Many valuable habitat features for migratory birds — such as forested old beach ridges, wooded wetlands and cobble beaches — may be found at Door County’s Ridges Sanctuary and throughout the Bailey’s Harbor area.
Researchers use a small, 1.5-gram device called a light level geolocator that captures and measures the intensity of visible light every minute and allows them to determine latitude and longitude coordinates. They now not only know how far a wood thrush migrates (233-271 kilometers per day in spring), but also the number and approximate duration of visits to, and relative locations of, “stopover sites,” where the bird briefly stops to refuel before continuing its migration.

Every spring and fall, tens of millions of migrating birds sweep through the Great Lakes region and stop at a variety of sites on their way to breeding grounds as far north as Greenland and the Arctic Ocean and wintering grounds as far south as Argentina’s Tierra del Fuego. These stopover sites provide birds with critical food and shelter en route. Loss of stopover habitats poses an ongoing threat to the health and stability of migratory bird populations in the Great Lakes region.

Wisconsin Stopover Initiative takes wing

For decades, reported declines in migratory bird populations have resulted in studies focused primarily on breeding and, to a lesser extent, wintering bird populations. Little serious attention had been given to identifying, prioritizing and protecting migratory bird stopover sites.

Many ornithologists believe that migration may be a part of the life cycle in which birds are most vulnerable. During migration, birds are under physiological stress and mortality may be quite high. For one group of migrants, the wood warblers, mortality rates during migration may be 15 times higher than in breeding and wintering periods, with adult rates as high as 85 percent for migrating black-throated blue warblers. Similar rates might also be true for the wood thrush and other...
forest-dependent migratory songbirds.

The Wisconsin Stopover Initiative (WISI), launched in 2005, aims to place protection of migratory stopover sites, particularly along the Great Lakes, in the forefront of conservation. Founded by the Department of Natural Resources (DNR) and The Nature Conservancy (TNC) with funding from the Natural Resources Foundation of Wisconsin and State Wildlife Grants, WISI’s goals are to protect 30,000 acres (about 25 percent of total coastal zone acreage) of critical stopover habitat in the Lake Michigan basin and 6,000 acres (about 5 percent of total coastal zone acreage) in the Lake Superior basin over the next decade.

To meet this challenge, the Department of Natural Resources depends upon a myriad of partners — including federal, state and local agencies as well as landowners, conservation organizations, private organizations and businesses — to accomplish the following four key steps:

1. Identify known priority migratory bird concentration sites;
2. Characterize important habitat features of stopover sites;
3. Map the known sites and the priority habitat features in order to pinpoint priority areas; and
4. Apply appropriate conservation measures, such as land acquisitions or habitat restoration, to protect the priority sites.

One size doesn’t fit all

Migratory birds require an array of sites between wintering and breeding areas to survive, including sites not often thought of as having conservation value. Ornithologists recognize these different types of sites and creatively categorize them as Fire Escapes, Convenience Stores and Full-service Hotels.

**Fire Escapes** are sites such as a city park or a fragmented forest on an island in Lake Michigan that may receive less use because they are resource-poor, yet they are vital during times of stress as places for migrants to seek shelter from predators or storms.

**Convenience Stores** are areas with intermediate amounts of resources, typically larger in size than a Fire Escape, such as a county park. These sites are used occasionally or regularly and allow migrants to replenish enough energy stores to continue on to their next stop.

**Full-service Hotels** are extensive, intact areas that are rich in resources and contain a diversity of habitat types that provide abundant food, water and shelter to large numbers of birds on a consistent basis. Examples of Full-service Hotels include a state or national park, national wildlife refuge or state wildlife area. All three types of stopover sites must be protected if we are to establish a network of sites that spans the Great Lakes region and beyond.

Recognizing the urgency of establishing a network of protected sites, the Department of Natural Resources invited local wildlife professionals, birders and other experts to attend workshops in 2006 to identify migratory stopover sites, which they knew well. These experts drew site boundaries on quadrangle maps and provided details about the habitats, surrounding land uses and migratory bird uses at 223 migratory bird sites. The data, combined with the literature and expert opinion, were used to construct spatial Geographic Information System (GIS) stopover habitat models that predict where migratory birds are likely to concentrate in each basin, thus helping to fill in gaps in our collective knowledge of Wisconsin’s stopover sites.

We produced GIS habitat models for three bird groups — landbirds (songbirds and other perching birds), waterfowl/waterbirds and shorebirds — in each Great Lakes basin in Wisconsin. One important finding was that the Lake Michigan basin has more sites and a larger area where action is needed to preserve stopover habitats than the Lake Superior basin.

**Partners are key to success**

As urban development expands in coastal areas, public land becomes increasingly important for providing migrating birds places to stop, rest and refuel. Although some publicly owned lands in the Great Lakes basins support high concentrations of migratory birds during spring and fall, these properties
Wisconsin Point

open-grown conifers with some grassland and upland and lowland shrubs, mature hardwoods.

and a great place for all birds, especially songbirds and shorebirds.

Bay Beach Wildlife Sanctuary has ponds, flooded fields in spring, forest and shrubby habitats including unfragmented forests, wetland areas. Songbirds, raptors and shorebirds may be observed.

Schlitz Audubon Nature Center contains a diversity of habitats including wooded bluff, wooded ravine, restored prairie, ponds, Great Lakes beach and an old field. Look for songbirds and waterbirds.

Wind Point is a small parcel of land that juts out into the lake with a wooded ravine extending back from the lake. Visit to see all types of birds, especially waterbirds and songbirds.

Lake Superior Basin

St. Louis River Estuary has many high quality habitats including extensive emergent marsh, shrub swamp, wet meadow and coniferous forests composed of boreal-associated species. Thousands of waterbirds, waterfowl and songbirds plus hundreds of roosting turkey vultures may be found here.

Wisconsin Point is a long, coastal barrier sand spit including several miles of open sand beach and dunes, small interdunal wetlands, and a white and red pine forest. Heavy concentrations of songbirds, raptors, waterfowl, waterbirds and shorebirds may be observed.

Apostle Islands National Lakeshore consists of islands in Lake Superior with diverse habitats including fragmented forests, boreal forest, wetlands, upland shrubs, wilderness, old growth and sandscapes. This is a great place to find all migratory birds, especially songbirds and raptors.

Lake Michigan Basin

Peninsula State Park contains extensive forests, including shoreline conifers, rocky outcroppings and openings located on a peninsula jutting into Green Bay. Look for raptors and songbirds; also diving ducks and waterbirds along the shore.

Bailey’s Harbor Area includes Mud Lake State Natural Area, Ridges Sanctuary and Toft Point. This area has highly diverse upland habitats, shorelines, wetlands and shallow bays of Lake Michigan with cobblestone beaches. Look for songbirds and waterfowl.

Bay Beach Wildlife Sanctuary has ponds, flooded fields in spring, forest and shrubby habitats including boreal forest, wetlands, upland shrubs, mature hardwoods, open-grown conifers with some grassland and wetland areas. Songbirds, raptors and shorebirds may be observed.

Point Beach State Forest has intact old beach ridges and swales with hardwoods, swamp areas and Lake Michigan shoreline. All types of migratory birds may be observed, especially songbirds and shorebirds.

Forest Beach Migratory Preserve has a variety of wooded habitats including oak savanna, upland and lowland shrubs, mature hardwoods, open-grown conifers with some grassland and may be seen just off the shore.

Forest Beach Migratory Preserve has a variety of wooded habitats including oak savanna, upland and lowland shrubs, mature hardwoods, open-grown conifers with some grassland and may be seen just off the shore.

For WISI to effectively protect, manage and maintain quality stopover habitats, partnerships are key, including TNC — the DNR’s first stopover partner — and our primary funding source, the Natural Resources Foundation of Wisconsin. The stopover project represents the collaborative efforts of seven TNC state chapters, Audubon chapters, the Wildlife Habitat Council, Canadian partner organizations and many other organizations. Since 2003, TNC has taken the lead in identifying, protecting and restoring stopover sites in fast-developing areas of the Great Lakes region, beginning with sites on Lake Erie. The Nature Conservancy’s Dr. David Ewert helped frame the stopover issue for the Department of Natural Resources and encouraged us to develop the models that we now use to assist land trusts, agency personnel and others.

Since 2006, WISI has formed partnerships with local land trusts, watershed groups, citizens and property managers to implement a strategic stopover plan. We are beginning to see the protection of migratory bird stopover sites become a conservation priority on the Great Lakes and are well on our way to achieving our protection goals by working with many agencies and organizations. Protection includes land acquisitions/easements; stewardship activities such as habitat restoration on public and private lands; recommendations on wind energy and communication tower sitings; application of bird diversion techniques on tall structures; and community planning and zoning.

Land trusts recognize the importance of conserving critical stopover habitats along the Great Lakes shores because of increasing recreational and development pressures affecting landscapes that interest them. For example, in 2007 the Ozaukee Washington Land Trust (OWLT) expressed an
interest in restoring a golf course to provide stopover habitat for shorebirds (see sidebar).

Now called the Forest Beach Migratory Preserve, this innovative stopover site provides valuable habitat on an important migratory bird corridor known as the Lake Michigan Flyway, a link between Canada and the Northwest Territories and Central and South America for many shorebirds, flycatchers, vireos, swallows, thrushes, warblers, sparrows and other birds. Rapidly declining species, many with globally important breeding populations in Wisconsin, such as the golden-winged warbler, will likely benefit from this restoration.

There also is a growing interest among governmental and non-governmental organizations in establishing stopover sites. The Forest Beach Migratory Preserve has generated interest among counties along Lake Michigan, not only because of the intrinsic conservation values but because there are potential economic rewards from birders willing to seek out and explore a Great Lakes bird preserve.

The Stopover Initiative in action
Mark Martin of the DNR’s State Natural Areas program has embraced the Stopover Initiative and is involved with two major efforts to protect and restore stopover habitat along Lake Michigan. Using our stopover habitat models and known priority site data, Martin is currently working with the Door County Land Trust, The Ridges Sanctuary, and TNC to protect more than 1,500 acres of stopover habitat along Door County’s coast through land acquisition using U.S. Fish and Wildlife Coastal Wetland and Knowles-Nelson Stewardship funds.

“The importance of these properties,” Martin commented, “is they include critical habitats, such as mixed hardwood forests, lowland forest, and coastal wetlands, for tens of thousands of migratory birds every spring and fall.” Martin also asserts that land protection efforts will provide habitat for nesting birds including 17 species of wood warblers as well as for rare species such as the dwarf lake iris and Hine’s emerald dragonfly. “These sites will protect natural communities, will help maintain water quality, and will provide land for education and research, and for the public to enjoy,” Martin said.

Martin is also involved with a DNR restoration project that is working with many partners to remove nonnative phragmites (giant reed grass) along 118 miles of Lake Michigan shoreline and 3,600 acres of coastal wetlands in six counties. Nonnative phragmites replaces native vegetation and provides little or no food or shelter for most wetland-dependent wildlife, including migratory birds.

In Manitowoc County, at Martin’s request, WISI drafted management recommendations for master planning of the Two Creeks Buried Forest State Natural Area. The master plan of this Lake Michigan property will provide a 22-acre stopover site in an otherwise open agricultural landscape that has little woody cover available for wood thrushes and other species.

In Door County, TNC is completing the protection of 88 acres at their Mink River preserve through the use of Great Lakes Restoration Initiative and Knowles-Nelson Stewardship funds. These acres were targeted because they hold high value habitat for migratory land and wetland associated birds. As with the lands being protected with the U.S. Fish and Wildlife Coastal Wetland funds, these lands will also protect habitat for a variety of other species.

Wisconsin DNR’s Environmental Review Program (ER) champions stopover habitat protection and worked with WISI to develop guidelines for locating communication towers and wind turbines in order to reduce bird collisions.

Most fatalities of migrants at communication towers occur because migrato-
ry birds become disoriented by certain lighting conditions on tall (taller than 200 meters) towers while migrating at night. Once confused by the light, they fly into guy wires that support the tower rather than colliding with the tower.

Recent studies reveal that mortality can be significantly reduced if towers are less than 200 meters in height, do not have guy wires, and are unlit, or, if taller than 200 meters, are marked with strobe rather than solid lighting. Environmental Review Program guidance incorporates results from these studies as well as federal guidelines to promote responsible placement of communication towers and wind turbines in Wisconsin.

Private lands are a very important part of a network of stopover sites, especially along Lake Michigan, where much of the coast is owned and managed by private individuals and businesses. Many of these properties contain stopover attributes (e.g. forest cover, emergent marsh, lowland shrubs, etc.) determined to be of high or very high priority for migratory birds during either spring, fall, or both. For those properties adjacent to or near managed properties where birds already concentrate, improved backyard habitat will increase the amount of shoreline habitat available. When backyard management occurs in isolated situations, even a small amount of habitat may serve as a Fire Escape, providing vital respite for migratory birds that need to rest before making the next leg of their journey.

Through a variety of promotional events, WISI is encouraging and equipping private landowners with tools and knowledge to enhance their properties for the benefit of migratory birds. For example, WISI, the Western Great Lakes Bird and Bat Observatory (WGLBBO), and many other partners host an annual spring celebration of International Migratory Bird Day at the Forest Beach Migratory Preserve. WISI and the WGLBBO will be hosting a workshop for private landowners on October 8 called, “Grosbeaks Galore: Birds on Your Landscape.” Learn landscaping techniques to attract migratory birds to appropriate habitat, food and water on your property. To register for the workshop contact the author at kim.grveles@wisconsin.gov.

Looking toward the future, it is only by working collaboratively and energetically, with the vision of an interconnected network of Great Lakes stopover sites uppermost in our minds, that we will save for posterity the landscapes needed by long-distance migratory birds such as the wood thrush and scores of other bird species. Together, we can secure the resting places they need on their often perilous migrations, and ensure our own enjoyment in their return.

Kim Grveles and Sumner Matteson are DNR avian ecologists.

**FOREST BEACH MIGRATORY PRESERVE**

Expansive, high quality, pristine habitats are the typical targets sought by conservation organizations for protection. Thinking outside the box, Angie Curtis and Shawn Graf of the Ozaukee Washington Land Trust (OWLT) presented the idea of protecting a most unusual site — a golf course — to add to their collection of preserves.

Formerly known as Squires Country Club in northeastern Ozaukee County, the site consisted of mowed fairways and a few water holes sandwiched between two hardwood forested corridors near Lake Michigan’s shore. OWLT recognized the potential to restore the water holes for migratory shorebird habitat and were considering converting the upland fairways to prairie grasslands. At the very least, acquisition of this site would improve water quality by eliminating the application of more than six tons of fertilizers and chemicals annually and the need to pump 12 million gallons of water from local wells for irrigation every year to maintain the golf course.

After evaluating the site with the Wisconsin Stopover Initiative habitat models, Kim Grveles, Sumner Matteson, and DNR wildlife manager Dale Katsma visited the golf course in October 2007 to assess its potential as a migratory bird preserve. We encouraged OWLT to focus on restoring the fairways for migratory songbirds and affirmed their decision to convert ponds to shorebird stopover habitat. After purchasing the site in 2008, OWLT renamed it Forest Beach Migratory Preserve, the first preserve of its kind consisting of 116 acres of newly planted hardwoods, shrublands, savanna, grasslands and constructed wetland ponds and ephemeral pools.

“This was a real opportunity,” said Graf, “because this is one of the last remaining 100 plus acre sites not developed on Lake Michigan. It is really a pleasure and rewarding that we’re making (the preserve) happen.”

To read more about Forest Beach Migratory Preserve, visit the OWLT website at owlt.org/visit-our-preserves/forest-beach-migratory-preserve

For more information on the Wisconsin Stopover Initiative, email Kim Grveles at kimgreveles@wisconsin.gov or Sumner Matteson at sumner.matteson@wisconsin.gov. To join us in protecting stopover habitat for migratory birds, please consider making a donation to the Natural Resources Foundation of Wisconsin, P.O. Box 2317, Madison, WI 53701, or visit the web at wisconsinfoundation.org.