
5. No — Connectivity
6. Yes — Jurisdiction

THEN keep the refuge (positive rule).

**Rule 5:** IF the answers to questions 1 through 3 are as follows:

1. Yes — Goal
2. Yes — Purpose
3. Yes — Trust Species

THEN keep the refuge (positive rule).

## Applying the Model to Kirwin NWR

When applied to Kirwin NWR, the divestiture model indicated that Kirwin should *not* be considered for divestiture.

This section provides a detailed and objective account of how Kirwin was evaluated using the divestiture model. In keeping with the model’s format, the refuge is subject to the criteria questions until the responses represent one of the above-mentioned rules—either to keep the refuge or consider it for divestiture.

## Primary Criteria

### 1. Does the refuge achieve one or more of the Refuge System goals?

Kirwin NWR achieves all six of the National Wildlife Refuge System goals. The refuge meets its purpose by perpetuating migratory bird populations. Kirwin NWR conserves and restores wildlife populations and mixed-grass prairie habitat. Additionally, the refuge conserves diversity of fish, wildlife and plants including 236 bird species, 30 reptile species, 8 amphibian species, 19 fish species, 45 mammal species and over 138 plant species.

Furthermore, Kirwin NWR conserves and restores a representative ecosystem of the United States—the mixed-grass prairie. The refuge lies solidly in the mixed-grass prairie ecoregion and is dominated by the bluestem-grama association. Currently 5,000 acres of the refuge are either unplowed virgin sod or in various stages of prairie restoration. Another 1,400 acres of the refuge are slated to be restored to prairie by 2008. Adjacent to the southeast side of the refuge are over 18,000 acres of native mixed-grass prairie. Adjacent to the west side of the refuge are over 22,000 acres of native mixed-grass prairie. Currently, these two parcels of habitat do not connect. The refuge is the hinge-pin linking these two large prairie tracts. Mixed-grass prairie will be restored in critical areas of the refuge to ensure that an expansive block of over 46,000 acres of mixed-grass prairie is added to the landscape for the benefit of migratory grassland birds by 2008.

Compatible wildlife-dependent public use opportunities at Kirwin NWR ensure that the refuge fosters understanding and appreciation of fish, wildlife and plants and their conservation. In 2004, visitor use days totaled 75,000 (fishing 34,000, hunting 29,000, wildlife observation and photography 12,000). Annual events at Kirwin include Eagle Day (400 visitors), Kids Fishing Day, Eco-Meet, monthly environmental education programs, and Boy Scout/Girl Scout programs. Although noncompatible uses are permitted on the refuge, these uses have been declining in recent years. The refuge has made a concerted effort to minimize the impacts of these noncompatible uses on the habitat. Over the course of the entire 2004 summer, refuge staff saw only four water skiers and one jet skier. On Labor Day weekend, generally the last opportunity of the year to camp, only four campers were observed on the refuge. One alternative in the draft CCP calls for the prohibition of all noncompatible uses.

### 2. Does the refuge meet its purpose (fulfill the refuge's intent and statutory purpose)?

Kirwin NWR's purpose reads as follows:

Kirwin National Wildlife Refuge .”.. shall be administered by him (Secretary of the Interior) directly or in accordance with cooperative agreements... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon,...the Secretary of the Interior shall have the right to assume the management and administration of such lands in behalf of the National Migratory Bird Management Program...” 16 U.S.C. 715d (Fish and Wildlife Coordination Act).

In keeping with the intent of the above legislation, Kirwin NWR is managed for wildlife with a special emphasis on migratory birds. *(For further discussion on migratory bird conservation, see question 3.)*

### 3. Does the refuge provide substantial support for migratory bird species, provide important sheltering, feeding and breeding habitat for threatened and endangered species, or support species identified in authorizing legislation?

Kirwin NWR does provide substantial support for migratory birds such as waterfowl, grassland dependents, and bald eagles. The refuge provides feeding and resting areas for thousands of waterfowl annually. Peak numbers for waterfowl include 70,000 Canada geese, 39,000 white-fronted geese, 26,000 snow/Ross' geese, and 218,000 ducks. Great blue heron and double-crested cormorant rookeries are also present on the refuge.

#### *Deepwater Habitat (1,300 acres)*

Species of concern that use deepwater habitat include eared grebe, western grebe, American white pelican, redhead, lesser scaup, Franklin's gull, common tern, and black tern. Threatened and endangered species that use this habitat are bald eagle and least tern.

#### *Shoreline Habitat (200 acres)*

Species of concern that use shoreline habitat include eared grebe, western grebe, American white pelican, Canada goose, white-front goose, snow-Ross' goose, wood duck, mallard, northern pintail, American wigeon, redhead, lesser scaup, snowy egret, whooping crane, piping plover, snowy plover, American avocet, semipalmated sandpiper, least sandpiper, Baird's sandpiper, long-billed dowitcher, Wilson's phalarope, Franklin's gull, common tern, and black tern. Threatened and

endangered species that use this habitat are bald eagle and least tern.

*Riparian Habitat (2 miles)*

Species of concern that use riparian habitat include wood duck, Swainson's hawk, northern bobwhite quail, yellow-billed cuckoo, red-headed woodpecker, western kingbird, loggerhead shrike, Bell's vireo, Baltimore oriole, American tree sparrow, and Harris' sparrow. Bald eagles are a threatened species found in the riparian habitat.

*Prairie Habitat (5,000 acres currently, 6,400 potentially following restoration; additionally, over 40,000 acres of prairie on private land adjacent to the refuge)*

Species of concern that use prairie habitat include mallard, Swainson's hawk, northern harrier, greater prairie chicken, upland sandpiper, burrowing owl, short-eared owl, red-headed woodpecker, western kingbird, loggerhead shrike, Bell's vireo, Baltimore oriole, dickcissel, lark sparrow, American tree sparrow, grasshopper sparrow, Harris' sparrow, chestnut-collared longspur, and Lapland longspur.

*Dry Reservoir/Transition Zone Habitat (3,500 acres)*

This area consists of prairie, cropland, shrub savanna, dense trees, and riparian habitats. Species of concern that use dry reservoir/transition zone habitat include Swainson's hawk, northern harrier, greater prairie chicken, yellow-billed cuckoo, short-eared owl, red-headed woodpecker, western kingbird, loggerhead shrike, Bell's vireo, Baltimore oriole, dickcissel, lark sparrow, American tree sparrow, grasshopper sparrow, Harris' sparrow, and chestnut-collared longspur.

Threatened and endangered species that use this habitat type are bald eagle and whooping crane.

*Threatened and Endangered Species Summary*

Up to 105 bald and golden eagles utilize the refuge from October to March every year. In normal years, least terns occur on the refuge with nesting occurring periodically. Whooping cranes annually visit the refuge during spring and fall migration.

**Rule 5 Applies**

According to Rule 5 of the Divestiture model, any refuge that answers "yes" to the first three questions regarding meeting Refuge System goals, fulfilling the refuge purpose, and supporting trust species does not warrant

further consideration for divestiture. Therefore, Kirwin NWR is not a candidate for divestiture and should remain in the NWRS.

**Other Considerations**

Although Kirwin is not subject to the other criteria because it falls out of the model with the positive responses to questions 1, 2, and 3, the remaining primary criteria do provide additional support for the argument to keep Kirwin in the Refuge System and warrant a brief discussion in this summary report.

**4A. Does the refuge have biological integrity? If not, is it feasible to restore the biological integrity?**

**4B. Does the Service have or can it reasonably acquire the right to restore the habitat?**

Kirwin NWR does have biological integrity. Located within the mixed-grass prairie ecoregion, the refuge contains 5,000 acres of prairie—a combination of restored grasslands and unplowed, virgin sod. Kirwin contributes to regional biodiversity by providing feeding and resting areas for multitudes of migratory birds within the Central Flyway. Restoration of prairie habitat is ongoing and refuge staff endeavors to restore an additional 1,400 acres of prairie by 2008.

**5. Does the refuge contribute to landscape conservation, provide a stepping stone for migratory birds or serve as a unique habitat patch important to the conservation of a trust species?**

Kirwin NWR's contribution to landscape conservation is evidenced by its location between two fragmented tracts of native mixed-grass prairie. Over 18,000 acres of native mixed-grass prairie abut the refuge's southeast boundary and to the west of the refuge lies over 22,000 acres of native mixed-grass prairie. With its own 5,000 acres of virgin or restored prairie habitat, Kirwin NWR serves as the connecting piece between these two large patches of native mixed-grass prairie. When considered altogether, this 45,000-acre patch of prairie provides substantial habitat for migratory grassland birds.

The refuge also provides a stepping stone to the waterfowl resources of the Central Flyway by providing resting and feeding areas during migrations and during the winter for 70,000 Canada geese, 39,000 white-fronted geese, 26,000 snow/Ross' geese, and 218,000 ducks. Given Kirwin NWR's location in the relatively arid mixed-grass prairie, the deepwater, shoreline, riparian, and upland habitats provide an important stepping stone for over 230 trust species.

# Appendix E. Draft Compatibility Determinations

**Refuge Name:** Kirwin National Wildlife Refuge; Established June 17, 1954.

**Establishing and Acquisition Authority:** Fish and Wildlife Coordination Act.

**Refuge Purpose:**

*“.. shall be administered by him [Secretary of the Interior] directly or in accordance with cooperative agreements ... and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon, ...” 16 U.S.C. § 664 (Fish and Wildlife Coordination Act).*

**National Wildlife Refuge System Mission:**

*“The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”*

**1. Description of Proposed Use: Use of Farming, Grazing, and Haying as Management Tools**—Continue upland management activities such as farming, grazing, and haying that are conducted under cooperative farming or special-use permit by private individuals. Currently these economic uses are used as tools to manage habitat for wildlife.

Cropland is planted to establish seedbeds free of invasive plants for the establishment of grassland, to provide food for migratory birds, and to control invasive plant species. The farming rotation is based on a diversified crop rotation to control invasive plants and insects, and to provide for soil fertility. The crops that may be used in the rotation include, but are not limited to, corn, milo (grain sorghum), winter wheat, cane (forage sorghum), and spring grains (e.g., barley).

The Service’s policy is to restrict pesticide use on National Wildlife Refuges. All cooperative farming permits do not allow insecticides and

restrict the use of herbicides to those least toxic and persistent in the environment.

**Availability of Resources:** The needed staff time for development and administration of cooperative farming, grazing, and haying programs is stretched thin to maintain existing programs. If additional staff support were available, these programs could be expanded to use these tools more effectively and additional monitoring could be accomplished.

Additional staff (assistant refuge manager) is identified in the CCP. This position would be needed to fully accomplish certain goals of the CCP and improve existing programs.

**Anticipated Impacts of the Use:** Current management affects approximately 25 percent of the uplands, transition zone (dry reservoir bottom), and riparian zones. Under the draft CCP, management would place increased emphasis on managing refuge habitats for migratory birds.

Without management, general habitat conditions would gradually deteriorate due to long periods of rest. While some short-term wildlife and habitat disturbance does occur with these activities, the long-term benefits to wildlife outweigh these short-term disturbances.

No cultural resources would be impacted. No impact to endangered species should occur.

**Determination:** The use of haying, grazing, and farming as habitat management tools is compatible.

**Stipulations Necessary to Ensure Compatibility:**

- Require general and special conditions for each permit to ensure consistency with management objectives.
- Restrict farming permittees to a list of approved chemicals that are less detrimental to wildlife and the environment.
- Restrict farming permittees to a list of crops that are beneficial to migratory birds.

**Justification:** To maintain and enhance habitat for migratory birds, some habitat manipulation needs to occur. Prairie grassland habitat conditions would deteriorate without the use of a full range of management tools. Migratory bird nesting and feeding habitat and ecological diversity would decrease as habitat suitability for these species declines. Invasive plant species would increase and habitat diversity would decrease.

Farming provides a useful tool to control invasive plants, restore prairie grasslands, provide open areas, and improve habitat conditions for the nesting, and feeding of migratory birds. Farming facilitates wildlife observation, wildlife photography, and environmental education by attracting and concentrating wildlife in areas where they are highly visible.

**Mandatory 10-year Reevaluation Date:** 2015

**2. Description of Proposed Use: Environmental Education and Interpretation**—Continue to provide opportunities for environmental education and interpretation.

Environmental education consists of activities conducted by refuge staff. Interpretation occurs in less formal activities with refuge staff through exhibits, educational trunks, signs, and brochures.

Currently, environmental education and interpretation activities are usually conducted at the refuge office. Programs and activities are also conducted at Bluegill Point, and Knob Hill day use areas. Additional programs are conducted at schools and other locations as personnel are available.

The CCP proposes an expansion of the multi-purpose room of the refuge office. This expansion would provide enough room, displays, and educational materials to maximize the public's learning experience while visiting the refuge. The remainder of the refuge would provide excellent opportunities for environmental learning. These uses occur year-round.

The CCP proposes to continue with the above uses and add the following to improve environmental education and interpretation opportunities for visitors.

- Expand the multi-purpose room of the refuge office.
- Update and improve refuge signs.
- Update existing brochures.

- Expand and enhance environmental education through various initiatives such as educational displays, presentations, and websites that feature programs, and wildlife of the refuge.

**Availability of Resources:** Currently all environmental education and interpretation are conducted using available resources. Implementing new programs, activities, and facilities outlined in the CCP is tied to funding requests in the form of refuge operations needs system (RONS) and maintenance management system (MMS) projects in chapter 6.

**Anticipated Impacts of Use:** Minimal disturbances to wildlife and wildlife habitat would result from these uses at the current and proposed levels. Adverse impacts are minimized through careful timing and placement of activities. Some disturbance to wildlife would occur in areas frequented by visitors. There would be some minor damage to vegetation, littering, and increased maintenance. Location and time limitations placed on environmental education and interpretation activities would ensure that this activity would have only minor impacts on wildlife and would not detract from the primary purpose of the refuge.

**Determination:** Environmental education and interpretation are compatible.

#### **Stipulations Necessary to Ensure Compatibility**

- Allow environmental education and interpretation only in designated areas or under the guidance of refuge staff, a volunteer, or a trained teacher to ensure minimal disturbance to wildlife, minimal damage to vegetation, and minimal conflicts between groups.
- Annually review environmental education and interpretation activities.

**Justification:** Based on biological impacts described in the EA and the draft CCP, it is determined that environmental education and interpretation within the Kirwin National Wildlife Refuge would not materially interfere with or detract from the purpose for which the refuge was established.

Environmental education and interpretation are priority public uses listed in the National Wildlife Refuge System Improvement Act of 1997. By facilitation of environmental education, refuge visitors would gain knowledge and an appreciation of fish, wildlife, and their habitats, which would lead to increased public awareness

and stewardship of migratory birds, and natural resources. Increased appreciation for migratory birds, and natural resources would support and complement the Service's actions in achieving the purposes of the refuge and the mission of the National Wildlife Refuge System.

**Mandatory 15-year Reevaluation Date:** 2020

### **3. Description of Proposed Use: Wildlife Observation and Wildlife Photography—**

Continue to provide opportunities that support priority wildlife-dependent recreation.

Wildlife observation and wildlife photography are facilitated by two hiking trails, two pull-outs with pergollas (observation platforms), and several parking areas (that are also used in support of hunting and fishing).

The CCP proposes to continue the above uses and add the following to improve wildlife observation and wildlife photography:

- Hire an outdoor recreation planner.
- Hire a full-time law enforcement officer to enforce wildlife laws.
- Update and improve refuge signs.
- Update existing brochures.

**Availability of Resources:** Currently, the programs for wildlife observation and wildlife photography are administered using available resources. Implementing new programs, activities, and facilities outlined in the CCP are tied to funding requests in the form of RONS and MMS projects (chapter 6).

**Anticipated Impacts of Use:** Anticipated impacts from visitors engaged in wildlife observation and wildlife photography include minor damage to vegetation, littering, increased maintenance activity, potential conflicts with other visitors, and minor disturbances to wildlife. These activities would have only minor impacts on wildlife and would not detract from the primary purposes of the refuge. All other potential impacts are considered minor.

**Determination:** Wildlife observation and wildlife photography are compatible.

### **Stipulations Necessary to Ensure Compatibility**

- Restrict vehicles to designated roads and trails.
- Monitor vehicle use for wildlife disturbance, law enforcement violations, etc.

- Monitor use, regulate access, and maintain necessary facilities to prevent habitat degradation and minimize wildlife disturbance.

**Justification:** Based on the anticipated biological impacts above and in the EA, it is determined that wildlife observation and wildlife photography on the Kirwin National Wildlife Refuge would not interfere with the habitat goals and objectives or purposes for which it was established.

**Mandatory 15-year Reevaluation Date:** 2020

### **4. Description of Use: Recreational Fishing—**

Continue recreational fishing in accordance with state regulations.

The primary game fish are walleye, black bass, white bass, wipers, crappie, and channel catfish. Foot travel is allowed in all parts of the refuge. There are three boat ramps that are available at varying water elevations. Anglers park within the road right-of-way or designated parking areas if available.

Fishing visitations and success fluctuate according to water conditions in the reservoir, Bow Creek, and the North Fork Solomon River. The river and creek have marginal fisheries due to their seasonal flows. During the prairie's wet cycles, high water in the reservoir promotes fish spawning and vegetation provides cover. Fish populations can flourish until the reservoir returns to normal (low) water levels.

**Availability of Resources:** The fishing program is administered using available resources.

**Anticipated Impacts of Use:** Fishing and other human activities cause disturbance to wildlife.

**Determination:** Recreational fishing is compatible.

### **Stipulations Necessary to Ensure Compatibility**

- See "Boating in support of the six priority public uses" CD for additional requirements.
- Require that fishing follow state regulations.
- Monitor vehicle use for wildlife disturbance, law enforcement violations, etc.
- Do not permit unattended boats to remain overnight.

**Justification:** Based on the biological impacts addressed above and in the EA, it is determined that recreational fishing would not materially interfere with the habitat goals and objectives or purposes for refuge establishment.

Fishing is a priority public use as listed in the National Wildlife Refuge System Improvement Act of 1997.

**Mandatory 15-year Reevaluation Date:** 2020

**5. Description of Use: Recreational Hunting—**Kirwin NWR allows hunting in four distinct areas.

- The western portion is only open to archery deer hunting.
- The Bow Creek area is open to waterfowl, doves, pheasants, quail, turkey, prairie chickens, snipe, coots, cottontail rabbits, fox squirrels, and archery deer hunting.
- The area between Quillback Cove and Prairie Dog Town is open to the same species as Bow Creek, except no more than six shells are allowed per hunter per day during dark goose seasons.
- The areas from Crappie Point to the dam, and the area around Knob Hill is open to the same species as Bow Creek, except that waterfowl hunting is not allowed.

Hunting pressure for upland game centers around opening weekends of pheasant and quail. Hunting pressure for waterfowl increases as waterfowl numbers increase. This varies annually depending on the weather.

**Availability of Resources:** The current administration of hunting programs is conducted using available resources.

**Anticipated Impacts of Use:** Hunting and other human activities cause disturbance to wildlife. Hunting has shown no detrimental environmental impacts to habitats or wildlife. Hunting harvests a small percentage of the populations of waterfowl and upland game species, which is in accordance with wildlife objectives and principles.

Restricting vehicle use to designated purposes, times, and established roads/trails, and parking areas minimizes habitat damage and disturbance to wildlife.

**Determination:** Recreational hunting is compatible.

### **Stipulations Necessary to Ensure Compatibility**

- Only nontoxic shot is permitted on the refuge when hunting with a shotgun (waterfowl, upland game, turkey).
- Hunting must be in accordance with federal, state, and refuge specific regulations.
- Vehicle travel is limited to designated established roads/trails and parking areas.

**Justification:** Hunting on National Wildlife Refuges has been identified as a priority public use in the National Wildlife Refuge System Improvement Act of 1997. Hunting is a legitimate wildlife management tool that can be used to manage populations.

Based on the biological impacts anticipated above and in the EA, it is determined that recreational hunting at Kirwin NWR would not materially interfere with or detract from the purposes for which this refuge was established or its habitat goals and objectives.

One of the secondary goals of the National Wildlife Refuge System is to provide opportunities for public hunting when it is found to be compatible.

**Mandatory 15-year Reevaluation Date:** 2020

**6. Description of Use: Boating in support of the six priority public uses—**Continue to allow motorized and nonmotorized boating in support of hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation.

**Availability of Resources:** The current administration of the boating program is conducted using available resources.

**Anticipated Impacts of Use:** Hunting and other human activities cause disturbance to wildlife. Disturbance to migrating and wintering waterfowl will be reduced by implementing the seasonal boat closure on the reservoir north of Crappie Point.

**Determination:** Boating in support of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation) is compatible.

### **Stipulations Necessary to Ensure Compatibility**

- Implement a seasonal boat closure from October 1 to April 1, on the reservoir



north of Crappie Point, when the water level is below 1,722 feet in elevation.

- Move the boat closure buoys from Railroad Flats to Grays Park and leave them there at all water levels. (This is made possible by implementing the seasonal boat closure.)
- Continue to allow motorless boats and float tubes in the area that is closed to boating (in the Solomon Arm) from August 1 to September 30.
- Continue to allow float tubes in areas open to boating.
- Continue the No Wake zone in Bow Creek.
- Continue the No Wake zone within 300 feet of all shorelines and islands.
- Boats must be equipped and operated in accordance with Kansas Boat and Water Safety Laws and appropriate federal regulations.

**Justification:** Based on biological impacts described in the EA and the draft CCP, it is determined that boating in support of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation) within the Kirwin NWR would not materially interfere with or detract from the purpose for which the refuge was established.

Boating is not a priority public use. However, it does facilitate the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, interpretation). By specifying areas, time of year, no wake zones, and implementing the seasonal boat closure, boating is determined to be compatible.

**Mandatory 10-year Reevaluation Date:** 2015

**7. Description of Use: Firewood Cutting—** Continue to allow the cutting of firewood in designated areas to facilitate refuge management. The main reason for allowing the cutting of firewood is to remove woody vegetation from areas where replanting and/or

restoring native prairie is occurring. Other reasons include reducing fuel loading, and preventing destruction/killing of desirable live native trees in portions of riparian areas, etc.

**Availability of Resources:** Resources are currently available to oversee the cutting of firewood. The workload of the staff involves issuing permits, checking permits in the field, etc.

**Anticipated Impacts of Use:** Anticipated adverse impacts to the refuge are minimal. Temporary displacement of wildlife from the area where cutting is occurring is expected. However, the benefits to migratory grassland birds exceeds the temporary disturbance (i.e., removing trees from grasslands reduces avian predators, nest parasites, and mammalian predators on grassland birds).

**Determination:** Firewood cutting is compatible.

**Stipulations Necessary to Ensure Compatibility**

- Firewood cutting may be allowed by special use permits issued by the refuge manager.
- Firewood cutting will only be allowed in areas specified by the refuge manager.

**Justification:** The refuge is currently in the process of removing trees for several reasons, including prairie enhancement and restoration, eliminating invasive terrestrial plants, gaining physical access to allow for noxious weed control, etc. Using contractors to remove trees costs approximately \$200 per acre, depending on how dense the trees are. Typically trees are piled and burned. Burning of the piles can sterilize the soil for a period of time.

Most of the trees are in places that were historically migratory grassland bird habitat. It is identified in the CCP that a block of 5,000 acres of prairie will be restored/enhanced. In order to accomplish this goal, removal of trees must occur.

**Mandatory 10-year Reevaluation Date:** 2016



# Appendix F. Fire Management Program

The U.S. Fish and Wildlife Service has administrative responsibility, including fire management, on approximately 10,778 acres of National Wildlife Refuge lands, in Phillips, Kansas.

## Fire: A Critical Natural Process

In ecosystems in the prairies of the Great Plains, vegetation has evolved under periodic disturbance and defoliation from bison, fire and drought. This periodic disturbance is what kept the ecosystem diverse and healthy while maintaining significant biodiversity for thousands of years. Historically, natural fire and including native American ignitions, have played an important disturbance role in many ecosystems by removing fuel accumulations, decreasing the impacts insects and diseases, stimulating regeneration, cycling critical nutrients, and providing a diversity of habitats for plant species and wildlife.

When fire is excluded on a broad scale (i.e., several decades) as it has been in many areas, the unnatural accumulation of living and dead fuel can contribute to degraded plant communities and wildlife habitats. These fuel accumulations often change fire regime characteristics, and have created a potential in many areas across the country for uncharacteristically severe wildland fires. These catastrophic wildfires often pose risks to public and firefighter safety. In addition, they threaten property and resource values such as wildlife habitat, grazing opportunities, timber, soils, water quality, and cultural resources.

Return of fire is essential for healthy vegetation and wildlife habitat in most ecosystems including grasslands and wetlands, and in woodlands and forests. When integrated back into an ecosystem, fire can help restore and maintain healthy systems and reduce the risk of wildland fires. To facilitate fire's natural role in the environment, fire must first be integrated into land and resource management plans and activities on a broad scale.

Reintroduced fire can:

- Improve waterfowl habitat, wetlands and riparian areas by reducing the density or modify the species in the vegetation.

- Improve deer and elk habitat, especially in areas with shortages such as winter habitat and on spring and fall transitional ranges.
- Sustain biological diversity;
- Improve access in woodlands and shrublands.
- Improve soil fertility.
- Improve the quality and amount of livestock forage.
- Improve growth in immature woodlands by reducing density.
- Remove excessive build-up of fuels.
- Reduce susceptibility of plants to insects and disease caused by moisture and nutrient stress.
- Improve water yield for off-site activities and communities dependent on wildlands for their water supply.

## Wildland Fire Management Policy and Guidance

In 2001, an update of the 1995 Federal Fire Policy was completed and approved by the Secretaries of Interior and Agriculture. The 2001 Federal Wildland Fire Management Policy directs federal agencies to achieve a balance between fire suppression to protect life, property, and resources and fire use to regulate fuels and maintain healthy ecosystems. In addition, it directs agencies to utilize the appropriate management response for all wildland fires regardless of the ignition source. This policy provides eight guiding principles that are fundamental to the success of the fire management program:

- Firefighter and public safety is the first priority in every fire management activity,
- The role of wildland fires as an essential ecological process and natural change agent will be incorporated into the planning process,
- Fire Management Plans (FMPs), programs, and activities support land and resource management plans and their implementation,
- Sound risk management is a foundation for all fire management activities,

- Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives,
- FMPs and activities are based upon the best available science,
- FMPs and activities incorporate public health and environmental quality consideration, federal, state, tribal, local, interagency, and international coordination and cooperation are essential,
- Standardization of policies and procedures among federal agencies is an ongoing objective.

The Fire Management considerations, guidance, and direction should be addressed in the land-use resources management plans (e.g., the Comprehensive Conservation Plan). Fire Management Plans are step-down processes from the land-use plans and habitat plans, with more detail on fire suppression, fire use, and fire management activities.

## Management Direction

The Kirwin Refuge will protect life, property, and other resources from wildfire by safely suppressing all wildfires. Prescribed fire and manual and/or mechanical fuel treatments will be utilized in an ecosystem management context for habitat management, and to protect both federal and private property. Fuel reduction activities will be applied where needed, especially in areas with a higher proportion of residences that may be considered “Wildland Urban Interface” (WUI) areas.

All aspects of the fire management program would be conducted in a manner consistent with applicable laws, policies, and regulations. The station will maintain a Fire Management Plan and implement the Plan to accomplish resource management objectives. Prescribed fire and manual and/or mechanical fuels treatments will be applied in a scientific way under selected weather and environmental conditions, on approximately 500 to 2,000, over a 5-year average, for native and restored prairie habitat, to accomplish habitat management objectives.

### Fire Management Goal:

Restore and enhance fire as an ecosystem process within prairie habitats. The return and maintenance of fire is essential for wildlife habitat in these ecosystems.

### Fire Management Objective:

Fire is an important management tool that can be utilized to accomplish habitat management objectives. If not used properly, fire is also a tool that can quickly damage or destroy natural resources, equipment, building and property, and hurt or kill those that work with it. Prescribed fire and manual and/or mechanical fuels treatments will be used to reduce hazardous fuels and on refuge lands to reduce the intensity and severity of wildland fires. Special attention will be given to Wildland Urban Interface areas, both on Service-owned and adjacent lands, in order to reduce the risk of wildfires to communities and improvements.

### Strategies:

Strategies and tactics that consider public and firefighter safety as well as resource values at risk will be used. Wildland fire suppression, prescribed fire methods, manual and/or mechanical means, timing, and monitoring are all found in a more detailed list, in a step-down Fire Management Plan.

All management actions would use prescribed fire and manual and/or mechanical means to restore and maintain desired habitat conditions and control nonnative vegetation and the spread of woody vegetation within the diverse ecosystem habitats. The prescribed fire program will be outlined in the Fire Management Plan for the refuge. Detailed Prescribed Burn Plans will be developed which describe the following:

- burn units and their predominant vegetation;
- the primary objectives for the units;
- acceptable range of results;
- site preparation requirements;
- weather requirements;
- safety considerations and measures to protect sensitive features;
- burn-day activities;
- communications and coordination for burns;
- ignition techniques;
- smoke management procedures; and
- post-burn monitoring.

Prescribed fire temporarily reduces air quality by reducing visibility and releasing several components through combustion. The four major components are carbon monoxide, carbon dioxide, hydrocarbons, and particulates. Varying amounts of particulate content are generated in different types of fuels (e.g., wildlife habitat improvement burns vs. fuel reduction burns). The refuge will meet the Clean Air Act emission standards by adhering to the Kansas State Implementation Plan requirements during all prescribed fire activities.

**Fire Management Organization, Contacts and Cooperation:**

Qualified fire management technical oversight and support for the refuge will be established by the Region using the Fire Management District approach. Under this approach, an appropriate fire management staffing organization will be determined by established modeling systems based on the fire management workload of a group of refuges and possibly even that of interagency partners. (Fire management workload consists of historical wildfire suppression activities and historical and planned fuels treatment workload.) Depending on budgets, fire

management staffing and support equipment may be located on the station or at other refuges in the district and shared between all units. Wherever possible, fire management activities will be conducted in a coordinated and collaborative manner with federal and nonfederal partners.

With the signature of this CCP, a new Fire Management Plan would be developed for the Kirwin NWR, as stand-alone Fire Management Plan, a Fire Management Plan with two or three refuges (i.e., three refuges in the fire management district), or as an interagency Fire Management Plan.



# Appendix G. Species List

This appendix shows the scientific and common names of vertebrates and plants known to occur on Kirwin NWR. Bold indicates species that have been recorded as nesting. Information on fish, amphibians, and reptiles was obtained from Kansas Department of Wildlife and Parks (refuge files dated 01/30/2003).

Birds follow the American Ornithologists' Union Committee on Classification and Nomenclature (American Ornithologists' Union 1998, 2000, 2002, 2003).

Common Name	Scientific Name
<b>Amphibians</b>	
Bullfrog	<i>Rana catesbeiana</i>
Great plains narrow-mouthed frog	<i>Gastrophryne olivacea</i>
Great plains toad	<i>Bufo cognatus</i>
Northern cricket frog	<i>Acris crepitans</i>
Plains leopard frog	<i>Rana blairi</i>
Plains spadefoot	<i>Scaphiopus bombifrons</i>
Rocky mountain toad	<i>Bufo woodhousii</i>
Tiger salamander	<i>Ambystoma tigrinum</i>
<b>Birds</b>	
American avocet	<i>Recurvirostra Americana</i>
American black duck	<i>Anas rubripes</i>
American bittern	<i>Botaurus lentiginosus</i>
American coot	<i>Fulica Americana</i>
American crow	<i>Corvus brachyrhynchos</i>
American golden plover	<i>Pluvialis dominica</i>
American goldfinch	<i>Carduelis tristis</i>
American kestrel	<i>Falco sparverius</i>
American pipit	<i>Anthus rubescens</i>
American redstart	<i>Setophaga ruticilla</i>
<b>American robin</b>	<i>Turdus migratorius</i>
American tree sparrow	<i>Spizella arborea</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
American widgeon	<i>Anas Americana</i>
Baird's sandpiper	<i>Calidris bairdii</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Baltimore oriole	<i>Icterus galbula</i>

Bank swallow	<i>Riparia riparia</i>
<b>Barn owl</b>	<i>Tyto alba</i>
<b>Barn swallow</b>	<i>Hirundo rustica</i>
Barred owl	<i>Strix varia</i>
Bell's vireo	<i>Vireo bellii</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Bullock's oriole	<i>Icterus bullockii</i>
Black-and-white warbler	<i>Mniotilta varia</i>
Black-bellied plover	<i>Pluvialis squatarola</i>
<b>Black-billed cuckoo</b>	<i>Coccyzus erythrophthalmus</i>
<b>Black-billed magpie</b>	<i>Pica hudsonia</i>
Black-capped chickadee	<i>Poecile atricapillus</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>
Black-necked stilt	<i>Himantopus mexicanus</i>
Black-throated gray warbler	<i>Dendroica nigrescens</i>
Blackpoll warbler	<i>Dendroica striata</i>
Black tern	<i>Chlidonias niger</i>
Blue grosbeak	<i>Passerina caerulea</i>
<b>Blue jay</b>	<i>Cyanocitta cristata</i>
<b>Blue-winged teal</b>	<i>Anas discors</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Bonaparte's gull	<i>Larus Philadelphia</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Brewer's sparrow	<i>Spizella breweri</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Brown creeper	<i>Certhia Americana</i>
<b>Brown thrasher</b>	<i>Toxostoma rufum</i>
Bufflehead	<i>Bucephala albeola</i>
<b>Burrowing owl</b>	<i>Athene cunicularia</i>
<b>Canada goose</b>	<i>Branta Canadensis</i>
Canvasback	<i>Aythya valisineria</i>
Caspian tern	<i>Sterna caspia</i>
Cattle egret	<i>Bubulcus ibis</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
Chestnut-collared longspur	<i>Calcarius ornatus</i>
Chimney swift	<i>Chaetura pelagica</i>
Chipping sparrow	<i>Spizella passerina</i>

Cinnamon teal	<i>Anas cyanoptera</i>	Greater white-fronted goose	<i>Anser albifrons</i>
Clay-colored sparrow	<i>Spizella pallida</i>	<b>Green-winged teal</b>	<i>Anas crecca</i>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>	Green heron	<i>Butorides virescens</i>
Common goldeneye	<i>Bucephala clangula</i>	Hairy woodpecker	<i>Picoides villosus</i>
Common grackle	<i>Quiscalus quiscula</i>	Harris' sparrow	<i>Zonotrichia querula</i>
Common loon	<i>Gavia immer</i>	Hermit thrush	<i>Catharus guttatus</i>
Common merganser	<i>Mergus merganser</i>	Herring gull	<i>Larus argentatus</i>
<b>Common nighthawk</b>	<i>Chordeiles minor</i>	Hooded merganser	<i>Lophodytes cucullatus</i>
Common redpoll	<i>Carduelis flammea</i>	Horned grebe	<i>Podiceps auritus</i>
Common snipe	<i>Gallinago gallinago</i>	<b>Horned lark</b>	<i>Eremophila alpestris</i>
Common tern	<i>Sterna hirundo</i>	House finch	<i>Carpodacus mexicanus</i>
Common yellowthroat	<i>Geothlypis trichas</i>	House sparrow	<i>Passer domesticus</i>
Cooper's hawk	<i>Accipiter cooperii</i>	<b>House wren</b>	<b><i>Troglodytes aedon</i></b>
Dark-eyed junco	<i>Junco hyemalis</i>	Hudsonian godwit	<i>Limosa haemastica</i>
<b>Dickcissel</b>	<i>Spiza Americana</i>	Indigo bunting	<i>Passerina cyanea</i>
<b>Double-crested cormorant</b>	<i>Phalacrocorax auritus</i>	Killdeer	<i>Charadrius vociferus</i>
<b>Downy woodpecker</b>	<i>Picoides pubescens</i>	Lapland longspur	<i>Calcarius lapponicus</i>
Dunlin	<i>Calidris alpina</i>	Lark bunting	<i>Calamospiza melanocorys</i>
Eared grebe	<i>Podiceps nigricollis</i>	<b>Lark sparrow</b>	<i>Chondestes grammacus</i>
Eastern bluebird	<i>Sialia sialis</i>	Lazuli bunting	<i>Passerina amoena</i>
<b>Eastern kingbird</b>	<i>Tyrannus tyrannus</i>	Least bittern	<i>Ixobrychus exilis</i>
<b>Eastern meadowlark</b>	<i>Sturnella magna</i>	Least flycatcher	<i>Empidonax minimus</i>
<b>Eastern phoebe</b>	<i>Sayornis phoebe</i>	Least sandpiper	<i>Calidris minutilla</i>
<b>Eastern screech owl</b>	<i>Megascops asio</i>	<b>Least tern</b>	<i>Sterna antillarum</i>
Eastern towhee	<i>Pipilo erythrophthalmus</i>	Lesser scaup	<i>Aythya affinis</i>
Eastern wood-pewee	<i>Contopus virens</i>	Lesser yellowlegs	<i>Tringa flavipes</i>
<b>European starling</b>	<i>Sturnus vulgaris</i>	Lincoln's sparrow	<i>Melospiza lincolni</i>
Ferruginous hawk	<i>Buteo regalis</i>	Little blue heron	<i>Egretta caerulea</i>
Field sparrow	<i>Spizella pusilla</i>	<b>Loggerhead shrike</b>	<i>Lanius ludovicianus</i>
Forster's tern	<i>Sterna forsteri</i>	Long-billed dowitcher	<i>Limnodromus scolopaceus</i>
Franklin's gull	<i>Larus pipixcan</i>	Long-billed curlew	<i>Numenius americanus</i>
<b>Gadwall</b>	<i>Anas strepera</i>	MacGillivray's Warbler	<i>Oporornis tolmiei</i>
Glaucous gull	<i>Larus hyperboreus</i>	Magnolia warbler	<i>Dendrocia magnolia</i>
Golden-crowned kinglet	<i>Regulus satrapa</i>	<b>Mallard</b>	<i>Anas platyrhynchos</i>
Golden eagle	<i>Aquila chrysaetos</i>	Marbled godwit	<i>Limosa fedoa</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>	Merlin	<i>Falco columbarius</i>
Gray catbird	<i>Dumetella carolinensis</i>	Mississippi kite	<i>Ictinia mississippiensis</i>
Greater prairie chicken	<i>Tympanuchus cupido</i>	Mountain bluebird	<i>Sialia currucoides</i>
Great blue heron	<i>Ardea herodias</i>	<b>Mourning dove</b>	<i>Zenaida macroura</i>
Great crested flycatcher	<i>Myiarchus crinitus</i>	<b>Northern bobwhite</b>	<i>Colinus virginianus</i>
Great egret	<i>Ardea alba</i>	<b>Northern cardinal</b>	<i>Cardinalis cardinalis</i>
<b>Great horned owl</b>	<i>Bubo virginianus</i>	Northern flicker	<i>Colaptes auratus</i>
Greater scaup	<i>Aythya marila</i>	Northern goshawk	<i>Accipiter gentiles</i>
Greater yellowlegs	<i>Tringa melanoleuca</i>	Northern harrier	<i>Circus cyaneus</i>
		<b>Northern mockingbird</b>	<i>Minus polyglottos</i>



<b>Northern pintail</b>	<i>Anas acuta</i>	Snowy owl	<i>Bubo scandiacus</i>
Northern rough-winged swallow	<i>Stelgidopterys serripennis</i>	Snowy plover	<i>Charadrius alexandrinus</i>
<b>Northern shoveler</b>	<i>Anas clypeata</i>	Song sparrow	<i>Melospiza melodia</i>
Northern waterthrush	<i>Seiurus noveboracensis</i>	Sora	<i>Porzana carolina</i>
Orange-crowned warbler	<i>Vermivora celata</i>	Spotted sandpiper	<i>Actitis macularia</i>
<b>Orchard oriole</b>	<i>Icterus spurius</i>	Spotted towhee	<i>Pipilo maculatus</i>
Osprey	<i>Pandion haliaetus</i>	Stilt sandpiper	<i>Calidris himantopus</i>
Ovenbird	<i>Seiurus aurocapilla</i>	<b>Swainson's Hawk</b>	<i>Buteo swainsoni</i>
Peregrine falcon	<i>Falco peregrinus</i>	Swainson's thrush	<i>Catharus ustulatus</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>	Tennessee warbler	<i>Vermivora peregrina</i>
Pine siskin	<i>Carduelis pinus</i>	Townsend's warbler	<i>Dendroica townsendi</i>
Piping plover	<i>Charadrius melodus</i>	Trumpeter swan	<i>Cygnus buccinator</i>
Plumbeous vireo	<i>Vireo plumbeus</i>	Tundra swan	<i>Cygnus columbianus</i>
Prairie falcon	<i>Falco mexicanus</i>	Turkey vulture	<i>Cathartes aura</i>
Purple martin	<i>Progne subis</i>	Upland sandpiper	<i>Bartramia longicauda</i>
Prairie warbler	<i>Dendroica discolor</i>	Veery	<i>Catharus fuscescens</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	Vesper sparrow	<i>Poocetes gramineus</i>
Red-eyed vireo	<i>Vireo olivaceus</i>	Virginia rail	<i>Rallus limicola</i>
Redhead	<i>Aythya Americana</i>	Warbling vireo	<i>Vireo gilvus</i>
Red-breasted nuthatch	<i>Sitta canadensis</i>	Western grebe	<i>Aechmophorus occidentalis</i>
<b>Red-headed woodpecker</b>	<i>Melanerpes erythrocephalus</i>	<b>Western kingbird</b>	<i>Tyrannus verticalis</i>
Red-shouldered hawk	<i>Buteo lineatus</i>	<b>Western meadowlark</b>	<i>Sturnella neglecta</i>
<b>Red-tailed hawk</b>	<i>Buteo jamaicensis</i>	Western sandpiper	<i>Calidris mauri</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>	White-breasted nuthatch	<i>Sitta carolinensis</i>
Ring-billed gull	<i>Larus delawarensis</i>	White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Ring-necked duck	<i>Aythya collaris</i>	White-faced ibis	<i>Plegadis chihi</i>
<b>Ring-necked pheasant</b>	<i>Phasianus colchicus</i>	White-rumped sandpiper	<i>Calidris fuscicollis</i>
Rock pigeon	<i>Columba livia</i>	White-throated sparrow	<i>Zonotrichia albicollis</i>
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	Whooping crane	<i>Grus Americana</i>
Ross's goose	<i>Chen rossii</i>	Wild turkey	<i>Meleagris gallopavo</i>
Rough-legged hawk	<i>Buteo lagopus</i>	Willet	<i>Catoptrophorus semipalmatus</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>	Willow flycatcher	<i>Empidonax traillii</i>
Ruddy duck	<i>Oxyura jamaicensis</i>	Wilson's phalarope	<i>Phalaropus tricolor</i>
Ruddy turnstone	<i>Arenaria interpres</i>	Winter wren	<i>Troglodytes troglodytes</i>
Sanderling	<i>Calidris alba</i>	<b>Wood duck</b>	<i>Aix sponsa</i>
Sandhill crane	<i>Grus Canadensis</i>	<b>Yellow-billed cuckoo</b>	<i>Coccyzus americanus</i>
Scissor-tailed flycatcher	<i>Tyrannus forficatus</i>	Yellow-breasted chat	<i>Icteria virens</i>
Scott's oriole	<i>Icterus parisorum</i>	Yellow-crowned night hereon	<i>Nyctanassa violacea</i>
Semipalmated plover	<i>Charadrius semipalmatus</i>	Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>
Semipalmated sandpiper	<i>Calidris pusilla</i>	Yellow-rumped warbler	<i>Dendroica coronata</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>	Yellow-throated vireo	<i>Vireo flavifrons</i>
Short-eared owl	<i>Asio flammeus</i>	Yellow warbler	<i>Dendroica petechia</i>
Snow goose	<i>Chen caerulescens</i>		
Snowy egret	<i>Egretta thula</i>		

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Fishes	
Black bullhead	<i>Ictalurus melas</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Bluegill	<i>Lepomis macrochirus</i>
Channel catfish	<i>Ictalurus punctatus</i>
Common carp	<i>Cyprinus carpio</i>
Creek chub	<i>Semotilus atromaculatus</i>
Flathead catfish	<i>Pylodictis olivaris</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Green sunfish	<i>Lepomis cyanellus</i>
Largemouth bass	<i>Micropterus salmoides</i>
Orangespotted sunfish	<i>Lepomis humilis</i>
Red shiner	<i>Cyprinella lutrensis</i>
River carpsucker	<i>Carpionodes carpio</i>
Sand shiner	<i>Notropis stramineus</i>
Walleye	<i>Stizostedion vitreum</i>
White crappie	<i>Pomoxis annularis</i>
White base	<i>Morone chrysops</i>
Wiper	<i>Morone chrysops XM. Saxatilis</i>

Mammals	
American beaver	<i>Castor canadensis</i>
American porcupine	<i>Erethizon dorsatum</i>
American badger	<i>Taxidea taxus</i>
Big brown bat	<i>Eptesicus fuscus</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>
Bobcat	<i>Felis rufus</i>
Brasilian free-tailed bat	<i>Tadarida brasiliensis</i>
Common muskrat	<i>Ondatra zibethicus</i>
Common raccoon	<i>Procyon lotor</i>
Coyote	<i>Canis latrans</i>
Deer mouse	<i>Peromyscus maniculatus</i>
Desert cottontail	<i>Sylvilagus audubonii</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern mole	<i>Scalopus aquaticus</i>
Eastern spotted skunk	<i>Spilogale putorius</i>
Eastern wood rat	<i>Peromyscus gossypinus</i>
Evening bat	<i>Nycticeius humeralis</i>
Fox squirrel	<i>Sciurus niger</i>
Franklin's ground squirrel	<i>Spermophilus franklinii</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Hispid cotton rat	<i>Sigmodon hispidus</i>
Hispid pocket mouse	<i>Chaetodipus hispidus</i>

Hoary bat	<i>Lasiurus cinereus</i>
Keen's bat	<i>Myotis keenii</i>
Least shrew	<i>Cryptotis parva</i>
Long-tailed weasel	<i>Mustela frenata</i>
Mule deer	<i>Odocoileus hemionus</i>
Northern grasshopper mouse	<i>Onychomys leucogaster</i>
Plains harvest mouse	<i>Reithrodontomys montanus</i>
Plains pocket gopher	<i>Geomys bursarius</i>
Plains pocket mouse	<i>Perognathus flavescens</i>
Prairie vole	<i>Microtus ochrogaster</i>
Ord's kangaroo rat	<i>Dipodomys ordii</i>
Red bat	<i>Lasiurus borealis</i>
Red fox	<i>Vulpes vulpes</i>
Short-tailed shrew	<i>Blarina brevicauda</i>
Silky pocket mouse	<i>Perognathus flavus</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Small-footed bat	<i>Myotis leibii</i>
Striped Skunk	<i>Mephitis mephitis</i>
Thirteen-lined ground squirrel	<i>Spermophilus tridecemlineatus</i>
Virginia opossum	<i>Didelphis virginiana</i>
Western harvest mouse	<i>Reithrodontomys megalotis</i>
White-footed mouse	<i>Peromyscus leucopus</i>
White-tailed deer	<i>Odocoileus virginianus</i>

Plants	
Grasses	
Big bluestem	<i>Andropogon gerardii</i>
Blue grama	<i>Bouteloua gracilis</i>
Buffalograss	<i>Buchloe dactyloides</i>
Canada wildrye	<i>Elymus canadensis</i>
Fall Panicum	<i>Digitaria cognatum.</i>
Foxtail barley	<i>Hordeum jubatum</i>
Green needlegrass	<i>Stipa viridula</i>
Hairy grama	<i>Bouteloua hirsuta</i>
Indiangrass	<i>Sorghastrum nutans</i>
Junegrass	<i>Koeleria macrantha</i>
Little bluestem	<i>Andropogon scoparius</i>
Marsh muhly	<i>Muhlenbergia racemosa</i>
Porcupine grass	<i>Stipa spartea</i>
Prairie cordgrass	<i>Spartina pectinata</i>
Prairie three-awn	<i>Aristida oligantha</i>
Purple lovegrass	<i>Eragrostis spectabilis</i>
Scribners Panicum	<i>Panicum oligosanthos</i>

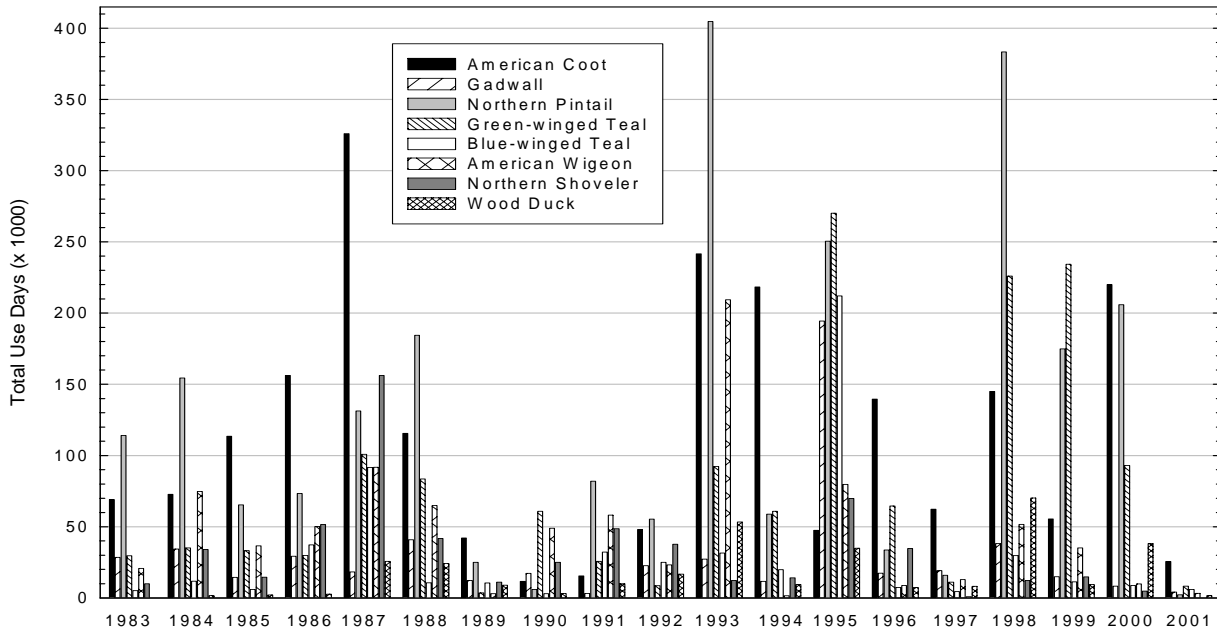
Side-oats grama	<i>Bouteloua curtipendula</i>	Heath aster	<i>Aster ericoides</i>
Slender Wheatgrass	<i>Elymus trachycaulus</i>	Hemp dogbane	<i>Apocynum cannabinum</i>
Switchgrass	<i>Panicum virgatum</i>	Hoary vervain	<i>Verbena stricta</i>
Tall dropseed	<i>Sporobolus asper</i>	Illinois bundleflower	<i>Desmanthus illinoensis</i>
Virginia wildrye	<i>Elymus virginicus</i>	Illinois tick clover	<i>Desmodium illinoensis</i>
Western wheatgrass	<i>Agropyron smithii</i>	Indian hemp dogbane	<i>Apocynum cannabinum</i>
<b>Forbs</b>			
American germander	<i>Teucrium canadense</i>	Indigo bush	<i>Amorpha fruticosa</i>
American vetch	<i>Vicia americana</i>	Jerusalem artichoke	<i>Helianthus tuberoso</i>
Bee balm	<i>Monarda fistulosa</i>	Leadplant	<i>Amorpha canescens</i>
Blackeyed Susan	<i>Rudbeckia hirta</i>	Lemon scurfpea	<i>Psoraleidum lanceolatum</i>
Blue lettuce	<i>Lactuca oblongifolia</i>	Longbeard hawkweed	<i>Hieracium longipilum</i>
Blue sage	<i>Salvia azurea</i>	Marble-seeded Borage	<i>Onosmodium molle</i>
Blue vervain	<i>Verbena hastata</i>	Maximillian sunflower	<i>Helianthus maximilliani</i>
Blue-eyed grass	<i>Sisyrinchium campestre</i>	Missouri goldenrod	<i>Solidago missouriensis</i>
Boneset	<i>Eupatorium perfoliatum</i>	Mountain mint	<i>Pycnanthemum virginianum</i>
Bracted spiderwort	<i>Tradescantia bracteata</i>	Narrowleaf pucoon	<i>L. incisum</i>
Buckbrush	<i>Symphoricarpos occidentalis</i>	New England aster	<i>Aster novae-angliae</i>
Canada goldenrod	<i>Solidago canadensis</i>	Norwegian cinquefoil	<i>Potentilla norvegica</i>
Canada milkvetch	<i>Astragalus canadensis</i>	Panicled aster	<i>Aster simplex</i>
Canada tickclover	<i>Desmodium canadense</i>	Philadelphia fleabane	<i>Erigeron philadelphicus</i>
Clammy ground cherry	<i>Physalis heterophylla</i>	Pink poppy mallow	<i>Callirhoe alcaeoidea</i>
Common milkweed	<i>Asclepias syriaca</i>	Plains sunflower	<i>Helianthus petiolaris</i>
Common sunflower	<i>Helianthus annuus</i>	Plains yellow primrose	<i>Calylophus serrulatus</i>
Compass plant	<i>Silphium laciniatum</i>	Prairie cinquefoil	<i>Potentilla arguta</i>
Coralberry	<i>Symphoricarpos orbiculatus</i>	Prairie coreopsis	<i>Coreopsis tinctoria</i>
Croton	<i>Croton texensis.</i>	Prairie goldenrod	<i>Solidago missouriensis</i>
Cudweed sagewort	<i>Artemesia ludoviciana</i>	Prairie larkspur	<i>Delphinium virescens</i>
Cup plant	<i>Silphium perfoliatum</i>	Prairie ragwort	<i>Senecio plattensis</i>
Curlycup gumweed	<i>Grindelia squarrosa</i>	Prairie violet	<i>Viola pedatifida</i>
Daisy fleabane	<i>Erigeron strigosus</i>	Prairie wild rose	<i>Rosa arkansana</i>
Dandelion hawks-beard	<i>Crepis runcinata</i>	Prickly poppy	<i>Argemone plyanthemus</i>
Deer vetch	<i>Lotus purshianus</i>	Purple coneflower	<i>Echinacea angustifolia</i>
False boneset	<i>Brickellia eupatorioides</i>	Purple poppy mallow	<i>Callirhoe involucrata</i>
False boneset	<i>Kuhnia eupatorioides</i>	Purple prairie clover	<i>Dalea purpureum</i>
False sunflower	<i>Heliopsis helianthoides</i>	Redroot New Jersey tea	<i>Ceanothus herbaceus</i>
Field pussytoes	<i>Antennaria neglecta</i>	Rigid goldenrod	<i>Solidago rigida</i>
Fox glove beard tongue	<i>Penstemon digitalis</i>	Rosinweed	<i>Silphium integrifolium</i>
Grass-leaved goldenrod	<i>Solidago graminifolia</i>	Rough blazingstar	<i>Liatris punctata</i>
Green sage	<i>Artemisia</i>	Rough rattlesnake-root	<i>Prenanthes aspera</i>
Ground plum	<i>Astragalus crassicaerpus</i>	Round head lespedeza	<i>Lespedeza capitata</i>
Hairy goldaster	<i>Chrysopsis villosa</i>	Rush skeleton plant	<i>Lygodesmia juncea</i>
Hairy pucoon	<i>Lithospermum carolinense</i>	Sand lovegrass	<i>Eragrostis trichoides</i>
		Sawtooth sunflower	<i>Helianthus grosseratus</i>
		Scarlet globemallow	<i>Spharalcea coccinea</i>

Sensitive brier	<i>Schrankia nuttallii</i>	Bull snake	<i>Pituophis melanoleucus</i>
Shell-leaf penstemon	<i>Penstemon grandiflorus</i>	Coachwhip	<i>Masticophis flagellum</i>
Short green milkweed	<i>Asclepias viridiflora</i>	Common garter snake	<i>Thamnophis sirtalis</i>
Showy partridge pea	<i>Cassia chamaecrista</i>	Common kingsnake	<i>Lampropeltis getula</i>
Silky prairie clover	<i>Dalea villosa</i>	Eastern fence lizard	<i>Sceloporus undulatus</i>
Silver-leaf scurf pea	<i>Psoralea argophylla</i>	Eastern hog-nosed snake	<i>Heterodon platirhinos</i>
Slender-leaf scurf pea	<i>Psoralea tenuiflora</i>	Five-lined skink	<i>Eumeces fasciatus</i>
Spider milkweed	<i>Asclepias viridis</i>	Great plains skink	<i>Eumeces fasciatus</i>
Stiff goldenrod	<i>S. rigida</i>	Lesser earless lizard	<i>Holbrookia maculata</i>
Stiff sunflower	<i>Helianthus rigidus</i>	Lined snake	<i>Tropidoclonion lineatum</i>
Tall thistle	<i>Cirsium altissimum</i>	Milk snake	<i>Lampropeltis triangulum</i>
Thick-spike gayfeather	<i>Liatris pycnostachya</i>	Northern water snake	<i>Nerodia sipedon</i>
Thimbleweed	<i>Anemone cylindrica</i>	Plains blackhead snake	<i>Tantilla nigriceps</i>
Upright prairie coneflower	<i>Ratibiada columnifera</i>	Plains garter snake	<i>Thamnophis radix</i>
Venus' looking glass	<i>Tridanis perfoliata</i>	Prairie rattle snake	<i>Crotalus viridis</i>
Violet wood sorrel	<i>Oxalis violacea</i>	Rat snake	<i>Elaphe obsoleta</i>
Virginia ground cherry	<i>Physallis virginiana</i>	Ringneck snake	<i>Diadophis punctatus</i>
Wavyleaf thistle	<i>Cirsium undulatum</i>	Slender glass lizard	<i>Ophisaurus attenuatus</i>
Western ironweed	<i>Vernonia fasciculata</i>	Texas horned lizard	<i>Phrynosoma cornutum</i>
Western wild lettuce	<i>Lactuca ludoviciana</i>	Western hog-nosed snake	<i>Heterodon nasicus</i>
Western yarrow	<i>Achillea millefolium</i>	Western ribbon snake	<i>Thamnophis proximus</i>
White prairie clover	<i>Dalea candida</i>	Yellow-bellied racer	<i>Coluber constrictor</i>
Whorled milkweed	<i>Asclepias verticillata</i>	<b>Turtles</b>	
Wild four-O'clock	<i>Mirabilis nyctaginea</i>	Alligator snapping turtle	<i>Macrolemys temminckii</i>
Wild lettuce	<i>Lactuca canadensis</i>	Common snapping turtle	<i>Chelydra serpentina</i>
Wild licorice	<i>Glycyrrhizia lepidota</i>	Ornate box turtle	<i>Terrapene ornata</i>
Wild onion	<i>Allium canadense</i>	Smooth soft-shelled turtle	<i>Apalone mutica</i>
Willowleaf aster	<i>Aster praealtus</i>	Spiny soft-shelled turtle	<i>Apalone spinifera</i>
Wooly plantain	<i>Plantago patagonica</i>	Western painted turtle	<i>Chrysemys picta</i>
<b>Wetland emergents</b>		Yellow mud turtle	<i>Kinosternon flavescens</i>
Duley rush	<i>Juncus dudleyyi</i>		
Fescue sedge	<i>Carex brevior</i>		
Fox sedge	<i>Carex vulpinoidea</i>		
Gravid sedge	<i>Carex grvida</i>		
Interior rush	<i>Juncus interior</i>		
Marsh smartweed	<i>Polygonum coccineum</i>		
Pale smartweed	<i>Polygonum lapathifolium</i>		
Self heal	<i>Prunella vulgaris</i>		
Wedgelead fog-fruit	<i>Lippia cuneifolia</i>		

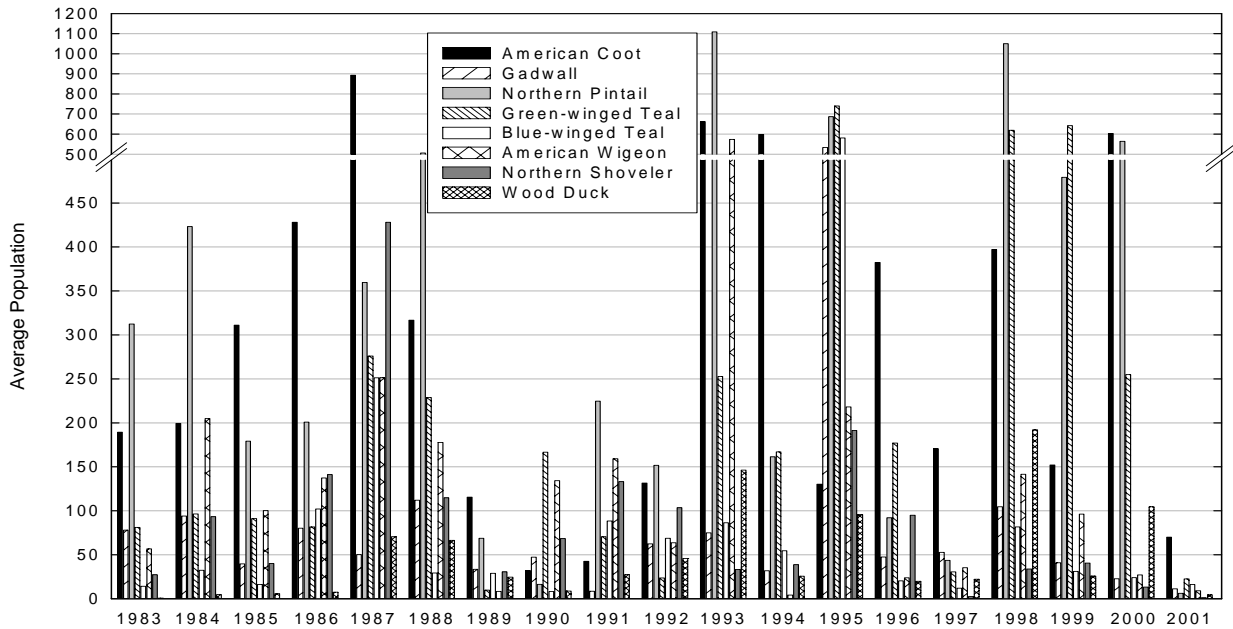
**Reptiles**Brown snake *Storeria dekayi*

# Appendix H. Graphs

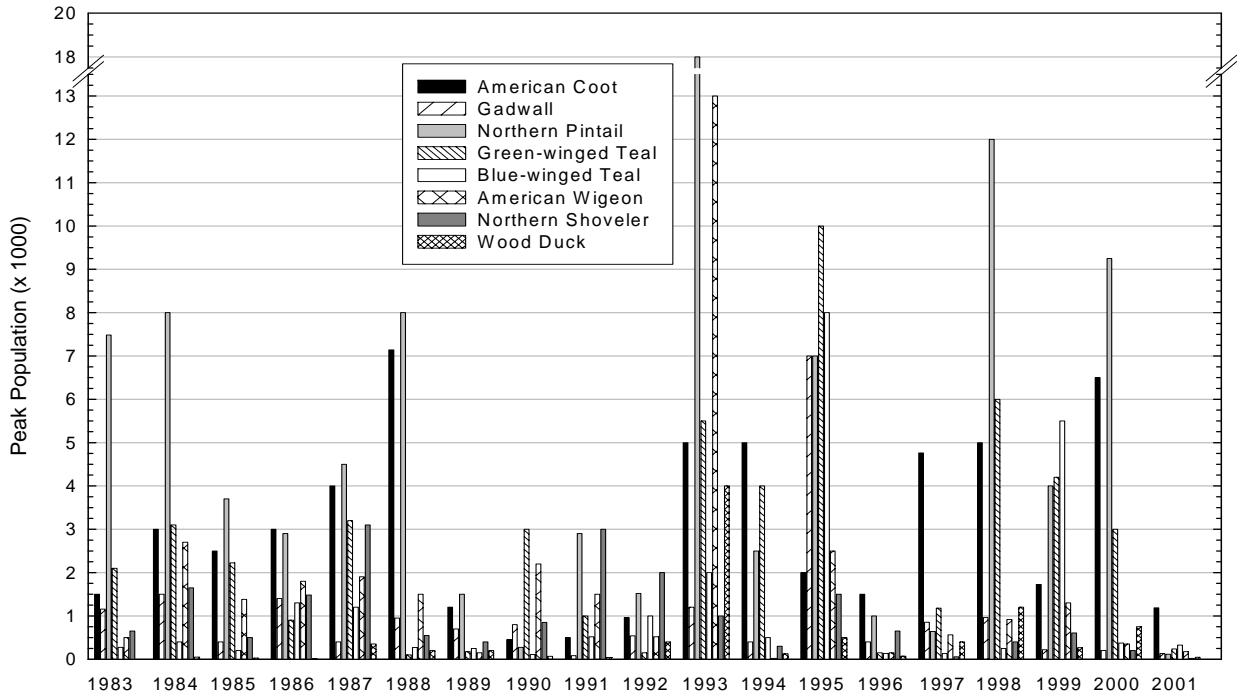
This appendix displays graphs showing total annual use days, average annual populations, and peak populations, respectively for the following waterfowl groups: American coot and dabbling ducks excluding mallard (a–c), diving ducks (d–f), Canada goose and mallard (g–i), and white-fronted goose and snow goose (j–l) using Kirwin National Wildlife Refuge between 1983 and 2001.



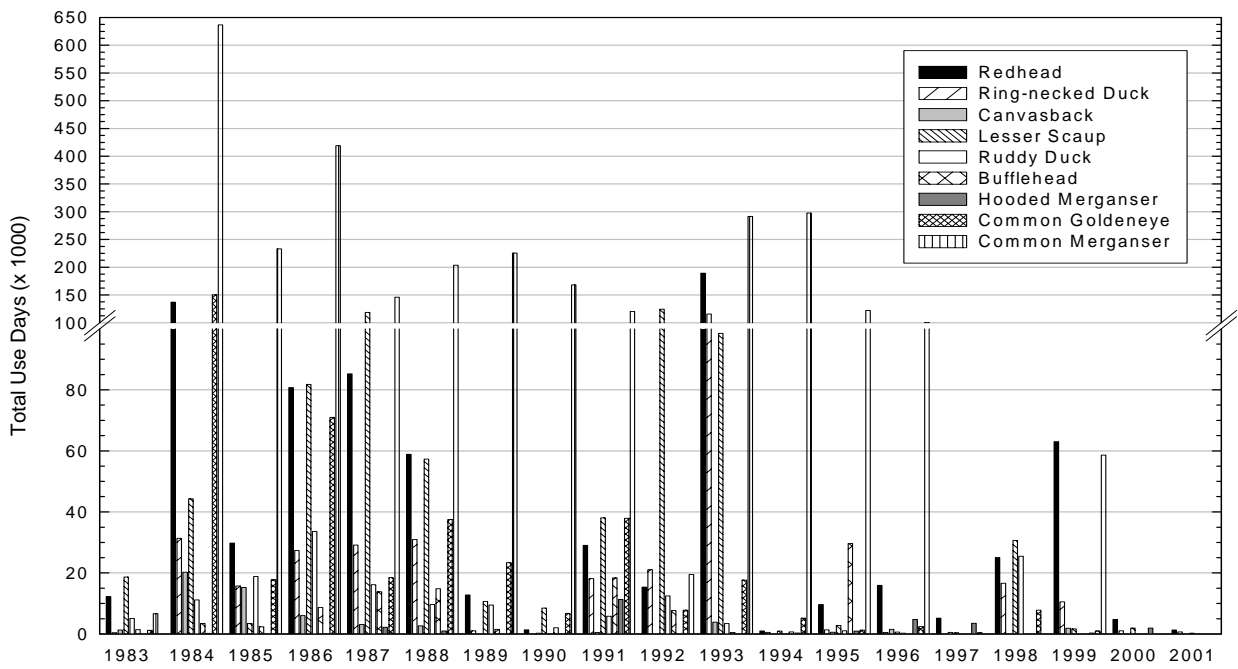
(a)



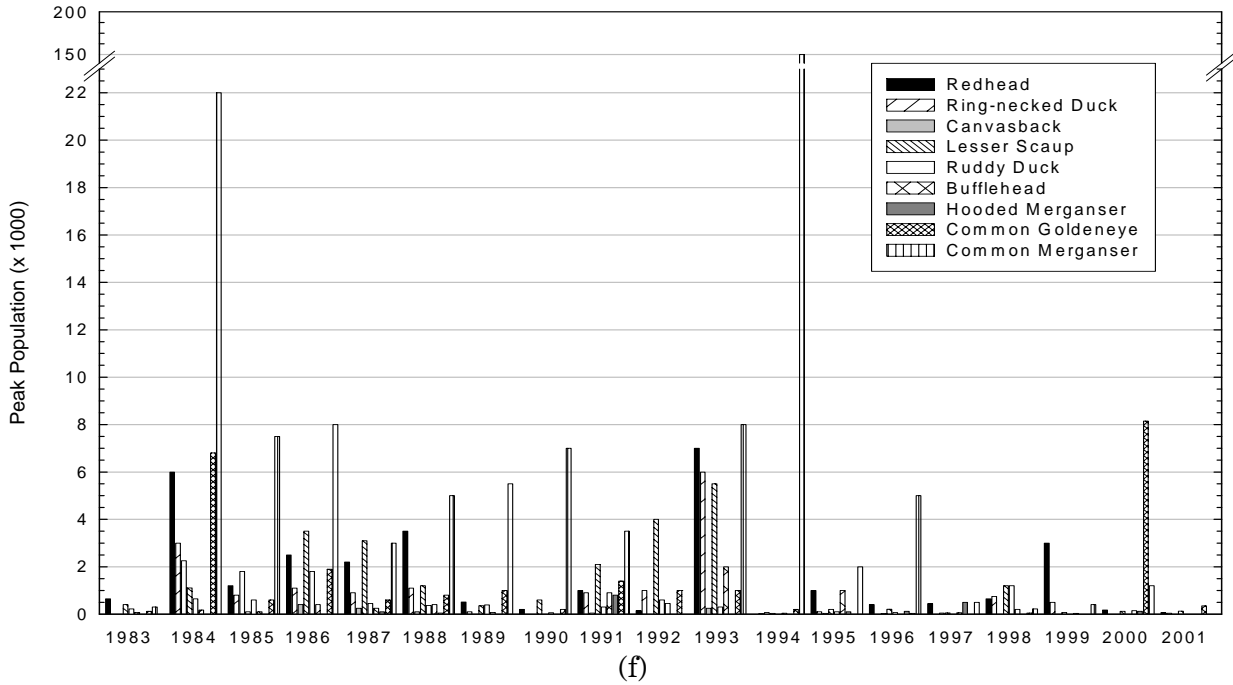
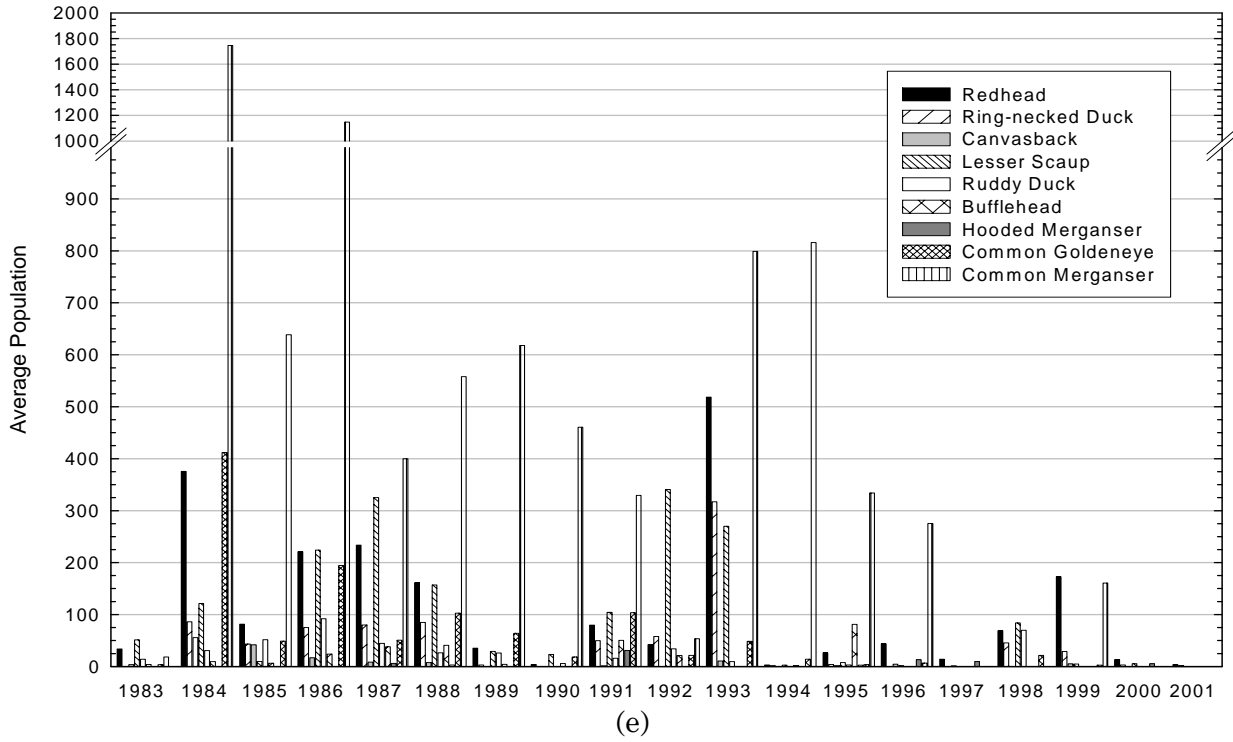
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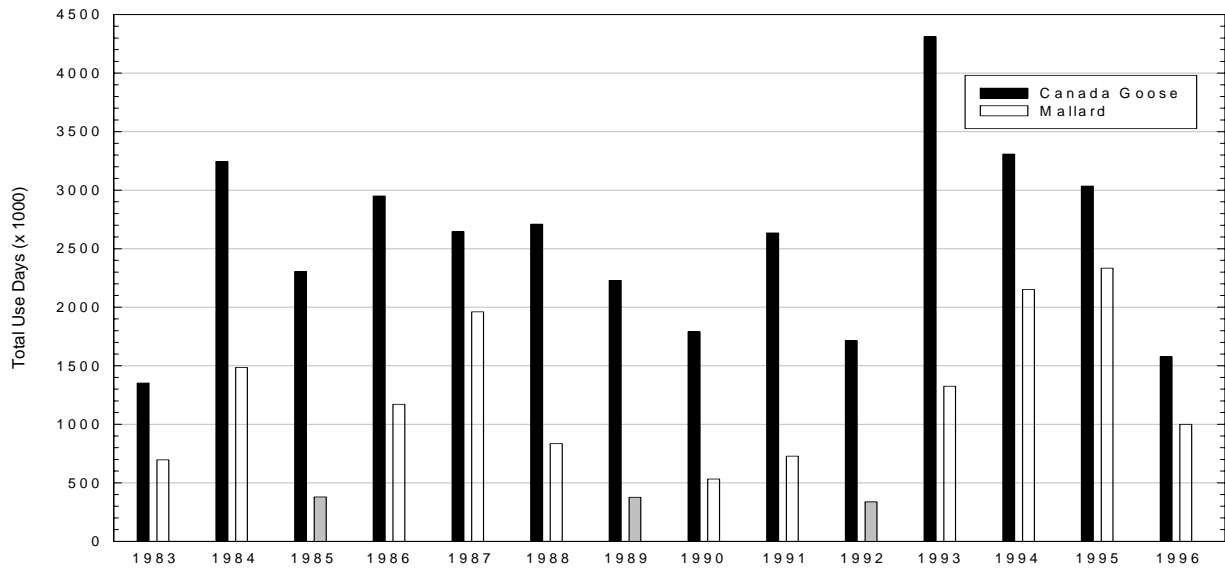


(c)

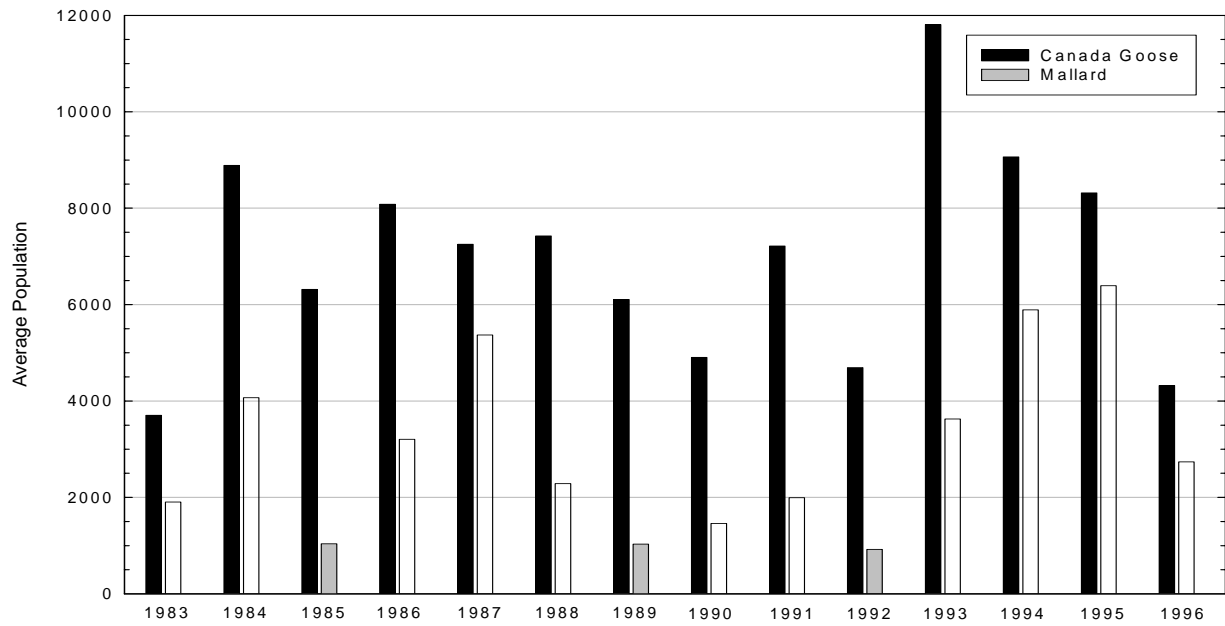


(d)



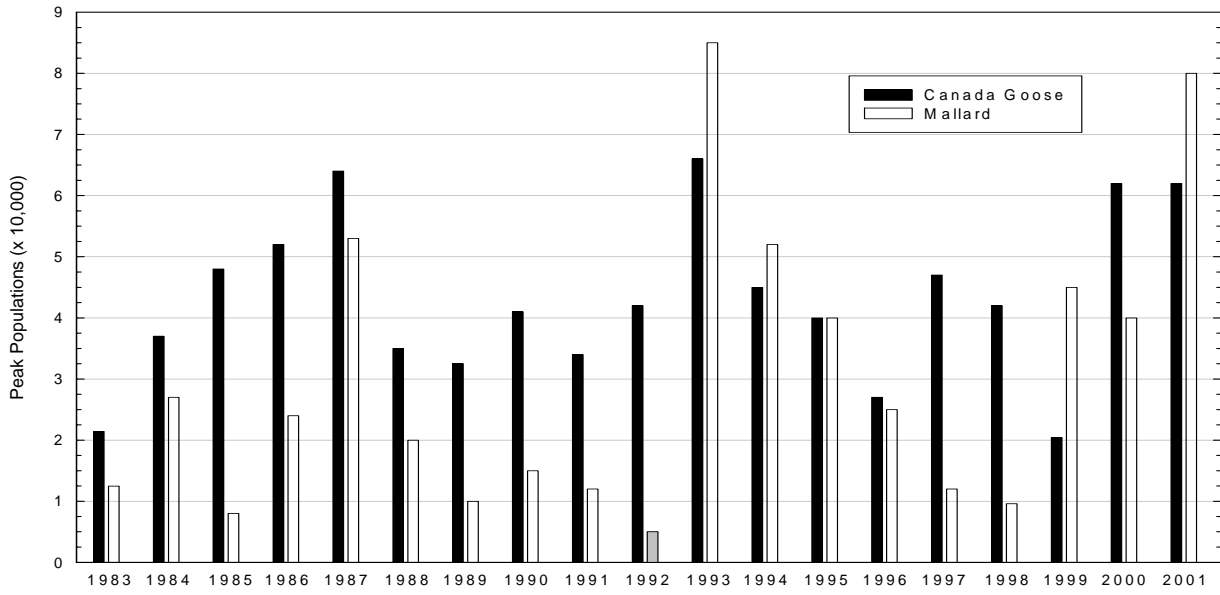


(g)

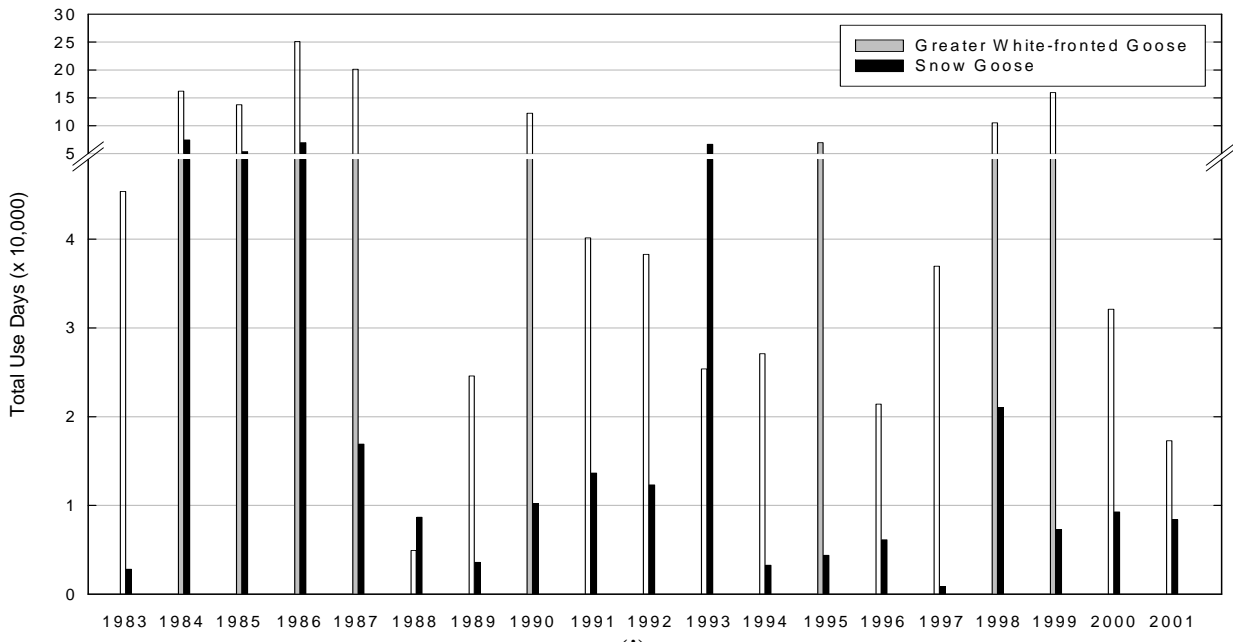


(h)

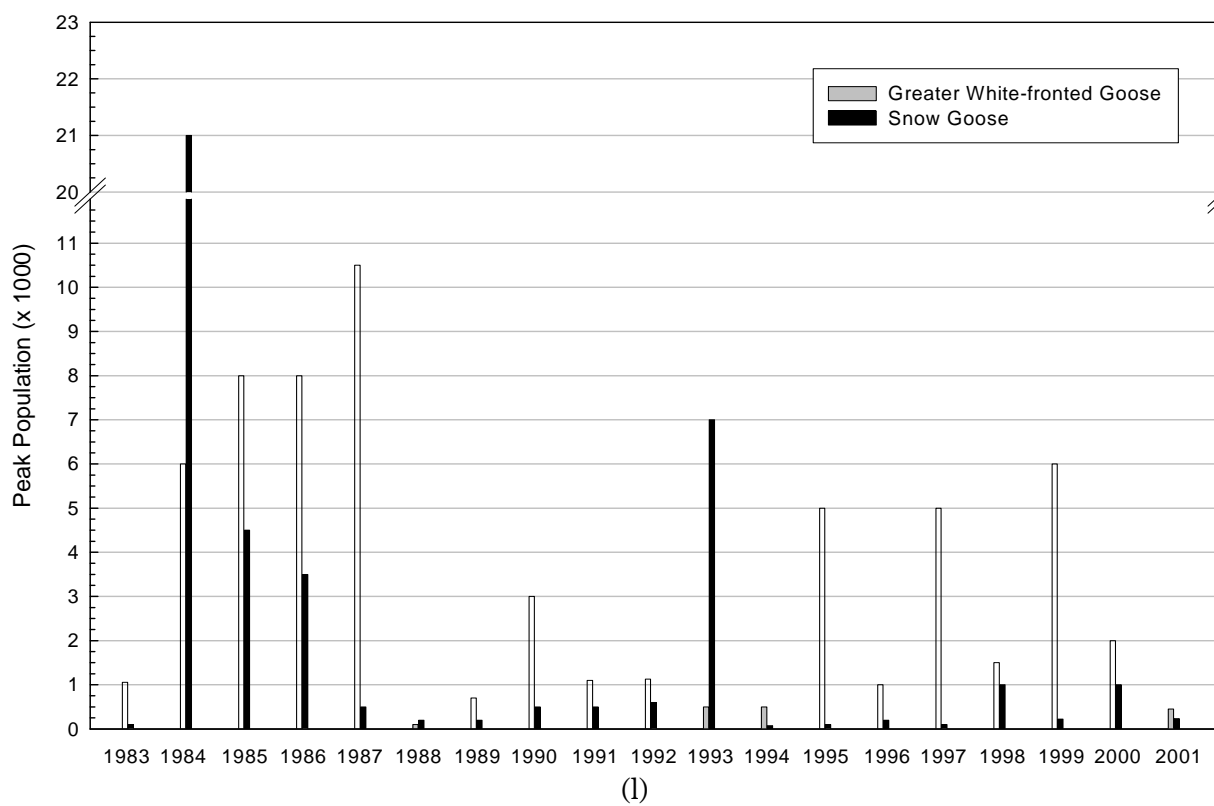
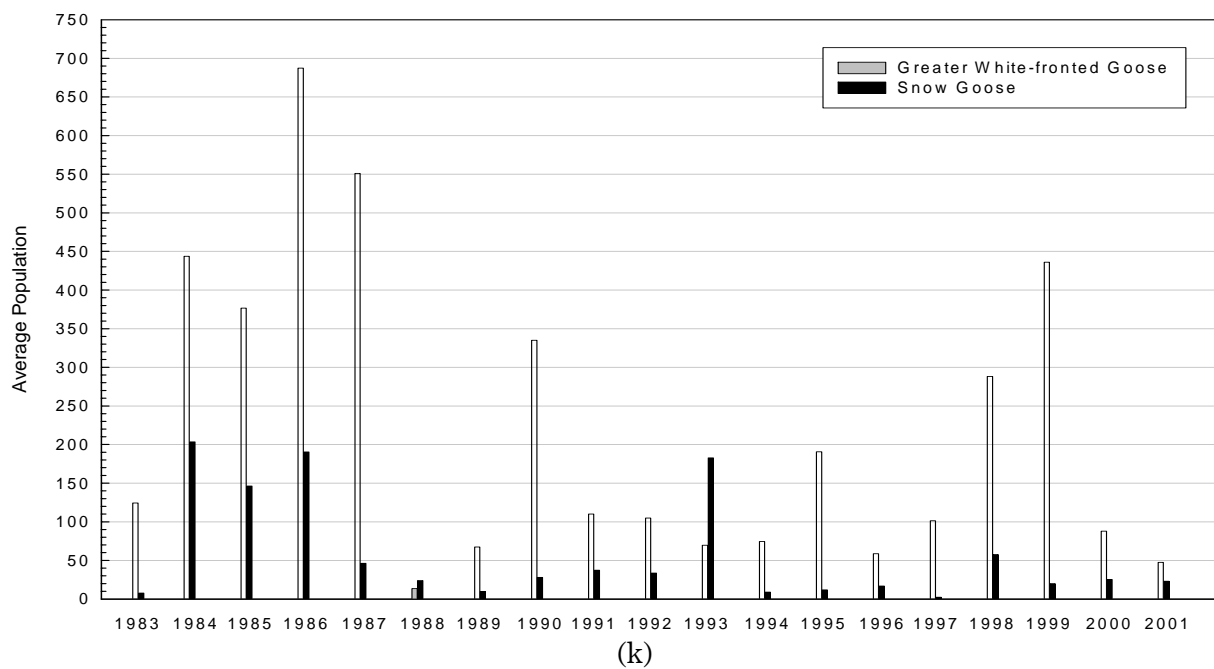




(i)



(j)





# **Appendix I. Section 7 Biological Evaluation**

Intra-Service Section 7 consultation will be completed prior to final approval of the comprehensive conservation plan.



# Appendix J. Mailing List

## Federal Officials

U.S. Senator Pat Roberts  
Dodge City, KS office—Debbie Pugh  
Wichita, KS office—Karin Wisdom  
Topeka, KS office—Gilda Lintz  
Prairie Village, KS office—Chad Tenpenny

U.S. Senator Sam Brownback  
Topeka, KS office  
Overland Park, KS office—Shawn Cowing  
Garden City, KS office—Dennis Mesa  
Pittsburg, KS office—Anne Emerson  
Wichita, KS office—Chuck Alderson, Jamie Woodworth

U.S. Congressman Jerry Moran  
Hutchinson, KS office  
Hays, KS office

## Federal Agencies

U.S. Army Corps of Engineers  
Kansas City District, Kansas City, MO  
Harlan County Lake, Republican City, NE

U.S. Bureau of Reclamation  
Grand Island, NE—Jill Manring  
Grand Island, NE—Gil Gyllenborg  
Grand Island, NE—Alice Johns  
Billings, MT—Jaralyn Beek

U.S. Fish and Wildlife Service  
Ecological Services, Manhattan, KS  
Ecological Services, Grand Island, NE  
Flint Hills National Wildlife Refuge, Harford, KS  
Marais des Cygnes National Wildlife Refuge, Pleasanton, KS  
Quivira National Wildlife Refuge, Stafford, KS  
Great Plains Nature Center, Wichita, KS

U.S. Geological Survey  
Biological Resources Division, Fort Collins, CO  
Northern Prairie Wildlife Research Center, Jamestown, ND

## Tribal Officials

Prairie Band Potawatomi Nation, Mayetta, KS  
Pawnee Tribe, Pawnee, OK

## State Officials

Kansas Governor Kathleen Sebelius, Topeka, KS  
Kansas State Senator Janice Lee, Kensington, KS  
Kansas State Representative John Faber, Brewster, KS  
Kansas State Representative Dan Johnson, Hays, KS  
Kansas State Representative Laura McClure, Osborne, KS

## State Agencies

Kansas Department of Wildlife and Parks  
Office of the Secretary, Topeka, KS—Mike Hayden  
Region 1 Office, Hays, KS—Bruce Taggart  
Region 1 Office, Hays, KS—Steve Price  
Region 1 Office, Hays, KS—Mark Shaw  
Area Conservation Officer, Kirwin, KS—Larry Stone

## Universities, Schools, and Libraries

Fort Hays State University Division of Biology, Hays, KS  
Kansas State University Division of Biology, Manhattan, KS  
Eastern Heights High School, Agra, KS  
Northern Valley High School, Almena, KS  
Osborne High School, Osborne, KS  
Hill City High School, Hill City, KS  
Hays High School, Hays, KS  
West Smith County High School, Kensington, KS  
Logan High School, Logan, KS  
Natoma High School, Natoma, KS  
Palco High School, Palco, KS  
Phillipsburg High School, Phillipsburg, KS  
Plainville High School, Plainville, KS  
Smith Center High School, Smith Center, KS  
Stockton High School, Stockton, KS  
Norton Community High School, Norton, KS

**Local Governments**

Mayor of Agra, KS—Scott Bretton  
 Mayor of Glade, KS—Willa Chestnut  
 Mayor of Kirwin, KS—Tracy Atchison  
 Mayor of Logan, KS—Jerry Gosha  
 Mayor of Long Island, KS—Tim Hammond  
 Mayor of Phillipsburg, KS—Doug Driggs  
 Mayor of Prairie View, KS—John Kats  
 Mayor of Speed, KS—Denise Lyon  
 Phillips County Commissioners  
 Phillips County Extension Office

**Organizations**

American Bass Anglers  
     Fort Collins, CO  
     Abilene, KS  
     Ceresco, NE  
 Blue Valley Bass Club, Seward, NE  
 Boothill Bass Club, Spearville, KS  
 Burroughs Audubon of Greater Kansas City,  
     Overland Park, KS  
 Coronado Area Council/BSA, Salina, KS  
 Douglas County Bassmasters, Boone, IA  
 Friends of Kirwin Lake, Phillipsburg, KS  
 Front Range Bassmasters, Colorado Springs, CO  
 Heartland His and Hers Bass Circuit, Omaha, NE  
 Kansas Audubon Society, Lawrence, KS  
 Kansas Bass Anglers Association, Junction City,  
     KS  
 Liberal Bassmaster Bass Club, Liberal, KS  
 Lincoln County Bassmasters, North Platte, NE  
 Lions Club  
     Phillipsburg, KS  
     Kirwin, KS  
     Kensington, KS  
     Smith Center, KS  
     Agra, KS  
     Stockton, KS

McPherson Bassmasters, Lindsborg, KS  
 Midwest Bass Anglers, Weeping Water, NE  
 Mile High Bass Pioneers, Longmont, CO  
 National Audubon Society, Manhattan, KS  
 National Wild Turkey Federation, Phillipsburg,  
     KS  
 Northern Colorado Bass Club, Johnstown, CO  
 Omaha Bass Club, Omaha, NE  
 Phillips County Chamber of Commerce,  
     Phillipsburg, KS  
 Pikes Peak Bassmasters, Security, CO  
 Rotary Club, Phillipsburg, KS  
 Sarpy County Bassmasters, Bellevue, NE  
 Solomon Valley Birdwatcher's, Agra, KS  
 Southern Colorado Bass Club, Pueblo, CO  
 Southwest Anglers, Hugoton, KS  
 Southwest Anglers, Liberal, KS  
 Trophy Teams Association, Colorado Springs, CO  
 Wildlife Society, Manhattan, KS

**Newspapers**

Hays Daily News, Hays, KS  
 Hill City Times, Hill City, KS  
 Norton Daily Telegram, Norton, KS  
 Osborne County Farmer, Osborne, KS  
 Phillips County Advocate, Phillipsburg, KS  
 Phillips County Review, Phillipsburg, KS  
 Plainville Times, Plainville, KS  
 Smith County Pioneer, Smith Center, KS  
 Stockton Sentinel, Stockton, KS  
 The Logan Republican, Logan, KS

**Radio Stations**

KKAN\_KQMA

**Individuals**

83 persons

# Bibliography

- Albertson, F. W. 1937. Ecology of mixed prairie in west central Kansas. *Ecological Monographs* 7:481–547.
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