

Appendix B: **Descriptions of natural communities and Species of Greatest Conservation Need in the Southeast Glacial Plain.**

A) Introduction.

This appendix provides information about ecologically sensitive habitats and species in the Southeast Glacial Plain Ecological Landscape (SEGP). The information presented here comes largely from the recently completed Wildlife Action Plan and from the DNR's Natural Heritage Inventory's database on known and historic locations of high quality natural communities and rare species. The NHI database is the most comprehensive statewide source of this information available. For more information about these species life history needs, threats, and associated conservation actions, go to the Wildlife Action Plan web site at <http://dnr.wi.gov/org/land/er/wwap/explore/>.

Natural communities are assemblages of different plant and animal species, living together in a particular area, at a particular time, in a specific habitat. Communities may be named for their dominant plant species (for example, pine barrens, sedge meadows, and oak savannas), a prominent environmental feature (Great Lakes Dune, Dry Cliff), or some combination of these factors. Occurrences of natural communities range in size from less than an acre to thousands of acres. Communities are dynamic and always changing; some change may be rapid while other change is too slow for many humans to notice.

The location and abundance of natural communities are determined by environmental factors such as climate, geology, landform, soils, and hydrology interacting with natural disturbance events, including windstorms, fires, droughts, floods, and insect infestations to shape Wisconsin's landscape. Human activities, beginning with Native Americans and continuing today with our pervasive and intensive uses of land and water, have also had profound impacts on Wisconsin's natural communities.

Species of Greatest Conservation Need (SCGN) have low or declining populations that are in need of conservation action. They include various birds, fish, mammals, reptiles, amphibians, and invertebrates (e.g. dragonflies, butterflies, and freshwater mussels) that are:

- Already listed as threatened or endangered;
- At risk because of threats to their life history needs or their habitats;
- Stable in number in Wisconsin, but declining in adjacent states or nationally;
- Of unknown status in Wisconsin and suspected to be vulnerable.

B) Natural communities of major¹ ecological importance and associated Species of Greatest Conservation Need in the Southeast Glacial Plain Ecological Landscape.

1) Open, treeless natural communities.

Dry Prairie

This dry grassland community usually occurs on steep south or west facing slopes or at the summits of river bluffs with sandstone or dolomite bedrock near the surface. Short to medium-sized prairie grasses such as little bluestem, side-oats grama, hairy grama, and prairie dropseed are the dominants in this community. Common shrubs and forbs include lead plant, silky aster, flowering spurge, purple prairie-clover, cylindrical blazing-star, and gray goldenrod. Stands on knolls in the Kettle Moraine region occur on gravelly substrates and may warrant recognition as distinctive subtypes of “Dry Prairie.”

Species of Greatest Conservation Need

Bell's Vireo	Northern Bobwhite
Blanding's Turtle	Northern Harrier
Brown Thrasher	Ornate Box Turtle
Eastern Massasauga Rattlesnake	Prairie Vole
Eastern Meadowlark	Short-eared Owl
Field Sparrow	Upland Sandpiper
Grasshopper Sparrow	Vesper Sparrow
Lark Sparrow	Western Meadowlark
Loggerhead Shrike	Yellow-bellied Racer

Dry-Mesic Prairie

Historically, this grassland community was common in parts of southern Wisconsin, occurring on slightly less droughty sites than dry prairie. Today, this community type is rare because of conversion to agricultural uses or the encroachment of woody vegetation due to the lack of wildfire. Dry-mesic prairie has many of the same grasses as dry prairie, but taller species such as big bluestem and Indian-grass dominate. Needle grass and prairie drop-seed may also be present. The herb component is more diverse than in dry prairies, as it may include many species that occur in both dry and mesic prairies. Composites and legumes are particularly well-represented in relatively undisturbed stands.

Soils are often somewhat sandy, either loamy sands or sandy loams. The landscape associations that can support this type include terraces on the margins of large river valleys, sandy outwash deposits, gravelly moraines, and the lower slopes of Driftless Area bluffs. As with the other tallgrass prairie communities (mesic prairie and wet-mesic prairie), well over 99% of this prairie type has been destroyed.

Species of Greatest Conservation Need

American Golden Plover	Henslow's Sparrow
Bell's Vireo	Loggerhead Shrike

¹ A **major** opportunity for sustaining the natural community in the Ecological Landscape exists, either because many significant occurrences of the natural community have been recorded in the landscape or major restoration activities are likely to be successful maintaining the community's composition, structure, and ecological function over a longer period of time.

Blanding's Turtle	Marbled Godwit
Blue-winged Teal	Northern Bobwhite
Bobolink	Northern Harrier
Brown Thrasher	Ornate Box Turtle
Buff-breasted Sandpiper	Prairie Vole
Butler's Garter Snake	Short-eared Owl
Dickcissel	Upland Sandpiper
Eastern Massasauga Rattlesnake	Vesper Sparrow
Eastern Meadowlark	Western Meadowlark
Field Sparrow	Willow Flycatcher
Franklin's Ground Squirrel	Yellow-bellied Racer
Grasshopper Sparrow	

Mesic Prairie

Although common historically, this type is extremely rare today. This grassland community occurs on rich, moist, well-drained sites, usually on level or gently rolling glacial topography. The dominant plant is the tall grass, big bluestem. The grasses little bluestem, Indian grass, needle grass, prairie dropseed, and switch grass are also frequent. The forb layer is diverse in the number, size, and physiognomy of the species. Common taxa include the prairie docks, lead plant, heath and smooth asters, prairie coreopsis, prairie sunflower, rattlesnake-master, flowering spurge, bee-balm, prairie coneflower, and spiderwort.

At the time of European settlement it is estimated that this type occupied over 800,000 acres in southern Wisconsin. Today one would be hard pressed to make the case that even 100 acres of intact tallgrass prairie still exists. The present rarity of this type is due to its high productivity for agricultural uses, such as corn and soybean production. It was associated with other tallgrass prairie communities, various wetland types, and oak openings.

Species of Greatest Conservation Need

American Golden Plover	Henslow's Sparrow
Blanding's Turtle	Marbled Godwit
Blue-winged Teal	Northern Bobwhite
Bobolink	Northern Harrier
Butler's Garter Snake	Pickerel Frog
Dickcissel	Prairie Vole
Eastern Massasauga Rattlesnake	Short-eared Owl
Eastern Meadowlark	Upland Sandpiper
Field Sparrow	Willow Flycatcher
Franklin's Ground Squirrel	

Wet-Mesic Prairie

This herbaceous grassland community is dominated by tall grasses, including big bluestem, Canada bluejoint grass, cordgrass, and Canada wild-rye. The forb component is diverse and includes azure aster, Eastern shooting-star, sawtooth sunflower, prairie blazing-star, prairie phlox, prairie coneflower, prairie docks, late and stiff goldenrods, and culver's-root. This community type was common historically but now is rare.

Wet-mesic prairie sometimes occurred in large wetland complexes with wet prairie, southern sedge meadow, calcareous fen, and emergent marsh communities. It was most abundant on level or gently rolling glacial moraine or outwash landforms where there were few natural barriers to wild fire, and where the upland vegetation was composed mostly of fire-dependent communities such as Mesic prairie and Oak opening.

Species of Greatest Conservation Need

American Golden Plover	Franklin's Ground Squirrel
Bell's Vireo	Henslow's Sparrow
Blanding's Turtle	Marbled Godwit
Blue-winged Teal	Northern Bobwhite
Bobolink	Northern Harrier
Buff-breasted Sandpiper	Pickerel Frog
Butler's Garter Snake	Short-eared Owl
Eastern Massasauga Rattlesnake	Upland Sandpiper
Eastern Meadowlark	Willow Flycatcher
Field Sparrow	

Calcareous Fen

Calcareous fens occur mostly in southern Wisconsin, on sites that are fed by carbonate-enriched groundwater. Most fens are small, covering no more than a few acres, and are often associated and can intergrade with more abundant and widespread wetland communities such as southern sedge meadow, wet prairie, shrub-carr, emergent marsh, and southern tamarack swamp. An accumulation of peat can raise the fen surface to a height of several meters above the adjoining lands.

The diverse fen flora is distinctive, containing many calciphiles of restricted distribution. Common or representative plants include sedges, marsh fern, shrubby cinquefoil, shrubby St. John's-wort, Ohio goldenrod, grass-of-parnassus, twig-rush, brook lobelia, boneset, swamp thistle, and asters. Many fens have a significant number of prairie or sedge meadow components, and some contain plants often associated with bogs, such as tamarack, bog birch and pitcher plant.

Fens occur in several landscape settings, including the bases of morainal slopes, on sloping deposits of glacial outwash, in the headwaters regions of spring runs and small streams, and on the shores of alkaline drainage lakes.

Species of Greatest Conservation Need

American Woodcock	Northern Long-eared Bat
Butler's Garter Snake	Pickerel Frog
Eastern Massasauga Rattlesnake	Rusty Blackbird
Eastern Red Bat	Silver-haired Bat
Hoary Bat	Willow Flycatcher

Southern Sedge Meadow

Widespread in southern Wisconsin, this open wetland community is most typically dominated by tussock sedge and Canada bluejoint grass. Common associates of relatively undisturbed sedge meadows are other sedges, marsh bellflower, marsh wild-timothy, water horehound, panicked

aster, swamp aster, blue flag, spotted Joe-Pye weed, marsh fern, and swamp milkweed. Reed canary grass may be dominant in grazed and/or ditched stands, sometimes to the exclusion of virtually all other species.

Sedge meadows are most common in glaciated landscapes, where they often border streams or drainage lakes. The southern sedge meadow community occurred with prairie, savanna, and hardwood forest communities, and many of them apparently burned periodically. In the absence of fire, shrubs and trees are able to readily encroach on the open wetlands; encroachment can be exacerbated when wetlands are drained. Many sedge meadows in southeastern Wisconsin are influenced by alkaline groundwater, and occur in complexes with emergent marsh, calcareous fen, wet prairie, wet-mesic prairie, and shrub-carr. Differentiating between these communities can be difficult, as they frequently intergrade.

Species of Greatest Conservation Need

American Bittern	King Rail
Blanding's Turtle	Northern Harrier
Blue-winged Teal	Northern Long-eared Bat
Bobolink	Pickereel Frog
Butler's Garter Snake	Queen Snake
Eastern Massasauga Rattlesnake	Short-eared Owl
Eastern Meadowlark	Silver-haired Bat
Eastern Red Bat	Whooping Crane
Four-toed Salamander	Willow Flycatcher
Hoary Bat	

Emergent Aquatic Marsh

These open, marsh, lake, riverine and estuarine communities with permanent standing water are dominated by robust emergent macrophytes, in pure stands of single species or in various mixtures. Dominants include cattails, bulrushes, bur-reeds, giant reed, pickereel-weed, water-plantains, arrowheads, the larger species of spikerush, and wild rice.

Aquatic plants, including both emergent and submergent aquatic vegetation, form the foundation of healthy and flourishing aquatic ecosystems - both within lakes and rivers and on the shores and wetlands around them. They not only protect water quality, but they also produce life-giving oxygen. Aquatic plants are a lake's own filtering system, helping to clarify the water by absorbing nutrients like phosphorus and nitrogen that could stimulate algal blooms. Plant beds stabilize soft lake and river bottoms and reduce shoreline erosion by reducing the effect of waves and current.

Species of Greatest Conservation Need

American Bittern	Marbled Godwit
American Golden Plover	Northern Long-eared Bat
Black Tern	Pickereel Frog
Blanding's Turtle	Queen Snake
Blue-winged Teal	Redhead
Buff-breasted Sandpiper	Red-necked Grebe
Butler's Garter Snake	Rusty Blackbird
Common Tern	Short-billed Dowitcher
Dunlin	Silver-haired Bat

Eastern Massasauga Rattlesnake	Snowy Egret
Eastern Red Bat	Solitary Sandpiper
Forster's Tern	Whimbrel
Four-toed Salamander	Whooping Crane
Hoary Bat	Wilson's Phalarope
Hudsonian Godwit	Yellow-crowned Night-Heron
King Rail	

2) Partial tree canopy and brush natural communities.

Oak Opening

This is an oak-dominated savanna community in which there is less than 50% tree canopy coverage. Historically, oak openings were very abundant and occurred on wet-mesic to dry sites. Today, very few examples of this type exist. The few extant remnants are mostly on drier sites, with the mesic and wet-mesic oak openings almost totally destroyed by conversion to agricultural or residential uses, and by the encroachment of other woody plants due to fire suppression. Bur, white, and black oaks are dominant in mature stands, typically as large, open-grown trees with distinctive limb architecture. Shagbark hickory is sometimes present. American hazelnut is a common understory shrub. The herb layer is similar to those found in oak forests and prairies, with many of the same grasses and forbs present. There are some plants and animals that reach their optimal abundance in the openings (e.g., red-headed woodpecker, orchard oriole, eastern bluebird, kittentails).

Species of Greatest Conservation Need

Blanding's Turtle	Henslow's Sparrow
Blue-winged Warbler	Northern Bobwhite
Brown Thrasher	Ornate Box Turtle
Eastern Meadowlark	Prairie Vole
Eastern Red Bat	Red-headed Woodpecker
Field Sparrow	Vesper Sparrow
Franklin's Ground Squirrel	Woodland Vole

Oak Woodland

The oak woodland community occupies a position on the vegetation continuum that is intermediate between the oak savannas (especially oak openings) and the oak forests (especially southern dry forest). Dominant trees included white oak, bur oak, and black oak, sometimes mixed with red oak and shagbark hickory. The denser growth of trees did not allow for the exaggerated crown spread demonstrated by oaks in true savannas (which in a natural state would usually exhibit less than 50% canopy cover). Under a characteristic fire regime, shrub and sapling representation in oak woodlands would be minimal. The herb layer is potentially diverse, including some members of the prairie, oak savanna, and oak forest communities, but also featuring grasses, legumes, composites and other forbs that are best adapted to light conditions of high filtered shade. Representative herbs are thought to include upland boneset, violet bush-clover, Virginia bush-clover, Culver's-root, rough-leaved sunflower, Eastern shooting-star, Short's aster, pimpernel, bottlebrush grass, silky wild-rye, and bracted tick-trefoil.

Many of the same plants and animals that reach their optimal abundance in the oak openings also occur in oak woodland, including red-headed woodpecker, orchard oriole, eastern bluebird, and kittentails. Oak woodland can also support forest species, such as yellow-throated vireo, scarlet tanager, tufted titmouse, and blue-gray gnatcatcher, and in large stands, some species that are restricted to forest interior conditions, such as the cerulean warbler.

The geographic range historically occupied by oak woodland would be virtually the same as that of oak openings and prairies in southern Wisconsin. Oak woodland would have been most common on sites that experienced frequent, low-intensity ground fires. Moisture conditions would have included dry, dry-mesic, mesic, and, possibly, wet-mesic sites. Today oak woodland is most likely to occur in those parts of southern Wisconsin that continue to support relatively large areas of natural vegetation that include prairie and savanna remnants in proximity to oak-dominated forests. Portions of the Driftless Area, the kettle interlobate moraine of southeastern Wisconsin, and perhaps portions of the Central Sand Hills, offer the best potential. This type is extraordinarily rare today.

Species of Greatest Conservation Need

Blanding's Turtle	Ornate Box Turtle
Blue-winged Warbler	Red-headed Woodpecker
Cerulean Warbler	Whip-poor-will
Eastern Red Bat	Wood Thrush
Franklin's Ground Squirrel	Woodland Vole
Northern Long-eared Bat	

Bog Relict

'Bog relict' is a term that has been used to describe tamarack-dominated forests and associated patches of "northern" shrubs, mosses, and other acid peatland herbs in the southernmost regions of Wisconsin, including some that are close to the Illinois border. Many of these sites are nearing the extreme southern range limits for many of the species they support and are also quite isolated from one another. They support many nutrient-demanding species, but may include a limited subset of the more northern peatland associates (e.g., Sphagnum mosses, ericaceous shrubs, and "bog" sedges). The tamarack canopy is often quite open and discontinuous, due to windthrow, beaver activity, or for other reasons. Poison sumac is often present, and is sometimes the most abundant tall shrub. Speckled alder, nannyberry, willows, and dogwoods are often common associates.

These sites are typically small, in kettle depressions on outwash or sometimes ground moraine landforms. Many of these stands are fed by groundwater seepage. The surface may include areas of relatively firm peat, but watery muck is often present as well.

Species of Greatest Conservation Need

American Woodcock	Northern Ribbon Snake
Blue-winged Warbler	Rusty Blackbird
Eastern Red Bat	Silver-haired Bat
Four-toed Salamander	Whip-poor-will
Hoary Bat	Willow Flycatcher
Northern Long-eared Bat	

Shrub Carr

This wetland community is dominated by tall shrubs such as red-osier dogwood, silky dogwood, meadowsweet, and various willows. Canada bluejoint grass is often very common. Associates are similar to those found in alder thickets and tussock-type sedge meadows. This type occupies areas that are transitional between open wetlands such as wet prairie, calcareous fen, or southern sedge meadow, and forested wetlands such as floodplain forest or southern hardwood swamp. Shrub-carr can persist at a given site for a very long time if natural hydrologic cycles are maintained. This type often occurs in bands around lakes or ponds, on the margins of river floodplains, or, more extensively, in glacial lakebeds. It is common and widespread in southern Wisconsin but also occurs in the north. In the south, shrub-carr was often an integral part of prairie-savanna landscapes, though it also occurred in wetlands within more forested regions.

Past drainage and marsh hay mowing likely had a negative effect on shrub-carr, whereas clearing of conifer swamps likely produced more of this habitat. Once fire was controlled and hay mowing was discontinued in lowland meadows, shrub-carr likely increased in extent. Drainage of meadows and marshes has also allowed shrub-carr habitats to increase in some areas. As a result of wetland drainage and fire suppression, shrub-carr now occupies many sites that formerly supported much more extensive marsh, wet meadow, prairie, and fen vegetation, and therefore, it is sometimes targeted for elimination. However, it is an important native wetland type that has its place on our landscape and should be protected, managed, and restored at appropriate locations.

Species of Greatest Conservation Need

American Woodcock	Northern Long-eared Bat
Bell's Vireo	Northern Ribbon Snake
Black-billed Cuckoo	Pickerel Frog
Blanding's Turtle	Queen Snake
Blue-winged Warbler	Rusty Blackbird
Butler's Garter Snake	Short-eared Owl
Eastern Massasauga Rattlesnake	Silver-haired Bat
Eastern Red Bat	Veery
Four-toed Salamander	Willow Flycatcher
Golden-winged Warbler	Yellow-billed Cuckoo
Hoary Bat	Yellow-crowned Night-Heron

3) Closed canopy, forested natural communities.

Southern Dry Forest

Oaks are the dominant species in this upland forest community of dry sites. White oak and black oak are dominant, often with admixtures of northern red and bur oaks and black cherry. In the well-developed shrub layer, brambles (*Rubus spp.*), gray dogwood, and American hazelnut are common. Frequent herbaceous species are wild geranium, false Solomon's-seal, hog-peanut, and rough-leaved sunflower. This community type intergrades to oak woodland, which has similar canopy composition but a more open forest floor due to relatively frequent ground fires and possibly also due to grazing by elk, bison, or deer prior to EuroAmerican settlement.

Species of Greatest Conservation Need

Blue-winged Warbler	Whip-poor-will
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Eastern Red Bat
Northern Long-eared Bat
Ornate Box Turtle
Red-headed Woodpecker

Wood Thrush
Woodland Vole
Yellow-bellied Racer

Southern Dry-Mesic Forest

Red oak is a common dominant tree of this upland forest community type. White oak, basswood, sugar and red maples, white ash, shagbark hickory, and black cherry are also important. The herbaceous understory flora is diverse and includes many species listed under southern dry forest plus jack-in-the-pulpit, enchanter's-nightshade, large-flowered bellwort, interrupted fern, lady fern, tick-trefoils, and hog peanut.

Southern dry-mesic forests occur on loamy soils of glacial till plains and moraines, and on erosional topography with a loess cap, south of the tension zone. This community type was common historically, although white oak was considerably more dominant than red oak, and the type is still common today. However, to the detriment of the oaks, mesophytic tree species are becoming increasingly important under current management practices and fire suppression policies. Oak forests are succeeding to more mesic species (e.g., central and northern hardwood forest types), or to brush.

Species of Greatest Conservation Need

Acadian Flycatcher
Blanding's Turtle
Blue-winged Warbler
Cerulean Warbler
Eastern Red Bat
Hooded Warbler
Louisiana Waterthrush
Northern Long-eared Bat
Ornate Box Turtle

Red-headed Woodpecker
Red-shouldered Hawk
Veery
Whip-poor-will
Wood Thrush
Woodland Vole
Yellow-bellied Racer
Yellow-billed Cuckoo
Yellow-throated Warbler

Northern Hardwood Swamp

The northern hardwood swamp is a deciduous forested wetland that occurs along lakes or streams, or in insular basins in poorly drained morainal landscapes. This community occurs across the state, but is most common in the northern Ecological Landscapes. The dominant tree species is black ash, but in some stands red maple, yellow birch, and (formerly) American elm are also important. The tall shrub speckled alder may be locally common. The herbaceous flora is often diverse and may include many of the same species found in alder thickets. Typical species are marsh-marigold, swamp raspberry, skullcap, orange jewelweed, and many sedges. Soils may be mucks or mucky sands.

Species of Greatest Conservation Need

American Woodcock
Eastern Red Bat
Four-toed Salamander
Golden-winged Warbler
Hoary Bat

Least Flycatcher
Northern Long-eared Bat
Silver-haired Bat
Veery

Floodplain Forest

This lowland hardwood forest community type occurs along large rivers, usually of Stream Order 3 or higher. As the stream gradients diminish, the floodplains become broader. Periodic floods, particularly in the spring, are the key natural disturbance event to which species of this community are adapted. Silt deposition and development of microtopography during flood events creates suitable sites for tree germination and establishment, and floods also carry seeds and propagules of plant species. The most extensive occurrences of floodplain forest are found along the large rivers of southern Wisconsin, but the community also occurs at scattered locations in the north. The type was uncommon historically.

Canopy dominants vary, but may include silver maple, river birch, green and black ashes, hackberry, swamp white oak, and eastern cottonwood. Black willow, basswood, red oak, and red maple are associated tree species found in these forests. Historically, the elms were highly significant components of the floodplain forests, but Dutch elm disease has eliminated most large elm trees that formerly provided supercanopy structure, snag and den sites, and large woody debris.

Understory composition is also quite variable, and follows the pattern exhibited by the canopy species, with the most extensive stands and highest plant species diversity occurring in southwestern Wisconsin. Buttonbush is a locally dominant shrub that may form dense thickets on the margins of oxbow lakes, sloughs and ponds, which are often important aquatic habitats within these forests. Wood nettle, stinging nettle, sedges, native grasses, ostrich fern and green-headed coneflower are important understory herbs, and lianas such as Virginia creepers, grapes, Canada moonseed, and poison-ivy are often common. Among the more striking herbs of this community are cardinal flower, fringed loosestrife, and green dragon.

The sprawling floodplains found along the largest rivers sometimes consist of several terraces capable of supporting forests. These are subject to floods with differing frequencies and levels of inundation, and support patches of varying floristic composition depending upon local elevation differences, edaphic factors, and disturbance history. The lower terraces experience the most frequent, severe, and long-lasting floods; the uppermost terraces flood infrequently, and the rich alluvial soils can support mesophytic trees species and rich groundlayers similar to those of the mesic hardwood forests.

Species of Greatest Conservation Need

Acadian Flycatcher	Pickering Frog
Black-billed Cuckoo	Prothonotary Warbler
Blanding's Turtle	Red-headed Woodpecker
Blue-winged Teal	Red-shouldered Hawk
Blue-winged Warbler	Rusty Blackbird
Butler's Garter Snake	Silver-haired Bat
Cerulean Warbler	Solitary Sandpiper
Eastern Massasauga Rattlesnake	Veery
Eastern Red Bat	Wood Thrush
Four-toed Salamander	Yellow-billed Cuckoo
Hoary Bat	Yellow-crowned Night-Heron
Least Flycatcher	Yellow-throated Warbler
Northern Long-eared Bat	

Southern Tamarack Swamp

The 'southern tamarack swamp' community is similar to 'northern wet forest' but less acidic, supporting understory associates that are more nutrient-demanding and tolerant of higher pH levels. Tamarack is the dominant tree, though in some stands hardwoods such as paper birch, red maple, black ash, or American elm may be present as associates, saplings, or as subcanopy trees. The understory is more diverse and structurally complex than in the more acid spruce-dominated swamps and includes nutrient-demanding species such as speckled alder, bog holly, winterberry holly, and black ash. Poison sumac is the most abundant tall shrub in many southern Wisconsin tamarack forests. The bryophytes may include many genera other than Sphagnum.

Stands that are fed by spring seepage sometimes support plants such as marsh-marigold, cinnamon fern, royal fern, and skunk-cabbage. These seepage stands have been separated out as a distinct type or subtype in some nearby states and provinces. In Wisconsin, the tamarack seepage swamps occur statewide but may be more common south of the tension zone. Historically, tamarack swamps occurred extensively in parts of southeastern Wisconsin and on the margins of Glacial Lake Wisconsin. Many of the swamps were drained and cleared for agricultural purposes. Intact examples are now uncommon but occur in a wide variety of settings, such as on the margins of lakes or streams, at the base of moraines, in outwash areas, and in a few Driftless Area stream valleys.

Species of Greatest Conservation Need

American Woodcock

Black-billed Cuckoo

Blanding's Turtle

Blue-winged Warbler

Four-toed Salamander

Rusty Blackbird