

Glossary

abiotic—Pertaining to nonliving things.

accessible—Pertaining to physical access to areas and activities for people of different abilities, especially those with physical impairments.

adaptive management—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 a 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.

Administration Act—National Wildlife Refuge System Administration Act of 1966.

alternatives—Different sets of objectives and strategies or means of achieving refuge purposes and goals, helping fulfill the Refuge System mission and resolving issues.

amphibian—Class of cold-blooded vertebrates including frogs, toads or salamanders.

animal unit month (AUM)—Measure of the quantity of livestock forage. Equivalent to the amount of forage needed to support a 1,000-pound animal (or one cow/calf pair) for one month.

annual—A plant that flowers and dies within 1 year of germination.

approved acquisition boundary—Project boundary that the director of the U.S. Fish and Wildlife Service approves on completion of the detailed planning and environmental compliance process.

ATV—All-terrain vehicle.

AUM—See *animal unit month*.

baseline—Set of critical observations, data, or information used for comparison or a control.

biological control, *also* **biocontrol**—Reduction in numbers or elimination of unwanted species by the introduction of natural predators, parasites, or diseases.

biological diversity, *also* **biodiversity**—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

(“U.S. Fish and Wildlife Service Manual” 052 FW 1.12B). The National Wildlife Refuge System’s focus is on endemic species, biotic communities, and ecological processes.

biological integrity—Composition, structure, and function at the genetic, organism, and community levels consistent with natural conditions and the biological processes that shape genomes, organisms, and communities.

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

biota—Animals and plants of a given region.

biotic—Pertaining to life or living organisms.

breeding habitat—Habitat used by migratory birds or other animals during the breeding season.

buffer zone or buffer strip—Protective land borders around critical habitats or water bodies that reduce runoff and nonpoint source pollution loading; areas created or sustained to lessen the negative effects of land development on animals and plants and their habitats.

canopy—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.

CCC—See *Civilian Conservation Corps*.

CCP—See *comprehensive conservation plan*.

CFR—See *Code of Federal Regulations*.

cfs—Cubic feet per second.

Civilian Conservation Corps (CCC)—Peacetime civilian “army” established by President Franklin D. Roosevelt to perform conservation activities from 1933–42. Activities included erosion control; firefighting; tree planting; habitat protection; stream improvement; and building of fire towers, roads, recreation facilities, and drainage systems.

climax—Community that has reached a steady state under a particular set of environmental conditions; a relatively stable plant community; the final stage in ecological succession.

Code of Federal Regulations (CFR)—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.

community—Area or locality in which a group of people resides and shares the same government.

compatible use—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 U.S. Fish and Wildlife Service Manual” 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identified stipulations or limits necessary to ensure compatibility.

complex—See *refuge complex*.

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 U.S. Fish and Wildlife Service Manual” 602 FW 1.5).

concern—See *issue*.

conservation—Management of natural resources to prevent loss or waste. Management actions may include preservation, restoration, and enhancement.

conspicuous—An individual belonging to the same species as another.

cool-season grass—Grass that begins growth earlier in the season and often become dormant in the summer; will germinate at lower temperatures (65–85°F). Examples are western wheatgrass, needle and thread, and green needlegrass.

cooperative agreement—Legal instrument used when the principal purpose of the transaction is the transfer of money, property, services or anything of value to a recipient in order to accomplish a public purpose authorized by federal statute and substantial involvement between the Service and the recipient is anticipated.

coordination area—Wildlife management area made available to a state, by “(A) cooperative agreement between the United States Fish and Wildlife Service and the state fish and game agency pursuant to Section 4 of the Fish and Wildlife Coordination Act (16 U.S.C. 664); of (B) by long-term leases or agreements pursuant to the Bankhead–Jones Farm Tenant Act (50 Stat. 525; 7 U.S.C. 1010 et seq.)” States manage coordination areas, but they are part of the Refuge System. CCPs are not required for coordination areas.

coteau—A hilly upland including the divide between two valleys; a divide; the side of a valley.

coulee—A deep ravine or gulch with sloping sides, often dry, that has been formed by running water.

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

CRP—Conservation Reserve Program.

cryptogamic crust—A thin, dry, somewhat flaky assemblage of algae, lichens, mosses, and fungi, plus byproducts of these organisms mixed with soil particles. Crusts influence processes at the soil–air interface. For example, they can prevent soil erosion, help facilitate nitrogen fixation, slow evaporation, and provide a hospitable environment for germinating plants. Although a somewhat inconspicuous component of the semi-arid northern prairie, these crusts are absent in areas disturbed by cultivation in the region.

cultivar—A plant variety that has been produced in cultivation by selective breeding.

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

cultural resource inventory—Professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined area. Inventories may involve various levels including background literature search (class I), sample inventory of project site distribution and density over a larger area (class II), or comprehensive field examination to identify all exposed physical manifestation of cultural resources (class III).

database—Collection of data arranged for ease and speed of analysis and retrieval, usually computerized.

deciduous—Pertaining to any plant organ or group of organs that is shed annually; perennial plants that are leafless for sometime during the year.

defoliation—Removing of vegetative parts; to strip vegetation of leaves; removal can be caused by weather, mechanical, animals, and fire.

demography—Quantitative analysis of population structure and trend.

dense nesting cover (DNC)—Composition of grasses and forbs that allows for a dense stand of vegetation that protects nesting birds from the view of predators, usually consisting of one to two species of wheatgrass, alfalfa, and sweetclover.

disturbance—Significant alteration of habitat structure or composition. May be natural (for example, fire) or human-caused events (for example, timber harvest).

DNC—See *dense nesting cover*.

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

EA—See *environmental assessment*.

early seral stage—Area that is in the primary stages of ecological succession.

easement—Agreement by which a landowner gives up or sells one of the rights on his/her property.

ecological succession—Orderly progression of an area through time from one vegetative community to another in the absence of disturbance. For example, an area may proceed from grass–forb through aspen forest to mixed-conifer forest.

ecological triage—Ecological triage is the assignment of priority order to habitats or habitat types on the basis of where funds and resources can be best used, are most needed, or are most likely to achieve success in meeting stated goals and objectives.

ecosystem—Dynamic and interrelating complex of plant and animal communities and their associated nonliving environment; 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.

ecotourism—Tourism that maintains and preserves natural resources as a basis for promoting economic growth and development resulting from visitation to an area.

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

endangered species, federal—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—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.

endemic species—Plants or animals that occur naturally in a certain region and whose distribution is relatively limited to a particular locality.

environmental assessment (EA)—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).

environmental education—Education aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its

associated problems, aware of how to help solve these problems, and motivated to work toward their solution.

environmental health—Natural composition, structure, and functioning of the physical, chemical, and other abiotic elements, and the abiotic processes that shape the physical environment.

EO—Executive order.

EPA—Environmental Protection Agency.

extinction—Complete disappearance of a species from the earth; no longer existing.

extirpation—Extinction of a population; complete eradication of a species within a specified area.

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

federal land—Public land owned by the federal government, including lands such as national forests, national parks, and national wildlife refuges.

federally listed species—Species listed under the federal Endangered Species Act of 1973, as amended, either as endangered, threatened, or species at risk (formerly candidate species).

fee title—Acquisition of most or all of the rights to a tract of land.

fen, also alkaline bog—Wetland that is primarily organic soil material (peat or muck) that took thousands of years to develop.

FERC—Federal Energy Regulatory Commission.

finding of no significant impact (FONSI)—Document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a federal action will have no significant effects on the human environment and for which an environmental impact statement will not be prepared (40 CFR 1508.13).

fire regime—Description of the frequency, severity, and extent of fire that typically occurs in an area or vegetative type.

flora—All the plant species of an area.

fluvial—Regarding flowing water, usually rivers and streams. Important fluvial processes include erosion, downcutting of channels, and suspension and transport of sediments.

FMP—Fire management plan.

FONSI—See *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.

forest—Group of trees with their crown overlapping (generally forming 60–100% cover).

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; the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.

FTE—Full-time equivalent employee.

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

geomorphology—The study of the physical features of the surface of the earth and their underlying geological structure.

GIS—See *geographic information system*.

global positioning system (GPS)—System that, by using satellite telemetry, can pinpoint exact locations of places on the ground.

goal—Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units (“Draft U.S. Fish and Wildlife Service Manual” 620 FW 1.5).

“go-back” prairie—Previously cultivated cropland that has been allowed to revert to herbaceous cover.

GPS—See *global positioning system*.

GS—General schedule (pay rate schedule for certain federal positions).

guild—A group of species that use a common resource base in a similar fashion within an ecological community. A guild can be generally defined (for example, grassland birds) or specifically defined (for example, seed-eating small mammals).

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

habitat conservation—Protection of animal or plant habitat to ensure that the use of that habitat by the animal or plant is not altered or reduced.

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

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

hemi-marsh—The emergent phase of a seasonal or semipermanent wetland where the ratio of open water area to emergent vegetation cover is about 50:50, and vegetation and open water areas are highly interspersed.

herbivore—Animal feeding on plants.

herbivory—The eating of plants, especially ones that are still living.

herptile—A reptile or amphibian.

hydrography—Graph of the water level or rate of flow of a body of water as a function of time, showing seasonal change.

hydroperiod—The seasonal and cyclical pattern of water in a wetland or river.

IBA—“Important Bird Area,” as designated by the American Bird Conservancy.

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.

Improvement Act—National Wildlife Refuge System Improvement Act of 1997.

integrated pest management—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.

“interseed”—Mechanical seeding of one or several plant species into existing stands of established vegetation.

introduced species—A nonnative plant or animal species that is intentionally or accidentally released into an ecosystem where it was not previously adapted.

introduction—Intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

invasive plant, also noxious weed—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.

involute sanctuary—Place of refuge or protection where animals and birds may not be hunted.

issue—Any unsettled matter that requires a management decision; for example, 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 U.S. Fish and Wildlife Service Manual” 602 FW 1.5).

lentic—Associated with standing fresh water.

lacustrine—Relating to, formed in, living in, or growing in lakes.

lek—A physical area where males of a certain animal species gather to demonstrate their prowess and compete for females before or during the mating season.

local agencies—Municipal governments, regional planning commissions, or conservation groups.

lotic—Relating to, or living in, flowing fresh water.

low-head dam—A human-constructed, wall-like structure that is typically built to back up water in a reservoir. The dam pools water as it flows over the crest or through control structures and drops to the lower water level downstream of the dam.

macrophyte—Plant, especially a marine plant, that is large enough to be visible to the naked eye.

management alternatives—See *alternatives*.

management plan—Plan that guides future land management practices on a tract of land. See *cooperative agreement*.

mean sea level—The sea level halfway between average levels of high and low water.

mechanical control—Reduction in numbers or elimination of unwanted species through the use of mechanical equipment such as mowers and clippers.

mesic—Characterized by, relating to, or requiring a moderate amount of moisture; having a moderate rainfall.

microhabitat—Habitat features at a fine scale; often identifies a unique set of local habitat features.

migration—Regular extensive, seasonal movements of birds between their breeding regions and their wintering regions; to pass usually periodically from one region or climate to another for feeding or breeding.

migratory bird—Bird species that follow a seasonal movement from their breeding grounds to their wintering grounds. Waterfowl, shorebirds, raptors, and songbirds are all migratory birds.

migratory game bird—Bird species, regulated under the Migratory Bird Treaty Act and state laws (legally hunted, including ducks, geese, woodcock, and rails).

mission—Succinct statement of purpose or reason for being.

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

mixed-grass prairie—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.

monitoring—Process of collecting information to track changes of selected parameters over time.

monotypic—Having only one type or representative.

moraine—Mass of earth and rock debris carried by an advancing glacier and left at its front and side edges as it retreats.

national wildlife refuge (NWR)—Designated area of land, water, or an interest in land or water within the 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 (Improvement Act)—Sets the mission and the administrative policy for all refuges in the 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—Species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

NAWMP—See *North American Waterfowl Management Plan*.

Neotropical migrant, also Neotropical migratory bird—Bird species that breeds north of the United States–Mexico border and winters primarily south of this border.

NEPA—National Environmental Policy Act.

nest success—Percentage of nests that successfully hatch one or more eggs of the total number of nests initiated in an area.

NOI—See *notice of intent*.

nongovernmental organization—Any group that does not include federal, state, tribal, county, city, town, local, or other governmental entities.

North American Waterfowl Management Plan (NAWMP)

—North American Waterfowl Management Plan, signed in 1986, recognizes that the recovery and perpetuation of waterfowl populations depends on restoring wetlands and associated ecosystems throughout the United States and Canada. It established cooperative international efforts and joint ventures composed of individuals; corporations; conservation organizations; and local, state, provincial, and federal agencies drawn together by common conservation objectives. The Souris River basin refuges are included in the “Prairie Pothole Joint Venture.”

notice of intent (NOI)—Notice that an environmental impact statement will be prepared and considered (40 CFR 1508.22); published in the “Federal Register.”

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 (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 United States and to public health.

NRCS—Natural Resources Conservation Service of the U.S. Department of Agriculture.

NWI—National wetland inventory.

NWR—See *national wildlife refuge*.

NWRS—See *National Wildlife Refuge System*.

objective—Concise statement of what is to be achieved, when and where it is to be achieved, and who is responsible for the work. Objectives are derived from goals and provide the basis for determining management strategies. Objectives should be attainable, time-specific, and measurable.

palustrine—Refers to a nontidal wetland dominated by trees, shrubs, persistent emergents, and emergent mosses or lichens; or a wetland in tidal areas where salinity due to ocean-derived salts is below 0.5 parts per thousand.

paradigm—An example, view, or philosophy serving as a pattern or model.

Partners in Flight—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.

partnership—Contract or agreement entered into by two or more individuals, groups of individuals, organizations or agencies in which each agrees to furnish a part of the capital or some in-kind service, such as labor, for a mutually beneficial enterprise.

patch—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.

phenology—The relationship between plant or animal development and climatic conditions.

PL—Public law.

planning team—Team that prepares the comprehensive conservation plan. Planning teams are interdisciplinary in membership and function. A team generally consists of a planning team leader; refuge manager and staff biologist; staff specialists or other representatives of Service programs, ecosystems or regional offices; and state partnering wildlife agencies as appropriate.

planning team leader—Typically a professional planner or natural resource specialist knowledgeable of the requirements of National Environmental Policy Act and who has planning experience. The planning team leader manages the refuge planning process and ensures compliance with applicable regulatory and policy requirements.

planning unit—Single refuge, an ecologically or administratively related refuge complex, or distinct unit of a refuge. The planning unit also may include lands currently outside refuge boundaries.

plant association—Classification of plant communities based on the similarity in dominants of all layers of vascular species in a climax community.

plant community—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 (ponderosa pine or bunchgrass).

population sink—A demographic deficit (deaths + immigration > births + emigration) that leads to local species extinction, without immigration from sources.

PPJV—“Prairie Pothole Joint Venture.”

predation—Mode of life in which food is primarily obtained by the killing or consuming of animals.

prescribed fire—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—See *wildlife-dependent recreational use*.

pristine—Typical of original conditions.

private land—Land that is owned by a private individual, a group of individuals, or a nongovernmental organization.

private landowner—Any individual, group of individuals, or nongovernmental organization that owns land.

private organization—Any nongovernmental organization.

propagule—Any part of a plant (such as a bud, sucker, spore, or other offshoot) that aids in dispersal of the species and from which a new individual may develop.

proposed action—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). The draft comprehensive conservation plan.

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—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.

public involvement plan—Broad long-term guidance for involving the public in the comprehensive planning process.

public land—Land that is owned by the local, state, or federal government.

purpose of the refuge—Purpose 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 U.S. Fish and Wildlife Service Manual” 602 FW 1.5).

refuge complex—A grouping of two or more Service units (for example, national wildlife refuge, wetland management district) that is administered by staff at one of the units.

refuge lands—Lands in which the Service holds full interest in fee title, or partial interest such as limited-interest refuges.

“Refuge Operations Needs System” (RONS)—National database that contains the unfunded operational needs of each refuge. Projects included are those required to carry out approved plans and meet goals, objectives, and legal mandates.

refuge purpose—See *purpose of the refuge*.

Refuge System—See *National Wildlife Refuge System*.

region 6—“Mountain–Prairie Region” of the U.S. Fish and Wildlife Service, which administers Service programs in Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Wyoming, and Utah.

rest—Free from biological, mechanical, or chemical manipulation, in reference to refuge lands.

restoration—Artificial manipulation of a habitat to restore it to something close to its natural state. Involves taking a degraded grassland and reestablishing habitat for native plants and animals. Restoration usually involves the planting of native grasses and forbs, and may include shrub removal and prescribed burning.

rhizomatous—A plant having rhizomes.

rhizome—A continuously growing, horizontal, underground stem that produces roots and sends shoots upward at intervals (for example, many iris species).

riparian area or riparian zone—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; of or 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.

riprap—Loose rock used in water or on soft ground to form an embankment or foundation for a structure.

RONS—See *Refuge Operations Needs System*.

rootstock—A root or part of a root used as a stock for reproduction.

runoff—Water from rain, melted snow, or agricultural or landscape irrigation that flows over the land surface into a water body.

SAMMS—See *Service Asset Maintenance Management System*.

sandhills—Sand dunes created by wind and wave action following the melting of large glaciers about 8,000–10,000 years ago. Soils are sand and silt. Local relief exceeds 80 feet in some places.

scarp—A line of low, steep-sloped cliffs or beaches caused by wind or wave erosion.

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

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

seral stage—Any plant community whose plant composition is changing in a predictable way; characterized by a group of species or plant community that will eventually be replaced by a different group of species or plant community, for example, an aspen community changing to a coniferous forest community.

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

“Service Asset Maintenance Management System” (SAMMS)—National database that 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.

shelterbelt—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.

snag—Standing dead tree from which the leaves or needles and most of the branches have fallen. Many species of wildlife and some plants rely on snags for food and cover.

sound professional judgment—Finding, determination, or decision that is consistent with principles of sound fish and wildlife management and administration, available science and resources, and adherence to the requirements of the National Wildlife Refuge System Administration Act and other applicable laws.

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

special status species—Plants or animals that have been identified through federal law, state law, or agency policy as requiring special protection of monitoring. Examples include federally listed

endangered, threatened, proposed, or candidate species; state-listed endangered, threatened, candidate, or monitor species; the Service’s species of management concern; and species identified by the Partners in Flight program as being of extreme or moderately high conservation concern.

special use permit—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 (“National Wildlife Refuge System 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. Species that: (1) are documented or have apparent population declines; (2) are small or restricted populations; or (3) depend on restricted or vulnerable habitats.

stand—Any homogenous area of vegetation with more or less uniform soils, landform, and vegetation. Typically used to refer to forested areas.

step-down management plan—Plan that provides the details necessary to carry out management strategies identified in the comprehensive conservation plan (“Draft U.S. Fish and Wildlife Service Manual” 602 FW 1.5).

strategy—Specific action, tool, or technique or combination of actions, tools, and techniques used to meet unit objectives (“Draft U.S. Fish and Wildlife Service Manual” 602 FW 1.5).

submergent—Vascular or nonvascular hydrophyte, either rooted or nonrooted, that lies entirely beneath the water surface, except for flowering parts in some species.

SUP—Special use permit.

surficial—Relating to or occurring on the surface.

tansy ragwort—*Senecio jacobaea* is an Eurasian invasive plant in the sunflower family (Asteraceae). It spreads primarily by seed—a single tansy ragwort plant may produce up to 150,000 seeds, which may remain viable for up to 15 years. All parts of this plant are poisonous. It causes liver damage to cattle and horses, while sheep are affected to a lesser extent. (<http://www.oneplan.org/index.htm>)

temporarily flooded—Surface water is present for brief periods during the growing season.

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—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.

triage—See *ecological triage*.

trust resource—Resource that, through law or administrative act, is held in trust for the people by the government. A federal trust resource is one for which trust responsibility is given in part to the federal government through federal legislation or administrative act. Generally, federal trust resources are those considered to be of national or international importance no matter where they occur, such as endangered species and species such as migratory birds and fish that regularly move across state lines. In addition to species, trust resources include cultural resources protected through federal historic preservation laws, nationally important and threatened habitats, notably wetlands, navigable waters, and public lands such as state parks and national wildlife refuges.

trust species—See *trust resource*.

understory—Any vegetation whose canopy (foliage) is below, or closer to the ground than canopies of other plants.

upland—Dry ground; other than wetlands.

USACE—U.S. Army Corps of Engineers.

USDA—U.S. Department of Agriculture.

U.S. Fish and Wildlife Service (Service, USFWS)—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 composed 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.

U.S. Fish and Wildlife Service mission—The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

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

U.S. Geological Survey (USGS)—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—Concise statement of what the planning unit should be, or what the Service hopes to do, based primarily on the Refuge System mission, specific refuge purposes, and other mandates. In addition, the vision statement is tied to the maintenance and restoration of biological integrity, diversity, and environmental health of each refuge and the Refuge System.

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)—Measurement of the density of a plant community; the height of vegetation that blocks the view of predators to a nest.

VOR—See *visual obstruction reading*.

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

warm-season grass—Grass that begins growth later in the season (early June); require warmer soil temperatures to germinate and actively grow when temperatures are warmer (85–95°F). Examples are Indiangrass, switchgrass, and big bluestem.

waterfowl—Category of birds that includes ducks, geese, and swans.

watershed—Geographic area within which water drains into a particular river, stream or body of water. A watershed includes both the land and the body of water into which the land drains.

wetland—Land transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.

wetland easement—Perpetual agreement entered into by a landowner and the Service. The easement covers only the wetlands specified in the agreement. In return for a single lump-sum payment, the landowner agrees not to drain, burn, level, or fill wetlands covered by the easement.

wetland management district (WMD)—Land that the Refuge System acquires with federal Duck Stamp funds for restoration and management primarily as prairie wetland habitat critical to waterfowl and other wetland birds.

WG—Wage grade schedule (pay rate schedule for certain federal positions).

wilderness—“A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain” (Wilderness Act of 1964 Section 2c [PL 88-577]). This legal definition places wilderness in the “untrammelled” or “primeval” end of the environmental modification spectrum. Wilderness is roadless lands, legally classified as component areas of the National Wilderness Preservation System, and managed to protect its qualities of naturalness, solitude, and opportunity for primitive types of recreation.

wilderness, recommended—Area studied and found suitable for wilderness designation by both the Director and Secretary, and recommended for designation by the President to Congress. These areas await only legislative action by Congress in order to become part of the Wilderness System. Such areas are also referred to as “pending in Congress” (“Draft U.S. Fish and Wildlife Service Manual” 610 FW 1.5).

wilderness, study area—Lands and waters identified through inventory as meeting the definition of wilderness and undergoing evaluation for recommendation for inclusion in the Wilderness System. A study area must meet the following criteria: (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least

5,000 contiguous roadless acres or is sufficient in size as to make practicable its preservation and use in an unimpaired condition (“Draft U.S. Fish and Wildlife Service Manual” 610 FW 1.5).

wildfire—Free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs in wildlands (“U.S. Fish and Wildlife Service Manual” 621 FW 1.7).

wildland fire—Every wildland fire is either a wildfire or a prescribed fire (“U.S. Fish and Wildlife Service Manual” 621 FW 1.3).

wildlife-dependent recreational use—Use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation. These are the six priority public uses of the Refuge System as established in the National Wildlife Refuge System Administration Act, as amended. Wildlife-dependent recreational uses, other than the six priority public uses, are those that depend on the presence of wildlife.

wildlife management—Practice of manipulating wildlife populations either directly through regulating the numbers, ages, and sex ratios harvested, or indirectly by providing favorable habitat conditions and alleviating limiting factors.

WMD—See *wetland management district*.

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

WUI—Wildland–urban interface.

xerophytic—Pertaining to a plant that needs very little water (adapted to growing in dry habitat).

Appendix A

Key Legislation and Policies

In alphabetical order of the name of the act, order, or regulation.

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.

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

Antiquities Act (16 U.S.C. 431–433): The act of June 8, 1906 (34 Stat. 225) authorizes the president to designate as national monuments objects or areas of historic or scientific interest on lands owned or controlled by the United States. The act required that a permit be obtained for examination of ruins, excavation of archaeological sites, and the gathering of objects of antiquity on lands under the jurisdiction of the Secretaries of Interior, Agriculture, and Army, and provided penalties for violations.

Archaeological Resources Protection Act (16 U.S.C. 470aa–470ll): Public Law (PL) 96-95, approved October 31, 1979 (93 Stat. 721): Largely supplants the resource protection provisions of the Antiquities Act for archaeological items. This act establishes detailed requirements for issuance of permits for any excavation for or removal of archaeological resources from federal or Indian lands. It also establishes civil and criminal penalties for the unauthorized excavation, removal, or damage of any such resources; for any trafficking in such resources removed from federal or Indian land in violation of any provision of federal law; and for interstate and foreign commerce in such resources acquired, transported, or received in violation of any state or local law.

PL 100-588, approved November 3, 1988 (102 Stat. 2983): Lowers the threshold value of artifacts triggering the felony provisions of the act from \$5,000 to \$500; makes attempting to commit an action prohibited by the act a violation; and requires the land managing agencies to establish public awareness programs regarding the value of archaeological resources to the nation.

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

Archeological and Historic Preservation Act (16 U.S.C. 469–469c): PL 86-523, approved June 27, 1960 (74 Stat. 220) as amended by PL 93291, approved May 24,

1974 (88 Stat. 174) to carry out the policy established by the “Historic Sites Act” (see below), directed federal agencies to notify the Secretary of the Interior whenever they find a federal or federally assisted, licensed, or permitted project may cause loss or destruction of significant scientific, prehistoric, or archaeological data. The act authorizes use of appropriated, donated, and transferred funds for the recovery, protection, and preservation of such data.

Clean Water Act (1977): Requires consultation with the USACE for major wetland modifications.

Criminal Code of Provisions of 1940, as amended, (18 U.S.C. 41): States the intent of Congress to protect all wildlife within federal sanctuaries, refuges, fish hatcheries, and breeding grounds. Provides that anyone (except in compliance with rules and regulations promulgated by authority of law) who hunts, traps, or willfully disturbs any such wildlife, or willfully injures, molests, or destroys any property of the United States on such land or water, shall be fined up to \$500 or imprisoned for not more than 6 months or both.

Emergency Wetland Resources Act of 1986:

Authorizes the purchase of wetlands from Land and Water Conservation Fund monies, 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 of 1973 and recent amendments (16 U.S.C. 1531–1543; 87 Stat. 884), as amended: This establishing legislation provides for conservation of threatened and endangered species of fish, wildlife, and plants by federal action and by encouraging state programs. Specific provisions include

the listing and determination of critical habitat for endangered and threatened species and consultation with the Service on any federally funded or licensed project that could affect any of these agencies;

prohibition of unauthorized taking, possession, sale, transport, etc., of endangered species;

an expanded program of habitat acquisition;

establishment of cooperative agreements and grants-in-aid to states that establish and

maintain an active, adequate program for endangered and threatened species;

assessment of civil and criminal penalties for violating the act or regulations.

Environmental Education Act of 1990 (20 U.S.C. 5501–5510; 104 Stat. 3325): PL 101-619, signed November 16, 1990, established the Office of Environmental Education within the U.S. Environmental Protection Agency (EPA) to develop and administer a federal environmental education program. Responsibilities of the office include developing and supporting programs to improve understanding of the natural and developed environment, and the relationships between humans and their environment; supporting the dissemination of educational materials; developing and supporting training programs and environmental education seminars; managing a federal grant program; and administering an environmental internship and fellowship program. The office is required to develop and support environmental programs in consultation with other federal natural resource management agencies, including the Service.

EO 11644—Use of Off-road Vehicles on Public Lands (1972): Provides policy and procedures for regulating off-road vehicles.

EO 11988—Floodplain Management: This executive order, signed May 24, 1977, prevents federal agencies from contributing to the “adverse impacts associated with occupancy and modification of floodplains” and the “direct or indirect support of floodplain development.” In the course of fulfilling their respective authorities, federal agencies “shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains.”

EO 12996—Management and General Public Use of the National Wildlife Refuge System (1996): Defines the mission, purpose, and priority public uses of the Refuge System. It also presents four principles to guide management of the system.

EO 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.

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.

Federal Records Act (1950): Requires the preservation of evidence of the government’s organization,

functions, policies, decisions, operations, and activities, as well as basic historical and other information.

Federal Water Pollution Control Act of 1972, Section 401 (PL 92-500; 86 Stat. 816, 33 U.S.C. 1411): Requires any applicant for a federal license or permit to conduct any activity that may result in a discharge into navigable waters to obtain a certification from the state in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over navigable waters at the point where the discharge originates or will originate, that the discharge will comply with applicable effluent limitations and water quality standards. A certification obtained for construction of any facility must also pertain to subsequent operation of the facility.

Federal Water Pollution Control Act of 1972, Section 404 (PL 92-500, 86 Stat. 816): Authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits, after notice and opportunity for public hearing, for discharge of dredged or fill material into navigable waters of the United States, including wetlands, at specified disposal sites. Selection of disposal sites will be in accordance with guidelines developed by the Administrator of the EPA in conjunction with the Secretary of the Army. Furthermore, the Administrator can prohibit or restrict use of any defined area as a disposal site whenever she/he determines, after notice and opportunity for public hearings, that discharge of such materials into such areas will have an unacceptable adverse effect on municipal water supplies, shellfish beds, fishery areas, wildlife, or recreational areas.

Fish and Wildlife Act of 1956 (70 Stat. 1119; 16 U.S.C. 742a–742j), as amended: Establishes a comprehensive fish and wildlife policy and directs the Secretary of the Interior to provide continuing research; and extension and conservation of fish and wildlife resources.

Fish and Wildlife Conservation Act of 1980 (PL 96-366, September 29, 1980, 16 U.S.C. 2901–2911, as amended 1986, 1988, 1990, and 1992): 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. All of 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 (1958): Allows the U.S. Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

Fish and Wildlife Improvement Act of 1978: Improves the administration of fish and wildlife programs and amends several earlier laws including the Refuge Recreation Act, the National Wildlife Refuge System Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers for Service projects and appropriations to carry out volunteer programs.

Historic Sites, Buildings and Antiquities Act (16 U.S.C. 461–462, 464–467): The act of August 21, 1935 (49 Stat. 666), popularly known as the “Historic Sites Act,” as amended by PL 89-249, approved October 9, 1965 (79 Stat. 971), declares it a national policy to preserve historic sites and objects of national significance, including those located at refuges. It provides procedures for designation, acquisition, administration, and protection of such sites. Among other things, National Historic and Natural Landmarks are designated under authority of this act. As of January 1989, 31 national wildlife refuges contained such sites.

Land and Water Conservation Fund Act of 1965: Provides funds from leasing bonuses, production royalties, and rental revenues for offshore oil, gas, and sulphur extraction to the Bureau of Land Management, the USDA Forest Service, the U.S. Fish and Wildlife Service, and state and local agencies for purchase of lands for parks, open space, and outdoor recreation.

Migratory Bird Conservation Act of 1929 (16 U.S.C. 715–715d, 715e, 715f–715r): Establishes the Migratory Bird Conservation Commission, which consists of the Secretaries of the Interior (chair), Agriculture, and Transportation; two members from the House of Representatives; and an ex-officio member from the state in which a project is located. The commission approves acquisition of land and water, or interests therein, and sets the priorities for acquisition of lands by the Secretary of the Interior for sanctuaries or for other management purposes. Under this act, to acquire lands or interests therein, the state concerned must consent to such acquisition by legislation. Such legislation has been enacted by most states.

Migratory Bird Conservation Act of 1929 (16 U.S.C. 715s, 45 Stat. 1222), as amended: Authorizes acquisition, development, and maintenance of

migratory bird refuges; cooperation with other agencies in conservation; and investigations and publications on North American birds. Authorizes payment of 25% of net receipts from administration of national wildlife refuges to the country or counties in which such refuges are located.

Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718–718h; 48 Stat. 51), as amended: The “Duck Stamp Act,” as this March 16, 1934 authority is commonly called, requires each waterfowl hunter 16 years of age or older to possess a valid federal hunting stamp. The act authorized the requirement of an annual stamp for the hunting of waterfowl. Proceeds go towards the purchase of habitat for waterfowl and other wildlife. Duck stamps are also purchased: (1) for entry into some refuges; (2) by conservationists; and (3) for stamp collections. Receipts from the sale of the stamp are deposited in a special Treasury account known as the Migratory Bird Conservation Fund and are not subject to appropriations.

Migratory Bird Treaty Act of 1918 (16 U.S.C. 703–711; 50 CFR subchapter B), as amended: Implements treaties with Great Britain (for Canada) and Mexico for protection of migratory birds whose welfare is a federal responsibility. The act provides for regulations to control taking, possession, selling, transporting, and importing of migratory birds and provides penalties for violations. This act enables the setting of seasons and other regulations (including the closing of areas, federal or nonfederal) related to the hunting of migratory birds.

National and Community Service Act of 1990 (42 U.S.C. 12401; 104 Stat. 3127): PL 101-610, signed November 16, 1990, authorizes several programs to engage citizens of the United States in full and part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. The act will make grants to states for the creation of programs for citizens over 17 years of age. Programs must be designed to fill unmet educational, human, environmental, and public safety needs. Initially, participants will receive postemployment benefits of up to \$1,000 per year for part-time and \$2,500 for full-time participants.

Several provisions are of particular interest to the Service:

American Conservation and Youth Service Corps: As a federal grant program established under subtitle C of the law, the corps offers an opportunity for young adults between the ages of 16 and 25, or in the case of summer programs, between 15 and 21, to engage in approved human and natural resources projects that 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. A stipend of not more than 100% of the poverty level will be paid to participants. A commission established to administer the Youth Service Corps will make grants to states, the Secretaries of Agriculture and Interior, and the Director of ACTION to carry out these responsibilities.

Thousand Points of Light: Creates a nonprofit Points of Light Foundation to administer programs to encourage citizens and institutions to volunteer to solve critical social issues, discover new leaders, and develop institutions committed to serving others.

National Environmental Policy Act of 1969 (PL 91-190, 42 U.S.C. 4321–4347, January 1, 1970, 83 Stat. 852) as amended by PL 94-52, July 3, 1975, 89 Stat. 258, and PL 94-83, August 9, 1975, 89 Stat. 424: Requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and the implementation of all actions, federal agencies must integrate the act with other planning requirements, and to prepare appropriate documents to facilitate better environmental decision making (40 CFR 1500). The act declares national policy to encourage a productive and enjoyable harmony between humans and their environment.

Section 102 of that act directs that “to the fullest extent possible

the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this act, and

all agencies of the Federal Government shall ... insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic technical considerations.”

Section 102(2)c of the NEPA requires all federal agencies, with respect to major federal actions significantly affecting the quality the quality of the human environment, to submit to the Council on Environmental Quality a detailed statement of

the environmental impact of the proposed action;

any adverse environmental effect that cannot be avoided should the proposal be implemented;

alternatives to the proposed action;

the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity;

any irreversible and irretrievable commitments of resources that would be involved in the proposed action, should it be implemented.

National Historic Preservation Act of 1966 (16 U.S.C. 470–470b, 470c–470n): PL 89-665, approved October 15, 1966 (80 Stat. 915), and repeatedly amended, provides for preservation of significant historical features (buildings, objects, and sites) through a grants-in-aid program to the states. It establishes the National Register of Historic Places and a program of matching grants under the existing National Trust for Historic Preservation (16 U.S.C. 468–468d). The act establishes the Advisory Council on Historic Preservation, which was made a permanent independent agency in PL 94-422, approved September 28, 1976 (90 Stat. 1319). That act also creates the Historic Preservation Fund. Federal agencies are directed to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register. As of January 1989, 91 historic sites at national wildlife refuges have been placed on the National Register.

National Wildlife Refuge System Administration Act of 1966 (PL 89-669; 80 Stat. 929; 16 U.S.C. 668dd–668ee), as amended: This act defines the Refuge System as including wildlife refuges, areas for protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas. The Secretary is authorized to permit any use of an area provided such use is compatible with the major purposes for which such area was established. The purchase considerations for rights-of-way go into the Migratory Bird Conservation Fund for the acquisition of lands. By regulation, up to 40% of an area acquired for a migratory bird sanctuary may be opened to migratory bird hunting unless the Secretary finds that the taking of any species of migratory game birds in more than 40% of such area would be beneficial to the species. The act requires an act of Congress for the divestiture of lands in the system, except for (1) lands acquired with Migratory Bird Conservation Commission funds, and (2) lands that can be removed from the system by land exchange, or if brought into the system by a cooperative agreement, then pursuant to the terms of the agreement.

National Wildlife Refuge System Improvement Act of 1997 (PL 105-57, October 9, 1997, Amendment to the National Wildlife Refuge System Administration Act of 1966): Sets the mission and the administrative policy for all refuges in the Refuge System. Clearly 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; establishes the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; and requires a CCP for each refuge by the

year 2012. This act amended portions of the Refuge Recreation Act and the National Wildlife Refuge System Administration Act of 1966.

Key provisions include the following:

a requirement that the Secretary of the Interior ensures maintenance of the biological integrity, diversity, and environmental health of the Refuge System;

the definition of compatible wildlife-dependent recreation as “legitimate and appropriate general public use of the [National Wildlife Refuge] System”;

the establishment of hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation as “priority public uses” where compatible with the mission and purpose of individual national wildlife refuges;

the refuge managers’ authority to use sound professional judgment in determining which public uses are compatible at national wildlife refuges and whether or not they will be allowed (a formal process for determining “compatible use” is currently being developed);

the requirement of open public involvement in decisions to allow new uses of national wildlife refuges and renew existing ones, as well as in the development of CCPs for national wildlife refuges.

National Wildlife Refuge Regulations (50 CFR 25-35, 43 CFR 3103.2 and 3120.3–3): Provides regulations for administration and management of national wildlife refuges including mineral leasing, exploration, and development.

Rights-of-way General Regulations (50 CFR 29.21; 34 FR 19907, December 19, 1969): Provides for procedures for filing applications. Provides terms and conditions under which rights-of-way over, above, and across lands administered by the Service may be granted.

Wilderness Preservation and Management (50 CFR 35; 78 Stat. 890; 16 U.S.C. 1131-1136; 43 U.S.C. 1201): Provides procedures for establishing wilderness units under the Wilderness Act of 1964 at units of the Refuge System.

National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998: The purposes of this act are: (1) to encourage the use of volunteers to assist the Service in the management of refuges within the Refuge System; (2) to facilitate partnerships between the Refuge System and nonfederal entities to promote public awareness of the resources of the Refuge System and public participation in the conservation of those resources; and (3) to encourage donations and other

contributions by persons and organizations to the Refuge System (PL 105-242; 112 Stat. 1575).

Native American Graves Protection and Repatriation Act (1990): Requires federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

North American Wetlands Conservation Act (103 Stat. 1968; 16 U.S.C. 4401–4412): PL 101-233, enacted December 13, 1989: An act to conserve North American wetland ecosystems, waterfowl and other migratory birds, fish, and wildlife that depend on such habitats. The act established a council to review project proposals and provided funding for the projects. The act provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, United States, 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% of the United States share of the cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100% of the cost of projects on federal lands). At least 50% and no more than 70% of the funds received are to go to Canada and Mexico each year.

Refuge Recreation Act of 1962: Authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the areas’ primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.

Refuge Recreation Act of 1966 (PL 87-714; 76 Stat. 653–654; 16 U.S.C. 460k et seq.): Authorizes appropriate, incidental, or secondary recreational use at conservation areas administered by the Secretary of the Interior for fish and wildlife purposes.

Refuge Revenue Sharing Act (16 U.S.C. 715s): Section 401 of the act of June 15, 1935 (49 Stat. 383) provides for payments to counties in lieu of taxes, using revenues derived from the sale of products from refuges.

PL 88-523, approved August 30, 1964 (78 Stat. 701): Makes major revisions by requiring 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.

PL 93-509, approved December 3, 1974 (88 Stat. 1603): Requires that moneys remaining in the fund after payments be transferred to the Migratory Bird Conservation Fund for land acquisition under provisions of the Migratory Bird Conservation Act.

PL 95-469, approved October 17, 1978 (92 Stat. 1319): Expands the revenue-sharing system to include national fish hatcheries and Service research stations. It also includes in the Refuge Revenue Sharing Fund receipts from the sale of salmonid carcasses. Payments to counties were established as follows:

On acquired land, the greatest amount calculated on the basis of 75 cents per acre, $\frac{3}{4}$ of 1% of the appraised value, or 25% of the net receipts produced from the land.

On land withdrawn from the public domain, 25% of net receipts and basic payments under PL 94-565 (31 U.S.C. 1601–1607, 90 Stat. 2662), payment in lieu of taxes on public lands.

This amendment also authorizes appropriations to make up any difference between the amount in the fund and the amount scheduled for payment in any year. The stipulation that payments be used for schools and roads was removed, but counties were required to pass payments along to other units of local government within the county that suffer losses in revenues due to the establishment of Service areas.

Refuge Revenue Sharing Act of 1978 [PL 95-469, October 17, 1978, (amended 16 U.S.C. 715s); 50 CFR, part 34]: Changes the provisions for sharing revenues with counties in a number of ways. It makes revenue sharing applicable to all lands administered by the Service, whereas previously it was applicable only to areas in the Refuge System. The new law makes payments available for any governmental purpose, whereas the old law restricted the use of payments to roads and schools. For lands acquired in fee simple, the new law provides a payment of 75 cents per acre, $\frac{3}{4}$ of 1% of fair market value or 25% of net receipts, whichever is greatest, whereas the old law provided a payment of $\frac{3}{4}$ of 1% adjustment cost or 25% of net receipts, whichever was greater. The new law makes reserve (public domain) lands entitlement lands under PL 94-565 (16 U.S.C. 1601–1607, and provides for a payment of 25% of net receipts. The new law authorizes appropriations to make up any shortfall in net receipts, to make payments in the full amount

for which counties are eligible. The old law provided that if net receipts were insufficient to make full payment, payment to each county would be reduced proportionality.

Refuge Trespass Act of June 28, 1906 (18 U.S.C. 41; 43 Stat. 98, 18 U.S.C. 145): Provides the first federal protection for wildlife at national wildlife refuges. This act makes 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.

Refuge Trespass Act of June 25, 1948 (18 U.S.C. 41. Stat 686), section 41 of the Criminal Code, title 18: Consolidates the penalty provisions of various acts from January 24, 1905 (16 U.S.C. 684–687; 33 Stat. 614), through March 10, 1934 (16 U.S.C. 694–694b; 48 Stat. 400) and restates the intent of Congress to protect all wildlife within federal sanctuaries, refuges, fish hatcheries, and breeding grounds.

The act provides that anyone (except in compliance with rules and regulations promulgated by authority of law) who hunts, traps, or willfully disturbs any wildlife on such areas, or willfully injures, molests, or destroys any property of the United States on such lands or waters, shall be fined, imprisoned, or both.

Rehabilitation Act of 1973 (29 U.S.C. 794), as amended: Title 5 of PL 93-112 (87 Stat. 355), signed October 1, 1973, prohibits discrimination on the basis of handicap under any program or activity receiving federal financial assistance.

Rivers and Harbors Act (1899): Section 10 of this act requires the authorization of USACE prior to any work in, on, over, or under navigable waters of the United States.

Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 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 of 1964 [PL 88-577, September 3, 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 the Refuge System and National Park Service for inclusion in the National Wilderness Preservation System.

Laws and Executive Orders that Regulate Recreational Use on the Refuge System

Alaska National Interest Lands Conservation Act of 1980 [16 U.S.C. 410 hh3233] [43 U.S.C. 1602–1784]

Alaska Native Claims Settlement Act [43 U.S.C. 1601–1624]

Antiques Act of 1906 [16 U.S.C. 431–433]

Archaeological and Historic Preservation Act of 1960 [16 U.S.C. 469–469c], as amended

Archaeological Resources Protection Act of 1979 [16 U.S.C. 470aa–470mm]

Comprehensive Environmental Responses, Compensation and Liability Act of 1980

Endangered Species Act of 1973 [16 U.S.C. 1531–1544], as amended

The Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)], as amended

Fish and Wildlife Conservation Act [16 U.S.C. 2901–2911], as amended

The Fish and Wildlife Coordination Act [16 U.S.C. 661(1)–662(c)]

Fish and Wildlife Improvement Act of 1978 [16 U.S.C. 7421]

Historic Sites, Building and Antiquities Act of 1935 [16 U.S.C. 461–462, 464–467]

Land and Water Conservation Fund [16 U.S.C. 460(l–4)–(l–11)], as amended.

Migratory Bird Conservation Act of 1929 [16 U.S.C. 715–715d, 715e, 715f–715r], as amended

National Wildlife Refuge System Administration Act of 1966 [16 U.S.C. 668dd–669ee], as amended

National Wildlife Refuge System Improvement Act of 1997

Natural Historic Preservation Act of 1966 [16 U.S.C. 470–470b, 470c–470n], as amended

Refuge Recreation Act of 1962 [16 U.S.C. 460k–460k4], as amended

Refuge Recreation Act of 1969 [16 U.S.C. 460k–460k4], as amended

Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended

Wild and Scenic Rivers Act [16 U.S.C. 1271–1287], as amended

Wilderness Act of 1964 [16 U.S.C. 1131–1136]

EO 11593—Protection and Enhancement of the Cultural Environment; Protection of Historical, Archaeological, and Scientific Properties

EO 11644—Use of Off-road Vehicles on Public Lands

EO 11988—Floodplain Management

EO 11990—Protection of Wetlands

EO 12372—Intergovernmental Review of Federal Program

Laws and Executive Orders that Regulate Recreational Use on the Refuge System

EO 12962—Recreational Fisheries

EO 12996—Management and General Public Use of the National Wildlife Refuge System

EO 13006—Locating Federal Facilities On Historic Properties In Our Nation’s Central Cities

EO 13007—Indian Sacred Sites

EO 13287—Preserve America

Appendix B

Contributors

This draft CCP and EA is the result of extensive, collaborative, and enthusiastic efforts by the 18 members of the Souris River basin refuges planning team below. Many others contributed insight and support.

Planning Team

<i>Name</i>	<i>Title</i>	<i>Agency</i>
Lee Albright	Former WMD manager, J. Clark Salyer NWR	USFWS
Duane Anderson	Biological science technician, Upper Souris NWR	USFWS
Mark Ely	GIS specialist	USFWS
Gary Erickson	Refuge manager, J. Clark Salyer NWR	USFWS
Fred Giese	Former project leader, Des Lacs NWR	USFWS
Todd Grant	Wildlife biologist, Souris River Basin Complex	USFWS
Toni Griffin	Planning team leader	USFWS
Tedd Gutzke	Project leader, Souris River Basin Complex	USFWS
Robert Howard	Former project leader, J. Clark Salyer NWR	USFWS
Dean Knauer	Former project leader, Upper Souris NWR	USFWS
Randy Kreil	Division chief, wildlife division	NDGF
Darla Leslie	Administrative assistant, Upper Souris NWR	USFWS
Chase Marshall	Fire management officer, J. Clark Salyer NWR	USFWS
Robert Murphy	Former wildlife biologist, Des Lacs NWR	USFWS
Tom Pabian	Refuge manager, Upper Souris NWR	USFWS
Scott Peterson	Wildlife resource management supervisor	NDGF
Dan Severson	Refuge manager, Des Lacs NWR	USFWS

Bob Murphy and Todd Grant (wildlife biologists for Des Lacs NWR Complex and J. Clark Salyer NWR Complex, respectively) were principle authors of the biological portions of this draft CCP and EA, in addition to their overall team participation.

Contributors

The Service would like to acknowledge the efforts of the following individuals toward the completion of this draft CCP and EA. The diversity, talents, and knowledge contributed by these individuals dramatically improved the vision and completeness of this document.

<i>Name</i>	<i>Title</i>	<i>Agency</i>
Bob Barrett	Deputy refuge supervisor; North Dakota, South Dakota	USFWS
Elgin Crows Breast	Cultural preservation officer	Three Affiliated Tribes
Rick Coleman	Assistant regional director, NWRS	USFWS

<i>Name</i>	<i>Title</i>	<i>Agency</i>
Megan Estep	Regional hydrologist	USFWS
Larry Gamble	Environmental contaminants coordinator	USFWS
Galen Green	Fire ecologist, <i>retired</i>	USFWS
Lloyd Jones	Regional compatibility coordinator	USFWS
Linda Kelly	<i>Former</i> branch chief, comprehensive conservation planning	USFWS
Jim Kelton	Regional fire management specialist	USFWS
Wayne King	Regional biologist	USFWS
Lynne Koontz	Economist	USGS, Fort Collins Science Center
Rod Krey	Refuge supervisor; North Dakota, South Dakota	USFWS
Murray Laubhan	Biologist	USGS, Northern Prairie Wildlife Research Center
Rachael Laubhan	Biologist	USFWS
Johnida Martin	<i>Former</i> wildlife biologist, Upper Souris NWR	USFWS
Rich Meyer	Tribal member	Three Affiliated Tribes
Bruce Nadeau	Tribal member	Turtle Mountain Band of Chippewa
Steve Odegaard	Resource manager	USACE
Deb Parker	Writer-editor	USFWS
Davis Redhorse	Native American liaison	USFWS
Cory Rubin	<i>Former</i> wildlife biologist, Upper Souris NWR	USFWS
Natalie Sexton	Wildlife biologist	USGS, Fort Collins Science Center
Michael Spratt	Division chief, division of refuge planning	USFWS
Jeffery Towner	Field supervisor, ecological services, Bismarck, ND	USFWS
Connie Young-Dubovsky	Regional NEPA coordinator	USFWS

Appendix C

Public Involvement

Public scoping began January 17, 2003, with publication of an NOI in the Federal Register to prepare comprehensive conservation plans and associated environmental documents for the three Souris River basin refuges.

In March 2003, a planning update was sent to each individual, organization, and government representative on the CCP mailing list (see list below). The planning update provided information on the history of the Refuge System and the CCP process, along with an invitation and schedule to upcoming open houses.

Open houses were announced in local newspapers, radio, and television stations. Flyers were posted at local businesses throughout the region, and announcements were made at meetings of local organizations including Minot City Council, Bottineau County Wildlife Club, and Bottineau Rotary Club.

Six public open houses were held in local communities throughout the Souris River basin area March 24–27, 2003. At the start of each meeting, the CCP planner or refuge personnel gave a presentation on the history of the program, along with an overview of the CCP and NEPA processes. Attendees were encouraged to ask questions and offer comments. The turnout was mixed, from a few attendees to 18 individuals at a single-refuge meeting. In addition to scoping meetings, postage-paid comment forms were sent to everyone on the mailing list.

A second planning update was distributed in November 2003. This update provided information about the on-going public involvement effort and a summary of public comments that were received during the public open houses.

A total of 57 comments were received during the scoping effort. Input obtained from open houses, letters, comment forms, and planning updates was considered in developing this draft CCP. These comments identified biological, social, and economic concerns regarding refuge management.

The planning team's response to public comments will be completed prior to final approval of the CCP.

The following list of recipients was developed for this draft CCP.

Federal Officials

U.S. Representative Earl Pomeroy, Washington DC
Rep. Pomeroy's Area Director, Bismarck, ND

U.S. Senator Kent Conrad, Washington DC
Sen. Conrad's Area Director, Minot, ND

U.S. Senator Byron Dorgan, Washington DC
Sen. Dorgan's Area Director, Minot, ND

Federal Agencies

USACE, Fargo, ND

U.S. Fish and Wildlife Service, Bismarck, ND

U.S. Fish and Wildlife Service, Ecological Services,
Bismarck, ND

U.S. Fish and Wildlife Service, Region 6 Missouri
River Fish and Wildlife Management Office,
Bismarck, ND

USGS, Northern Prairie Wildlife Research Center,
Jamestown, ND

USGS, Fort Collins Science Center, Fort Collins, CO

Tribal Officials

Fort Peck Tribal Executive Board, Poplar, MT

Sisseton–Wahpeton Sioux Tribe, Agency Village, SD

Spirit Lake Tribal Council, Fort Totten, ND

Standing Rock Sioux Tribe, Fort Yates, ND

Three Affiliated Tribes, New Town, ND

Turtle Mountain Band of Chippewa, Belcourt, ND

State Officials

Governor John Hoeven, Bismarck, ND

Representative Glen Froseth, Kenmare, ND

Representative Bob Hunskor, Newburg, ND

Senator David O'Connell, Lansford, ND

State Agencies

NDGF, Bismarck, ND
NDGF, Minot, ND
NDGF, Riverdale, ND
North Dakota State Water Commission, Bismarck, ND

Local Government

Callahan Township Chairman, Carpio, ND
Council Chair, Carpio, ND
Grassland Township Chairman, Lansford, ND
Grover Township Chairman, Tolley, ND
Hamlet Township Chairman, Mohall, ND
Lockwood Township Chairman, Lansford, ND
Mayland Township Chairman, Carpio, ND
Mayor of Berthold, ND
Mayor of Burlington, ND
Mayor of Carpio, ND
Mayor of Des Lacs, ND
Mayor of Donnybrook, ND
Mayor of Glenburn, ND
Mayor of Grano, ND
Mayor of Kenmare, ND
Mayor of Lansford, ND
Mayor of Minot, ND
Mayor of Mohall, ND
Mayor of Tolley, ND
Mayor of Sherwood, ND
McKinney Township Chairman, Tolley, ND
Mouse River Park Board, Sherwood and Tolley, ND
Muskego Township Chairman, Lansford, ND
Plain Township Chairman, Carpio, ND
Renville County Agent, Mohall, ND
Renville County Auditor, Mohall, ND
Renville County Commissioners, Mohall, ND
Renville County District Conservationist, Mohall, ND
Renville County Historical Society, Sherwood, ND

Renville County Sheriff's Office, Mohall, ND
Renville County Soil Conservation Technician, Mohall, ND
Renville County Water Board Chairman, Mohall, ND
Renville County Water Board, Glenburn and Kenmare, ND
Renville County Weed Board Chairman, Kenmare, ND
Roosevelt Township Chairman, Sherwood, ND
St. Mary's Township Chairman, Berthold, ND
Ward County Commissioners, Minot, ND
Ward County Engineer, Minot, ND
Ward County Historical Society, Minot, ND
Ward County Sheriff's Office, Minot, ND
Ward County Water Resource Board, Minot, ND
Ward County Weed Control Officer, Minot, ND

Local Fire Departments

Carpio Rural Fire District, Carpio, ND
Lansford Rural Fire District, Lansford, ND
Mohall Rural Fire District, Mohall, ND
Tolley Fire Department, Kenmare, ND

Universities, Schools, and Libraries

Glenburn School Board President, Glenburn, ND
Kenmare School Board President, Kenmare, ND
Mohall, Lansford, and Sherwood (MLS) School District #1, Mohall, ND
United School District Board President, Des Lacs, ND

Organizations

Berthold Sportsman Club, Berthold, ND
Hooterville Flying Lions, Minot, ND
The Humane Society of the United States, Washington, DC
Kenmare Chamber of Commerce, Kenmare, ND
Kenmare Goosefest, Kenmare, ND
Minot Area Chamber of Commerce, Minot, ND
Minot Convention and Visitors Bureau, Minot, ND
Minot Pheasants for the Future, Minot, ND

Mouse River Basin Longbeards, Granville, ND

Mouse River Pheasants, Mohall, ND

North Dakota Wildlife Federation, Minot, ND

Rolling Plains Sportsman Club, Stanley, ND

Roosevelt Park Zoo, Minot, ND

Souris Valley Bird Club, Minot, ND

Theodore Roosevelt Nature and History
Association, Medora, ND

Vets Gaming Board, Kenmare, ND

The Wilderness Society, Washington DC

Newspapers

Renville County Farmer, Mohall, ND

Minot Daily News, Minot, ND

Radio and Television Stations

KCJB Radio, Minot, ND

KMOT TV, Minot, ND

KXMC TV, Minot, ND

North Dakota Public Radio, Bismarek, ND

Individuals

141 persons

Appendix D

Plants of the Souris River Basin Refuges

This list includes 410 plant species for which specimens were collected from the Souris River basin refuges during 1998–2005. For each, at least one specimen was mounted, its taxonomy was verified by expert botanists, and specimen(s) were permanently stored in a herbarium at one or more of the three refuges. This is not an exhaustive list of plant species found in the Souris River basin refuges and some omissions are likely.

Nomenclature follows that of the Great Plains Flora Association (1986).

Polypodiaceae (True Fern Family)

Cystopteris fragilis—fragile fern

Equisetaceae (Horsetail Family)

Equisetum arvense—common horsetail

Equisetum laevigatum—smooth scouring rush

Selaginellaceae (Spikemoss Family)

Selaginella densa—clubmoss

Cupressaceae (Cypress Family)

Juniperus scopulorum—Rocky Mountain juniper

Alismataceae (Waterplantain Family)

Alisma gramineum—grass water plantain

Alisma plantago-aquatica—water plantain

Sagittaria cuneata—arrowhead

Juncaginaceae (Arrowgrass Family)

Triglochin maritima—arrowgrass

Triglochin palustris—arrowgrass

Potamogetonaceae (Pondweed Family)

Potamogeton pectinatus—sago pondweed

Potamogeton richardsonii—claspingleaf pondweed

Zannichelliaceae (Horned Pondweed Family)

Zannichellia palustris—horned pondweed

Juncaceae (Rush Family)

Juncus balticus—Baltic rush

Juncus interior—inland rush

Juncus torreyi—Torrey's rush

Cyperaceae (Sedge Family)

Carex atherodes—slough sedge

Carex brevior—fescue sedge

Carex douglassii—Douglas's sedge

Carex duriuscula (+*Carex eleocharis*)—needleleaf sedge

Carex emoryi—Emory's sedge

Carex filifolia—threadleaf sedge

Carex gravida—heavy sedge

Carex hallii—Hall's sedge

Carex inops subsp. *heliophila* (+*Carex heliophila*)—sun sedge

Carex lacustris—unnamed sedge

Carex laeviconica—glabrous sedge

Carex lanuginosa—woolly sedge

Carex obtusata—unnamed sedge

Carex pellita—woolly sedge

Carex praegracilis—clustered field sedge

Carex rosea—unnamed sedge

Carex sartwellii—Sartwell's sedge

Carex spengelii—long-beaked sedge

Carex sychnocephala—dense long-beaked sedge

Carex tetanica—unnamed sedge

Cyperus schweinitzii—Schweinitz's flatsedge

Eleocharis acicularis—needle spikesedge

Eleocharis erythropoda—spikesedge

Eleocharis obtusata—blunt spikesedge

Eleocharis palustris—common spikerush

Schoenoplectus acutus (+*Scirpus acutus*)—hardstem bulrush

Scirpus americanus—three-square

Scirpus fluviatilis—river bulrush

Scirpus heterochaetus—slender bulrush

Scirpus maritimus var. *paludosus*—prairie bulrush

Scirpus nevadensis—Nevada bulrush

Scirpus tabernaemontani—softstem bulrush

Poaceae (Grass Family)

Agropyron caninum—slender wheatgrass

Agropyron caninum subsp. *majus* var.

unilaterale—bearded wheatgrass

Agropyron cristatum—crested wheatgrass

Agropyron repens—quackgrass

Agropyron smithii—western wheatgrass

Agrostis scabra—tickleglass

Alopecurus aequalis—short-awn foxtail

Alopecurus arundinaceus—creeping foxtail
Andropogon gerardii—big bluestem
Andropogon hallii—sand bluestem
Andropogon scoparius—little bluestem
Aristida purpurea—three-awn
Beckmannia syzigachne—American sloughgrass
Bouteloua curtipendula—sideoats grama
Bouteloua gracilis—blue gramma
Bromus inermis—smooth brome
Buchloe dactyloides—buffalo grass
Calamovilfa longifolia—prairie sandreed
Dichanthelium wilcoxianum—Wilcox dichanthelium
Distichlis spicata var. *stricta*—inland saltgrass
Echinochloa muricata—barnyard grass
Elymus canadensis—Canada wild rye
Eragrostis cilianensis—stinkgrass
Festuca ovina—sheep's fescue
Glyceria grandis—American mannagrass
Glyceria striata—fowl mannagrass
Helictotrichon hookeri—spike oat
Hierochloa odorata—sweetgrass, vanilla grass
Hordeu jubatum—foxtail barley
Koeleria pyramidata—Junegrass
Muhlenbergia asperifolia—scratchgrass
Muhlenbergia cuspidate—plains muhly
Panicum capillare—witchgrass
Panicum virgatum—switchgrass
Phalaris arundinacea—canarygrass
Phleum pratense—timothy
Phragmites australis—common reed
Poa arida—plains bluegrass
Poa cusickii—early bluegrass
Poa juncifolia—bluegrass
Poa pratensis—Kentucky bluegrass
Poa sandbergii—Sandberg bluegrass
Puccinellia nuttalliana—Nuttall's alkaligrass
Schizachne purpurascens—false melic
Scholochloa festucacea—whitetop
Setaria viridis—green foxtail
Spartina gracilis—alkali cordgrass
Spartina pectinata—prairie cordgrass
Sporobolus cryptandrus—sand dropseed
Sporobolus heterolepis—prairie dropseed
Stipa comata—needle and thread
Stipa spartea—porcupine grass
Stipa viridula—green needlegrass

Sparganiaceae (Bur-reed Family)

Sparganium eurycarpum—giant bur-reed

Typhaceae (Cattail Family)

Typha angustifolia—narrowleaf cattail

Typha angustifolia × *latifolia*—hybrid cattail

Typha latifolia—common cattail

Lemnaceae (Duckweed Family)

Lemna trisulca—star duckweed

Lemna turionifera—duckweed

Commelinaceae (Spiderwort Family)

Tradescantia bracteata—spiderwort

Liliaceae (Lily Family)

Allium stellatum—pink wild onion

Allium textile—white wild onion, textile onion

Asparagus officinalis—asparagus

Hypoxis hirsuta—yellow stargrass

Lilium philadelphicum—wild lily

Maianthemum canadense—lily-of-the-valley

Smilacina stellata—spikenard

Zigadenus elegans—white camas

Smilacaceae (Catbrier Family)

Smilax herbacea—carrion flower

Iridaceae (Iris Family)

Sisyrinchium montanum—blue-eyed grass

Orchidaceae (Orchid Family)

Cypripedium calceolus—yellow ladyslipper

Salicaceae (Willow Family)

Populus balsamifera—balsam poplar

Populus deltoides—cottonwood

Populus tremuloides—aspen

Salix amygaloides—peachleaf willow

Salix bebbiana—beaked willow

Salix discolor—pussy willow

Salix eriocephala—diamond willow

Salix exigua subsp. *interior*—sandbar willow

Salix humilis var. *microphylla*—prairie willow

Salix lutea—yellow willow

Salix petiolaris—meadow willow

Fagaceae (Beech/Oak Family)

Quercus macrocarpa—bur oak

Ulmaceae (Elm Family)

Ulmus americana—American elm

Cannabaceae (Hemp Family)

Humulus lupulus—common hops

Urticaceae (Nettle Family)

- Laportea canadensis*—wood nettle
Urtica dioica—stinging nettle

Santalaceae (Sandalwood Family)

- Commandra umbellata*—bastard toadflax

Polygonaceae (Buckwheat Family)

- Eriogonum flavum*—yellow wild buckwheat
Polygala alba—white milkwort
Polygonum amphibium var. *emursum*—
 marsh smartweed
Polygonum amphibium var. *stipulaceum*—
 water smartweed
Polygonum coccineum—marsh smartweed
Polygonum lapathifolium—pale smartweed
Polygonum ramosissimum—knotweed
Rumex crispus—curled dock
Rumex maritimus—golden dock
Rumex stenophyllus—dock

Chenopodiaceae (Goosefoot Family)

- Atriplex nuttallii*—moundscale
Atriplex subspicata—spearscale
Chenopodium album—lamb's quarters
Chenopodium leptophyllum—narrow-leaved
 goosefoot
Kochia scoparia—kochia, fireweed
Salsola iberica—Russian thistle

Amaranthaceae (Amaranth Family)

- Amaranthus retroflexus*—pigweed

Nyctaginaceae (Four O'clock Family)

- Mirabilis nyctaginea*—wild four o'clock

Portulacaceae (Purslane Family)

- Portulaca oleracea*—common purslane

Caryophyllaceae (Pink Family)

- Cerastium arvense*—prairie chickweed
Cerastium nutans—nodding chickweed
Gypsophila paniculata—baby's breath
Silene pratensis—white campion
Stellaria crassifolia—fleshy stichwort

Ceratophyllaceae (Hornwort Family)

- Ceratophyllum demersum*—coontail

Ranunculaceae (Buttercup Family)

- Actea rubra*—baneberry
Anemone canadensis—Canada anemone,
 meadow anemone

- Anemone cylindrica*—candle anemone
Anemone patens—pasqueflower
Ranunculus abortivus—early wood buttercup
Ranunculus cymbalaria—shore buttercup
Ranunculus flabellaris—yellow water-crowfoot
Ranunculus longirostris—white water-crowfoot
Ranunculus macounii—Macoun's buttercup
Ranunculus pensylvanicus—bristly crowfoot
Ranunculus sceleratus—cursed crowfoot
Ranunculus subrigidus—white water-crowfoot
Thalictrum venulosum—early meadowrue

Menispermaceae (Moonseed Family)

- Menispermum canadense*—moonseed

Brassicaceae (Mustard Family)

- Arabis divaricarpa*—rock cress
Arabis holboellii—rock cress
Berteroa incana—hoary false alyssum
Brassica kaber—charlock
Capsella bursa-pastoris—shepherd's purse
Descurainia sophia—flixweed
Draba nemorosa—yellow whitlowort
Erysimum asperum—western wallflower
Lepidium densiflorum—peppergrass
Lesquerella ludoviciana—bladderpod
Rorripa plaustris—bog yellow cress
Sisymbrium altissimum—tumble mustard
Sisymbrium loeselli—tall hedge mustard
Thlaspi arvense—field pennycress

Capparidaceae (Caper Family)

- Cleome serrulata*—Rocky Mountain bee plant

Saxifragaceae (Saxifrage Family)

- Heuchera richardsonii*—alumroot
Ribes americanum—wild black current

Rosaceae (Rose Family)

- Agrimonia striata*—striate agrimony
Amelanchier alnifolia—Saskatoon serviceberry
Chamaerhodos erecta—little ground rose
Crataegus rotundifolia—northern hawthorn
Fragaria virginiana—wild strawberry
Geum triflorum—torch flower
Potentilla anserina—silverweed
Potentilla arguta—tall cinquefoil
Potentilla norvegica—Norwegian cinquefoil
Potentilla paradoxa—bushy cinquefoil
Potentilla pensylvanica—cinquefoil
Prunus americana—wild plum
Prunus pensylvanica—pin cherry
Prunus virginiana—chokecherry
Rosa arkansana—prairie wild rose

Rosa woodsii—western wild rose, Woods' rose
Rubus idaeus—red raspberry
Spiraea alba—meadow-sweet

Fabaceae (Bean Family)

Amorpha canescens—leadplant
Amorpha nana—dwarf wild indigo
Astragalus adsurgens var. *robustior*—standing milk-vetch
Astragalus agrestis—field milkvetch
Astragalus bisulcatus—two-grooved vetch
Astragalus canadensis—Canada milkvetch
Astragalus crassicaarpus—ground-plum
Astragalus flexuosus—pliant mildvetch
Astragalus missouriensis—Missouri milkvetch
Astragalus pectinatus—narrow-leaved poinsonvetch
Astragalus tenellus—pulse milkvetch
Caragana araboescens—Siberian pea-shrub
Dalea candida—white prairie clover
Dalea purpurea—purple prairie clover
Dalea villosa—silky prairie clover
Glycyrrhiza lepidota—wild licorice
Lathyrus ochroleucus—yellow vetchling
Lathyrus venosus—bushy vetchling
Medicago lupulina—black medic
Medicago sativa—alfalfa
Melilotus alba—white sweetclover
Melilotus officianalis—yellow sweetclover
Oxytropis campestris—plains loco
Oxytropis campestris var. *gracilis*—slender locoweed
Oxytropis lambertii—purple locoweed
Oxytropis splendens—showy locoweed
Psoralea argophylla—silver-leaf scurf pea
Psoralea esculenta—breadroot scurf-pea
Thermopsis rhombifolia—prairie buckbean
Vicia americana minor—American vetch

Oxalidaceae (Woodsorrel Family)

Oxalis stricta—yellow wood sorrel

Linaceae (Flax Family)

Linum perenne—blue flax
Linum rigidum var. *compactum*—compact stiffstem flax
Linum rigidum var. *rigidum*—stiffstem flax
Linum sulcatum—grooved flax

Euphorbiaceae (Spurge Family)

Euphorbia esula—leafy spurge
Euphorbia glyptosperma—ridge-seeded spurge

Rhamnaceae (Buckthorn Family)

Rhamnus cathartica—common buckthorn

Callitrichaceae (Water Starwort Family)

Callitriche hermaphroditica—water starwort

Anacardiaceae (Sumac Family)

Rhus glabra—smooth sumac
Toxicodendron radicans—poison ivy

Aceraceae (Maple Family)

Acer negundo—boxelder

Balsaminaceae (Balsam Family)

Impatiens capensis—spotted touch-me-not

Vitaceae (Grape Family)

Parthenocissus quinquefolia—Virginia creeper
Vitis riparia—river-bank grape

Malvaceae (Mallow Family)

Sphaeralcea coccinea—red false mallow

Violaceae (Violet Family)

Viola adunca—hook-spurred violet
Viola canadensis—tall white violet
Viola nuttallii—Nuttall's violet
Viola pedatifida—prairie violet
Viola rugulosa—tall white violet

Cactaceae (Cactus Family)

Coryphantha vivipara—pincushion cactus
Opuntia fragilis—little prickly pear
Opuntia polycantha—plains prickly pear

Elaeagnaceae (Oleaster Family)

Elaeagnus angustifolia—Russian olive
Elaeagnus commutata—silverberry
Shepherdia argentea—buffaloberry

Onagraceae (Evening Primrose Family)

Calylophus serrulatus—plains yellow primrose
Epilobium angustifolium—fireweed
Epilobium ciliatum subsp. *glandulosum*—willow herb
Gaura coccinea—scarlet gaura
Oenothera biennis—common evening primrose
Oenothera nuttallii—white-stemmed evening primrose

Haloragaceae (Water Milfoil Family)*Myriophyllum exalbescens*—water milfoil**Araliaceae (Ginseng Family)***Aralia nudicaulis*—wild sarsaparilla**Apiaceae (Parsley Family)***Cicuta maculata*—common water hemlock*Heracleum sphondylium*—cow parsnip*Musineon divaricatum*—wild parsley*Osmorhiza longistylis*—anise root*Sanicula marilandica*—black snakeroot*Sium suave*—water parsnip*Zizia aptera*—meadow parsnip**Cornaceae (Dogwood Family)***Cornus stolonifera*—redosier dogwood**Ericaceae (Heath Family)***Arctostaphylos uva-ursi*—bearberry**Primulaceae (Primrose Family)***Androsace occidentalis*—western rock
jasmine*Dodecatheon pulchellum*—shooting star*Lysimachia ciliata*—fringed loosestrife*Lysimachia hybrida*—loosestrife*Lysimachia thyrsoiflora*—tufted loosestrife**Oleaceae (Olive Family)***Fraxinus pennsylvanica*—green ash*Syringa vulgaris*—lilac**Gentianaceae (Gentian Family)***Gentiana affinis*—northern gentian**Apocynaceae (Dogbane Family)***Apocynum androsaemifolium*—spreading
dogbane**Asclepiadaceae (Milkweed Family)***Asclepias incarnata*—swamp milkweed*Asclepias involucrate*—dwarf milkweed*Asclepias ovalifolia*—ovalleaf milkweed*Asclepias syriaca*—common milkweed*Asclepias verticillata*—whorled milkweed*Asclepias viridiflora*—green milkweed**Convolvulaceae (Morning-glory Family)***Convolvulus arvensis*—field bindweed*Calystegia sepium* subsp. *angulata*—hedge
bindweed**Cuscutaceae (Dodder Family)***Cuscuta gronovii*—Gronovius' dodder**Polemoniaceae (Phlox Family)***Collomia linearis*—collomia*Phlox hoodii*—Hood's phlox**Boraginaceae (Borage Family)***Hackelia deflexa*—stickseed*Lithospermum canescens*—hoary puccoon*Lithospermum incisum*—narrow leaved
puccoon*Mertensia lanceolata*—lungwort, wild forget-
me-not*Onosmodium molle* var. *occidentale*—false
gromwell**Verbenaceae (Verbena Family)***Verbena bracteata*—prostrate vervain*Verbena hastata*—swamp vervain**Lamiaceae (Mint Family)***Agastache foeniculum*—lavender hyssop*Hedeoma hispida*—rough false pennyroyal*Lycopus americanus*—American bugleweed*Lycopus asper*—rough bugleweed*Mentha arvensis*—field mint*Monarda fistulosa*—wild bergamot*Nepeta cataria*—catnip*Physostegia parviflora*—obedient plant*Scutellaria galericulata*—marsh skullcap*Scutellaria lateriflora*—blue skullcap*Stachys palustris*—hedge nettle*Teucrium canadense*—American germander**Hippuridaceae (Mare's-tail Family)***Hippuris vulgaris*—common mare's-tail**Solanaceae (Nightshade Family)***Physalis virginiana*—Virginia ground cherry*Solanum triflorum*—cut-leaved nightshade**Scrophulariaceae (Figwort Family)***Castilleja sessiliflora*—downy paintbrush*Limmosella aquatica*—mudwort*Linaria vulgaris*—butter and eggs*Orthocarpus luteus*—owl clover*Penstemon albidus*—white beardtongue*Penstemon angustifolius*—narrow beardtongue*Penstemon gracilis*—slender beardtongue**Lentibulariaceae (Bladderwort Family)***Utricularia vulgaris*—common bladderwort

Plantaginaceae (Plantain Family)

- Plantago major*—common plantain
Plantago rugelii—Rugel's plantain

Rubiaceae (Madder Family)

- Galium boreale*—northern bedstraw
Hedyotis longifolia—slender-leaved bluet

Caprifoliaceae (Honeysuckle Family)

- Lonicera dioica*—limber honeysuckle
Lonicera tatarica—tartarian honeysuckle
Symphoricarpos occidentalis—western snowberry
Viburnum lentago—nannyberry

Cucurbitaceae (Gourd Family)

- Echinocystis lobata*—wild cucumber

Campanulaceae (Bluebell Family)

- Campanula rotundifolia*—harebell
Lobelia kalmii—Kalm's lobelia

Asteraceae (Aster Family)

- Achillea millefolium*—yarrow
Agoseris glauca—false dandelion
Ambrosia psilostachya—western ragweed
Antennaria microphylla—pink pussy-toes
Antennaria neglecta—field pussytoes
Antennaria parvifolia—pussy-toes
Arctium minus—common burdock
Artemisia absinthium—wormwood
Artemisia cana—dwarf sagebrush
Artemisia dracuncululus—silky wormwood
Artemisia frigida—fringed sage
Artemisia longifolia—long-leaved sage
Artemisia ludoviciana—white sage
Aster ericoides—white aster
Aster falcatus—smallflower aster
Aster hesperius—marsh aster
Aster laevis—smooth blue aster
Aster oblongifolia—aromatic aster
Aster simplex—panicled aster
Bidens comosa—beggar-ticks
Bidens frondosa—beggar-ticks
Bidens vulgate—beggar-ticks
Centaurea maculosa—spotted knapweed
Chrysopsis villosa—golden aster

- Chrysothamnus nauseosus*—rabbit brush
Cirsium arvense—Canada thistle
Cirsium flodmanii—Floodman's thistle
Cirsium undulatum—wavy-leaf thistle
Cirsium vulgare—bull thistle
Conyza Canadensis—horse-weed
Crepis runcinata—hawksbeard
Echinacea angustifolia—purple coneflower
Erigeron strigosus—daisy fleabane
Euthamia graminifolia—narrow-leaved goldenrod
Gaillardia aristata—blanket flower
Grindelia squarrosa—curly-top gumweed
Gutierrezia sarothrae—snakeweed
Haplopappus spinulosus—ironplant
Helianthus annuus—common sunflower
Helianthus maximilianii—Maximilian sunflower
Helianthus nuttallii subsp. *rydbergii*—Nuttall's sunflower
Helianthus petiolaris—plains sunflower
Helianthus rigidus—stiff sunflower
Iva xanthifolia—marsh elder
Lactuca oblongifolia—blue lettuce
Liatris ligulistylis—gay-feather
Liatris punctata—blazing star
Lygodsmia juncea—skeletonweed
Matricaria chamomile—false chamomile
Matricaria maritime—wild chamomile
Matricaria matricarioides—pineapple weed
Ratibida columnifera—prairie coneflower
Rudbeckia hirta—black-eyed susan
Senecio canus—gray ragwort
Senecio integerrimus—lambstongue groundsel
Senecio platensis—prairie ragwort
Solidago canadensis—Canada goldenrod
Solidago gigantea—late goldenrod
Solidago missouriensis—prairie goldenrod
Solidago mollis—soft goldenrod
Solidago nemoralis—gray goldenrod
Solidago ptarmicoides—sneezewort aster
Solidago rigida—rigid goldenrod
Sonchus arvensis—field sow thistle
Tanacetum vulgare—common tansy
Taraxacum officinale—dandelion
Tragopogon dubius—goat's beard, western salsify
Vernonia fasciculata—ironweed

Appendix E

Plant Group Types of Upland Vegetation at the Souris River Basin Refuges

This appendix describes the hierarchical listing of plant group types (modified from Grant et al. 2004b) used for belt transect surveys of upland vegetation that occurs at the Souris River basin refuges and surrounding areas in North Dakota. One of the below types is recorded for each 0.3 x 1.5-foot segment along an outstretched measuring tape, based on >50% dominance by canopy cover unless otherwise indicated. Scientific names are listed in appendix D.

Shrub and Tree Types

Low Shrub (generally <5 feet tall except in one to few postdisturbance years)

- 11 snowberry dense (other low shrub species total 0–25%); other plants few or none
- 12 snowberry (and other low shrub species); remainder mostly native grass–forb types
- 13 snowberry (and other low shrub species); remainder mostly Kentucky bluegrass
- 14 snowberry (and other low shrub species); remainder mostly smooth brome (or quackgrass)
- 15 silverberry prominent, remainder mostly native or invaded native grass–forb types
- 16 silverberry prominent; remainder mostly Kentucky bluegrass
- 17 silverberry prominent; remainder mostly smooth brome (or quackgrass)

Tall Shrub (generally 5–16 feet tall) or tree (>16 feet tall)

- 21 chokecherry, Juneberry, hawthorn, willow, dogwood
- 22 shrub-stage aspen
- 23 exotic shrub (for example, caragana, honeysuckle, Russian olive)
- 31 aspen tree
- 32 burned-over aspen tree (dead or dying postfire snags)
- 33 shade-tolerant woodland tree (green ash, boxelder, elm)

Native Grass–Forb and Forb Types

(>95% dominance by native herbaceous plants)*

- 41 dry cool-season plants (sedges, green needlegrass, needle and thread, wheatgrass species, prairie Junegrass, forbs; often blue grama and some other warm-season plant species)
- 42 dry warm-season plants (little bluestem, prairie sandreed, plains muhly, fescue species, blue grama, forbs)
- 43 mesic warm–cool mix (big bluestem, switchgrass, little bluestem, porcupine grass; mat muhly, prairie dropseed, forbs)
- 46 subirrigated wet meadow microsite within upland (fowl bluegrass, foxtail barley, northern reedgrass, coarse sedge species, baltic rush, dock, prairie cordgrass)
- 47 cactus
- 48 clubmoss

**Prairie rose is considered a native forb in this classification.*

Exotic and Invaded Native Grass–Forb Types

- 51 Kentucky bluegrass >95%
- 52 Kentucky bluegrass and native grass–forbs, bluegrass 50–95%
- 53 native grass–forbs and Kentucky bluegrass, bluegrass 5–50%
- 61 smooth brome (or quackgrass) >95%
- 62 smooth brome (or quackgrass) and native grass–forbs, brome 50–95%
- 63 native grass–forbs and smooth brome (or quackgrass), brome 5–50%
- 71 crested wheatgrass >95%
- 72 crested wheatgrass and native grass–forbs, crested wheatgrass 50–95%

- 73 native grass-forbs and crested wheatgrass, crested wheatgrass 5-50%
- 78 tall, intermediate, or pubescent wheatgrass

Noxious Weed Types

- 81 leafy spurge
- 85 Canada thistle
- 88 other noxious weeds (user defined)

Other

- 91 barren, unvegetated (for example, rock, anthill, bare soil)
- 98 tall exotic legume (sweetclover or alfalfa)
- 00 wetland basin (temporary, seasonal, or semipermanent wetland [Stewart and Kantrud 1971])

Appendix F

Birds of the Souris River Basin Refuges

Bird species found at the three Souris River basin refuges since 1935 total 308, of which 30 are “accidentals” and 1 is extirpated. About 170 species are known to have nested at the refuges, and 150 of these nest regularly. The following list is adapted from that produced for the refuges by G. Berkey and R. Martin, updated January 2001, as published in the Service publication “National Wildlife Refuges, Along the Souris River Loop, Bird List.”

Seasons of Occurrence

- Sp** spring (March–May)
S summer (June–July)
F fall (August–November)
W winter (December–February)

Abundance Categories

The following abundance categories indicate the peak daily and seasonal totals of birds that may be seen by an active, experienced observer spending at least 8 hours per week sampling all types of habitat at a refuge.

- a* abundant= >125 per day, >600 per season
c common= 25–125 per day, 125–600 per season
f fairly common= 5–25 per day, 25–125 per season
u uncommon= 1–5 per day, 5–25 per season
r rare= 1–5 per season
o occasional= small numbers seen at intervals of 2–10 years
- nested= species that have nested
 - (*i*) irregular= indicates a species that is irregular; the abundance category indicates the numbers expected in peak years
 - (1) extirpated as a breeding species
 - (2) last observed 1956

Loons	Sp	S	F	W
common loon	<i>r</i>	<i>o</i>	<i>r</i>	—

Grebes	Sp	S	F	W
pie-billed grebe•	<i>f</i>	<i>f</i>	<i>f</i>	—
horned grebe•	<i>f</i>	<i>r</i>	<i>u</i>	—
red-necked grebe•	<i>o</i>	<i>o</i>	—	—
eared grebe•	<i>a</i>	<i>a</i>	<i>a</i>	—
western grebe•	<i>c</i>	<i>c</i>	<i>c</i>	—
Clark's grebe	<i>r</i>	<i>r</i>	<i>r</i>	—

Pelicans and Cormorants	Sp	S	F	W
American white pelican	<i>c</i>	<i>c</i>	<i>c</i>	—
double-crested cormorant	<i>c</i>	<i>c</i>	<i>c</i>	—

Bitterns, Herons, and Egrets	Sp	S	F	W
American bittern•	<i>u</i>	<i>u</i>	<i>u</i>	—
least bittern	<i>o</i>	<i>o</i>	<i>o</i>	—
great blue heron•	<i>f</i>	<i>f</i>	<i>f</i>	—
great egret	<i>o</i>	<i>o</i>	<i>o</i>	—
snowy egret•	<i>o</i>	<i>o</i>	<i>o</i>	—
little blue heron•	<i>o</i>	<i>o</i>	<i>o</i>	—
cattle egret•(<i>i</i>)	<i>f</i>	<i>f</i>	<i>f</i>	—
black-crowned night-heron•	<i>f</i>	<i>f</i>	<i>f</i>	—

Ibises and Spoonbills	Sp	S	F	W
white-faced ibis	<i>o</i>	<i>o</i>	<i>o</i>	—

New World Vultures	Sp	S	F	W
turkey vulture	<i>r</i>	—	<i>r</i>	—

Swans, Geese, and Ducks	Sp	S	F	W
greater white-fronted goose	<i>f</i>	—	<i>f</i>	—
snow goose	<i>a</i>	<i>o</i>	<i>a</i>	<i>o</i>
Ross' goose	<i>u</i>	—	<i>u</i>	—
Canada goose•	<i>a</i>	<i>c</i>	<i>a</i>	<i>o</i>
trumpeter swan(1)	—	<i>o</i>	<i>o</i>	—
tundra swan	<i>c</i>	<i>o</i>	<i>a</i>	—
wood duck•	<i>f</i>	<i>f</i>	<i>f</i>	—
gadwall•	<i>a</i>	<i>c</i>	<i>a</i>	—
American wigeon•	<i>c</i>	<i>u</i>	<i>c</i>	—
American black duck•	<i>o</i>	<i>o</i>	<i>r</i>	—
mallard•	<i>a</i>	<i>c</i>	<i>a</i>	<i>o</i>
blue-winged teal•	<i>a</i>	<i>c</i>	<i>a</i>	—
cinnamon teal	<i>o</i>	<i>o</i>	—	—
northern shoveler•	<i>a</i>	<i>c</i>	<i>a</i>	—
northern pintail•	<i>a</i>	<i>c</i>	<i>c</i>	<i>o</i>

Swans, Geese, and Ducks				
(continued)	Sp	S	F	W
green-winged teal•	<i>f</i>	<i>u</i>	<i>c</i>	<i>o</i>
canvasback•	<i>c</i>	<i>f</i>	<i>c</i>	—
redhead•	<i>c</i>	<i>f</i>	<i>a</i>	—
ring-necked duck•	<i>f</i>	<i>r</i>	<i>f</i>	—
greater scaup	<i>r</i>	—	<i>r</i>	—
lesser scaup•	<i>a</i>	<i>u</i>	<i>a</i>	<i>o</i>
surf scoter	—	—	<i>r</i>	—
white-winged scoter	—	—	<i>r</i>	—
black scoter	—	—	<i>o</i>	—
long-tailed duck	—	—	<i>r</i>	—
bufflehead•	<i>c</i>	<i>r</i>	<i>c</i>	—
common goldeneye	<i>c</i>	—	<i>c</i>	—
hooded merganser•	<i>f</i>	<i>f</i>	<i>f</i>	—
common merganser	<i>c</i>	—	<i>f</i>	—
red-breasted merganser	<i>o</i>	—	<i>o</i>	—
ruddy duck•	<i>a</i>	<i>c</i>	<i>a</i>	—

Osprey, Kites, Hawks, and Eagles				
Eagles	Sp	S	F	W
osprey	<i>r</i>	—	<i>r</i>	—
bald eagle	<i>f</i>	<i>o</i>	<i>f</i>	<i>r</i>
northern harrier•	<i>c</i>	<i>f</i>	<i>c</i>	<i>o</i>
sharp-shinned hawk•	<i>f</i>	<i>f</i>	<i>f</i>	<i>r</i>
Cooper's hawk•	<i>u</i>	<i>u</i>	<i>u</i>	—
northern goshawk	<i>o</i>	—	<i>r</i>	<i>r</i>
broad-winged hawk•	<i>u</i>	<i>o</i>	<i>u</i>	—
Swainson's hawk•	<i>f</i>	<i>u</i>	<i>f</i>	—
red-tailed hawk•	<i>c</i>	<i>f</i>	<i>c</i>	<i>o</i>
ferruginous hawk•	<i>r</i>	<i>o</i>	<i>r</i>	—
rough-legged hawk	<i>u</i>	—	<i>u</i>	<i>r</i>
golden eagle	<i>r</i>	—	<i>r</i>	<i>r</i>

Falcons and Caracaras				
	Sp	S	F	W
American kestrel•	<i>f</i>	<i>u</i>	<i>f</i>	—
merlin	<i>r</i>	—	<i>u</i>	<i>u</i>
gyrfalcon	—	—	<i>o</i>	<i>o</i>
peregrine falcon	<i>r</i>	<i>o</i>	<i>r</i>	<i>o</i>
prairie falcon	<i>o</i>	—	<i>r</i>	<i>r</i>

Gallinaceous Birds				
	Sp	S	F	W
gray partridge•	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
ring-necked pheasant•	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>
ruffed grouse•	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
sharp-tailed grouse•	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>
greater prairie-chicken(1)(2)	—	—	—	—
wild turkey•	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>

Rails				
	Sp	S	F	W
yellow rail•	<i>r</i>	<i>o</i>	<i>r</i>	—
Virginia rail•	<i>u</i>	<i>u</i>	<i>u</i>	—
sora•	<i>c</i>	<i>c</i>	<i>c</i>	—
American coot•	<i>a</i>	<i>a</i>	<i>a</i>	—

Cranes				
	Sp	S	F	W
sandhill crane•	<i>a</i>	<i>r</i>	<i>a</i>	—
whooping crane	<i>o</i>	—	<i>o</i>	—

Plovers				
	Sp	S	F	W
black-bellied plover	<i>f</i>	—	<i>f</i>	—
American golden-plover	<i>f</i>	—	<i>f</i>	—
semipalmated plover	<i>u</i>	<i>u</i>	<i>u</i>	—
piping plover•	<i>o</i>	<i>o</i>	<i>o</i>	—
killdeer•	<i>c</i>	<i>c</i>	<i>c</i>	—

Stilts and Avocets				
	Sp	S	F	W
American avocet•	<i>c</i>	<i>f</i>	<i>c</i>	—

Sandpipers and Phalaropes				
	Sp	S	F	W
greater yellowlegs	<i>f</i>	<i>f</i>	<i>f</i>	—
lesser yellowlegs	<i>c</i>	<i>c</i>	<i>c</i>	—
solitary sandpiper	<i>u</i>	<i>u</i>	<i>u</i>	—
willet•	<i>f</i>	<i>f</i>	<i>f</i>	—
spotted sandpiper•	<i>f</i>	<i>f</i>	<i>f</i>	—
upland sandpiper•	<i>f</i>	<i>f</i>	<i>u</i>	—
Hudsonian godwit	<i>u</i>	<i>o</i>	<i>o</i>	—
marbled godwit•	<i>f</i>	<i>f</i>	<i>f</i>	—
ruddy turnstone	<i>r</i>	<i>o</i>	<i>o</i>	—
red knot	<i>o</i>	<i>o</i>	<i>o</i>	—
sanderling	<i>u</i>	<i>u</i>	<i>u</i>	—
semipalmated sandpiper	<i>a</i>	<i>c</i>	<i>a</i>	—
western sandpiper	<i>o</i>	<i>o</i>	<i>o</i>	—
least sandpiper	<i>c</i>	<i>f</i>	<i>c</i>	—
white-rumped sandpiper	<i>a</i>	<i>f</i>	<i>o</i>	—
Baird's sandpiper	<i>c</i>	<i>f</i>	<i>c</i>	—
pectoral sandpiper	<i>c</i>	<i>f</i>	<i>c</i>	—
dunlin	<i>u</i>	—	<i>o</i>	—
stilt sandpiper	<i>f</i>	<i>c</i>	<i>c</i>	—
buff-breasted sandpiper	<i>o</i>	—	<i>o</i>	—
short-billed dowitcher	<i>f</i>	<i>f</i>	<i>f</i>	—
long-billed dowitcher	<i>c</i>	<i>c</i>	<i>a</i>	—
common snipe•	<i>f</i>	<i>u</i>	<i>c</i>	—
Wilson's phalarope•	<i>c</i>	<i>a</i>	<i>a</i>	—
red-necked phalarope	<i>a</i>	<i>a</i>	<i>a</i>	—

Skuas, Jaegers, Gulls, and Terns				
	Sp	S	F	W
Franklin's gull•	<i>a</i>	<i>a</i>	<i>a</i>	—
Bonaparte's gull	<i>r</i>	<i>r</i>	<i>u</i>	—
ring-billed gull•	<i>a</i>	<i>c</i>	<i>a</i>	—
California gull•	<i>u</i>	<i>r</i>	<i>u</i>	—
herring gull	<i>u</i>	—	<i>u</i>	—
common tern•	<i>f</i>	<i>r</i>	<i>f</i>	—
Forster's tern•	<i>f</i>	<i>f</i>	<i>f</i>	—
black tern•	<i>a</i>	<i>c</i>	<i>a</i>	—

Pigeons and Doves				
	Sp	S	F	W
rock dove•	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
mourning dove•	<i>c</i>	<i>c</i>	<i>a</i>	<i>o</i>

Cuckoos and Anis				
	Sp	S	F	W
black-billed cuckoo•	<i>u</i>	<i>u</i>	<i>r</i>	—
yellow-billed cuckoo	<i>o</i>	—	—	—

Typical Owls	Sp	S	F	W
eastern screech-owl•	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
great horned owl•	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>
snowy owl	<i>r</i>	—	<i>r</i>	<i>r</i>
burrowing owl•	<i>o</i>	<i>o</i>	<i>o</i>	—
long-eared owl•(<i>i</i>)	<i>u</i>	<i>u</i>	<i>r</i>	<i>o</i>
short-eared owl•(<i>i</i>)	<i>u</i>	<i>u</i>	<i>u</i>	<i>r</i>
boreal owl	—	—	—	<i>o</i>
northern saw-whet owl	<i>o</i>	—	<i>o</i>	<i>o</i>
Goatsuckers	Sp	S	F	W
common nighthawk•	<i>u</i>	<i>r</i>	<i>u</i>	—
common poorwill•	<i>o</i>	<i>o</i>	<i>o</i>	—
whip-poor-will	<i>o</i>	<i>o</i>	—	—
Swifts	Sp	S	F	W
chimney swift	<i>o</i>	—	<i>o</i>	—
Hummingbirds	Sp	S	F	W
ruby-throated hummingbird•	<i>r</i>	<i>r</i>	<i>r</i>	—
Kingfishers	Sp	S	F	W
belted kingfisher•	<i>u</i>	<i>u</i>	<i>u</i>	<i>o</i>
Woodpeckers	Sp	S	F	W
red-headed woodpecker•	<i>r</i>	<i>o</i>	<i>r</i>	—
yellow-bellied sapsucker•	<i>u</i>	<i>u</i>	<i>u</i>	—
downy woodpecker•	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
hairy woodpecker•	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
northern flicker•	<i>f</i>	<i>f</i>	<i>f</i>	<i>o</i>
Tyrant Flycatchers	Sp	S	F	W
olive-sided flycatcher	<i>r</i>	<i>r</i>	<i>r</i>	—
western wood-pewee	<i>o</i>	<i>o</i>	<i>o</i>	—
eastern wood-pewee•	<i>f</i>	<i>f</i>	<i>f</i>	—
yellow-bellied flycatcher	<i>o</i>	—	<i>o</i>	—
alder flycatcher•	<i>u</i>	<i>r</i>	<i>r</i>	—
willow flycatcher•	<i>f</i>	<i>f</i>	<i>f</i>	—
least flycatcher•	<i>c</i>	<i>c</i>	<i>c</i>	—
eastern phoebe•	<i>r</i>	<i>r</i>	<i>r</i>	—
Say's phoebe•	<i>r</i>	<i>r</i>	<i>r</i>	—
great crested flycatcher•	<i>f</i>	<i>f</i>	<i>u</i>	—
western kingbird•	<i>c</i>	<i>c</i>	<i>c</i>	—
eastern kingbird•	<i>c</i>	<i>c</i>	<i>c</i>	—
Shrikes	Sp	S	F	W
loggerhead shrike•	<i>r</i>	<i>r</i>	<i>r</i>	<i>o</i>
northern shrike	<i>u</i>	—	<i>u</i>	<i>u</i>
Vireos	Sp	S	F	W
yellow-throated vireo•	<i>u</i>	<i>u</i>	<i>u</i>	—
blue-headed vireo	<i>u</i>	—	<i>u</i>	—
warbling vireo•	<i>f</i>	<i>f</i>	<i>f</i>	—
Philadelphia vireo	<i>r</i>	<i>o</i>	<i>r</i>	—
red-eyed vireo•	<i>c</i>	<i>c</i>	<i>c</i>	—

Crows, Jays, and Magpies	Sp	S	F	W
blue jay•	<i>f</i>	<i>u</i>	<i>f</i>	<i>u</i>
black-billed magpie•	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>
American crow•	<i>a</i>	<i>f</i>	<i>a</i>	<i>u</i>
common raven•	<i>r</i>	<i>r</i>	<i>o</i>	<i>o</i>
Larks	Sp	S	F	W
horned lark•	<i>a</i>	<i>f</i>	<i>a</i>	<i>f</i>
Swallows	Sp	S	F	W
purple martin•	<i>f</i>	<i>f</i>	<i>f</i>	—
tree swallow•	<i>c</i>	<i>f</i>	<i>u</i>	—
northern rough-winged swallow•	<i>f</i>	<i>f</i>	<i>r</i>	—
bank swallow•	<i>a</i>	<i>c</i>	<i>a</i>	—
cliff swallow•	<i>a</i>	<i>a</i>	<i>a</i>	—
barn swallow•	<i>a</i>	<i>c</i>	<i>a</i>	—
Titmice and Chickadees	Sp	S	F	W
black-capped chickadee•	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>
Nuthatches	Sp	S	F	W
red-breasted nuthatch•(<i>i</i>)	<i>u</i>	<i>r</i>	<i>u</i>	<i>r</i>
white-breasted nuthatch•	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
Creepers	Sp	S	F	W
brown creeper	<i>u</i>	—	<i>u</i>	<i>r</i>
Wrens	Sp	S	F	W
rock wren•	<i>r</i>	<i>r</i>	<i>r</i>	—
house wren•	<i>c</i>	<i>c</i>	<i>c</i>	—
winter wren	—	—	<i>o</i>	—
sedge wren•(<i>i</i>)	<i>c</i>	<i>c</i>	<i>c</i>	—
marsh wren•	<i>c</i>	<i>c</i>	<i>c</i>	—
Kinglets	Sp	S	F	W
golden-crowned kinglet	<i>f</i>	—	<i>f</i>	<i>r</i>
ruby-crowned kinglet	<i>f</i>	—	<i>f</i>	—
Thrushes	Sp	S	F	W
eastern bluebird•	<i>u</i>	<i>u</i>	<i>u</i>	—
mountain bluebird•	<i>u</i>	<i>u</i>	<i>u</i>	—
Townsend's solitaire	<i>o</i>	—	<i>o</i>	<i>o</i>
veery•	<i>f</i>	<i>f</i>	<i>u</i>	—
gray-cheeked thrush	<i>f</i>	—	<i>r</i>	—
Swainson's thrush	<i>c</i>	—	<i>f</i>	—
hermit thrush	<i>u</i>	—	<i>u</i>	—
American robin•	<i>a</i>	<i>c</i>	<i>a</i>	<i>r</i>
Mimic Thrushes	Sp	S	F	W
gray catbird•	<i>f</i>	<i>f</i>	<i>f</i>	—
northern mockingbird	<i>o</i>	<i>o</i>	<i>o</i>	—
brown thrasher•	<i>f</i>	<i>f</i>	<i>f</i>	—
Starlings	Sp	S	F	W
European starling•	<i>c</i>	<i>f</i>	<i>a</i>	<i>u</i>

Wagtails and Pipits	Sp	S	F	W
American pipit	<i>u</i>	—	<i>f</i>	—
Sprague's pipit•	<i>f</i>	<i>f</i>	<i>u</i>	—

Waxwings	Sp	S	F	W
Bohemian waxwing(<i>i</i>)	<i>c</i>	—	<i>c</i>	<i>c</i>
cedar waxwing•	<i>f</i>	<i>c</i>	<i>c</i>	<i>u</i>

Wood Warblers	Sp	S	F	W
Tennessee warbler	<i>c</i>	<i>r</i>	<i>f</i>	—
orange-crowned warbler•	<i>f</i>	<i>r</i>	<i>c</i>	—
Nashville warbler	<i>u</i>	—	<i>u</i>	—
northern parula	<i>o</i>	—	<i>o</i>	—
yellow warbler•	<i>c</i>	<i>c</i>	<i>c</i>	—
chestnut-sided warbler	<i>o</i>	—	<i>r</i>	—
magnolia warbler	<i>u</i>	—	<i>u</i>	—
Cape May warbler	<i>o</i>	—	<i>o</i>	—
black-throated blue warbler	<i>o</i>	—	<i>o</i>	—
yellow-rumped warbler	<i>a</i>	<i>o</i>	<i>a</i>	—
black-throated green warbler	<i>o</i>	—	<i>r</i>	—
Blackburnian warbler	<i>o</i>	—	<i>r</i>	—
palm warbler	<i>u</i>	—	<i>u</i>	—
bay-breasted warbler	<i>o</i>	—	<i>r</i>	—
blackpoll warbler	<i>c</i>	—	<i>f</i>	—
black-and-white warbler•	<i>f</i>	<i>u</i>	<i>f</i>	—
American redstart•	<i>f</i>	<i>u</i>	<i>f</i>	—
ovenbird•	<i>f</i>	<i>f</i>	<i>u</i>	—
northern waterthrush•	<i>f</i>	<i>r</i>	<i>u</i>	—
Connecticut warbler	<i>r</i>	<i>o</i>	<i>o</i>	—
mourning warbler	<i>u</i>	<i>o</i>	<i>r</i>	—
MacGillivray's warbler	<i>o</i>	—	<i>o</i>	—
common yellowthroat•	<i>c</i>	<i>c</i>	<i>c</i>	—
Wilson's warbler	<i>u</i>	—	<i>f</i>	—
Canada warbler	<i>r</i>	—	<i>r</i>	—
yellow-breasted chat•	<i>r</i>	<i>r</i>	<i>o</i>	—

Tanagers	Sp	S	F	W
scarlet tanager•	<i>o</i>	<i>o</i>	—	—
western tanager	—	—	<i>o</i>	—

Towhees and Sparrows	Sp	S	F	W
spotted towhee•	<i>f</i>	<i>f</i>	<i>f</i>	—
eastern towhee	<i>o</i>	—	<i>o</i>	—
American tree sparrow	<i>a</i>	—	<i>a</i>	<i>u</i>
chipping sparrow•	<i>c</i>	<i>u</i>	<i>c</i>	—
clay-colored sparrow•	<i>a</i>	<i>a</i>	<i>a</i>	—
field sparrow•	<i>r</i>	<i>r</i>	<i>r</i>	—
vesper sparrow•	<i>c</i>	<i>c</i>	<i>c</i>	—
lark sparrow•	<i>u</i>	<i>u</i>	<i>r</i>	—
lark bunting•(<i>i</i>)	<i>u</i>	<i>u</i>	<i>u</i>	—
Savannah sparrow•	<i>a</i>	<i>c</i>	<i>a</i>	—
grasshopper sparrow•(<i>i</i>)	<i>c</i>	<i>c</i>	<i>c</i>	—
Baird's sparrow•(<i>i</i>)	<i>f</i>	<i>f</i>	<i>f</i>	—
Le Conte's sparrow•(<i>i</i>)	<i>f</i>	<i>f</i>	<i>f</i>	—

Towhees and Sparrows (continued)	Sp	S	F	W
song sparrow•	<i>c</i>	<i>f</i>	<i>c</i>	<i>o</i>
Lincoln's sparrow	<i>f</i>	—	<i>f</i>	—
swamp sparrow•	<i>f</i>	<i>r</i>	<i>f</i>	—
white-throated sparrow	<i>c</i>	—	<i>c</i>	<i>o</i>
Harris' sparrow	<i>c</i>	—	<i>c</i>	<i>o</i>
white-crowned sparrow	<i>f</i>	—	<i>f</i>	—
dark-eyed junco	<i>a</i>	<i>o</i>	<i>a</i>	<i>r</i>
McCown's longspur•	<i>o</i>	<i>o</i>	<i>o</i>	—
Lapland longspur	<i>a</i>	—	<i>a</i>	<i>u</i>
Smith's longspur	<i>r</i>	—	<i>r</i>	—
chestnut-collared longspur•	<i>u</i>	<i>u</i>	<i>u</i>	—
snow bunting	<i>c</i>	—	<i>a</i>	<i>c</i>
Nelson's sharp-tailed sparrow•	<i>f</i>	<i>f</i>	<i>f</i>	—
fox sparrow	<i>r</i>	—	<i>u</i>	—

Cardinals, Grosbeaks, and Allies	Sp	S	F	W
rose-breasted grosbeak•	<i>f</i>	<i>f</i>	<i>f</i>	—
black-headed grosbeak•	<i>r</i>	<i>r</i>	<i>o</i>	—
lazuli bunting•	<i>r</i>	<i>r</i>	<i>r</i>	—
indigo bunting•	<i>r</i>	<i>r</i>	<i>r</i>	—
dickcissel•	<i>o</i>	<i>o</i>	<i>o</i>	—

Blackbirds and Orioles	Sp	S	F	W
bobolink•	<i>c</i>	<i>c</i>	<i>f</i>	—
red-winged blackbird•	<i>a</i>	<i>a</i>	<i>a</i>	<i>o</i>
western meadowlark•	<i>a</i>	<i>a</i>	<i>a</i>	<i>o</i>
yellow-headed blackbird•	<i>a</i>	<i>a</i>	<i>a</i>	<i>o</i>
rusty blackbird	<i>r</i>	—	<i>f</i>	<i>o</i>
Brewer's blackbird•	<i>c</i>	<i>f</i>	<i>a</i>	<i>o</i>
common grackle•	<i>a</i>	<i>c</i>	<i>a</i>	<i>o</i>
brown-headed cowbird•	<i>a</i>	<i>a</i>	<i>u</i>	—
orchard oriole•	<i>f</i>	<i>f</i>	<i>o</i>	—
northern oriole•	<i>f</i>	<i>f</i>	<i>f</i>	—

Finches	Sp	S	F	W
pine grosbeak(<i>i</i>)	<i>u</i>	—	<i>u</i>	<i>f</i>
purple finch	<i>u</i>	—	<i>u</i>	<i>r</i>
house finch•	<i>u</i>	<i>u</i>	<i>u</i>	<i>f</i>
red crossbill•(<i>i</i>)	<i>u</i>	<i>o</i>	<i>u</i>	<i>f</i>
white-winged crossbill(<i>i</i>)	<i>o</i>	—	<i>o</i>	<i>o</i>
common redpoll(<i>i</i>)	<i>a</i>	—	<i>c</i>	<i>a</i>
hoary redpoll	<i>o</i>	—	—	<i>o</i>
pine siskin•(<i>i</i>)	<i>c</i>	<i>o</i>	<i>c</i>	<i>f</i>
American goldfinch•	<i>c</i>	<i>c</i>	<i>c</i>	<i>u</i>
evening grosbeak	<i>o</i>	—	<i>o</i>	<i>o</i>

Old World Sparrows	Sp	S	F	W
house sparrow•	<i>f</i>	<i>f</i>	<i>f</i>	<i>f</i>

*The following birds are rarely seen at the refuges
and are out of their normal ranges:*

Pacific loon
brown pelican
tricolored heron
green heron
yellow-crowned night-heron
white ibis
fulvous whistling-duck
Eurasian wigeon
harlequin duck
red-shouldered hawk
black-necked stilt
whimbrel
long-billed curlew
American woodcock

glaucous gull
black-legged kittiwake
barn owl
barred owl
scissor-tailed flycatcher
violet-green swallow
sage thrasher
Townsend's warbler
prothonotary warbler
hooded warbler
Henslow's sparrow
golden-crowned sparrow
Bullock's oriole
lesser goldfinch

Appendix G

Birds of Conservation Concern in the United States Prairie Pothole Region

The following bird species occur in “Bird Conservation Region Number 11” (prairie potholes–U.S. portion only), as listed in “Birds of Conservation Concern: the 2002 List” (USFWS 2002).

An asterisk (*) denotes species that currently breed in the Souris River basin in North Dakota. Others migrate through the area.

American bittern*	Wilson's phalarope*
northern harrier*	black-billed cuckoo*
Swainson's hawk*	burrowing owl*
ferruginous hawk*	short-eared owl*
peregrine falcon	red-headed woodpecker*
yellow rail*	loggerhead shrike*
solitary sandpiper	Sprague's pipit*
willet*	grasshopper sparrow*
upland sandpiper*	Baird's sparrow*
long-billed curlew	Henslow's sparrow
Hudsonian godwit	Le Conte's sparrow*
marbled godwit*	Nelson's Sharp-tailed sparrow*
sanderling	McCown's longspur
white-rumped sandpiper	chestnut-collared longspur*
buff-breasted sandpiper	

Appendix H

Mammals of the Souris River Basin Refuges

Mammal species that have been documented at the Souris River basin refuges, before and after establishment of the refuges, total 62 species including 6 that have been largely extirpated from the area (Jones et al. 1983, Kadrmas 2005). Some species likely have been overlooked, especially secretive, rare, or nocturnal species such as some species of bats. Voucher specimens of most small mammal species are stored at the University of North Dakota's biology department.

ORDER INSECTIVORA

Family Soricidae

- Sorex cinereus*—masked shrew
- Sorex arcticus*—Arctic shrew
- Microsorex hoyi*—pigmy shrew
- Blarina brevicauda*—short-tailed shrew

ORDER CHIROPTERA

Family Vespertilionidae

- Myotis lucifugus*—little brown myotis
- Myotis septentrionalis*—northern myotis
- Myotis evotis*—long-eared myotis
- Lasionycteris noctivagans*—silver-haired bat
- Eptesicus fuscus*—big brown bat
- Lasiurus borealis*—red bat
- Lasiurus cinereus*—hoary bat

ORDER LAGOMORPHA

Family Leporidae

- Sylvilagus floridanus*—eastern cottontail
- Sylvilagus audubonii*—desert cottontail
- Lepus americanus*—snowshoe hare
- Lepus townsendii*—white-tailed jackrabbit

ORDER RODENTIA

Family Sciuridae

- Eutamias minimus*—least chipmunk
- Marmota monax*—woodchuck
- Spermophilus richardsonii*—Richardson's ground squirrel
- Spermophilus tridecemlineatus*—thirteen-lined ground squirrel
- Spermophilus franklinii*—Franklin's ground squirrel

- Sciurus carolinensis*—gray squirrel
- Sciurus niger*—fox squirrel
- Tamiasciurus hudsonicus*—red squirrel

Family Geomyidae

- Thomomys talpoides*—northern pocket gopher

Family Heteromyidae

- Perognathus fasciatus*—olived-backed pocket mouse
- Perognathus flavescens*—plains pocket mouse

Family Heteromyidae

- Castor canadensis*—beaver

Family Cricetidae

- Peromyscus maniculatus*—deer mouse
- Peromyscus leucopus*—white-footed mouse
- Onychomys leucogaster*—northern grasshopper mouse
- Clethrionomys gapperi*—southern red-backed vole
- Microtus pennsylvanicus*—meadow vole
- Microtus ochrogaster*—prairie vole
- Ondatra zibethicus*—muskrat

Family Muridae

- Rattus norvegicus*—Norway rat
- Mus musculus*—house mouse

Family Zapodidae

- Zapus hudsonius*—meadow jumping mouse
- Zapus princeps*—western jumping mouse

Family Erethizontidae

- Erethizon dorsatum*—porcupine

ORDER CARNIVORA

Family Canidae

- Canis latrans*—coyote
- Canis lupus*—gray wolf*
- Vulpes vulpes*—red fox
- Vulpes velox*—swift fox*

Family Ursidae

- Ursus americanus*—black bear

Family Procyonidae

- Procyon lotor*—raccoon

*Largely extirpated from the area.

Family Mustelidae

- Mustela erminea*—ermine
- Mustela nivalis*—least weasel
- Mustela frenata*—long-tailed weasel
- Mustela vison*—mink
- Taxidea taxus*—badger
- Mephitis mephitis*—striped skunk
- Lutra canadensis*—river otter*

Family Felidae

- Felis concolor*—mountain lion*
- Felis lynx*—lynx*
- Felis rufus*—bobcat

ORDER ARTIODACTYLA

Family Cervidae

- Cervus elaphus*—elk*
- Odocoileus hemionus*—mule deer
- Odocoileus virginianus*—white-tailed deer
- Alces alces*—moose

Family Antilocapridae

- Antilocapridae americana*—pronghorn

Family Bovidae

- Bison bison*—bison*

*Largely extirpated from the area.

Appendix I

Reptiles and Amphibians of the Souris River Basin Refuges

Reptile and amphibian species that have been documented in the Souris River basin include at least the 16 species listed here (Beachy, unpublished data; Wheeler and Wheeler 1966).

CLASS REPTILIA

ORDER CHELONIA

Family Chelydridae

Chelydra serpentina—common snapping turtle

Family Emydidae

Chrysemys picta belli—western painted turtle

ORDER SQUAMATA

Family Colubridae

Pituophis catenifer—bullsnake

Thamnophis sirtalis (subsp. *parietalis*)—
red-sided garter snake

Thamnophis radix—plains garter snake

Storeria occipitomaculata—redbelly snake

Opheodrys vernalis—smooth green snake

Heterodon nasicus—western hognose snake

CLASS AMPHIBIA

ORDER CAUDATA

Family Ambystomidae

Ambystoma tigrinum—tiger salamander

ORDER SALIENTIA

Family Pelobatidae

Scaphiopus bombifrons—plains spadefoot

Family Bufonidae

Bufo hemiophrys—Canadian toad

Bufo cognatus—Great Plains toad

Bufo woodhousei—Woodhouse's toad

Family Hylidae

Pseudacris triseriata—western chorus frog

Family Ranidae

Rana pipiens—northern leopard frog

Rana sylvatica—wood frog

Appendix J

Fishes of the Souris River Basin Refuges

Fishes include about 26 species that occurred in the Souris River basin system circa the 1980s. Most of these species probably still occur at the three Souris River basin refuges, but several may be extirpated from the river system. The following list was compiled by Wade King, USFWS–Bismarck, North Dakota (personal communication), based on unpublished data (sampling records).

Family Esocidae

Esox lucius—northern pike

Family Cyprinidae

Hybognathus hankinsoni—brassy minnow

Notemigonus crysoleucas—golden shiner

Notropis blennioides—river shiner

Notropis cornutus—common shiner

Notropis atherinoides—emerald shiner

Notropis dorsalis—bigmouth shiner

Notropis hudsonius—spottail shiner

Notropis stramineus—sand shiner

Pimephales promelas—fathead minnow

Rhinichthys atratulus—blacknose dace

Rhinichthys cataractae—longnose dace

Semotilus atromaculatus—creek chub

Family Catostomidae

Catostomus catostomus—longnose sucker

Catostomus commersoni—white sucker

Moxostoma anisurum—silver redhorse

Family Ictaluridae

Ictalurus melas—black bullhead

Noturus gyrinus—tadpole madtom

Family Percopsidae

Percopsis omiscomaycus—trout-perch

Family Gasterosteidae

Culaea inconstans—brook stickleback

Family Percidae

Etheostoma exile—Iowa darter

Etheostoma nigrum—Johnny darter

Perca flavescens—yellow perch

Percina maculata—blackside darter

Stizostedion vitreum—walleye

Family Centrarchidae

Micropterus dolomieu—smallmouth bass

At least five other fish species once occurred at the refuges through stocking programs during the 1940s.

Pomoxis nigromaculatus—black crappie

Lepomis macrochirus—bluegill

Micropterus salmoides—largemouth bass

Ictalurus punctatus—channel catfish

Ictalurus natalis—yellow bullhead