Wildlife and Your Land

a series about managing your land for wildlife

How to
Inventory and Monitor Wildlife on Your Land

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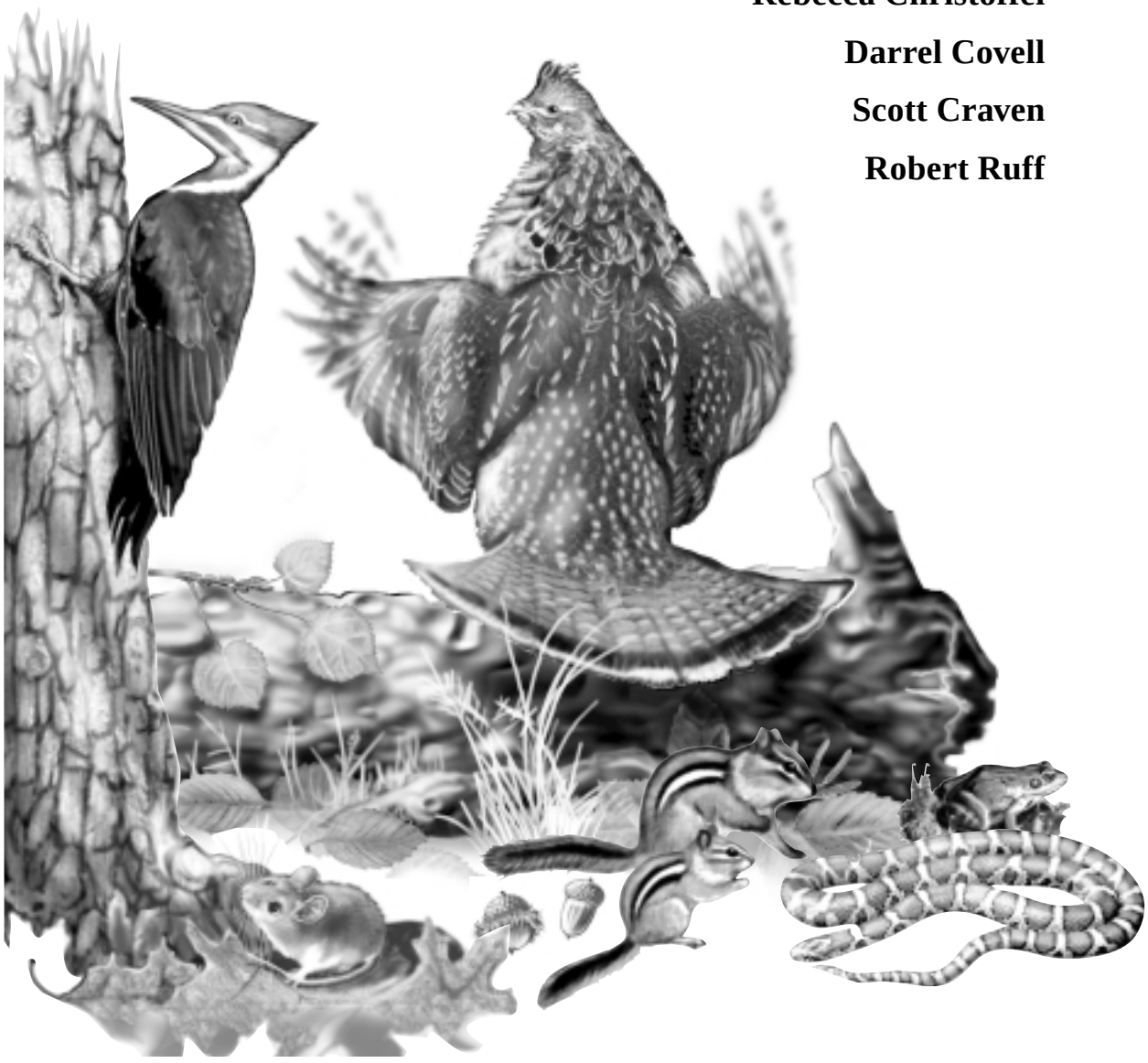

How to Inventory and Monitor Wildlife on Your Land

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Overview

Why survey wildlife?

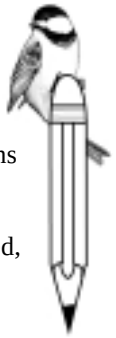
Many people, especially private landowners, want to better understand their environment. The sight and sound of a grouse flushing inspires all kinds of questions. "How many grouse do I have? Where are they most abundant on my property? Do I have as many birds as my neighbors?" Most landowners appreciate the diversity of animals on their property. Some engage in identifying and keeping lists of the species they see. This is the first step in completing an inventory. Once you are able to identify various species of wildlife, then you are ready to begin to monitor the wildlife on your property. This opens the door to a whole new understanding of your property's potential as a home to wildlife. Population monitoring enables you to see what habitats are favorable to certain wildlife and how your habitat management efforts affect the species living on your land.

Surveying wildlife not only provides you with a measurement of your land's potential to attract and hold wildlife, but it can also provide others with a bigger and clearer picture of Wisconsin's wildlife abundance. The foundation of the excellent program of wildlife management in Wisconsin today is the availability of accurate, current information on wildlife abundance. Such information is not easy to obtain, especially on Wisconsin's private lands. You can help! If you choose to participate in one of the many wildlife monitoring programs, the information you collect can be shared with others in Wisconsin, the Great Lakes, and even the nation. A better understanding of selected species' overall population health can be achieved when coordinators of these monitoring programs combine many people's information. For example, wildlife populations can be affected by local events (e.g., a timber harvest on your property) which you may detect in surveys, or they can be affected by more regional or global events (e.g., climate change, an invasion of goshawks that impacts a region's entire grouse population) which would be more apparent from pooled information. For this reason, we encourage you to share your wildlife survey data with others. Participating in a wildlife monitoring program is good for the wildlife and it helps you understand the bigger picture by comparing your results with those of others.

What is this publication all about?

This book is about giving you an opportunity to better understand the wildlife on your land. In our work with private landowners, we have found that *people are intensely curious about the wildlife on their lands, but they are often unsure about how to systematically find out more about the animals on their property.* Landowners are also looking for a way to assess their land management activities. *By monitoring key species or species that are of personal interest, landowners are provided with a barometer of the outcomes of their management activities and the ecological health of their land.* This book was assembled in response to those landowners who wanted to know how best to inventory and monitor wildlife on their lands, with the ultimate goal of being the best possible stewards of their land.

To produce this publication, we did three things: 1) asked natural resources agency and conservation organization members which wildlife species and techniques should be included in such a guide, 2) asked a sample of landowners which wildlife species and techniques were of special interest to them, and 3) reviewed many inventory and monitoring programs and techniques for inclusion. This publication is a composite of those three sets of information. In order to make this guide useful, relevant and of manageable size, we prioritized wildlife species and survey techniques to provide better focus. Hence, this is not a comprehensive manual on how to conduct wildlife surveys; rather, it is a subset, prioritized according to what agencies, organizations and landowners believe are important species groups and practical methods for surveying them. If you find species or techniques of interest missing, we have provided numerous references for more information. You can use many of the techniques listed to survey any group of organisms in which you are especially interested, and much of your survey work can be accomplished incidental to other land use activities on your property. The most powerful tool that you can use is your power of observation whenever you are out on your land.



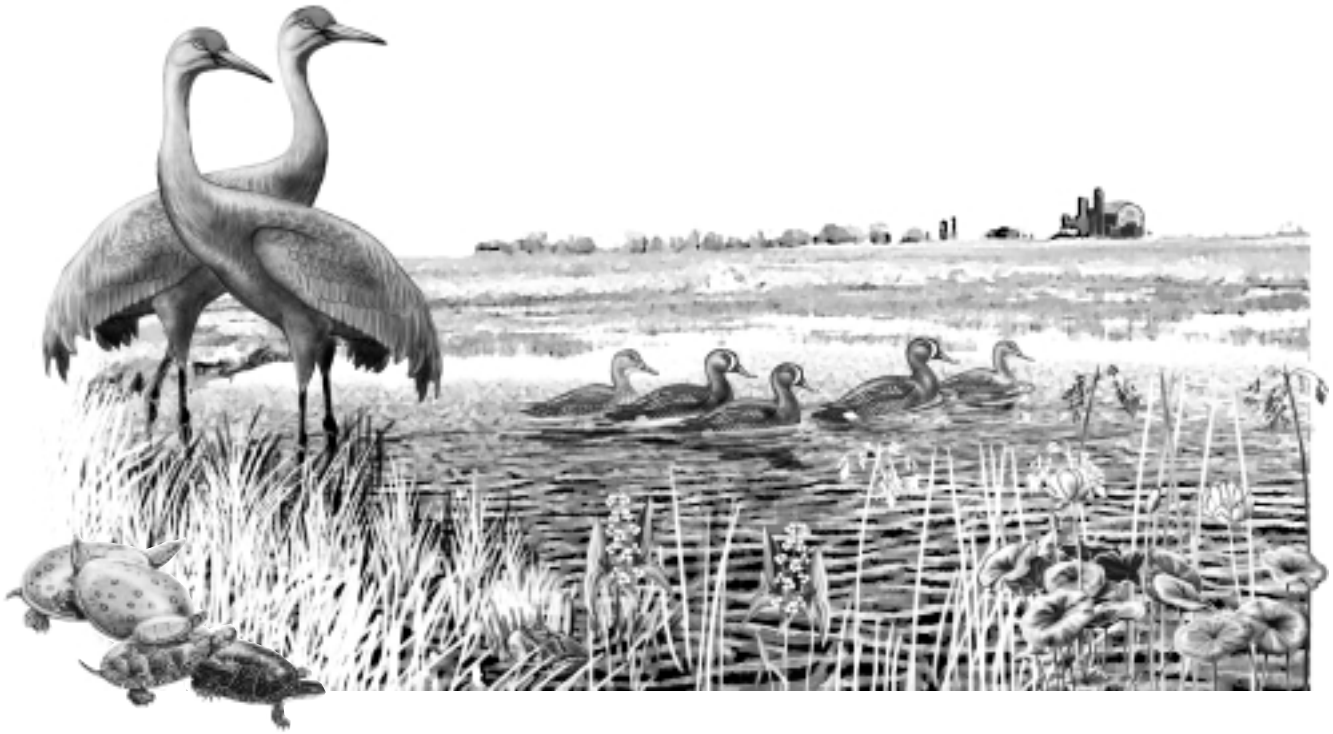
How is this publication organized?

First, we describe the ecoregions and habitats of Wisconsin. By becoming familiar with these landscape classifications you can both place your land in the context of the state as a whole, and have a starting point for the inventory of species on your land. Please read the appropriate ecoregion description for your property and the 2–3 habitat descriptions that apply to your land. You can then turn to the appropriate section on inventorying and monitoring.

Second, we describe the process of inventorying and monitoring in general, and then go over each of the specific techniques we believe you will find useful. Approximate dates are listed under each technique for its use, but it should be noted that these are average dates based on a typical year, and these may differ according to the current year's phenology.

Finally, we provide the mechanics of additional references, key contacts and data sheets for your use.

What are you waiting for? Go see what's out there!



Wisconsin Ecoregions and Habitats

Habitats are the plant communities in which animals live. Every plant community has an animal community associated with it. In Wisconsin, there are animals that are associated with the northern forest such as fishers and pine martens, while the typical animals found in southern agricultural lands include cottontail rabbits and opossums. On a more local scale, there are animals that are habitat specialists such as the pickerel frog, which is found in certain types of wetlands fed by cold-water springs. To know the habitat is to know the animals that could or should be present. Various inventorying and monitoring techniques allow you to verify a species' presence, evaluate its abundance, and use that information to plan management, or to measure its success.

Some of Wisconsin's wildlife is commonly found throughout the state. These animals are primarily generalists, species that adapt readily to various habitats and disturbances, and are not particularly fussy about their diet. Amphibians found throughout the state include green frogs, mudpuppies, American toads, spring peepers, and northern leopard frogs. Reptiles found statewide include snapping turtles, painted turtles, and eastern garter snakes. Some mammals are common throughout Wisconsin such as short-tailed shrews, cottontail rabbits, white-tailed deer, coyotes, raccoons, gray squirrels, beavers, white-footed mice, meadow voles, muskrats, Norway rats, house mice, red foxes, and striped skunks. Some birds can be found statewide for at least part, if not all of the year. These include Canada geese, wood ducks, mallards, blue-winged teal, turkey vultures, northern harriers, Cooper's hawks, kestrels, Virginia rails, soras, sandhill cranes, killdeer, mourning doves, great horned owls, barred owls, northern saw-whet owls, common nighthawks, ruby-throated hummingbirds, belted kingfishers, and downy and hairy woodpeckers.

ECOREGIONS

Northern Highland Lake Superior Lowland

The most northern ecoregion in Wisconsin, the Northern Highland/Lake Superior Lowland area was dominated by northern mesic (of moderate moisture—not wet and not dry) forests in pre-European settlement times. Large areas of barrens habitat were present in the northwest and the northeast. Other habitat types included pine forests, conifer swamps, bogs, boreal forests, large sedge meadows, lowland hardwood forests, and some southern oak forests. This area is peppered with an abundance of lakes.

Animals present include: Red-backed salamanders, mink frogs, wood turtles, Blanding's turtles, northern prairie skinks, northern ringneck snakes, northern red-bellied snakes, northern water snakes, water shrews, star-nosed moles, snowshoe hares, least chipmunks, woodland deer mice, northern flying squirrels, woodland jumping mice, porcupines, timber wolves, pine martens, fishers, common loons, ospreys, sharp-tailed grouse, and broad-winged hawks.

Southwestern Upland

The Southwestern Upland area of Wisconsin has not been glaciated recently; thus, it is hilly. Prior to European settlement, this area was dominated by oak savanna. Savanna is a combination of grassland and forest, in which most of the land is covered by grasses and a few shrubs but which also has widely spaced tall trees, usually of one species in a given area. Scattered areas of prairie, oak forest, lowland hardwood forests, and southern mesic forests were also present. A few areas in the northeast consisted of pine forest and pine and oak barrens. Barrens also occurred along two major rivers, the Chippewa and Wisconsin. Wetlands are not common in the Southwestern Upland, though there are some lakes in a pothole area in St. Croix County.

Animals present include: Four-toed salamanders, blue-spotted salamanders, Blanchard's cricket frogs, chorus frogs, spring peepers, eastern gray treefrogs, pickerel frogs, wood frogs, musk turtles, wood turtles, Blanding's turtles, map turtles, midland and spiny softshell turtles, six-lined racerunners, bullsnakes, blue racers, black rat snakes, prairie ringneck snakes, timber

Wisconsin Ecoregions

Figure 1. Natural Divisions of Wisconsin, as described by Hole and Germain (1994).

rattlesnakes, eastern moles, little brown bats, northern bats, eastern pipistrelles, big brown bats, red bats, 13-lined ground squirrels, prairie voles, pocket gophers, pine voles, great egrets, wild turkeys, northern bobwhites, eastern screech owls, long-eared owls, red-bellied woodpeckers, pileated woodpeckers, blue-gray gnatcatchers, loggerhead shrikes, Bell's vireos, lark sparrows, orchard orioles, prothonotary warblers, Louisiana waterthrushes and Kentucky warblers.

Central Plains

The Central Plains were glaciated about 10,000 years ago, and the area was once covered by Glacial Lake Wisconsin. This area is characterized by extensive areas of very sandy soil. Oak savanna and oak and pine barrens were the primary habitat types prior to European settlement. Other habitat types present included sedge meadows, pine forests, southern oak forests, conifer swamps, prairies, and lowland hardwood forests.

Animals present include: Tiger salamanders, blue-spotted salamanders, chorus frogs, spring peepers, Cope's gray treefrogs, eastern gray treefrogs, pickerel frogs, wood frogs, Blanding's turtles, western slender glass lizards, five-lined skinks, eastern hognose snakes, smooth green snakes, fox snakes, DeKay's snakes, northern red-bellied snakes, massasauga rattlesnakes, snowshoe hares, 13-lined ground squirrels, Franklin's ground squirrels, fox squirrels, southern bog lemmings, red-backed voles, meadow jumping mice, porcupines, western harvest mice, wild turkeys, northern bobwhites, common snipes, eastern screech owls, red-bellied woodpeckers, blue-gray gnatcatchers, and clay-colored sparrows.

Lake Michigan Shoreland

The Lake Michigan Shoreland was an extensively forested area prior to European settlement. It was covered primarily by northern mesic forests. Boreal forests covered northern Door County. Other habitats present included conifer swamps, pine barrens, pine forests, sedge meadows, lowland hardwood forests, southern mesic forests and oak savannas.

Animals present include: Spotted salamanders, red-backed salamanders, wood frogs, spring peepers, eastern gray treefrogs, fox snakes, northern water snakes, big brown bats, red bats, snowshoe hares, 13-lined ground squirrels, double-crested cormorants, black-crowned night herons, gadwalls, common snipes, Caspian terns, Forster's terns, common terns, blue-gray gnatcatchers, golden-winged warblers, cerulean warblers, mourning warblers, and clay-colored sparrows.

Southeastern Ridges and Low lands

The Southeastern Ridges and Lowlands area of Wisconsin was glaciated most recently about 10,000 years ago, and is fairly flat. This area was dominated by oak savanna and southern mesic forest prior to European settlement. Interspersed in these habitats were patches of prairie, sedge meadow, oak forest, conifer swamp and lowland hardwood forest. This area contains plentiful lakes and other wetlands.

Animals present include: Blue-spotted salamanders, tiger salamanders, central newts, chorus frogs, pickerel frogs, Blanding's turtles, musk turtles, smooth green snakes, milk snakes, eastern plains garter snakes, DeKay's snakes, northern water snakes, queensnakes, Butler's garter snakes, eastern plains garter snakes, Arctic shrews, pygmy shrews, little brown bats, silver-haired bats, big brown bats, red bats, hoary bats, 13-lined ground squirrels, Franklin's ground squirrels, fox squirrels, southern flying squirrels, meadow jumping mice, great egrets, northern shovelers, redheads, gray partridges, wild turkeys, northern bobwhites, common moorhens, eastern screech owls, long-eared owls, red-bellied woodpecker, acadian flycatchers, blue-gray gnatcatchers, cerulean warblers, and orchard orioles.

HABITATS

Forests

Forests are plant communities dominated by trees. Cutover forests may contain densely packed tree seedlings and saplings. As a forest ages, fewer seedlings are able to survive in the shade of their larger counterparts. The forest floor then becomes available for wildflowers and other herbaceous vegetation. In mature or old-growth forests, there are fewer trees per acre but canopy coverage is complete and few tree seedlings can survive under such shade.

Boreal Forest

Only about 2% of Wisconsin's land area is covered by boreal forest. It is best developed along Lake Superior and near the tip of the Door County peninsula. This habitat is dominated by balsam fir and white spruce, but may also include white pine, white cedar, white birch and aspen and maple species. Fly-honeysuckle and beaked hazelnut are two shrubs commonly found in boreal forest. Common understory plants include dwarf raspberry, Canada mayflower, large-leaved aster, wild sarsaparilla, bluebead lily, and bunchberry.

Mammals associated with the boreal forest include red squirrels, porcupines, southern bog lemmings, meadow voles, hoary bats, least chipmunks, northern flying squirrels, red-backed voles, porcupines, timber wolves, pine martens and lynx. The red-bellied snake is found in boreal forest. Birds found in this habitat include grosbeaks, gray jays, boreal chickadees, spruce grouse,

white-throated sparrows, crossbills, golden-crowned kinglets, ruby-crowned kinglets, Swainson's thrushes, black-backed woodpeckers, Nashville warblers, northern parula warblers, magnolia warblers, Cape May warblers, yellow-rumped warblers, black-throated green warblers, Blackburnian warblers, pine warblers, black and white warblers, Canada warblers, white-winged crossbills, pine siskins, and brown creepers.

Lowland Hardwood Forest

Lowland forests are characterized by very high soil moisture. They frequently receive additions of silt from spring floodwaters, that may arrive as late as mid-June. This habitat type is present along all of the major rivers in Wisconsin. These forests include a number of trees from the South, which have entered Wisconsin along river valleys and are found nowhere else. This includes smooth buckeye, river birch, honey locust and sycamore. This habitat is frequently dominated by cottonwood, swamp white oak, silver maple and American elm. Many of these trees are multi-trunked and support many vines including poison ivy, Virginia creeper, grape, moonseed, hog peanut, parasitic dodder, wild yam, groundnut, carrionflower and bittersweet. Seedling production is low in this habitat due to flooding, and few shrubs are found, though prickly ash is one notable example. Common understory plants include honewort, sweet cicely, black snakeroot, wood nettle, false nettle, and jewelweed.

Mammals found in this habitat include opossums, pygmy shrews, red bats and southern flying squirrels. Many amphibians use this habitat including central newts, blue-spotted salamanders, gray treefrogs, Cope's gray treefrogs, spring peepers, green frogs, and wood frogs. Reptiles using lowland forests include Blanding's turtles, hognose snakes, fox snakes, northern water snakes, and Massasauga rattlesnakes. Many birds live in lowland forest including prothonotary warblers, golden-winged warblers, cardinals, tufted titmice, brown creepers, house wrens, great crested flycatchers, blue-gray gnatcatchers, gray catbirds, orchard orioles, barred owls, red-shouldered hawks, red-bellied woodpeckers, red-headed woodpeckers, pileated woodpeckers, and northern flickers.

Northern Mesic Forest

The northern mesic forest is found widely throughout the northern 2/3 of the state. Prior to European settlement, about 1/3 of the total land area of Wisconsin was covered by this forest type. The leading dominant tree in this habitat type is the sugar maple. Depending on how far west you are in Wisconsin, there may be several other dominant trees. In far eastern Wisconsin, beech is a prevalent component of the forest. Hemlock is an important element in the eastern half of the state. Yellow birch is another common tree in northern mesic forest, but it drops out in the far western areas. Several other trees are commonly associated with these dominants including hop hornbeam, American elm, red oak, red maple, white birch, white ash and balsam fir. Some shrubs include Canada yew, beaked hazelnut, leatherwood, swamp currant and arrow-wood. Many creeping vines are found here including partridgeberry, bunchberry, and twinflower. The most widespread groundlayer species are Canada mayflower, Solomon's seal and twisted stalk. The understory vegetation in northern mesic forest is relatively low due to the heavy shading of hemlock and beech.

Several Wisconsin mammals make their home in the northern mesic forest including long-tailed weasels, snowshoe hares, hoary bats, northern flying squirrels, red-backed voles, porcupines, wolves, black bears, and fishers. Only a few amphibians make their home in the northern mesic forest. These include four-toed salamanders, blue-spotted salamanders, and wood frogs. Birds associated with this habitat include red-eyed vireos, solitary vireos, ovenbirds, veeries, hermit thrushes, scarlet tanagers, rose-breasted grosbeaks, purple finches, broad-winged hawks, sharp-shinned hawks, Cooper's hawks, goshawks, great horned owls, barred owls, northern saw-whet owls, red-breasted nuthatches, white-breasted nuthatches, whip-poor-wills, brown creepers, least flycatchers, pileated woodpeckers, downy woodpeckers, yellow-bellied sapsuckers, black-throated blue warblers, black-throated green warblers, blackburnian warblers, black-and-white warblers, American redstarts, Canada warblers, and ruffed grouse.

Pine Forest

Pine forests are found in the northern half of Wisconsin and are especially prevalent in Marinette, Vilas, Oneida, Burnett, Washburn, Bayfield, Adams, Juneau, Wood and Jackson counties. Prior to European settlement, over 6% of the land surface in Wisconsin was covered by pine forests. Dominant trees in this habitat include jack pine, red pine and white pine. Some deciduous trees include red maple, trembling aspen, and paper birch. The shrub layer may include blueberry, beaked hazelnut, bush honeysuckle, and maple-leaved viburnum. Common understory plants include Canada mayflower, bracken fern, starflower, and wild sarsaparilla.

Wisconsin mammals inhabiting pine forests include red squirrels, red-backed voles, least chipmunks, pine martens, hoary bats, snowshoe hares, porcupines and timber wolves. Birds found in this habitat type include gray jays, sharp-shinned hawks, common ravens, golden-crowned kinglets, ruby-crowned kinglets, mourning doves, Swainson's thrushes, long-eared owls, northern saw-whet owls,

black-backed woodpeckers, solitary vireos, Nashville warblers, northern parula warblers, magnolia warblers, Cape May warblers, black-throated blue warblers, black-throated green warblers, blackburnian warblers, pine warblers, black-and-white warblers, Connecticut warblers, Canada warblers, and red-breasted nuthatches.

Southern Mesic Forest

About 10% of Wisconsin's acreage was covered by southern mesic forest prior to European settlement. This community is dominated by sugar maple trees, but also includes basswood, slippery elm, red oak, yellowbud hickory and hop hornbeam. Beech may also be found in forests in the eastern counties of Wisconsin, where the largest areas of this habitat were found historically. Shrubs and woody vines are scarce in this forest, but may include Virginia creeper, poison ivy, bittersweet, gooseberries, and bladdernut. This habitat is heavily shaded by sugar maple, and so the groundlayer is dominated by spring blooming plants such as trout lilies, squirrel-corn, Dutchman's breeches, spring beauty, toothwort and false rue-anemone. Other plants include Jack-in-the-pulpit, wild ginger, blue cohosh, hepatica, mayapple and trilliums.

Wisconsin mammals utilizing this habitat include southern flying squirrels. Some amphibians can be found including blue-spotted salamanders, spring peepers, and wood frogs. Many birds are found in southern mesic forests including cerulean warblers, red-eyed vireos, veeries, wood thrushes, rufous-sided towhees, indigo buntings, Acadian flycatchers, eastern wood pewees, ovenbirds, black-billed cuckoos, yellow-billed cuckoos, white-breasted nuthatches, eastern screech owls, great horned owls, barred owls, red-bellied woodpeckers, and pileated woodpeckers.

Southern Oak Forest

Oak forests in Wisconsin are found on well-drained sites on sandy flatlands, south and west hillsides, or on thin soils on hilltops and ridges. About 4% of the state was covered by oak forests prior to settlement, and the greatest concentration was in the west central counties. The dominant trees in these forests are white oak, red oak, and black oak. Other common trees include black cherry, bur oak, Hill's oak, chinquapin oak, trembling aspen, boxelder, big-toothed aspen, red maple, and shagbark hickory. The shrub layer is well developed and may include gray dogwood, American hazelnut, blackberry, gooseberry, witch hazel, and prickly ash. Some common plants in the groundlayer include hog peanut, enchanter's nightshade, lopseed, pointed-leaved tick trefoil and bottlebrush grass.

Mammals inhabiting oak forests include gray squirrels, fox squirrels, southern flying squirrels, eastern chipmunks, cottontail rabbits, woodchucks, raccoons, opossums, red foxes and white-tailed deer. Some amphibians using this habitat include tiger salamanders, blue-spotted salamanders, American toads, spring peepers, and gray treefrogs. Brown snakes are common residents of oak forests, and black rat snakes may be found in the southwest quarter of the state. Many birds reside in oak forests including scarlet tanagers, black-capped chickadees, downy woodpeckers, wild turkeys, black-billed cuckoos, yellow-billed cuckoos, rose-breasted grosbeaks, cardinals, blue jays, northern orioles, red-headed woodpeckers, northern flickers, pileated woodpeckers, wood thrushes, eastern wood pewees, least flycatchers, eastern screech owls, great horned owls, barred owls, turkey vultures, redstarts, blue-gray gnatcatchers, yellow-throated vireos, ruby-throated hummingbirds, and veeries.

SAVANNAS

In Wisconsin, savanna was one of the most widespread plant communities prior to European settlement. A savanna is a combination of grassland and forest. Trees are a component of this community, but their density is so low that it allows grasses and other herbaceous vegetation to become dominant. Most of the land is occupied by grasses and shrubs.

Oak Barrens

Oak barrens are found primarily on very sandy soils and in the southern half of the state. This habitat consists of widely spaced oaks (20–30 trees/acre) of various kinds, including black oak, bur oak, white oak, Hill's oak, and red oak. Other associated trees include shagbark hickory, black cherry, paper birch, and trembling aspen. Most of the oaks are of grub origin, and usually have multiple trunks but rarely achieve the great size and splendor of isolated bur oaks. Understory plants include American hazelnut, flowering spurge, leadplant, wild rose, starry Solomon's seal, bracken fern, false Solomon's seal, strawberry and frostweed.

Mammals using this habitat include meadow voles and badgers. Wisconsin amphibians found in oak barrens include tiger salamanders, American toads and Cope's gray treefrogs. Many reptiles inhabit the barrens such as western glass lizards, blue racers, hognose snakes, milk snakes, and bullsnakes. Birds found in oak barrens include red-tailed hawks, rough-legged hawks, American kestrels, gray catbirds, brown thrashers, loggerhead shrikes, northern shrikes, indigo buntings, and chipping sparrows.

Oak Savanna

A savanna is a blend of grassland and forest. Most of the land's surface is covered with grasses and some shrubs, but widely spaced tall trees are also present, and these are usually of just one species in any given place. Savanna was one of the most widespread communities in Wisconsin prior to European settlement, covering 5.5 million acres. Currently, an oak savanna with an intact groundlayer is the rarest Wisconsin plant community. The trees within the savanna are generally all of the same size and age, although the age may range from under 50 years to over 200 years. Frequently, the large lower branches hang down close to the ground and extend a long way from the base of the tree. The most commonly found trees on the savannas were bur oaks, white oaks, or black oaks. Other species occur rarely but include shagbark hickory, large- toothed aspen and black cherry. The groundlayer is much more well developed than the overstory and may include leadplant, hog peanut, big bluestem, little bluestem, thimbleweed, spreading dogbane, New Jersey tea, gray dogwood, American hazelnut, showy tick trefoil, flowering spurge, wild bergamot, purple prairie clover, poison ivy, wild roses, oxeye, hoary puccoon and northern bedstraw.

Mammals inhabiting Wisconsin's savannas include fox squirrels, pine voles, and meadow voles. Amphibians found on savanna include tiger salamanders, American toads, and Cope's gray treefrogs. The savanna is used by many reptiles such as western glass lizards, blue racers, eastern hognose snakes, milk snakes and bullsnakes. Birds using savanna include rough-legged hawks, American kestrels, bluebirds, northern shrikes, loggerhead shrikes, warbling vireos, chipping sparrows, and orchard orioles.

Pine Barrens

This habitat type is found in the northern half of Wisconsin, and is concentrated in areas of very sandy soil. Like the oak barrens of southern Wisconsin, the pine barrens of northern Wisconsin contains widely spaced trees (2–8 trees/acre on average). The most common tree on pine barrens is the jack pine, but there may also be red pine present. Hill's oak is often found on pine barrens as grubs or as a scattering of larger trees. Other trees are sometimes present such as bur oak and big-toothed aspen. The shrub layer is very well-developed in pine barrens and includes redroot, huckleberry, American hazelnut, blueberry and sweet fern. Common groundlayer plants include wild lupine, hoary puccoon, spreading dogbane, flowering spurge, wild strawberry, dwarf raspberry, Canada mayflower, wild roses, false Solomon's seal, and starry Solomon's seal.

Mammals inhabiting Wisconsin's pine barrens include meadow voles, prairie voles, timber wolves, black bears, and badgers. Birds using pine barrens include magnolia warblers, Connecticut warblers and Kirtland's warblers.

Shrub Communities

There are 2 plant communities in Wisconsin which are dominated by shrubs 1.5 to 3 meters tall. These are alder thickets and shrub carrs, described in detail below. These communities are distributed throughout Wisconsin; alder thickets are scattered in northern Wisconsin, while shrub carrs are found in the southern half of the state. In some cases, a shrub community can cover an extensive area of land.

Alder Thicket

Alder thickets occur mainly along cold creeks and streams, and are generally found in the northern two-thirds of the state. This habitat is dominated by speckled alder clumps reaching 10–15 feet in height. The soil is usually a wet muck, made up of decomposed plant and animal matter. The understory is rich, and is provided with nitrogen via the alder which fixes nitrogen in its leaves that are later shed on the ground in autumn. Common groundlayer plants in alder thickets include asters, bluejoint grass, marsh bellflower, spotted joe-pye weed, jewelweed, blue flag, sensitive fern, arrow-leaved tearthumb, meadowsweet, marsh fern, cattails, and bulrush.

Wisconsin mammals inhabiting alder thickets include snowshoe hares, star-nosed moles, black bears, and white-tailed deer. Many birds are found in alder thickets such as American woodcocks, common redpolls, black-capped chickadees, ruffed grouse, alder flycatchers, eastern kingbirds, common yellowthroats, and yellow warblers.

Shrub Carr

A shrub carr is a dense shrubby community that occurs mainly along cold creeks and streams. It is dominated by tall shrubs other than alder, and has an understory intermediate between a meadow and forest. The most common shrubs are red-osier dogwood, and various willows. Other shrubs found in this community include silky dogwood, currant, red raspberry, elderberry and nannyberry. Many vines are present such as virgin's bower, wild cucumber, Virginia creeper, bindweed, and poison ivy. Understory plants include swamp milkweed, asters, bluejoint grass, horsetail, spotted joe-pye weed, jewelweed, blue flag, water horehound, bugleweed, Canada goldenrod, meadow rue and cattails.

Mammals found in Wisconsin's shrub carrs include Franklin's ground squirrels, prairie mice, meadow jumping mice, masked shrews and the short-tailed weasels. Amphibians such as pickerel frogs and leopard

frogs can be found in shrub carr. Reptiles found in this habitat include milk snakes, water snakes and in the southeast corner of the state, queensnakes. Many birds reside in shrub carr such as northern bobwhites, willow flycatchers, eastern kingbirds, brown thrashers, cedar waxwings, golden-winged warblers, yellow warblers, chestnut-sided warblers, American redstarts, northern waterthrushes, common yellowthroats, indigo buntings, rufous-sided towhees, American tree sparrows, clay-colored sparrows, dark-eyed juncos, brown-headed cowbirds, and American goldfinches.

PRAIRIES

The word "prairie" comes from the French word for meadow. Wisconsin is the northeastern boundary of the American prairies. This habitat type is most apparent in the southwest corner of the state but was commonly found throughout the southern half of Wisconsin prior to European settlement. Prairies are plant communities that are dominated by grasses and contain less than one mature tree per acre. A tremendous variety of forbs live on prairie due to light and nutrient availability. These forbs provide an individual with the opportunity to revisit an area on a weekly or bi-weekly basis during field season, and always have a new and beautiful vista for viewing. Prairies can vary greatly in plant composition due to changes in soil, topography, and temperature. In this guide, prairies have been divided into three distinct types; the dry prairie, mesic prairie, and the wet prairie.

Dry Prairie

The majority of dry prairie remnants in Wisconsin are found on steep rocky hillsides that slope toward the southwest. This aspect facilitates soil warming, and leads to dryer conditions than the surrounding area. Dry prairies are also found in valleys with very sandy soils. This is the shortest and most sparsely vegetated prairie in Wisconsin. Common plants include pasque flower, side oats grama grass, fringed puccoon, silky aster, big bluestem grass, little bluestem grass, leadplant, common milkweed, wild bergamot and gray goldenrod.

Mammals inhabiting Wisconsin's dry prairies include 13-lined ground squirrels, Franklin's ground squirrels, pocket gophers, prairie voles, western harvest mice, and badgers. A multitude of reptiles use this habitat including ornate box turtles (state-endangered), six-lined racerunners, milk snakes, blue racers, bullsnakes, and timber rattlesnakes. Many birds can be found in dry prairie such as prairie horned larks, dickcissels, grasshopper sparrows, Henslow's sparrows, bobolinks, American goldfinches, Brewer's blackbirds, and eastern and western meadowlarks.

Mesic Prairie

Mesic prairies are found on flat or gently rolling land, and on richer soils than dry prairie. It is easy to get disoriented in this habitat late in the summer or autumn due to the great height (>2m) and density of the grasses. Plants found in this habitat include big bluestem grass, Indian grass, smooth aster, wild indigo, Illinois tick trefoil, rattlesnake master, compass plant, gray-headed coneflower, wild roses, spiderwort, pale purple coneflower (state-threatened), and shooting star.

Wisconsin mammals found in this habitat include badgers, striped skunks, prairie moles, pocket gophers, 13-lined ground squirrels, western harvest mice, and prairie voles. Reptiles may include blue racers, bullsnakes, smooth green snakes, and plains garter snakes. Many birds inhabit mesic prairie including red-tailed hawks, rough-legged hawks, American kestrels, upland sandpipers, cliff swallows, barn swallows, dickcissels, vesper sparrows, savannah sparrows, grasshopper sparrows, Henslow's sparrows, LeConte's sparrows, bobolinks, ring-necked pheasants, eastern and western meadowlarks, and Brewer's blackbirds.

Wet Prairie

Wet prairies are usually located on lowlands that are subject to floodwaters from nearby streams or that are subject to heavy rains. Many of these prairies are located on the beds of extinct glacial lakes, and many have artesian springs or wells that keep the moisture level up even during times of drought. These prairies are closely related to sedge meadows, but the plants in wet prairies are primarily grasses instead of sedges. Plants found in this habitat include big bluestem grass, bluejoint grass, wild rye, cordgrass, New England aster, bottle gentian, yellow star grass, blazing star, stiff goldenrod, azure aster, Virginia mountain mint, black-eyed susan, Turk's-cap lily, and prairie dock.

Mammals inhabiting Wisconsin's wet prairies include Franklin's ground squirrels, prairie voles, and least weasels. Many amphibians are found in this habitat such as Cope's gray treefrogs, western chorus frogs, American toads, central newts and tiger salamanders. Reptiles in wet prairie include Blanding's turtles, painted turtles, and the eastern hognose snakes. Many birds are found in wet prairie such as greater prairie chickens, bobolinks, northern harriers, red-tailed hawks, rough-legged hawks, American kestrels, sandhill cranes, common snipes, marsh wrens, dickcissels, Henslow's sparrows, savanna sparrows, and Brewer's blackbirds.

WETLANDS

Wisconsin is home to a variety of wetlands, habitats in which water covers the ground for part or all of the year. Wisconsin wetlands include bogs, conifer swamps, lakes, marshes, sedge meadows, streams, wet prairies, and woodland ponds. You will find detailed information on each of these wetlands below except for wet prairie, which was described in the previous section.

Bog

Bogs are characterized by a spongy mat of wet, nutrient-poor, acidic peat. Atop the peat is a carpet of sphagnum moss in which bog-hardy plants and shrubs grow. This habitat type is generally found in the northern half of the state. Many bogs were formed when the last ice age ended, developing in kettle-shaped lakes where large ice chunks were left and melted. Temperatures tend to be lower (as much as 20–30 F) in bogs than in the surrounding uplands, thus enabling some more arctic loving plants to survive there. Some bogs are young enough that there are few or no trees present. In others, black spruce and tamaracks are the dominant trees, but they can sometimes be joined by various pines. Shrubs found on the bog may include bog birch and bog holly. Groundlayer species include Labrador tea, bog Rosemary, leatherleaf, bog laurel, cotton grass and blueberries. Bogs are particularly known for the insectivorous plants inhabiting them including pitcher plants and sundews.

Some mammals that are commonly associated with bogs include minks, muskrats, meadow voles, masked shrews, snowshoe hares, southern bog lemmings and short-tailed shrews. Amphibians include leopard frogs, American toads, and four-toed salamanders. Painted turtles, garter snakes and ribbon snakes are found in bogs. Some birds that use bog habitat include swamp sparrows, song sparrows, palm warblers, and black-backed woodpeckers.

Conifer Swamp

Conifer swamps are found in the northern half of Wisconsin, and cover over 2 million acres (6.4%) of land surface. The greatest concentration of swamps are found in southern Iron County, northern Forest County, Price and Oconto counties. These swamps are distributed on the landscape as small discrete bodies, rarely covering any extensive contiguous areas. The dominant trees in this habitat are white cedar and balsam fir, but other species such as hemlock, yellow birch, black ash and American elm may also be present. Shrubs found in this habitat include winterberry, Canada yew, and speckled alder. Lots of berry bushes (which provide food for wildlife) are found in conifer swamps including poison sumac, blueberries, cranberries, snowberry, wintergreen, dogwoods, gooseberries and dewberries. The groundlayer may include dwarf raspberry, wild sarsaparilla, jewelweed, starflower, naked mitrewort, sweet-scented bedstraw and fancy woodfern. There are often various orchids present.

Conifer swamps are often used as yarding areas by white-tailed deer during winter. Other mammals including black bears, arctic shrews, short-tailed weasels, star-nosed moles, snowshoe hares, red-backed voles and muskrats also inhabit these areas. Birds that inhabit conifer swamps include double-crested cormorants, bald eagles, winter wrens, veeries, hermit thrushes, alder flycatchers, palm warblers, northern waterthrushes, Connecticut warblers, Lincoln's sparrows, swamp sparrows, white-winged crossbills, pine siskins, and purple finches.

Lake

Wisconsin might as easily have become known as the "land of 10,000 lakes" as Minnesota. Most of Wisconsin is covered with a multitude of lakes, especially in the northeast. Most lakes in Wisconsin are of glacial origin, and the only area bypassed by the last glacier was the southwest quarter, where lakes are scarce. (Lakes are defined as deeper than 6 feet deep, and greater than 10 acres in size.)

Some mammals that are affiliated with lakes include minks, river otters, beavers, silver-haired bats and muskrats. Amphibians that use lakes include bullfrogs, mudpuppies, green frogs, and cricket frogs. Reptiles found in lakes include snapping turtles, spiny softshell turtles, garter snakes and northern water snakes. Many birds inhabit Wisconsin's lakes including common loons, several duck species, great blue herons, belted kingfishers, pied-billed grebes, great egrets, green-backed herons, ospreys, bald eagles, black terns, and double-crested cormorants.

Marsh

Marshes provide one of the richest habitats for plant and animal life (marshes are formed in shallow basins and contain 0.5–3 feet of standing water throughout much of the year). Most Wisconsin marshes are located on extinct glacial lake beds. Prevalent marsh plants include cattails, reeds and other grasslike plants. However, many other plants are commonly found in marshy areas including arrowhead, duckweed, pickerelweed, spike-rush, bur-reed, bladderwort, wild rice, and blue flag.

Wisconsin mammals inhabiting marshes include meadow voles, least weasels, minks, pygmy shrews, muskrats and star-nosed moles. Many amphibians use marshes including western chorus frogs, leopard frogs, American toads, central newts, and tiger salamanders. Marsh reptiles include Blanding's turtles and eastern

garter snakes. There is an abundance of marsh-dwelling birds in Wisconsin including several duck species, coots, gallinules, Canada geese, red-winged blackbirds, sora rails, Virginia rails, king rails, common snipes, yellow-headed blackbirds, marsh wrens, swamp sparrows, American bitterns, and pied-billed grebes.

Sedge Meadow

Sedge meadows are formed where the ground lies just above the permanent water table. The substrate is peat, and is covered primarily by sedges. The soils often produce marsh gases such as methane. Sedge meadows are found throughout Wisconsin, but they are restricted to small areas in the north. Sedge meadows in the north tend to be acidic and therefore nutrient-poor. Southern sedge meadows tend to be alkaline and nutrient-rich.

Prevalent plants found in southern sedge meadows besides sedges include Canada anemone, swamp milkweed, bluejoint grass, horsetail, spotted joe-pye weed, jewelweed, blue flag, water horehound, Canada goldenrod, cattails, boneset, meadow rue and angelica.

Plants found commonly in northern sedge meadows in addition to sedges include bluejoint grass, spotted joe-pye weed, blue flag, bugleweed, sensitive fern, arrow-leaved tearthumb, meadowsweet, cattails, and marsh fern.

Wisconsin mammals inhabiting sedge meadows include meadow voles, arctic shrews, southern bog lemmings, muskrats, meadow jumping mice and the least weasel. Many amphibians can be found in this habitat such as northern leopard frogs and western chorus frogs. Reptiles using sedge meadows include Blanding's turtles, eastern garter snakes, smooth green snakes, and eastern Massasauga rattlesnakes. Many birds are found in sedge meadows such as sedge wrens, LeConte's sparrows, common snipes, sora rails, sandhill cranes, Wilson's phalaropes, American bitterns, short-eared owls, ring-necked pheasants, and northern harriers.

Stream

Streams constantly change as they flow down a gradient. These water bodies provide habitat for many of Wisconsin's wildlife species.

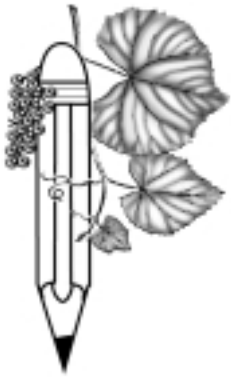
Mammals utilizing streams in Wisconsin include water shrews, silver-haired bats, river otters, raccoons, minks, white-tailed deer, black bears, opossums, beavers, muskrats, woodland jumping mice, fishers, and short-tailed weasels. Some amphibians found along streams include bullfrogs, green frogs, Blanchard's cricket frogs and northern leopard frogs. Pickerel frogs and four-toed salamanders may be found in or along spring-fed streams. Several reptiles use streams such as northern water snakes, wood turtles, and painted turtles. Birds found streamside include northern waterthrushes, wood ducks, bald eagles, rough-winged swallows, winter wrens, cedar waxwings, eastern phoebes, bank swallows, belted kingfishers, and spotted sandpipers.

Woodland Pond

Woodland ponds are bodies of water found in forests of any sort that are under 10 acres in size and less than six feet deep. These water bodies provide important habitat for many of Wisconsin's wildlife species.

Mammals found in woodland ponds include beavers, minks, river otters, eastern pipistrelle bats, skunks, raccoons, water shrews, star-nosed moles, and muskrats. Some amphibians utilizing these ponds include blue-spotted salamanders, central newts, green frogs, spring peepers, wood frogs, and eastern gray treefrogs. Reptiles utilizing woodland ponds include Blanding's turtles and northern water snakes. Many birds use these ponds such as wood ducks, mallards, green-winged teal, blue-winged teal, red-winged blackbirds, Virginia rails, marsh wrens, and black ducks.

Now that we are familiar with habitats and the animals most likely to be found in them, let's get to the fun part; finding, inventorying and monitoring!



An Introduction to Wildlife Inventorying and Monitoring

Before you begin to inventory or monitor wildlife, you should familiarize yourself with identification features of those species of interest. For example, if you plan to conduct a frog calling survey, you must first learn the dozen calls of those frogs (and one toad) before listening at a marsh. You will be surprised at how much you already know, especially if you have extensive outdoors experience. Even young children quickly learn some species such as skunks and rabbits, or species groups such as ducks or bats. As you scan the animals listed for a given habitat or ecoregion, make a list (either mental or written) of those species you feel knowledgeable about, and those you may have never seen or heard. For the groups of animals that require a higher degree of skill, or with which you are unfamiliar, it may be necessary to review field guides and audio tapes or compact disks to gain needed experience before conducting a conclusive survey.

We have tried to keep the complexity of species groups at a manageable level. Instead of recommending a complete inventory of all your land's birdlife, we suggest learning and looking for a subset of those birds in which you are particularly interested. By surveying any species or group of species on a regular basis (e.g. annually) in the same area and using the same technique(s), you will be able to monitor that species' or species group's population(s). This is especially important when assessing the effectiveness of land management on wildlife; by surveying the area prior to and following the land management activity, you can assess its impact on selected wildlife species.

Animals can be identified directly by sight or sound, or indirectly by their tracks, scat or other sign (e.g., tooth marks of beavers on trees). There are many field guides to animals by sight, as well as audio tapes and CD's to bird and frog calls. Fewer guides exist that identify animals by their tracks, scats or other signs. We have provided a list of some of these resources in a later section of this guide. If you still cannot identify an animal or its sign, you should call upon friends, family members or "experts" for assistance. It is important for you to be able to positively identify what you are seeing or hearing as you conduct your inventory or continually monitor one or more species. Rare species, especially endangered and threatened species, may require some documentation before they are reported to a formal program. This may require a photograph, detailed notes, a tape recording, or other evidence of the animal's presence.

Learning how to identify an animal or read its sign is half the fun of the inventorying and monitoring process!

Wildlife Inventorying and Monitoring Techniques

The following taxa (groups of animals) were identified as being of most interest to landowners, governmental agencies and conservation organizations in Wisconsin. Techniques are separated by vertebrate class, beginning with birds, followed by mammals and herptiles (amphibians and reptiles). Each technique is listed followed by the species groups that it addresses, objectives, a description, skill level, methods, associated programs, season in which to conduct the technique, time of day, duration, and the list of equipment needed.

Please note that under several of the techniques (e.g. woodcock surveys), a large parcel is generally being surveyed. Your parcel may not be large enough to encompass a complete survey. The important thing to remember is that you do not want to count the same bird twice; thus, the necessity of placing sample points such a far distance (1/2 mile) apart. If you are interested in conducting a full survey (sometimes requiring up to 10 miles of paved road or path), you can simply enlarge the area you survey to include some of the roads surrounding your property.

Birds

Species Groups: Upland game birds, exotic or pest bird species, waterfowl or marsh birds, avian nest predators or parasites (birds that lay in their eggs in other birds' nests, such as the brown-headed cowbird), songbirds, non-game birds, colonial-nesting birds (birds that nest in colonies consisting of hundreds or thousands of individuals, such as great blue herons), night birds, raptors, cavity-nesting birds, threatened and endangered birds.

Bird Checklist

SPECIES GROUPS: All birds.

OBJECTIVES: Provides information on presence/absence (inventory) of bird species.

DESCRIPTION: This checklist is simply a list of birds that are seen or heard during a particular time. *The Wisconsin Checklist Project* asks each participant to maintain a weekly checklist. Separate checklists are maintained for each county visited. Our recommendations here differ only in one respect. We suggest a weekly recording period of Monday–Sunday (rather than Sunday–Saturday). This means that only one data sheet would be needed during a weekend visit to your property.

SKILL LEVEL: Medium. There may be 100 species breeding on your property, but you do not have to be able to identify the birds by sight and sound beforehand. You can learn as you encounter them.

METHODS: Record all birds observed on a periodic basis (e.g., daily, weekly or monthly).

ASSOCIATED PROGRAMS: *The Wisconsin Checklist Project* is a statewide bird monitoring project coordinated by the Wisconsin Society for Ornithology. If you are interested in participating in this project, the appropriate contact is listed on p. 37.

SEASON: Year-round.

TIME OF DAY: Anytime.

DURATION: Self-determined.

EQUIPMENT NEEDED: Binoculars, bird book, checklist data sheets, pencil.

Nest Box Survey

SPECIES GROUPS: Cavity-nesting birds.

OBJECTIVES: The objectives of a nest box survey can be twofold. One objective may be to determine the appropriateness of a nest box to the target species. For example, testing the effectiveness of two bluebird house styles or two similar bluebird houses placed in different habitats. Another objective may be to monitor the overall health of a population over time.

DESCRIPTION: Open each nest box, being careful not to let eggs or chicks tumble from the opened box. Note the date, nesting material if present, and number of eggs if present. Once eggs are present, you want to identify to whom they belong, and the number by observing the adults or by using a field guide to eggs and nests. By checking the

nest box once a week, you can estimate the date on which eggs were laid. Once young are present, you can track the number of eggs that successfully hatched, and the number of young that survive to fledging. *Note: Songbirds have a very poor sense of smell and contrary to popular belief, will not abandon the nest due to your handling the nest, eggs, or chicks.*

SKILL LEVEL: Easy. You only need to be familiar with a handful of nest box users.

METHODS: Routine checking of nest boxes to determine occupancy rates, parasitism rates and reproductive parameters (i.e., number of eggs, chicks, fledglings)

ASSOCIATED PROGRAMS: The Bluebird Restoration Association of Wisconsin coordinates an annual bluebird nest box survey to track recruitment success and birdhouse preferences for eastern bluebirds. To learn more about this project or to contribute data, the appropriate contact is listed on page 37.

SEASON: March–July. Bluebirds typically begin scouting for suitable nest boxes in March, although cavity nesters such as barred owls begin nesting as early as February.

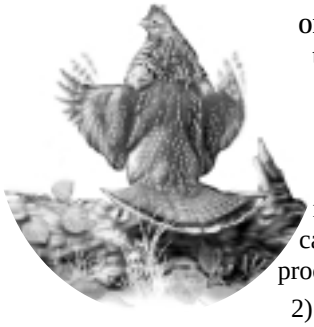
TIME OF DAY: You may check nest boxes at any time of day. Nest monitoring should only be done during calm, mild and dry weather so as to avoid chilling any eggs or chicks present should adults flush from the box.

DURATION: Nest boxes should be monitored once a week during the season in which they are in use. Including data entry, the procedure should take under 5 minutes per box.

EQUIPMENT NEEDED: Data form, pencil, clipboard, gloves.

Grouse Drumming Counts

SPECIES: Ruffed grouse



OBJECTIVES: 1) Spot mapping along trails allows for close monitoring of habitat use by drumming grouse. The objective is to locate all the drumming sites on your property. Drummers and relative numbers of grouse using your land can be determined from this procedure.

2) Roadside surveys of drumming grouse provide an index to the grouse population. Since this method is commonly used by the Wisconsin Department of Natural Resources, the grouse population index in your area may be compared to others throughout the state.

DESCRIPTION: 1) Spot mapping. Spot mapping of ruffed grouse is a most rewarding experience. Drumming sites can be located by searching the wooded areas of your property at any time of year when there is no snow cover to obscure a site, or by walking in on a drumming male. The best time to spot map is from mid-April till late May, during the peak of drumming activity and before "leaf out" in the woods. Look for clues to grouse activity, including bare spots adjacent to logs created by the waving action of the grouse's wings, worn areas on logs, and accumulations of ruffed grouse droppings. Drumming logs within 100 m of each other are likely used by the same bird, and constitute an activity center. You can map these sites by pacing (or measuring) from trails. By placing brightly colored flagging around a twig of a nearby shrub, you can check these same logs for use in future years. Drumming logs may be added or may go unused depending on the status of the ruffed grouse population, and their numbers provide a good way to monitor the population.

2) Roadside surveys are easy to conduct. Set out a route to either be driven using a 4-wheeler or dirt bike, traveled on by horseback, or walked along your interior roads and paths. Each stop on a route should be at least a half-mile apart to avoid counting the same bird twice. You can extend your survey to include the boundaries of your land and roads within a mile or two of your property if necessary. If you would like to contribute or compare data with WDNR, each stop should be one mile apart. Stop the car, wait one minute, and then tally the number of drums you hear during the next 4 minutes. Do not perform a drumming count survey if the air temperature is below 25° F, or if it is cloudy and misty, raining or storming. All of these conditions tend to stop or sharply curb drumming activity. Nearby human activity can also disturb birds; if possible on your route, begin your survey at the place where there is most likely to be human activity later in the morning and thereby avoid human interference.

SKILL LEVEL: Easy. Requires ability to identify the low "drumming" sound of ruffed grouse.

METHODS: 1) Spot mapping of drumming grouse from points on trails.

2) Numbers of drumming grouse tallied for stops along roadside.

ASSOCIATED PROGRAMS: The Wisconsin Department of Natural Resources conducts annual Ruffed Grouse Drumming Surveys to monitor ruffed grouse

populations. To contribute data to this project, the appropriate contact is listed on page 37.

SEASON: Spot mapping may be done at any time of year but is best in spring. Drumming counts should be done in spring (mid April till late May).

TIME OF DAY: Spot mapping can be done anytime during the day, but is easiest in the morning if your are using drumming activity to locate sites. Drumming counts are conducted in the early morning (1/2 hour before sunrise until about 1 hour after sunrise).

DURATION: Time spent spot mapping ruffed grouse along trails on your property is self-determined and dependent on the size of your property and amount of suitable habitat available. For drumming counts, listen at each stop for 4 minutes. For a 10-mile survey, time spent will be approximately 1.5 hours.

EQUIPMENT NEEDED: Data sheet (see Appendix B, page 42), pencil, map, compass.

Woodcock Peenting Surveys

SPECIES: Woodcock.

OBJECTIVES: By observing woodcock displaying on your property, you gain presence/absence information (inventory). Over time, you can compare relative abundance of woodcock using your land.

DESCRIPTION: Listen and look for woodcock as you traverse a pre-determined route on your property. Male woodcock seek mates by producing a nasal "peenting" sound from the ground, followed by an aerial display called a "sky dance" by Aldo Leopold. Woodcock are most likely to display in large open areas. Each stop on your route should be at least a half-mile apart. Listen for 3 minutes at each stop. Record date, weather, numbers of bird seen and/or heard displaying on data form (see Appendix B, page 43).

SKILL LEVEL: Easy. You need only be able to identify one bird, the American woodcock, by sight and sound.

METHODS: Watch and listen for woodcock displaying.

ASSOCIATED PROGRAMS: The United States Fish and Wildlife Service conducts annual Peenting Woodcock Surveys to track population trends. To contribute to this project, the appropriate contact is listed on page 37.

SEASON: March 15–May 15

TIME OF DAY: One-half hour before sunset to shortly after dusk.

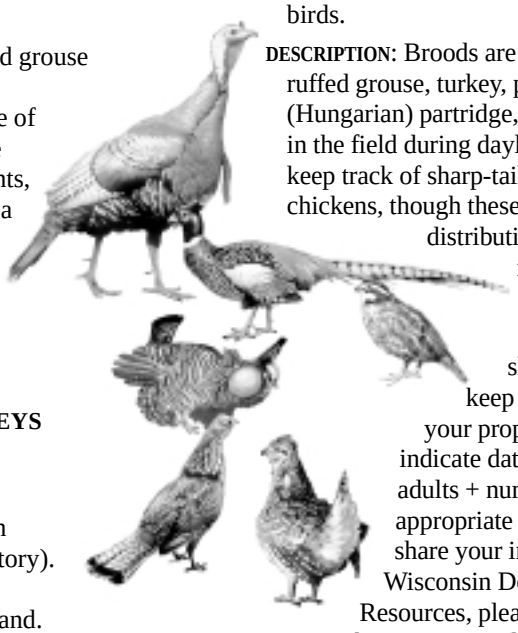
DURATION: A route with 10 stops should take about one hour to complete.

EQUIPMENT NEEDED: Clipboard, data form (see page 43), pencil, binoculars.

Game Bird Brood Surveys

SPECIES GROUP: Upland game birds.

OBJECTIVES: Game bird brood surveys provide information on reproductive success and an index to trends in summer populations of selected game birds.



DESCRIPTION: Broods are counted and reported for ruffed grouse, turkey, pheasant and gray (Hungarian) partridge, in the course of time spent in the field during daylight hours. (You may also keep track of sharp-tailed grouse or greater prairie chickens, though these birds have very limited distributions in Wisconsin and so most people will not have any of these birds to record.) You need use only one data sheet for each season that you keep track of game bird broods on your property. For each observation, indicate date, and record number of adults + number of young under the appropriate bird species. If you decide to share your information with the Wisconsin Department of Natural Resources, please indicate how many hours or the percentage (based on 400 hours) of time during the 10-week survey period that you spent out in the field.

SKILL LEVEL: Easy. You need only identify four of Wisconsin's game birds; ring-necked pheasant, gray (Hungarian) partridge, ruffed grouse, and wild turkey.

METHODS: Make incidental observations of birds while on your property attending to land management activities or simply walking about.

ASSOCIATED PROGRAMS: Personnel from the Wisconsin Department of Natural Resources conduct 10-week brood surveys to track trends in Wisconsin game bird populations. To participate in this program, the appropriate contact is listed on page 37.

SEASON: June 15–August 15

TIME OF DAY: Anytime from dawn to dusk.

DURATION: The amount of time spent observing game bird broods is self-determined. Observations are made incidentally, while performing chores, hiking, or attending to land management practices.

EQUIPMENT NEEDED: Data form (see page 44), clipboard, pencil.

Project FeederWatch

SPECIES GROUPS: Exotic or pest bird species, songbirds and non-game birds.

OBJECTIVES: Your bird feeder data can be used for many purposes, including:

a) documenting the presence or absence of feeder species at a specific locale.

b) tracking an increase or decline in winter bird populations over time.

c) tracking the expansion or contraction in winter ranges of species over time.

d) documenting the kinds of habitats and foods that attract birds.

e) documenting rare or unusual birds.

f) determining seed preferences of various bird species

g) documenting how fast and how far an infectious disease can spread through a wild bird population.

DESCRIPTION: Observe birds at your feeder. Count the highest number of individuals of each species in view at one time and record this on your Tally Sheet. Repeat this as often as you wish while observing birds. Record the predominant weather over the 2-day count period including the daylight temperature extremes, type of precipitation (if any), and snow cover depth and patchiness.

SKILL LEVEL: Medium. You may have up to 50 species of birds that come to your feeders, but you need not be able to identify all beforehand. You may learn as you encounter them.

METHODS: Observe and count birds at your feeders.

ASSOCIATED PROGRAMS: Project FeederWatch was started in 1987, and is a joint research and education project of the Cornell Laboratory of Ornithology, the National Audubon Society, Bird Studies Canada, and the Canadian Nature Federation. Project FeederWatch monitors birds that visit feeders in winter. Data collected in this project are used to document and explain population changes of bird species that visit feeders. To learn more make the appropriate contact listed on page 37.

SEASON: November through April.

TIME OF DAY: You may count at any time of day that you wish, but it pays to be consistent with your timing for comparison purposes.

DURATION: Observe birds on two consecutive days within each two-week period. You may count for as little or as long as you like. Record the amount of time you spent watching birds on your data sheet (see Appendix B, page 45).

EQUIPMENT NEEDED: Data sheet (see Appendix B, page 45), pencil, outdoor thermometer, and binoculars.

Turkey Poult Surveys

SPECIES: Wild turkey.

OBJECTIVES: This technique will provide you with presence/absence (inventory), and has the potential for providing an index to turkey recruitment (addition of youngsters to the adult population) on your land. You may also be able to track brood survival if you see the same brood a number of times during the course of the summer.

DESCRIPTION: Observe turkeys while out on your property. Use a separate data sheet for each month (June, July and August) in which you observe turkeys. Record date, weather, number of adults and their sex, and number of juveniles. For each brood, indicate whether poults were ¼ grown (e.g., size of grouse), ½ grown (e.g., size of barnyard fowl) or full grown. If you decide to contribute information to the Wisconsin Department of Natural Resources, please provide them with your name, address, and county in which observations were made.

SKILL LEVEL: Easy. You need only identify one type of game bird, the wild turkey.

METHODS: Observe wild turkeys on your land.

ASSOCIATED PROGRAMS: The Wisconsin Department of Natural Resources gathers this information on an annual basis from 21 counties in the state to track wild turkey recruitment. To contribute to this program, the appropriate contact is listed on page 37.

SEASON: June 1–September 1

TIME OF DAY: You can observe turkeys anytime during the day.

DURATION: You can spend as little or as much time as you wish observing turkeys.

EQUIPMENT NEEDED: Data form (see Appendix B, page 46) and pencil.

Night Bird Survey

SPECIES GROUP: Night birds including owls, rails, woodcock, and others.

OBJECTIVES: Provides information on presence/absence (inventory).

DESCRIPTION: Observers should choose one survey station from which to play the tape of calling birds. The tape includes 30 seconds of a bird species' call followed by 30 seconds of silence. Actual numbers of each bird species responding should be recorded on the data sheet. The tape should be played twice. A total of 30 minutes should be spent at your site.

SKILL LEVEL: Easy. There are only about a dozen species that may be heard (and sometimes seen) on a night birds survey.

METHODS: Record all birds detected from a chosen point while playing a callback tape.

ASSOCIATED PROGRAMS: The Marsh Monitoring Program is coordinated by the Long Point Bird Observatory. To contribute data to this project, the appropriate contact is listed on page 37.

SEASON: June is the best month for conducting a night bird survey. However, you may get some response at any time of year.

TIME OF DAY: Beginning at dusk.

DURATION: 30 minutes per site.

EQUIPMENT NEEDED: Binoculars, bird book, data sheets (see page 47), pencil, callback tape, and tape player.

Breeding Bird Survey

SPECIES GROUPS: Upland game birds, exotic or pest birds, major avian nest predators or parasites, songbirds, non-game birds, colonial-nesting birds, night birds, raptors, cavity-nesting birds, and threatened and endangered birds.

OBJECTIVES: Provides an index to the abundance of breeding birds on your site and presence/absence (inventory).

DESCRIPTION: Data sheets allow for the use of five survey stations. Surveys should begin no earlier than a half-hour before dawn and run no later than 9:30 a.m. These are "point counts," whereby the observer records all birds heard or seen from a point in 3 minutes. Each survey station should be located at 1/2 mile intervals. The total number of each species detected should be entered on the data sheet for each survey point. The number of each species of bird seen and heard at each site are then added together to get an index to abundance.

SKILL LEVEL: High. There may be 100 species breeding on your site. Identifying them by sight and song is not an easy process.

METHODS: Record all birds heard or seen from a chosen point during a 3 minute period.

ASSOCIATED PROGRAMS: North American Breeding Bird Survey was initiated in 1966 to monitor breeding bird populations across North America. To learn more or to contribute data to this project, please make the appropriate contact listed on page 37.

SEASON: June.

TIME OF DAY: Dawn to 9:30 a.m.

DURATION: Five minutes per survey point.

EQUIPMENT NEEDED: Binoculars, bird book, data sheets (see Appendix B, page 48–51), pencil.

Breeding Bird Atlas

SPECIES GROUPS: Upland game birds, exotic or pest bird species, waterfowl, marsh birds, major avian nest predators and parasites, songbirds, non-game birds, colonial-nesting birds, night birds, raptors, cavity-nesting birds, and threatened and endangered birds.

OBJECTIVES: 1) Record breeding bird diversity and abundance.

2) Document breeding bird habitat use, thereby identifying areas important to nesting birds.

3) Learn about bird breeding phenology.

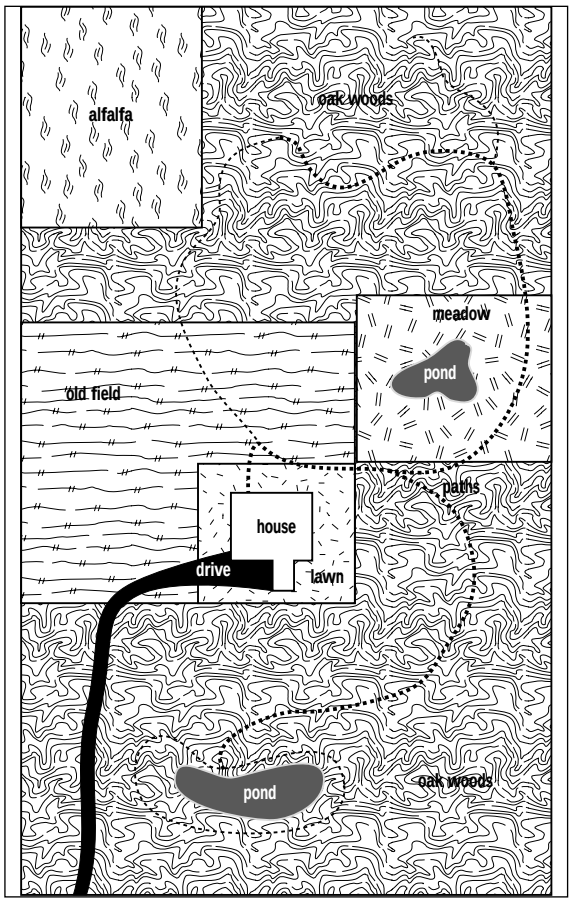


Figure 2. Landowner's map

DESCRIPTION: A breeding bird atlas is an inventory of nesting birds. As the name "Atlas" implies, these nesting birds are usually mapped on a certain scale. At the finest scale, for example, you may put an "X" on your property map where a red-tailed hawk nest was found. At a coarser level, the Wisconsin Breeding Bird Atlas would determine which 10-square-mile block the nest was found in, and document that red-tailed hawk breeding was confirmed there. It's up to you to use the scale that best suits your objectives. As a compromise between the above examples, you may want to divide your property into easily recognized sections, recording the breeding birds identified in each area (Figure 2). Creating separate sections is only necessary if you want to discern breeding bird differences among areas of your property. Compartmentalizing is especially helpful on large properties (>200 acres) or where you have distinct habitat types (e.g., an aspen clearcut, an old-growth hemlock stand and a bog).

Two field cards are needed for each section: one that stays at home as a permanent record of your observations, and one that goes in the field with you (Fig. 3). The field card contains information about the bird species seen on your property:

- Habitat (HA).
- Abundance (AB).
- Date of highest evidence of breeding
- Breeding evidence category (O = observed, PO = possible, PR = probable, and CO = confirmed).

You may choose not to include all the data on your card. The level of detail is up to you, but keep in mind what your objective is. If you only want a breeding bird species list, then perhaps habitat, abundance and type of breeding behavior within a category are not important to record. On the other hand, to make management decisions, certainly you would want to record habitat and probably have separate sections (field cards) for major habitat types.

HABITAT: For a given species, a habitat code can be recorded that refers to the habitat in which the highest evidence of breeding was observed. We have adopted the Wisconsin Breeding Bird Atlas habitat classification scheme, which allows you to determine the level of precision (Figure 4).

ABUNDANCE: An estimate of the total number of breeding pairs for a section can be made. Following the protocols of the WBBA, estimate these to the nearest power of ten (Table 1).

To do this, estimate the nesting density of a particular species and multiply by the amount of suitable habitat available. For example, if you estimate 10 pairs of downy woodpeckers in a sampled habitat, and you searched through 50% of the habitat on your property, then multiply 10 x 2 = 20 pairs of downy woodpeckers, which would be abundance code 3.

Breeding Bird Atlas Field Card

Page 1 of 4

Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO	Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO
FUFm	2	Common Loon	6/30				FY			Common merganser					
FLMc	3	Pied Billed Grebe	7/14	0			NB			Red-breasted merganser					
FLMc	5	Red-necked Grebe	7/21	0			NE			Ruddy duck					
		Double-crested Cormorant								Turkey vulture					
		American bittern								Osprey					
		Least Bittern								Bald eagle					
		Great Blue Heron								North harrier					

Figure 3. Examples of breeding bird atlas field card.

Figure 4 : Habitat Classification

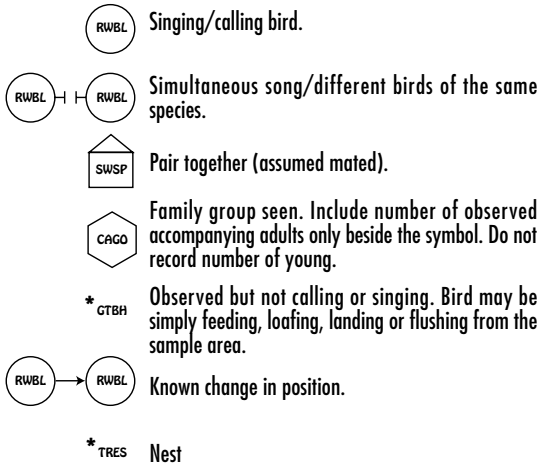
A "nested" scheme works well to classify habitat at the level of precision that you feel most comfortable with. Three of the four precision levels are shown here. See Appendix B for the complete listing.

Level	Code	Habitat
1	F	FOREST (>50% tree cover)
2	FU	Upland vs. Lowland (FL)
3	FUH	Hardwood vs. Conifer (e.g., FUC) vs. Mixed (e.g., FUM)
1	S	SHRUB/SAVANNA (<50% tree cover, but with >25% total cover of woody vegetation–shrubs, saplings, trees)
2	SU	Upland vs. Lowland (SL)
3	SUH	Hardwood vs. Conifer (e.g., SUC) vs. Mixed (e.g., SUM)
1	O	OPEN (<25% cover of woody vegetation)
2	OU	Upland vs. Lowland (OL)
3	OUA	Agriculture vs. Native (e.g., OUN) vs. Uncropped (e.g.,OUU) vs. Water/wetland (e.g., OLW)
1	U	URBAN/RURAL (Cities, villages, farmsteads and rural homes)
2	UU	Urban vs. Small town (US) vs. Rural (UR)
3	UUC	Commercial vs. Residential (e.g., UUR) vs. Open space (e.g., UUO) vs. Miscellaneous (e.g., UUX)

Table 1. Codes and associated estimates of breeding pairs in survey section.

Abundance Codes	
Code	Breeding Pairs of Species in a Surve Section
1	1
2	2–10
3	11–100
4	101–1000
5	>1000

Figure 5. Mapping symbols for Wetland Bird Survey data form (Page 57).



DATE OF HIGHEST EVIDENCE: This column on your field card is reserved for the date on which you observed a bird species and recorded its behavior under one of the four breeding evidence categories (O, PO, PR or CO; see descriptions below). If you observe a breeding behavior that provides higher evidence that the bird is breeding on your property, then erase and replace the new date and new code on your field card. For example, you see a downy woodpecker feeding on June 3rd, so you record an "O" under the Observed (O) column. Later, on June 7th, you see a downy woodpecker carrying food into a tree cavity, so you erase your previous observation and replace it with 6/7, and write "FY" (Feeding Young) under the Confirmed (CO) category. You should also upgrade your Habitat (HA) category.

EVIDENCE OF BREEDING: There are 4 main levels of breeding evidence:

- **O**bserved (**O**)
- **P**ossible (**PO**)
- **P**robable (**PR**)
- **C**onfirmed (**CO**)

The goal is to obtain confirmed evidence of breeding. Under the "Probable" and "Confirmed" levels, there are codes used to identify what was observed that indicated breeding. There are 8 codes under the "Probable" level and 11 codes under the "Confirmed" level. Examples of "Probable" evidence are as follows:

- **M = M**ultiple (7 or more) singing or territorial birds in a block on one day.
- **S = S**inging male present at same location on at least two occasions 7 or more days apart.
- **P = P**air observed in suitable nesting habitat during the breeding season.

Examples of confirmed evidence are as follows:

- **CN** = seeing a bird **C**arrying **N**esting material.
- **NB** = **N**est **B**uilding seen at the actual nest site.
- **NE** = **N**est with **E**ggs or eggshells on ground.

SKILL LEVEL: Medium. There may be 100 species breeding on your property, but you don't have to be able to identify the birds by sight and sound beforehand. You can learn as you encounter them.

METHODS: Observations of breeding bird behaviors

ASSOCIATED PROGRAMS: The Wisconsin Breeding Bird Atlas is a formal process that terminated in the fall of 2000, with a book planned for publication in 2002. When the book becomes available, this will be an excellent reference for your site. You can still use this method to inventory and monitor breeding birds on your site, and the Atlas will accept any data that you collect during 2000. Please see p. 37 to make the appropriate contact. The North American Breeding Bird Survey has been conducted on a nationwide basis for over 30 years. To learn more about this project please make the appropriate contact listed on p. 37. The Marsh Monitoring Program is coordinated through the Long Point Bird Observatory. To learn more or to contribute data to this project, please make the appropriate contact listed on p. 37. The Wisconsin Bird Checklist Project is administered through the Wisconsin Society for Ornithology. To learn more or to contribute data to this project, please make the appropriate contact listed on p. 37.

SEASON: Primarily June–July, but also January–September.

TIME OF DAY: Mainly 5–10 a.m.

DURATION: Variable; each visit self-determined. Good coverage for a Wisconsin Breeding Bird Atlas block of 10 square miles (6400 acres) can be attained at 25 hours spread over 4–5 visits.

EQUIPMENT NEEDED: Data sheets (2 field cards) see page 52–55, pencil, binoculars, Atlasing Handbook.

EQUIPMENT RECOMMENDED: Field guide, map of property, field notebook.

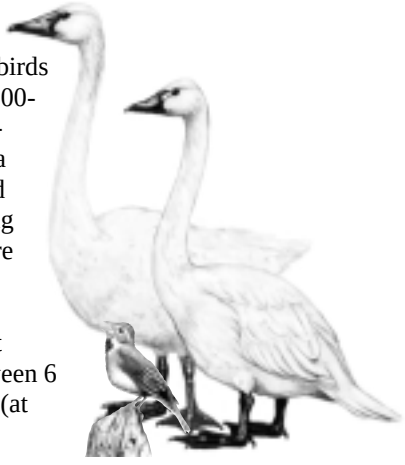
Wetland Birds Survey

(For more details, see the Marsh Monitoring Program Training Kit and Instructions. Note that the Marsh Monitoring Program includes amphibian monitoring in addition to the wetland birds. We recommend that protocols from the Wisconsin Frog and Toad Survey be used for amphibian monitoring—see p. 34)

SPECIES GROUPS: Waterfowl, marsh birds, songbirds, non-game birds, and night birds.

SKILL LEVEL: Medium. About 40 bird species to learn by sight and sound.

OBJECTIVES: A wetland birds survey will provide you with presence/absence information, and an index to abundance. Performed on a regular basis (e.g. annually), it will provide you with a measure of relative abundance over time.



DESCRIPTION: The wetland birds survey is a point count of the birds detected in a marsh within a 100-meter-radius (110-yard) semi-circle. Birds heard or seen in a 10-minute period are recorded on a map. Those birds foraging or flying through the marsh are simply listed, rather than mapped (See data sheet in Appendix B, p. 56). The point counts should take place between 6 p.m. and sunset. Two surveys (at

least 10 days apart) should be conducted at each chosen marsh point each year between May 20 and July 5. Surveys should not be done during inclement weather (i.e., <60°F or 16°C, fog, rain, wind). It will help you to judge the 100 meter distance if you place a marker at this observation limit.

Start the 10-minute observation period by playing the 5-minute broadcast tape of 6 marsh birds (Virginia Rail, Sora, Least Bittern, Pied-billed Grebe, and a combination of Common Moorhen/American Coot). The recorder should be played so that it can be heard even at the outermost limit of your 100-meter, semi-circle observation area. You will record birds detected during the tape and in the 5 minutes after it is done.

There are three categories of birds that may be recorded (listed in order of most to least important): mapped observations, aerial foragers, and outside/flythrus. Only record an individual bird in *one* of the three categories—always choosing the highest priority level. The definitions of these categories are as follows:

Priority 1. Mapped Observations are all birds seen or heard actually residing within the boundaries of the 100-meter (110-yard) sample area. These birds make actual, physical contact with the sample area. Birds *in flight* are to be *excluded.*

Priority 2. Aerial Foragers are birds seen *actively foraging* in the air within the sample area, no higher than 100 meters (110 yards), and not otherwise using the sample area.

Priority 3. Outside/Flythrus are additional species of marsh birds which are seen *during* the 10-minute point count *outside* of the sample area or *flying through* the sample area without landing.

Use a separate data sheet for each visit. If there are species heard or seen that you could not identify, make notes in the Remarks section (Don't map or tally these). Also, record in the Remarks section any birds observed between stations (not during the official, 10-minute point count).

PRIORITY 1. MAPPED OBSERVATIONS: All birds observed or heard within the sample area, other than those which are simply flying through or foraging in the air, are mapped using four-letter species codes and symbols in the appropriate location on the Data Form. *Young of the year are not to be counted*, even if independent. We are interested in adults only!

The only two species for which you will not record birds of both sexes are Red-winged Blackbird and Yellow-headed Blackbird. Record male blackbirds of both species only! The mapping symbols to be used on the Data Form are illustrated in Figure 5.

PRIORITY 2. AERIAL FORAGERS: Aerial foragers are only those birds that are actively foraging in the airspace above the 100- meter radius sample area, at an altitude of less than 100 meters. Record aerial foragers using the appropriate species codes in the box labeled Aerial Foragers on the Data Form. Because there are often many aerial foragers (swallows in particular), it helps if you tally them separately, and then produce a summary count at the end of the survey. Examples of aerial foragers include swallows, terns, kingfishers, ospreys, bald eagles and northern harriers.

PRIORITY 3. OUTSIDE/FLYTHRUS: Although emphasis should be on Mapped Observations and Aerial Foragers, there will be additional species of marsh birds which do not belong in either of the above two categories. These birds will be seen merely flying through the sample area (without foraging or landing) or be detected outside of the 100-meter sample area. Record these observations using the appropriate species code in the box labeled Outside/Flythrus on the Data Form. These are only birds detected during the 10-minute point count.

METHODS: Semi-circular point count of birds seen and heard.

ASSOCIATED PROGRAMS: The Marsh Monitoring Program is a cooperative effort of Long Point Bird Observatory, Environment Canada and U. S. Great Lakes Protection Fund. This program's focus is on marsh conservation in the Great Lakes region. To learn more or to contribute data to this project, please make the appropriate contact listed on page 37. Other associated programs include the North American Breeding Bird Survey and the Wisconsin Breeding Bird Atlas. To learn more about these efforts or to contribute data to these projects, please make the appropriate contact listed on page 37.

SEASON: May–July.

TIME OF DAY: Evenings.

LENGTH OF SURVEY: 10 minutes.

EQUIPMENT NEEDED: Pencil, watch/timer (preferably with an alarm), clip board, data sheets, binoculars, portable tape recorder, broadcast tape, mosquito repellent.

Optional Equipment: Compass, thermometer, spare batteries, spare pencil, Marsh Monitoring Program Training Kit and Instructions.

Mammals

Species groups: Game mammals, predators, furbearers, bats, threatened and endangered mammals.

Mammal Checklist

SPECIES GROUPS: All mammals.

OBJECTIVES: This technique provides you with a snapshot in time of the mammals using your property (presence/absence). Conducted over the course of a calendar year, it will provide you with a more complete inventory of the mammals that use your property.

DESCRIPTION: This checklist is simply a list of mammals and mammal sign that are seen or heard during a particular time. The usual time period is weekly, but you may also keep a daily, monthly, or yearly list. Separate checklists should be maintained for each county in which you are collecting data. In addition, you may be interested in making note of any rare mammal observations that you make on your property. A separate data sheet (see Appendix B, page 57) is included for this. You need use only one data sheet for each year that you keep track of rare mammal observations on your property. For each observation, indicate date, number of animals observed, and habitat type in which they were observed. There is a separate column for comments, in case you are lucky enough to observe an interesting behavior such as a predator making a kill.

SKILL LEVEL: Medium. There are over 60 species of mammals living in Wisconsin, but you don't need to be able to identify them by sign, sight or sound beforehand. You can learn as you encounter them.

METHODS: Record all mammals and mammal sign (scats, clawmarks, rubs, tracks, etc.) observed on a periodic basis (weekly, monthly, yearly).

ASSOCIATED PROGRAMS: Wisconsin Department of Natural Resources wildlife managers and technicians keep track of rare mammals throughout the course of the year while performing routine work. This informal survey provides the only population index for badgers, white-tailed jackrabbits and other non-hunted mammals for the state and is an important supplement to other surveys for bobcat, fisher, pine marten, otter, red fox, gray fox, coyote and black bear. To contribute information to this project, the appropriate contact is listed on page 37. (If you would like to share your information with the Wisconsin Department of Natural Resources, please also indicate the number of road kills observed for each selected species under the "comments" column.)

SEASON: Mammals and mammal sign can be observed on your property any time during the year. You will achieve a more complete inventory if you repeat your checklist usage at least once each month throughout a calendar year.

TIME OF DAY: A checklist of mammals can be made at any time of day.

DURATION: You can spend as much or as little time as you like looking for mammals and mammal sign. However, you will get the most complete picture of the mammal community living on your property if you visit all parts of the property.

EQUIPMENT NEEDED: Data form (see page 57), pencil, clipboard, mammal field guide, binoculars, plastic bags (to collect fur, scat, etc.), ruler (for measuring tracks), measuring tape (to measure distance between tracks).

Predator Scent Post Survey

SPECIES GROUP: Predators and furbearers including raccoon, striped skunk, coyote, timber wolf, bobcat, fisher, pine marten, mink, red fox, gray fox and black bear.

OBJECTIVES: This technique will yield presence/absence (inventory) results for various predators. Because of the great mobility of most of these animals, it is unlikely that most private properties are large enough to enable you to track the abundance of predators in the area. However, by conducting a predator scent post survey on a regular basis (e.g.

annually), you will be able to track relative abundance of these animals using your property.

DESCRIPTION: A scent-post survey consists of 10 scent post stations established along an unpaved road or trail. Scent post stations are set up on day 1, and checked on day 2. Predators that are attracted to the scented disc in the center of the station leave behind tracks that can be identified using a mammal track field guide. Scent post surveys should not be conducted on rainy or snowy evenings, when there is a high probability that tracks will be obliterated by the weather.

SKILL LEVEL: Medium. There are about a dozen predators (listed above) in Wisconsin that may be attracted to a scent post. You will need to be able to identify tracks that are left by these animals.

METHODS: Establish a scent post line consisting of 10 stations (at least 300 m apart) along the sides of an unpaved road or trail on your property. It is most effective if you alternate the side of the road or trail on which you establish each station to account for different wind directions. Each station is 1 meter in diameter (a hula hoop works nicely as a guide). All rocks and vegetation should be removed from the station, and sifted soil should be distributed evenly over the station. A plaster scented disc available through USDA Pocatello Supply Depot (238 E. Dillon, Pocatello, Idaho 8320, (208) 236-6920) is placed at the center of each station. The disc may be elevated on a pebble to maximize scent dispersal. It is advisable to wear rubber gloves when handling the disc to minimize any human scent. You may use other forms of bait to attract predators to your station, such as rotten eggs or meat if you do not wish to purchase the discs from Pocatello. The following day, check each scent post station for the tracks of predators. One data sheet (see page 58) should be used for each scent post line that you establish.

ASSOCIATED PROGRAMS: Wisconsin Department of Natural Resources wildlife managers and technicians keep track of rare mammals throughout the course of the year while performing routine work. This informal survey provides the only population index for badgers, white-tailed jackrabbits and other non-hunted mammals for the state and is an important supplement to other surveys for bobcat, fisher, pine marten, otter, red fox, gray fox, coyote and black bear. To contribute information to this project, the appropriate contact is listed on page 37. (If you would like to share your information with the Wisconsin Department of Natural Resources, please also indicate the number of road kills observed for each selected species under the "comments" column.)

SEASON: You are most likely to have visitation when juvenile predators are dispersing from their natal areas. In Wisconsin, September is a good time to conduct scent post surveys. However, many of the tracks at this time will belong to animals that are dispersing and just passing through your property.

TIME OF DAY: You can set up the scent station line anytime during daylight hours, and check the line the following day.

DURATION: It takes about 2 hours to set up the scent post line, and will take about 2 hours to check it the following day.

EQUIPMENT NEEDED: Rake, shovel, sifter (wood frame with 1/8–1/4 inch mesh hardware cloth), hula hoop or 1 meter-diameter hoop of rubber hose or stiff wire, old broom, scent discs or other bait, rubber or canvas gloves, data sheet (see page 58), pencil, clipboard, field guide to mammal tracks.

Snow Track Survey

SPECIES GROUPS: Game mammals, predators, furbearers, rabbits, squirrels, and threatened and endangered mammals.

OBJECTIVES: This survey will provide you with presence/absence (inventory) information for various mammals that remain active during Wisconsin's winters. By recording the numbers of sets of tracks that you find during your survey and conducting the survey on a regular basis (e.g. annually), you will be able to monitor the relative abundance of selected species over time.

DESCRIPTION: To count mammal tracks on your land, you will need to drive, snowshoe, or cross-country ski down all of your unpaved roads and well-traveled foot paths. Because some animals such as predators have large home ranges, it may take several surveys to feel confident that you have inventoried all the winter-active mammals found on your property. If you drive your route, use two observers and keep your speed under 10 miles per hour or you will probably miss many tracks. Get out of your vehicle to identify tracks. It's best to measure tracks as they sometimes appear much larger or smaller than they are. Surveys should be run 1–3 days after a fresh snowfall. This will allow time for new tracks to accumulate, and will

prevent traffic from obliterating tracks. *Do not conduct surveys when snow depth is >12 inches or when night temperatures fall much below 0° F.* To record as many species as possible, it is recommended that you conduct at least 3 surveys in a season spanning from November until March.

SKILL LEVEL: Medium–High. There are about 2 dozen mammals that may leave tracks in newly fallen snow in Wisconsin. It may be difficult to differentiate between a coyote and a dog, or a bobcat and a domestic cat, but some excellent tracking guides are available and are listed under Resources.

METHODS: Establish a track survey using existing roads or trails on your property. Observe tracks left by mammals within 48 hours after a snowfall of 0.5–2.0 inches.

ASSOCIATED PROGRAMS: Wisconsin's Volunteer Carnivore Tracking Program was established in 1995 to: 1) determine the number, distribution, breeding status, and territories of wolves in Wisconsin, 2) develop a sense of the abundance and distribution of other medium-sized and large carnivores in the state, and 3) determine the existence of rare carnivores such as Canada lynx, cougar and possibly wolverine. To participate in this program, make the appropriate contact listed on page 37.

SEASON: November–March. Note: Predator activity will be greatly reduced up to two weeks after the close of the gun deer season. It is best to avoid conducting track count survey during this period.

TIME OF DAY: Surveys should be run during daylight hours when headlights are not necessary for driving.

DURATION: It may take about a half-day to conduct a track survey along 10 miles of road or trail.

EQUIPMENT NEEDED: Tracking guide (see Halfpenny and Murie under Resources), detailed map of survey area, data sheet (see page 59), clipboard, pencil, 6-inch ruler, tape measure, and 35 mm camera (to aid in track identification and for the purposes of sending to expert for input).

Summer Deer Survey

SPECIES: White-tailed deer.

OBJECTIVES: The objectives of a summer deer survey are two-fold. This survey will tell you whether or not white-tailed deer are present (inventory), and will provide an estimate of annual recruitment.

DESCRIPTION: This is an informal survey, similar to one that state natural resources agency personnel use to track deer recruitment annually. Simply record the number of deer observed while out doing other work during the months of July, August and September. It is important that every deer seen is recorded. Use a separate data sheet for each month (July, August and September) in which you observe deer (see Appendix B, page 60). For each observation, indicate date, number of deer of unknown sex/age, number of bucks, number of lone does, number of lone fawns, number of doe + 1 fawn groups, number of doe + 2 fawns groups, and number of doe + 3 fawns groups. (If you decide to contribute information to the Wisconsin Department of Natural Resources, please provide them with your name, and the deer management unit(s) in which your observations were made.)

SKILL LEVEL: Easy. You need only be able to identify white-tailed deer, and separate fawns and adults.

METHODS: Record the number of deer observed while out on your land.

ASSOCIATED PROGRAMS: Team Deer monitoring is a program of the Wisconsin Department of Natural Resources, Bureau of Wildlife Management. Each year, wildlife managers and technicians make summer observations of deer which are used in tracking deer abundance and recruitment throughout the state. To submit information to this program, the appropriate contact is listed on page 37.

SEASON: July–September

TIME OF DAY: Record only those deer observed during the period of the day when headlights are not used in driving.

DURATION: There is no set time limit. Simply record the number of deer observed while out on your land.

EQUIPMENT NEEDED: Data form (Appendix B, page 60), pencil.

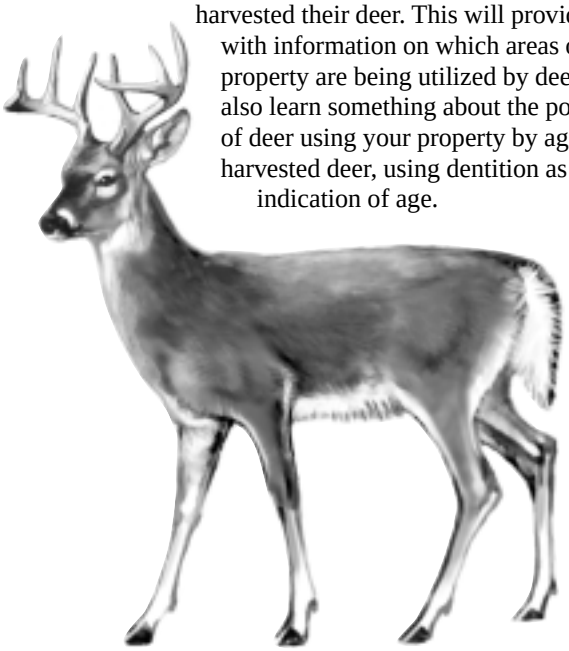
Deer Harvest Monitoring

SPECIES GROUP: White-tailed deer.

OBJECTIVES: This method will provide you with an estimate or a complete count of the deer harvested on your property. Over time, it can track the abundance of deer on your property. This is very useful information to include in a land management plan, especially if you have noted impacts to the native plant community (tree seedlings and wildflowers) on your property, or are suffering deer damage to tree plantings or crops.

DESCRIPTION: Every deer shot during the gun or bow season is registered. Complete a data form (see Appendix B, page 61) with the hunter present. Type of deer killed should include (1) forked buck, (2) spike buck, and (3) antlerless deer (adult doe, sub-legal buck, buck fawn and doe fawn). You need also find out from the hunter how many hours she/he spent hunting to harvest the deer. To monitor the population trend of deer on your property, you will want to compare the number of hours hunted per deer harvested between years, and the number of deer seen while hunting. This is a better measure of abundance than the actual number of deer harvested because it takes into account the amount of hunting pressure on your land in any given year.

OPTIONAL: You can find out more specific information about the deer using your property and improve long-term hunting success by collecting additional information from hunters. For long-term records, note type of season and regulations on data forms to be archived (i. e. were permits numerous or scarce, t-zone, etc.). Ask them to place a dot on a map of your property to mark where they harvested their deer. This will provide you with information on which areas of your property are being utilized by deer. You can also learn something about the population of deer using your property by aging harvested deer, using dentition as an indication of age.



SKILL LEVEL: Easy. White-tailed deer identification is the only necessary skill.

METHODS: Record information on every deer shot on your property during the gun or bow season.

ASSOCIATED PROGRAMS: None.

SEASON: September–December

TIME OF DAY: Sunrise to sundown.

DURATION: Registering each deer should take no more than 10 minutes.

EQUIPMENT NEEDED: Data form (see Appendix B, page 61), clipboard, and pencil.

Optional Equipment: Adhesive backed dots, pins, a map of your property, rubber gloves, and knife for cutting mouth of deer open to view teeth.

Bat House Monitoring

SPECIES: Bats.

OBJECTIVES: This survey will yield presence/absence (inventory) information.

DESCRIPTION: You can observe roosting bats by shining a bright light into the open bottom of the bat house. You may need to have someone shine a bright light up into the house while you look with binoculars if your house is mounted quite high up. Once a bat colony is established, individuals are quite tolerant of people looking at them as long as you do not touch the mounting poles or houses, and do not shine bright lights for longer than 10 seconds. If there are a large number of bats inhabiting the house, you will get your best count by observing the animals emerging from the house at dusk. To find out if your house is being used by a nursery colony, briefly look in the house after the adults emerge. Young are left behind over a roughly 3-week period until they have learned to fly, normally in July in Wisconsin.

SKILL LEVEL: Easy. There are eight species of bats living in Wisconsin, but only three species are likely to inhabit bat houses.

METHODS: Observe bats using houses that you have erected for them to provide critical habitat. For bat house designs or sources, see “The Bathouse Builder’s Handbook” under Resources on page 36, or contact the Wisconsin Department of Natural Resources, Bureau of Endangered Resources at (608) 266-7012.

ASSOCIATED PROGRAMS: The North American Bat House Research Project is run by Bat Conservation International. This program was started to encourage experimentation in bat houses and to

contribute to our knowledge of bat roosting behavior. To join this effort, the appropriate contact is listed on page 37.

SEASON: April to October

TIME OF DAY: To monitor small numbers of bats occupying a house, you can check the house any time during the day. If large numbers of bats are occupying the house, the best way to count the bats is as they emerge from the house at dusk.

DURATION: It should take less than a minute to observe small numbers of bats residing in a house. It may take up to 15 minutes to count bats emerging from a house at dusk. It is suggested that you monitor your house on a monthly basis.

EQUIPMENT NEEDED: Data form (see Appendix B, page 62), pencil, clipboard, and flashlight.

Optional Equipment: Camera (in case you cannot identify bats occupying your house, and would like to obtain a positive identification from an expert) and binoculars (if your house is mounted high up).

Medium Mammals

SPECIES GROUPS: rabbits, predators, furbearers, porcupines

OBJECTIVES: Provides information on presence/absence (inventory) of medium-sized mammals.

DESCRIPTION: We have not included a formal protocol for inventorying or monitoring medium-sized mammals. The cost to purchase enough traps to construct a trapping grid is prohibitive. Instead, we encourage you to use any of the previous techniques which use sign as evidence for the presence of these animals, such as the predator scent post survey. You may also scout your land for scats (droppings) of these animals. There are several field guides to help you with such identification, including the Stokes field guide to Animal Tracks and Behavior, which is listed in the Resources section of this guide. Animal homes or structures can also be used to document the presence of many medium-sized mammals on your property. There are several field guides available that will help you in identifying such structures or burrows.

SKILL LEVEL: Medium. There are less than two dozen medium-sized mammal species residing in Wisconsin. With practice, you will be able to accurately identify their various scats, tracks, homes, and other sign.

METHODS: Scout your property for evidence of medium-sized mammals including scats, tracks, and homes.

ASSOCIATED PROGRAMS: Wisconsin Department of Natural Resources wildlife managers and technicians keep track of rare mammals throughout the course of the year while performing routine work. This informal survey provides the only population information for badgers, white-tailed jackrabbits and other non-hunted mammals for the state and is an important supplement to other surveys for bobcat, fisher, pine marten, otter, red fox, gray fox, coyote and black bear. To contribute information to this project, the appropriate contact is listed on page 37. (If you would like to share your information with the Wisconsin Department of Natural Resources, please also indicate the number of road kills observed for each selected species.)

SEASON: Year-round.

TIME OF DAY: Scouting for sign can be done at any time during the day.

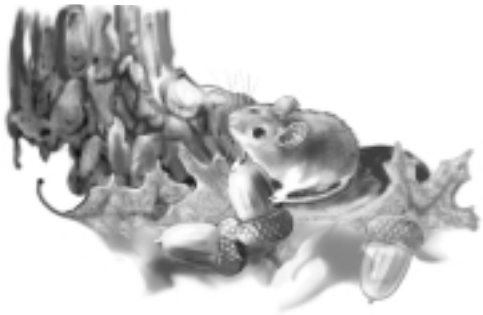
DURATION: Self-determined. You may spend as little or as much time as you wish scouting for sign. To have the most complete inventory possible, it is advisable that you cover all of your property when scouting for sign.

EQUIPMENT NEEDED: Field guide to mammal sign, data sheet (see page 63), pencil, clipboard, ziplock bags.

Small Mammal Survey

SPECIES GROUPS: Rodents, shrews, and moles.

OBJECTIVES: Provides information on presence/absence (inventory), and can provide an index to abundance over time. ***This technique is lethal.*** If you do not wish to kill any small mammals on your property, you may substitute sheet metal or wire live traps for snap traps. However, these traps are at least 10–20 times as costly as snap traps, and live mammals are very quick and may easily escape when a trap is opened. If you decide to use live traps, be sure to empty the contents into a bucket or bag for purposes of identification. Be very careful handling small mammals—they have sharp claws and teeth. because of the threat of hantavirus, we strongly advise wearing gloves when checking traps.



DESCRIPTION: Trappers should set up a grid of 25 traps as shown on the data sheets. This includes 16 small snap traps, 8 medium snap traps and 1 pitfall trap. Be sure to flag and number your sites. Snap traps are most effectively placed next to logs, stumps, rocks, or under brush, places that small mammals are likely to frequent. Traps should be set in the evening, using a peanut butter/oats mix. They should be checked at first light and shut for the day. Alternatively, they can be reset in the morning to be checked again in the evening. The pitfall trap should be two coffee cans deep. A drift fence, a 5-m or greater length of 24 inches sediment fencing or 24 inches aluminum flashing, can be set up on two sides of the trap to lead small mammals into the trap (see figure below). The trap should be opened only if no rain will occur during the trapping period. Record the species trapped on the data sheet beside the appropriate trap number.

SKILL LEVEL: Medium. There are about twenty species of small mammals that may occur on your property and could be caught in snap traps and pitfalls.

METHODS: Set up a grid of snap traps and pitfall traps. Set traps in the evening and check in the morning. You can either reset traps in the morning or keep them closed during the day. Traps that are successful should be cleaned before subsequent use.

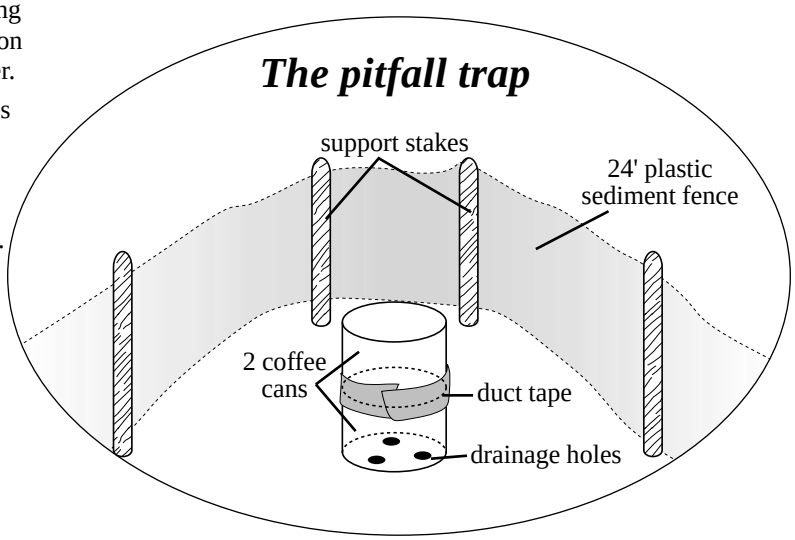
ASSOCIATED PROGRAMS: None.

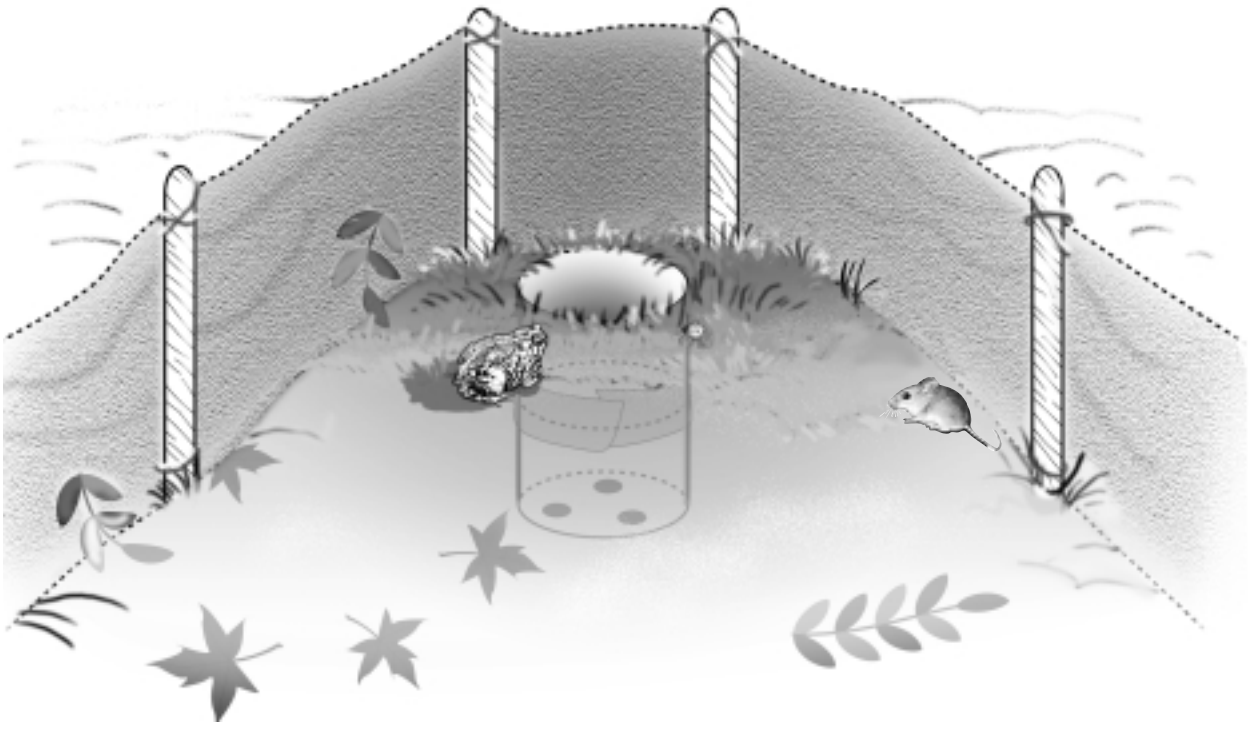
SEASON: April–October.

TIME OF DAY: Most effective when conducted overnight.

DURATION: About 2 minutes per trap to set. Depending on difficulty in identification and processing, it can take anywhere from 2 to 10 minutes per successful trap. Trap success rates are quite variable, and may be as high as 75%. However, success is more commonly around 20%.

EQUIPMENT NEEDED: Mammal book, data sheets, pencil, gloves, large ziplock bags.

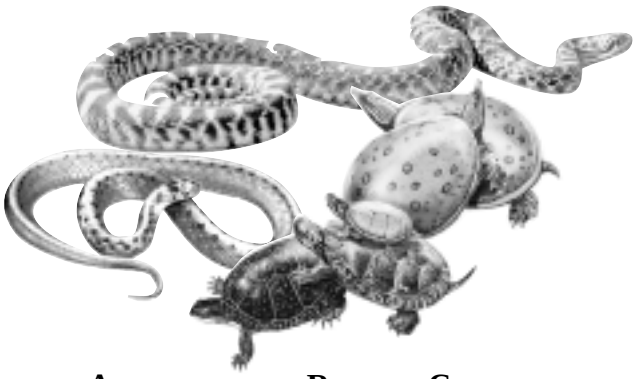




Herptiles

Reptiles and Amphibians

Species groups: Frogs, toads, salamanders, snakes, lizards, and turtles.



Amphibian and Reptile Checklist

SPECIES GROUPS: All amphibian and reptile groups.

OBJECTIVES: Produces a measure of presence/absence (inventory) of amphibians and reptiles.

DESCRIPTION: This checklist is simply a list of herptiles (amphibians and reptiles) that are seen or heard during a particular time. To fully inventory your property, it is suggested that you conduct an inventory on a monthly basis from April through October.

SKILL LEVEL: Medium. There are over 50 species of reptiles and amphibians living in Wisconsin, but you do not need to be able to identify them by sight and sound beforehand. You can learn as you encounter them.

METHODS: Observe reptiles and amphibians on a periodic basis (weekly, monthly, yearly).

ASSOCIATED PROGRAMS: The Herpetological Atlas Project was initiated by the Milwaukee Public Museum in 1986, with support of the Natural Heritage Inventory Program (of the WDNR, Bureau of Endangered Resources and The Nature Conservancy, Wisconsin Chapter). Data collected for this project help to map species distributions, document rare species occurrences, analyze population trends, examine habitat requirements and plan herptile conservation priorities. Volunteers submit data on an annual basis, and are provided each spring with a packet that includes information on "Most Wanted" species for each Wisconsin county. To participate in this program, which is scheduled to conclude in 2000, the appropriate contact is listed on page 37. However, the techniques and data will be useful beyond the conclusion date.

SEASON: March–October

TIME OF DAY: Anytime, but you will probably observe the greatest number of animals during the warmest part of the day in spring and fall, and during the coolest times of the day during the summer. You can listen for frogs calling in the evening.

DURATION: You can spend as much or as little time as you wish looking for herptiles on your property. However, you will obtain the most complete picture of the reptile and amphibian community on your land if you cover your entire property on your searches.

EQUIPMENT NEEDED: Herptile checklist (see page 65), pencil, clipboard, gloves, ruler, and herptile field guide.

Optional Equipment: Camera for documenting new county records.

Frog and Toad Survey

SPECIES GROUP: Frogs and toads.

OBJECTIVES: The frog and toad survey provides information on presence/absence (inventory), and over time provides information on relative abundance (monitoring).

DESCRIPTION: Visit the various wetlands found on your property after dark three times during the frog calling season (once between April 8–30, once between May 20–June 5, and once between July 1–15). Wetlands that are less than ⁄ mile apart should be combined as one due to the difficulty in distinguishing where calls are originating from. Record air temperature at the start and end of your survey. Take water temperature (if possible) upon arrival at wetland. Wait for one minute, then listen and record frogs for three minutes. Repeat at each wetland or water course found on your property.

SKILL LEVEL: Easy. There are 12 species of frogs and toads living in Wisconsin, and usually a maximum of 4 or 5 are calling at any one time in a wetland.

METHODS: Listen for calling frogs and toads at wetlands.

ASSOCIATED PROGRAMS: The Wisconsin Frog and Toad Survey program was initiated in the early 1980's to track population trends for Wisconsin's frogs and toads. Volunteers make three trips to ten selected wetlands over the course of the breeding season to listen for frogs and toads. To contribute information to this project, or to learn more about it, the appropriate contact is listed on page 37.

SEASON: April–July

TIME OF DAY: Evening (after nightfall)

DURATION: Wait for one minute upon arrival at wetland, then listen for three minutes. Go out to listen for frogs three times over the course of the calling season to observe all species (once between April 8–30, once between May 20–June 5, and once between July 1–15).

EQUIPMENT NEEDED: Frog call tape (available through Madison Audubon Society (608) 255-BIRD), frog and toad survey data form (see page 66–67), pencil, clipboard, and air/water thermometer.

Salamander Coverboard Survey

SPECIES GROUP: Salamanders

OBJECTIVES: The objectives of the Salamander Coverboard Survey are two-fold. This survey method will provide you with presence/absence (inventory) information, and over time, will provide you with relative abundance (monitoring) information.

DESCRIPTION: Many types of terrestrial salamanders hide under logs or other debris in their forested habitats. Transects or arrays of cover boards are installed in such habitats, and terrestrial salamanders crawl under them. This enables one to inventory and monitor their populations. The best material to use for cover boards is *untreated* wood. The chemicals that are used to treat wood can seep into the soil and be absorbed by salamanders.

The preferred size for cover boards is 12 × 12 inches. To set up a transect or array, choose a wooded area on your property for surveying. Cover boards should be placed at least 50 meters (~150 feet) from the edge of the wooded area, because salamanders avoid forest edges. Pairs of cover boards should be either laid out in a straight line (transect) or in an array (see Salamander Cover Board Survey data sheet, Appendix B, page 68–69). Each pair of cover boards should be placed at least 18 feet apart. Each cover board used in your survey should be assigned an individual number, and each cover board in a pair should be placed 0.5 m apart to minimize the potential effects of territoriality.

Remove the leaf litter, level the mineral soil, and place a cover board so that its entire surface is in contact with the earth when installing it for your survey. Newly placed cover boards have very low capture rates in relation to ones that have been there for a long period of time; therefore, do not use your first year of cover board data to look at trends in salamander populations on your property.

Cover boards should be checked 3 times during the season, with one week between sampling periods. Cover boards should not be checked if it is misty or rainy or within 24 hours of rain; these are times when salamanders may be out foraging in the litter. Only check cover boards when the temperature is above freezing. Upon finding an animal under a cover board, capture it, identify it, and then release it immediately next to the cover board so that it can crawl back under without being crushed. To hold an animal for identification, mist the inside of a sandwich bag with a plant sprayer and place the salamander in the sandwich bag, keeping the top of the bag open.

SKILL LEVEL: Easy. There are only four salamander species that may be found under cover boards in Wisconsin. Some frogs, snakes and small mammals may also use your cover boards.

METHODS: Set out a transect or array of cover boards and check periodically for the presence of salamanders.

NOTE: A sample search under logs and rocks can also provide useful information on salamanders using your property.

ASSOCIATED PROGRAMS: The North American Amphibian Monitoring Program (NAAMP) is a program of the United States Geological Survey. Their goal is "to develop a statistically defensible program to monitor the distribution and abundance of amphibians in North America, with applicability at the state, provincial, ecoregional, and continental scales." The Terrestrial Salamander Monitoring Program of NAAMP was set up in 1997 to inventory and monitor populations of terrestrial salamanders throughout the United States. The appropriate contact is listed on page 37 if you would like to join or learn more about this program.

SEASON: The best times to run cover board surveys are early spring or late autumn when temperatures are above freezing and the ground is not frozen. It is possible to sample any time between early spring and late autumn, but capture success is much lower when daytime temperatures exceed 50° Fahrenheit.

TIME OF DAY: Cover boards can be checked during daylight hours.

DURATION: Expect to spend 1.5 hours to check 25 cover boards. Where densities of salamanders are low, we recommend laying out an array of at least 50 cover boards; this will take about 3 hours to check.

EQUIPMENT NEEDED: Field guide to amphibians, cover boards, pencil, clipboard, plastic sandwich bags, and data sheets (see Appendix B, page 68–69).

Resources

KEY

A = Amphibians

B = Birds

M = Mammals

R = Reptiles

V = Vegetation

Barbour, R. W., and W. H. Davis. 1969. Bats of America. The University Press of Kentucky, Lexington, KY. 286 pp. **M**

Clark, W.S., and B.K. Wheeler. 1987. Hawks. Houghton Mifflin Company, Boston, MA. **B**

Conant, R. and J. T. Collins. 1991. A field guide to reptiles and amphibians of eastern and central North America. Houghton Mifflin Company, Boston, MA. 450 pp. **A, R**

Cronin, E. W. Jr. 1986. Getting started in birdwatching. Houghton Mifflin Company, Boston, MA. 216 pp. **B**

Curtis, J.T. 1959. The Vegetation of Wisconsin. The University of Wisconsin Press, Madison, WI. 657 pp. **V**

Dunne, P., D. Sibley, and C. Sutton. 1988. Hawks in flight. Houghton Mifflin Company, Boston, MA. **B**

Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. The birder's handbook. Simon and schuster, Inc., New York, NY. 785 pp. **B**

Harding, J. H. 1997. Amphibians and reptiles of the Great Lakes region. University of Michigan Press, Ann Arbor, MI. 378 pp. **A, R**

Harding, J. H., and J. A. Holman. 1992. Michigan frogs, toads and salamanders. Michigan State University Museum, East Lansing, MI. 144 pp. **A**

Heintzelman, D.S. 1975. Autumn hawk flights: the migrations in eastern North America. Rutgers University Press, New Brunswick, NJ. **B**

Heintzelman, D.S. 1979. A guide to hawk watching in North America. Penn State Press (Keystone Books), University Park, PA. **B**

Heintzelman, D.S. 1986. The migration of hawks. Indiana University Press, Bloomington, IN. **B**

Heyer, W.R., M.A. Donnelly, R.W. McDiarmid, L.C. Hayek and M.S. Foster, editors. 1994. Measuring and monitoring biological diversity. Standard methods for amphibians. Smithsonian Institution Press, Washington, D.C. **A**

Jackson, H. H. T. 1961. Mammals of Wisconsin. The University of Wisconsin Press, Madison, WI. 504 pp. **M**

Johnsgard, P.A. 1990. Hawks, eagles and falcons of North America. Smithsonian Institution Press, Washington, D.C. **B**

Kurta, A. 1995. Mammals of the Great Lakes region. University of Michigan Press, Ann Arbor, MI. 376 pp. **M**

Oldfield, B. and J. J. Moriarty. 1994. Amphibians and reptiles native to Minnesota. University of Minnesota Press, Minneapolis, MN. 237 pp. **A, R**

Peterson, R. T. 1980. A field guide to the birds of eastern and central North America. Houghton Mifflin Company, Boston, MA. 384 pp. **B**

Sample, D. W. and M. J. Mossman. 1997. Managing habitat for grassland birds. A guide for Wisconsin. Bureau of Integrated Science Services, WI Department of Natural Resources, Madison, WI. 154 pp. **B**

Snyder, N. and H. 1991. Birds of prey: natural history and conservation of North American raptors. Voyageur Press. **B**

Stokes, D. and L. Stokes. 1986. A guide to animal tracking and behavior. Little, Brown and Company, Boston, MA. 418 pp. **M**

Stokes, D. and L. Stokes. 1987. The bird feeder book. Little, Brown and Company, Boston, MA. 86 pp. **B**

Temple, S.A., J.R. Cary, and R. Rolley. 1997. Wisconsin birds: A seasonal and geographical guide, 2nd edition. University of Wisconsin Press. 320 pp. **B**

Tuttle, M. D. 1988. America's neighborhood bats. University of Texas Press, Austin, TX. 96pp. **M**

Tuttle, M. D. and D. L. Hensley. 1993. The bat house builder's handbook. Bat Conservation International, Austin, Texas. **M**

Tyning, T. F. 1990. A guide to amphibians and reptiles. Little, Brown and Company, Boston, MA. 400 pp. **A, R**

Wheeler, B.K., and W.S. Clark. 1995. A photographic guide to North American raptors. Academic Press. **B**

Wilson, D.E., F.R. Cole, J.D. Nichols, R. Rudran, and M.S. Foster, editors. 1996. Measuring and monitoring biological diversity. Standard methods for mammals. Smithsonian Institution Press, Washington, D.C. 409 pp. **M**

Appendix A

Wildlife Monitoring Programs and Contacts

Birds

BLUEBIRD RESTORATION ASSOCIATION OF WISCONSIN
Route 1, Box 137 Akron Avenue
Plainfield, Wisconsin 54966

BREEDING BIRD SURVEY
North American Breeding Bird Survey
http://www.mbr.nbs.gov/bbs/bbs.html
To contact the current Wisconsin coordinator go to:
http://www.mp2-pwrc.usgs.gov/bbs/bbs/body_bbs_coordinators.htm

GAME BIRD BROOD SURVEY
Surveys and Databases
Wisconsin Department of Natural Resources
Bureau of Integrated Science Services
1350 Femrite Drive
Monona, Wisconsin 53716

MARSH MONITORING PROGRAM
Long Point Bird Observatory
P.O. Box 160
Port Rowan
Ontario, Canada N0E 1M0
http://www.bsc-eoc.org/mmpmain.html

PROJECT FEEDERWATCH
Cornell Laboratory of Ornithology
P.O. Box 11
Ithaca, New York 14851-0011
1-800-843-2473
http://birdsource.cornell.edu/pfw/

WILD TURKEY BROOD CENSUS
Surveys and Databases
Wisconsin Department of Natural Resources
Bureau of Integrated Science Services
1350 Femrite Drive
Madison, Wisconsin 53716

WISCONSIN BIRD CHECKLIST PROJECT
Wisconsin Society for Ornithology
http://wso.uwgb.edu/wso.htm

WISCONSIN BREEDING BIRD ATLAS
Wisconsin Society for Ornithology
Data Management Center
University of Wisconsin-Green Bay
Department of Natural and Applied Sciences
Green Bay, Wisconsin 54311
920-465-2545
http://wso.uwgb.edu/wso.htm

WOODCOCK PEENTING SURVEYS
United States Fish and Wildlife Service
Office of Migratory Birds
1 Federal Drive
Fort Snelling, MN 55111
612-713-5473
Minneapolis Regional Office
612-713-5470

Mammals

NORTH AMERICAN BAT HOUSE RESEARCH PROJECT
Bat Conservation International
P.O. Box 162603
Austin, Texas 78716-2603
http://www.batcon.org/bhra/bhratop.html

RARE MAMMALS OBSERVATIONS
Surveys and Databases
Wisconsin Department of Natural Resources
Bureau of Integrated Science Services
1350 Femrite Drive
Monona, Wisconsin 53716

TEAM DEER SUMMER DEER SURVEY
Surveys and Databases
Wisconsin Department of Natural Resources
Bureau of Integrated Science Services
1350 Femrite Drive
Monona, Wisconsin 53716

WISCONSIN'S VOLUNTEER CARNIVORE TRACKING PROGRAM
Northern Wildlife Research Group
Box 576
Rhinelander, Wisconsin 54501

Herptiles (Amphibians and Reptiles)

NORTH AMERICAN AMPHIBIAN MONITORING PROGRAM (NAAMP)
Terrestrial Salamander Monitoring Program
NAAMP Coordinator
Biological Resources Division of the
United States Geological Survey
12100 Beech Forest Road
Laurel, Maryland 20708-4038
http://www.im.nbs.gov/amphibs.html

WISCONSIN FROG AND TOAD SURVEY
Wisconsin Department of Natural Resources
Bureau of Endangered Resources
Box 7921
Madison, Wisconsin 53707-7921

WISCONSIN HERPETOLOGICAL ATLAS PROJECT
Milwaukee Public Museum
Section of Vertebrate Zoology
800 W. Wells Street
Milwaukee, Wisconsin 53233
www.mpm.edu/collect/vertzo/herp/atlas/atlas.html

Appendix B

Wildlife Survey Sheets

Wisconsin Bird Checklist

- Common loon
- Pied-billed grebe
- Red-necked grebe
- Double-crested cormorant
- American bittern
- Least bittern
- Great blue heron
- Great egret
- Snowy egret
- Cattle egret
- Green heron
- Black-crowned night heron
- Yellow-crowned night heron
- Trumpeter swan
- Mute swan
- Canada goose
- Wood duck
- Green-winged teal
- American black duck
- Mallard
- Northern pintail
- Blue-winged teal
- Northern shoveler
- Gadwall
- Tufted titmouse
- Red-breasted nuthatch
- White-breasted nuthatch
- Brown creeper
- Carolina wren
- House wren
- Winter wren
- Sedge wren
- Marsh wren
- Golden-crowned kinglet
- Ruby-crowned kinglet
- Blue-gray gnatcatcher
- Eastern bluebird
- Veery
- Swainson's thrush
- Hermit thrush
- Wood thrush
- American robin
- Gray catbird
- Northern mockingbird
- Brown thrasher
- Cedar waxwing
- American widgeon
- Redhead
- Ring-necked duck
- Hooded merganser
- Common merganser
- Red-breasted merganser
- Ruddy duck
- Turkey vulture
- Osprey
- Bald eagle
- Northern harrier
- Sharp-shinned hawk
- Cooper's hawk
- Northern goshawk
- Red-shouldered hawk
- Broad-winged hawk
- Red-tailed hawk
- American kestrel
- Merlin
- Peregrine falcon
- Gray partridge
- Ring-necked pheasant
- Spruce grouse
- Ruffed grouse
- Loggerhead shrike
- European starling
- White-eyed vireo
- Bell's vireo
- Solitary vireo
- Yellow-throated vireo
- Warbling vireo
- Red-eyed vireo
- Blue-winged warbler
- Golden-winged warbler
- Tennessee warbler
- Nashville warbler
- Northern parula
- Yellow warbler
- Chestnut-sided warbler
- Magnolia warbler
- Cape May warbler
- Black-throated blue warbler
- Yellow-rumped warbler
- Black-throated green warbler
- Blackburnian warbler
- Yellow-throated warbler
- Greater prairie chicken
- Sharp-tailed grouse
- Wild turkey
- Northern bobwhite
- Yellow rail
- King rail
- Virginia rail
- Sora
- Common moorhen
- American coot
- Sandhill crane
- Piping plover
- Killdeer
- Spotted sandpiper
- Upland sandpiper
- Common snipe
- American woodcock
- Wilson's phalarope
- Little gull
- Ring-billed gull
- Herring gull
- Caspian tern
- Common tern
- Forster's tern
- Pine warbler
- Prairie warbler
- Palm warbler
- Cerulean warbler
- Black-and-white warbler
- American redstart
- Prothonotary warbler
- Worm-eating warbler
- Ovenbird
- Northern waterthrush
- Louisiana waterthrush
- Kentucky warbler
- Connecticut warbler
- Mourning warbler
- Common yellowthroat
- Hooded warbler
- Wilson's warbler
- Canada warbler
- Yellow-breasted chat
- Scarlet tanager
- Northern cardinal
- Rose-breasted grosbeak
- Black tern
- Rock dove
- Mourning dove
- Black-billed cuckoo
- Yellow-billed cuckoo
- Eastern screech owl
- Great horned owl
- Barred owl
- Great gray owl
- Long-eared owl
- Short-eared owl
- Northern saw-whet owl
- Common nighthawk
- Whip-poor-will
- Chimney swift
- Ruby-throated hummingbird
- Belted kingfisher
- Red-headed woodpecker
- Red-bellied woodpecker
- Yellow-bellied sapsucker
- Downy woodpecker
- Hairy woodpecker
- Black-backed woodpecker
- Northern flicker
- Indigo bunting
- Dickcissel
- Rufous-sided towhee
- Chipping sparrow
- Clay-colored sparrow
- Field sparrow
- Vesper sparrow
- Lark sparrow
- Savannah sparrow
- Grasshopper sparrow
- Henslow's sparrow
- LeConte's sparrow
- Sharp-tailed sparrow
- Song sparrow
- Lincoln's sparrow
- Swamp sparrow
- White-throated sparrow
- Dark-eyed junco
- Bobolink
- Red-winged blackbird
- Eastern meadowlark
- Western meadowlark
- Pileated woodpecker
- Olive-sided flycatcher
- Eastern wood pewee
- Yellow-bellied flycatcher
- Acadian flycatcher
- Alder flycatcher
- Willow flycatcher
- Least flycatcher
- Eastern phoebe
- Great crested flycatcher
- Eastern kingbird
- Horned lark
- Purple martin
- Tree swallow
- Northern rough-winged swallow
- Bank swallow
- Cliff swallow
- Barn swallow
- Gray jay
- Blue jay
- American crow
- Common raven
- Black-capped chickadee
- Boreal chickadee
- Yellow-headed blackbird
- Brewer's blackbird
- Common grackle
- Brown'headed cowbird
- Orchard oriole
- Northern oriole
- Purple finch
- House finch
- Red crossbill
- Pine siskin
- American goldfinch
- Evening grosbeak
- House sparrow
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Nest Box Survey

Observer(s): _____ Date: _____

Weather
Air temperature: _____ Cloud cover: _____ Wind speed: _____

Box #	Species using	# eggs	# young	Observations
1				
2				
3				
4				
5				

Nest Box Survey

Observer(s): _____ Date: _____

Weather
Air temperature: _____ Cloud cover: _____ Wind speed: _____

Box #	Species using	# eggs	# young	Observations
1				
2				
3				
4				
5				

Ruffed Grouse Drumming Count

Observer(s): _____ Date: _____

Start time: _____ Wind speed: _____ Cloud cover: _____

End time: _____ Wind speed: _____ Cloud cover: _____

Stop #	Stop Description	Start time	Finish time	Tally of drummings
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Woodcock Peenting Survey

Observer(s): _____ Date: _____

Start time: _____ Air temp: _____ Wind speed: _____ Cloud cover: _____

End time: _____ Air temp: _____ Wind speed: _____ Cloud cover: _____

Stop #	Stop Description	Start time	End time	# Birds		Other observations
				seen	heard	
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Game Bird Brood Survey

Number of broods* seen

Date	Ruffed Grouse	Pheasant	Gray Partridge	Wild Turkey

* A brood must include one or more immature birds.

Feeder Birds Data Sheet

Observer(s): _____ Date: _____

Weather

Low temp: _____ High temp: _____ Time spent: _____

Precipitation

Kind _____ Amount _____ Snow depth: _____ Patchiness: _____

Species	Time	# Birds seen
American crow		
American goldfinch		
American robin		
American tree sparrow		
Black-capped chickadee		
Blue jay		
Common grackle		
Dark-eyed junco		
Downy woodpecker		
European starling		
Evening grosbeak		
Hairy woodpecker		
House finch		
House sparrow		
Mourning dove		
Northern cardinal		
Northern flicker		
Pine grosbeak		
Pine siskin		
Purple finch		
Red-breasted nuthatch		
Red-bellied woodpecker		
Tufted titmouse		
White-breasted nuthatch		

Wild Turkey Poult Survey

Date _____ **Brood 1**

Number of Hens _____

Number of Poults _____ ☐¼ ☐½ ☐ grown

Date _____ **Brood 2**

Number of Hens _____

Number of Poults _____ ☐¼ ☐½ ☐ grown

Date _____ **Brood 3**

Number of Hens _____

Number of Poults _____ ☐¼ ☐½ ☐ grown

Date _____ **Brood 4**

Number of Hens _____

Number of Poults _____ ☐¼ ☐½ ☐ grown

Number of adult hens seen without broods _____ during month of _____

Night Birds Survey

Route No. _____ County _____ Observers _____

Date _____ Time _____ Weather _____

RAILS

Sora ☐ #_____
King Rail ☐ #_____
Virginia Rail ☐ #_____
Yellow Rail ☐ #_____

SANDPIPERS

American Woodcock ☐ #_____
Common Snipe ☐ #_____

OWLS

Barred Owl ☐ #_____
Eastern Screech-Owl ☐ #_____
Great Gray Owl ☐ #_____
Great Horned Owl ☐ #_____
Long-eared Owl ☐ #_____
Northern Saw-whet Owl ☐ #_____
Short-eared Owl ☐ #_____

NIGHTJARS

Common Nighthawk ☐ #_____
Whip-poor-will ☐ #_____

SWIFT

Chimney Swift ☐ #_____

OTHERS

_____ ☐ #_____
_____ ☐ #_____
_____ ☐ #_____
_____ ☐ #_____
_____ ☐ #_____

Breeding Bird Survey

Route No. _____ County _____ Observers _____

Date _____ Time _____ Weather _____

SPECIES	1	2	3	4	5	TOTAL
Common loon ☐						
Pied-billed grebe ☐						
Red-necked grebe ☐						
Double-c. cormorant ☐						
American bittern ☐						
Least bittern ☐						
Great blue heron ☐						
Great egret ☐						
Snowy egret ☐						
Cattle egret ☐						
Green heron ☐						
Black-cr. night heron ☐						
Yellow-cr. night heron ☐						
Trumpeter swan ☐						
Mute swan ☐						
Canada goose ☐						
Wood duck ☐						
Green-winged teal ☐						
Am. black duck ☐						
Mallard ☐						
Northern pintail ☐						
Blue-winged teal ☐						
Northern shoveler ☐						
Gadwall ☐						
American widgeon ☐						
Redhead ☐						
Ring-necked duck ☐						

SPECIES	1	2	3	4	5	TOTAL
Hooded merganser ☐						
Common merganser ☐						
Red-breasted merganser ☐						
Ruddy duck ☐						
Turkey vulture ☐						
Osprey ☐						
Bald Eagle ☐						
Northern harrier ☐						
Sharp-shinned hawk ☐						
Cooper's hawk ☐						
Northern goshawk ☐						
Red-shouldered hawk ☐						
Broad-winged hawk ☐						
Red-tailed hawk ☐						
American kestrel ☐						
Merlin ☐						
Peregrine falcon ☐						
Gray partridge ☐						
Ring-necked pheasant ☐						
Spruce grouse ☐						
Ruffed grouse ☐						
Greater prairie-chicken ☐						
Sharp-tailed grouse ☐						
Wild turkey ☐						
Northern bobwhite ☐						
Yellow rail ☐						
King rail ☐						

Breeding Bird Survey

Page 2 of 4

SPECIES	1	2	3	4	5	TOTAL
Virginia rail ☐						
Sora ☐						
Common moorhen ☐						
American coot ☐						
Sandhill crane ☐						
Piping plover ☐						
Killdeer ☐						
Spotted sandpiper ☐						
Upland sandpiper ☐						
Rock Dove ☐						
Mourning Dove ☐						
Black-billed cuckoo ☐						
Yellow-billed cuckoo ☐						
Eastern screech owl ☐						
Great horned owl ☐						
Barred owl ☐						
Great gray owl ☐						
Long-eared owl ☐						
Short-eared owl ☐						
Northern saw-whet owl ☐						
Common nighthawk ☐						
Belted Kingfisher ☐						
Whip-poor-will ☐						
Red headed woodpecker ☐						
Chimney swift ☐						
Red-bellied woodpecker ☐						
Ruby-throated hummingbird ☐						
Yellow-bellied Sapsucker ☐						
Gray jay ☐						
Blue Jay ☐						
American Crow ☐						
Common snipe ☐						

SPECIES	1	2	3	4	5	TOTAL
American woodcock ☐						
Wilson's phalarope ☐						
Little gull ☐						
Ring-billed gull ☐						
Herring gull ☐						
Caspian tern ☐						
Common tern ☐						
Forster's tern ☐						
Black tern ☐						
Downy woodpecker ☐						
Hairy woodpecker ☐						
Black-backed woodpecker ☐						
Yellow-shafted Flicker ☐						
Pileated Woodpecker ☐						
Olive sided flycatcher ☐						
Eastern Wood-pewee ☐						
Yellow-bellied flycatcher ☐						
Acadian flycatcher ☐						
Alder Flycatcher ☐						
Willow flycatcher ☐						
Least Flycatcher ☐						
Horned lark ☐						
Eastern Phoebe ☐						
Purple Martin ☐						
Great Crested Flycatcher ☐						
Tree Swallow ☐						
Eastern kingbird ☐						
N. Rough-winged swallow ☐						
Bank swallow ☐						
Cliff Swallow ☐						
Barn Swallow ☐						
Common Raven ☐						

Breeding Bird Survey

Page 3 of 4

SPECIES	1	2	3	4	5	TOTAL
Black-capped Chickadee ☐						
Boreal chickadee ☐						
Tufted titmouse ☐						
Red-breasted nuthatch ☐						
White-breasted Nuthatch ☐						
Brown creeper ☐						
Carolina wren ☐						
House Wren ☐						
Winter Wren ☐						
Sedge wren ☐						
Marsh wren ☐						
Golden-crowned kinglet ☐						
Ruby-crowned kinglet ☐						
Blue-gray gnatcatcher ☐						
Eastern bluebird ☐						
Veery ☐						
Swainson's thrush ☐						
Hermit Thrush ☐						
Wood thrush ☐						
Magnolia warbler ☐						
Cape May warbler ☐						
Black-thr. blue warbler ☐						
Myrtle Warbler ☐						
Black-throated Green Warbler ☐						
Blackburnian warbler ☐						
Yellow-throated warbler ☐						
Pine warbler ☐						
Prairie warbler ☐						
Palm warbler ☐						
American Robin ☐						
Gray Catbird ☐						

SPECIES	1	2	3	4	5	TOTAL
Northern mockingbird ☐						
Brown thrasher ☐						
Cedar Waxwing ☐						
Loggerhead shrike ☐						
European Starling ☐						
White-eyed vireo ☐						
Bell's vireo ☐						
Solitary vireo ☐						
Yellow-throated vireo ☐						
Warbling vireo ☐						
Red-eyed Vireo ☐						
Blue-winged warbler ☐						
Golden-winged warbler ☐						
Tennessee warbler ☐						
Nashville Warbler ☐						
Northern parula ☐						
Yellow Warbler ☐						
Chestnut-sided Warbler ☐						
Cerulean warbler ☐						
Black-and-white Warbler ☐						
American Redstart ☐						
Prothonotary warbler ☐						
Worm-eating warbler ☐						
Ovenbird ☐						
Northern waterthrush ☐						
Louisiana waterthrush ☐						
Kentucky warbler ☐						
Connecticut warbler ☐						
Mourning Warbler ☐						
Common Yellowthroat ☐						
Hooded warbler ☐						

Breeding Bird Survey

Page 4 of 4

SPECIES	1	2	3	4	5	TOTAL
Wilson's warbler ☐						
Canada warbler ☐						
Yellow-breasted chat ☐						
Scarlet Tanager ☐						
Northern cardinal ☐						
Rose-breasted Grosbeak ☐						
Indigo Bunting ☐						
Dickcissel ☐						
Rufous-sided towhee ☐						
Chipping Sparrow ☐						
Clay-colored sparrow ☐						
Field sparrow ☐						
Vesper sparrow ☐						
Lark sparrow ☐						
Savannah Sparrow ☐						
Grasshopper sparrow ☐						
Henslow's sparrow ☐						
LeConte's sparrow ☐						
Sharp-tailed sparrow ☐						
Song sparrow ☐						
Lincoln's sparrow ☐						
Swamp sparrow ☐						
White-throated Sparrow ☐						
Dark-eyed junco ☐						
Bobolink ☐						

SPECIES	1	2	3	4	5	TOTAL
Red-winged Blackbird ☐						
Eastern meadowlark ☐						
Western meadowlark ☐						
Yellow-headed blackbird ☐						
Brewer's Blackbird ☐						
Common Grackle ☐						
Brown-headed Cowbird ☐						
Orchard oriole ☐						
Northern oriole ☐						
Purple Finch ☐						
House finch ☐						
Red crossbill ☐						
Pine siskin ☐						
American Goldfinch ☐						
Evening grosbeak ☐						
House Sparrow ☐						
---------- ☐						
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Breeding Bird Atlas Field Card

Page 1 of 4

Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO	Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO
		Common Loon								Common merganser					
		Pied Billed Grebe								Red-breasted merganser					
		Red-necked Grebe								Ruddy duck					
		Double-crested Cormorant								Turkey vulture					
		American bittern								Osprey					
		Least Bittern								Bald eagle					
		Great Blue Heron								Northern harrier					
		Great egret								Sharp-shinned hawk					
		Snowy egret								Cooper's hawk					
		Cattle egret								Northern goshawk					
		Green heron								Red-shoulder hawk					
		Black-crowned night-heron								Broad-winged hawk					
		Yellow-crowned night-heron								Red-tailed hawk					
		Trumpeter swan								American kestrel					
		Mute swan								Merlin					
		Canada goose								Peregrine falcon					
		Wood duck								Ring-neck pheasant					
		Green-winged teal								Spruce grouse					
		Am. black duck								Ruffed grouse					
		Mallard								Greater prairie chicken					
		Northern pintail								Sharp-tailed grouse					
		Blue-winged teal								Wild turkey					
		Northern shoveler								Northern bobwhite					
		Gadwall								Yellow rail					
		American widgeon								King rail					
		Redhead								Virginia rail					
		Ring-necked duck								Sora rail					
		Hooded merganser								Common moorhen					

Breeding Bird Atlas Field Card

Page 2 of 4

Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO	Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO
		American coot								Whip-poor-will					
		Sandhill crane								Chimney swift					
		Piping plover								Ruby-throated hummingbird					
		Killdeer								Belted kingfisher					
		Spotted sandpiper								Red-headed woodpecker					
		Upland sandpiper								Red-bellied woodpecker					
		Common snipe								Yellow-bellied sapsucker					
		American woodcock								Downy woodpecker					
		Wilson's phalarope								Hairy woodpecker					
		Little gull								Black-backed woodpecker					
		Ring-billed gull								Northern flicker					
		Herring gull								Pileated woodpecker					
		Caspian tern								Olive-sided flycatcher					
		Common tern								Eastern wood-pewee					
		Forster's tern								Yellow-bellied flycatcher					
		Black tern								Acadian flycatcher					
		Rock dove								Alder flycatcher					
		Mourning dove								Willow flycatcher					
		Black-billed cuckoo								Least flycatcher					
		Yellow-billed cuckoo								Eastern phoebe					
		Eastern screech owl								Great crested flycatcher					
		Great horned owl								Eastern kingbird					
		Barred owl								Horned lark					
		Great gray owl								Purple martin					
		Long-eared owl								Tree swallow					
		Short-eared owl								Northern red-wing swallow					
		Northern saw-whet owl								Bank swallow					
		Common nighthawk								Cliff swallow					

Breeding Bird Atlas Field Card

Page 3 of 4

Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO	Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO
		Barn swallow								European starling					
		Gray jay								Cedar waxwing					
		Blue jay								Loggerhead shrike					
		American crow								White-eyed vireo					
		Common raven								Bell's vireo					
		Black-capped chickadee								Solitary vireo					
		Boreal chickadee								Yellow-throated vireo					
		Tufted titmouse								Warbling vireo					
		Red-breasted nuthatch								Red-eyed vireo					
		White-breasted nuthatch								Blue-winged warbler					
		Brown creeper								Gold-winged warbler					
		Carolina wren								Tennessee warbler					
		House wren								Nashville warbler					
		Winter wren								Northern parula					
		Sedge wren								Yellow warbler					
		Marsh wren								Chestnut-sided warbler					
		Golden-crowned kinglet								Magnolia warbler					
		Ruby-crowned kinglet								Cape May warbler					
		Blue-gray gnatcatcher								Black-throated blue warbler					
		Eastern bluebird								Yellow-rumped warbler					
		Veery								Black-throated green warbler					
		Swainson's thrush								Blackburnian warbler					
		Hermit thrush								Yellowed-throated warbler					
		Wood thrush								Pine warbler					
		American robin								Prairie warbler					
		Gray catbird								Palm warbler					
		Northern mockingbrid								Cerulean warbler					
		Brown thrasher								Black/white warbler					

Breeding Bird Atlas Field Card

Page 4 of 4

Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO	Hab	Abu	SPECIES	Date of Highest Evidence	O	PO	PR	CO
		American redstart								LeConte's sparrow					
		Prothonotary warbler								Sharp-tailed sparrow					
		Worm-eating warbler								Song sparrow					
		Ovenbird								Lincoln's sparrow					
		Northern waterthrush								Swamp sparrow					
		Louisiana waterthrush								White-throated sparrow					
		Kentucky warbler								Dark-eyed junco					
		Connecticut warbler								Bobolink					
		Mourning warbler								Red-winged blackbird					
		Common yellowthroat								Eastern meadowlark					
		Hooded warbler								Western meadowlark					
		Wilson's warbler								Yellow-headed blackbird					
		Canada warbler								Brewer's blackbird					
		Yellow-breasted shat								Common grackle					
		Scarlet tanager								Brown-headed cowbird					
		Northern cardinal								Orchard oriole					
		Rose-breasted grosbeak								Northern oriole					
		Indigo bunting								Purple finch					
		Dickcissel								House finch					
		Rufous-sided towhee								Red Crossbill					
		Chipping sparrow								Pine siskin					
		Clay-colored sparrow								American goldfinch					
		Field sparrow								Evening grosbeak					
		Vesper sparrow								House sparrow					
		Lark sparrow													
		Savannah sparrow													
		Grasshopper sparrow													
		Henslow's sparrow													

Wetland Bird Survey

Observer: _____Wetland Name _____

Date: _____Station: _____Visit #: _____ Start time: _____

Wind speed (approx.): _____ Cloud Cover (10ths): _____ Air Temp: _____

Mapping Symbols

RWBL — Singing/calling bird

RWBL ⊣⊢ RWBL — Simultaneous song/ different birds of same species

SWSP — Pair together (assumed mated)

CAGO — Family group (record # adults)

*GTBH — Observed (e.g. feeding)

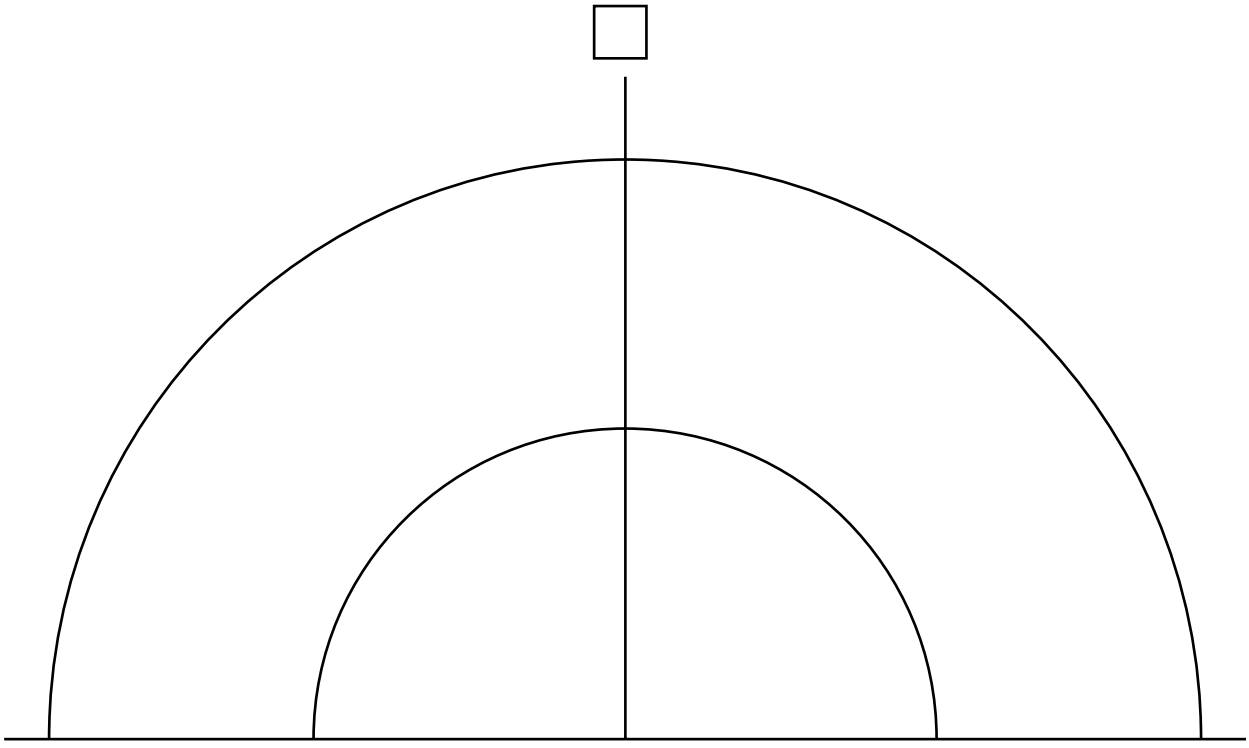
RWBL → RWBL — Change in position

*TRES — Nest

Aerial Foragers

Species	Tally	No.

Outside/Flythru
(Additional Species)



Wisconsin Mammal Checklist

Marsupialia

- ☐ Virginia opossum *Didelphis virginianus*

Insectivora

- ☐ Star-nosed mole *Condylura cristata*
- ☐ Common mole *Scalopus aquaticus*
- ☐ Short-tailed shrew *Blarina brevicauda*
- ☐ Least shrew *Cryptotis parva*
- ☐ Pygmy shrew *Microsorex hoyi*
- ☐ Arctic shrew *Sorex arcticus*
- ☐ Masked shrew *Sorex cinereus*
- ☐ Water shrew *Sorex palustris*

Chiroptera

- ☐ Big brown bat *Eptesicus fuscus*
- ☐ Silver-haired bat *Lasionycteris noctivagans*
- ☐ Red bat *Lasiurus borealis*
- ☐ Hoary bat *Lasiurus cinereus*
- ☐ Little brown bat *Myotis lucifugus*
- ☐ Northern bat *Myotis septentrionalis*
- ☐ Indiana bat *Myotis sodalis*
- ☐ Eastern pipistrelle *Pipistrellus subflavus*

Lagomorpha

- ☐ Snowshoe hare *Lepus americanus*
- ☐ White-tailed jackrabbit *Lepus townsendi*
- ☐ Cottontail rabbit *Sylvaligus floridanus*

Rodentia

- ☐ Beaver *Castor canadensis*
- ☐ Franklin's ground squirrel *Citellus franklini*
- ☐ 13-lined ground squirrel *Citellus tridecemlineatus*
- ☐ Redback vole *Clethrionomys gapperi*
- ☐ Porcupine *Erithizon dorsatum*
- ☐ Plains pocket gopher *Geomys bursarius*
- ☐ Southern flying squirrel *Glaucomys volans*
- ☐ Northern flying squirrel *Glaucomys sabrinus*
- ☐ Woodchuck *Marmota monax*
- ☐ Prairie vole *Microtis ochragaster*
- ☐ Meadow vole *Microtus pensylvanicus*
- ☐ House mouse *Mus musculus*

Rodentia (continued}

- ☐ Woodland jumping mouse *Napaeozapus insignis*
- ☐ Muskrat *Ondatra zibethica*
- ☐ White-footed mouse *Peromyscus leucopus*
- ☐ Deer mouse *Peromyscus maniculatus*
- ☐ Pine vole *Pitymys pinetorum*
- ☐ Norway rat *Rattus norvegicus*
- ☐ Western harvest mouse *Reithrodontomys megalotis*
- ☐ Gray squirrel *Sciurus carolinensis*
- ☐ Fox squirrel *Sciurus niger*
- ☐ Bog lemming *Synaptomys cooperi*
- ☐ Least chipmunk *Tamias minimus*
- ☐ Eastern chipmunk *Tamias striatus*
- ☐ Red squirrel *Tamiasciurus hudsonicus*
- ☐ Meadow jumping mouse *Zapus hudsonius*

Carnivora

- ☐ Coyote *Canis latrans*
- ☐ Gray wolf *Canis lupus*
- ☐ Otter *Lutra canadensis*
- ☐ Lynx *Lynx canadensis*
- ☐ Bobcat *Lynx rufus*
- ☐ Marten *Martes americana*
- ☐ Fisher *Martes pennanti*
- ☐ Striped skunk *Mephitis mephitis*
- ☐ Short-tailed weasel *Mustela erminea*
- ☐ Long-tailed weasel *Mustela frenata*
- ☐ Least weasel *Mustela rixosa*
- ☐ Mink *Mustela vison*
- ☐ Raccoon *Procyon lotor*
- ☐ Spotted skunk *Spilogale putorius*
- ☐ Badger *Vulpes fulva*
- ☐ Gray fox *Taxidea taxus*
- ☐ Black bear *Urocyon cinereoargenteus*
- ☐ Red fox *Ursus americanus*

Artiodactyla

- ☐ White-tailed deer *Odocoileus virginianus*

Predator Scent Post Survey

NIGHT__ Date_____ Time_____ Observers _____

Overnight Weather _____ Current Weather _____

Scent Post #	Observations
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Comments:

Snow Track Survey

Date _____ Observers _____

Snow depth _____ Temperature (start) _____ (end) _____

Mileage	Coyote	Dog	Wolf	Fox	Fisher	Otter	Skunk	Badger	Bobcat	Cat	Puma	Lynx	Bear	Raccoon	Other
0.0 – 0.5															
0.5 – 1.0															
1.0 – 1.5															
1.5 – 2.0															
2.0 – 2.5															
2.5 – 3.0															
3.0 – 3.5															
3.5 – 4.0															
4.0 – 4.5															
4.5 – 5.0															
5.0 – 5.5															
5.5 – 6.0															
6.0 – 6.5															
6.5 – 7.0															
7.0 – 7.5															
7.5 – 8.0															
8.0 – 8.5															
8.5 – 9.0															
9.0 – 9.5															
9.5 – 10.0															

Comments:

Summer Deer Survey

Date	Unknown	Bucks	Lone doe	Lone fawn	Doe + 1 fawn	Doe + 2 fawns	Doe + 3 fawns	Remarks

Deer Harvest Monitoring

Hunter Name _____ Date _____

Bow _____ Gun _____ No. Days Hunted _____ No. Hours Hunted _____

Deer observed _____ Type of deer killed _____

Deer age _____ Location of kill _____

Map of Property

Place dot on above map of property to signify kill location.

Bat House Monitoring

Observer(s) _____ Date_____

Air temperature _____ Cloud cover _____

Bat house	Occupied?	Species	# adults	# young	Observations
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Medium Mammal Survey

Date	Species	Scats	Tracks	Home	Comments

Small Mammal Survey

Night____ Date_____ Time _____ Observer(s)_____

Overnight weather_____ Current weather_____

KEY: 00 = small snap trap **00** = medium snap trap *00* = pitfall

1	2	**3**	4	5
6	7	8	**9**	10
11	**12**	*13*	14	**15**
16	17	**18**	19	20
21	22	23	**24**	25

Comments:

Annual Rare Mammal Records

Date	Species	# Adults/# Young	Habitat	Comments

Wisconsin Herptile Checklist

AMPHIBIA

Caudata (Salamanders)

- ☐ Blue-spotted salamander *Ambystoma laterale*
- ☐ Spotted salamander *Ambystoma maculatum*
- ☐ Tiger salamander *Ambystoma tigrinum*
- ☐ Four-toed salamander *Hemidactylium scutatum*
- ☐ Mudpuppy *Necturus maculosus*
- ☐ Central newt *Notophthalmus viridescens*
- ☐ Red-backed salamander *Plethodon cinereus*

Anura (Frogs and Toads)

- ☐ Blanchard's cricket frog *Acris crepitans*
- ☐ American toad *Bufo americanus*
- ☐ Eastern gray treefrog *Hyla versicolor*
- ☐ Cope's gray treefrog *Hyla chrysoscelis*
- ☐ Spring peeper *Pseudacris crucifer*
- ☐ Chorus frog *Pseudacris triseriata*
- ☐ Bullfrog *Rana catesbeiana*
- ☐ Green frog *Rana clamitans*
- ☐ Pickerel frog *Rana palustris*
- ☐ Leopard frog *Rana pipiens*
- ☐ Mink frog *Rana septentrionalis*
- ☐ Wood frog *Rana sylvatica*

REPTILIA

Chelonia (Turtles)

- ☐ Smooth softshell *Apalone mutica*
- ☐ Spiny softshell *Apalone spinefera*
- ☐ Snapping turtle *Chelydra serpentina*
- ☐ Painted turtle *Chrysemys picta*
- ☐ Stinkpot *Sternotherus odoratus*
- ☐ Wood turtle *Clemmys insculpta*
- ☐ Blanding's turtle *Emydoidea blandingii*
- ☐ Map turtle *Graptemys geographica*
- ☐ Ouachita map turtle *Graptemys ouachitensis*
- ☐ False map turtle *Graptemys pseudogeographica*
- ☐ Ornate box turtle *Terrapene ornata*

Squamata (Lizards and Snakes)

Lizards

- ☐ Six-lined racerunner *Cnemidophorus sexlineatus*
- ☐ 5-lined skink *Eumeces fasciatus*
- ☐ Prairie skink *Eumeces septentrionalis*
- ☐ Slender glass lizard *Ophisaurus attenuatus*
- ☐ Blue racer *Coluber constrictor*

Snakes

- ☐ Timber rattlesnake *Crotalus horridus*
- ☐ Prairie ringneck snake *Diadophis punctatus arnyi*
- ☐ Northern ringneck snake *Diadophis punctatus edwardsii*
- ☐ Black rat snake *Elaphe obsoleta*
- ☐ Fox (or pine) snake *Elaphe vulpina*
- ☐ Hognose snake *Heterodon platyrhinos*
- ☐ Milk snake *Lampropeltis triangulum*
- ☐ Northern water snake *Nerodia sipedon*
- ☐ Smooth green snake *Opheodrys vernalis*
- ☐ Bullsnake *Pituophis melanoleucus*
- ☐ Queensnake *Regina septemvittata*
- ☐ Massasauga rattlesnake *Sistrurus catenatus*
- ☐ Brown snake *Storeria dekayi*
- ☐ Red-bellied snake *Storeria occipitomaculata*
- ☐ Butler's garter snake *Thamnophis butleri*
- ☐ Western ribbon snake *Thamnophis proximus*
- ☐ Plains garter snake *Thamnophis radix*
- ☐ Northern ribbon snake *Thamnophis sauritus*
- ☐ Eastern garter snake *Thamnophis sirtalis*

Frog and Toad Calling Survey Data Form

Observer Names: _____

Start time: _____ Wind: _____ Sky: _____ Air temperature: _____

End time: _____ Wind: _____ Sky: _____ Air temperature: _____

Sky and wind codes found on following page.

Call index

1 = individuals can be counted; space between calls

2 = individuals can be distinguished but calls overlap

3 = full chorus; calls constant and overlapping

		Toad	Frogs									Treefrogs	
Location	H_2O temp	American	Chorus	Spring peeper	Leopard	Pickerel	Wood	Cricket	Mink	Green	Bullfrog	Eastern gray	Central gray
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

Frog and Toad Survey Data Form
Sky and Wind codes

To be used on data sheet:

Sky code #	Sky condition
0	Clear or a few clouds
1	Partly cloudy or variable
2	Cloudy (broken) or overcast
3	Fog
4	Drizzle
5	Showers

Wind code #	Wind speed (mph)	Indicators of wind speed
0	less than 1	Smoke rises vertically
1	1-3	Wind direction shown by smoke drift
2	4-7	Wind felt on face; leaves rustle
3	8-12	Leaves and small twigs in constant motion; wind extends light flag
4	13-18	Raises dust and loose paper; small branches are moved

---

Comments

(difficulties, background noise levels, uncertain calls,
other animal observations, habitat changes since previous year, etc.)

Salamander Coverboard Survey (A)

High Population Density

Route No. _____ County _____ Observers _____

Date _____ Time _____ Weather _____

SALAMANDERS	Number of Coverboard	OTHER ANIMALS	Number of Coverboard
☐ Blue-spotted Salamander	#_____	☐ _____	#_____
☐ Northern Redback Salamander	#_____	☐ _____	#_____
☐ Red eft	#_____	☐ _____	#_____
☐ Spotted salamander	#_____	☐ _____	#_____
☐ _____	#_____	☐ _____	#_____
☐ _____	#_____	☐ _____	#_____

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

Comments:

Salamander Coverboard Survey (B)

Low Population Density

Route No. _____ County _____ Observers _____

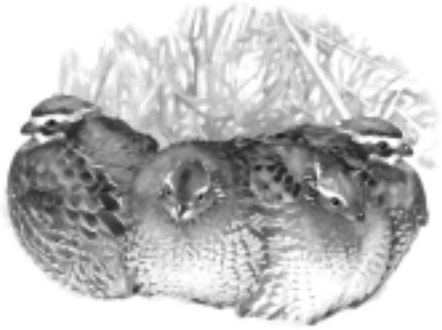
Date _____ Time _____ Weather _____

SALAMANDERS	Number of Coverboard	OTHER ANIMALS	Number of Coverboard
☐ Blue-spotted Salamander	#_____	☐ _____	#_____
☐ Northern Redback Salamander	#_____	☐ _____	#_____
☐ Red eft	#_____	☐ _____	#_____
☐ Spotted salamander	#_____	☐ _____	#_____
☐ _____	#_____	☐ _____	#_____
☐ _____	#_____	☐ _____	#_____

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50

Appendix C

A Seasonal Index to Wildlife Surveying



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Note that the Marsh Monitoring Program includes amphibian monitoring in addition to the wetland birds. We recommend that protocols from the Wisconsin Frog and Toad Survey be used for amphibian monitoring (see p. 34).

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