



**ILLINOIS NATURAL
HISTORY SURVEY**
PRAIRIE RESEARCH INSTITUTE

**Conservation guidance for Yellow-headed Blackbird (*Xanthocephalus
xanthocephalus*)**

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Illinois Natural History Survey has undertaken a project producing documents that provide conservation guidance for listed species in Illinois for the Illinois Department of Natural Resources. The project is titled: Conservation Guidance for Species in Greatest Need of Conservation (SGNC) T-96-R-001. The primary purpose of guidance documents is to provide various project developers/land managers with information on the species, how their actions may impact the species, and how they can minimize/mitigate/monitor those impacts. In addition, the documents may be useful for identifying research needs to direct various funds, as a first step towards recovery planning, or for informing the general public. We intend the documents to be comprehensive and inclusive of scientific and experiential knowledge of the species and its conservation. The documents incorporate information on current conservation efforts, conservation opportunities and research needs.

Interviews with stakeholders were held to identify information that should be included in conservation guidance documents. We prioritized document production for species that were frequently the subject of Incidental Take Authorizations or were consulted on in the IDNR's EcoCat program. Initial literature reviews was conducted to produce first draft documents. Then a list of potential document reviewers, including academic taxa experts, conservation organizations, private consultants, and government agency staff, was compiled for each species. The documents underwent two rounds of review and revision. What follows is the final document providing conservation guidance for Yellow-headed Blackbird, which was reviewed by at least 8 individuals.



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Conservation Guidance for

Yellow-headed Blackbird

Xanthocephalus xanthocephalus (Bonaparte)

IL status:

Endangered

US status:

Not listed

Global rank:

Secure¹, Least concern²

Trend:

Declining³

Family:

Icteridae

Habitat:

Marshes, sloughs, and marshy borders of other deep waterbodies


Similar species:

Other blackbirds

Seasonal cycle:

Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

 In Illinois

 Time for surveys

Species information

Characteristics

Male yellow-headed blackbirds (YHB) have a **bright yellow head and breast** with a **black body**⁴. Their eyes and sharply pointed bill are black. There is a white patch on their wings that may be seen while perched or flying. The female's color is more subdued with a **duller-yellow throat, breast, and face**. The rest of female's body is **grayish-brown** with **white streaks** extending down her breast⁴. Juveniles (less than 1 year old) are similar in appearance to females, but have white at the bend of their wings. YHB are large songbirds, at around 8-10 inches in length⁴.

YHB are highly social and are often found in large flocks of blackbirds. They are easily distinguished from other blackbirds by their yellow head and throat. The male's call consists of a few musical notes followed by a screeching buzz, that sounds like a very **rusty metal hinge** opening, and the female makes a chattering noise⁴: https://www.allaboutbirds.org/guide/Yellow-headed_Blackbird/sounds.

Habitat

During the breeding season, YHB inhabit deep-water marshes, sloughs, and marshy borders of lakes, ponds, or streams⁵. YHB will inhabit small permanent wetlands (less than 2 acres), as well as much larger wetland complexes⁶⁻⁸.

Hemi-marshes, or marshes with roughly equal proportions of interspersed vegetation and open water, are ideal for YHB⁹⁻¹¹. These conditions produce the highest abundance of prey¹². However, YHB have also been observed nesting in areas as far as 0.2 miles from open water¹³. Ideal nest sites



Top: male Yellow-headed Blackbird.
Bottom: female Yellow-headed Blackbird.
Photos by Ryan Moehring/USFWS and Brian Washburn. Creative Commons Attribution 2.0 Generic License



Hemi-marsh habitat with interspersed dense emergent vegetation and deep water. Copyright 2012 Illinois State Museum

have water 2–5 ft. deep to exclude predators and abundant emergent vegetation (~5 stems/ft²), such as cattail (*Typha spp.*), bulrush (*Schoenoplectus spp.*), or reed (*Phragmites spp.*) that is robust enough to support the weight of nests^{4,5,7,9,12}.

YHB are more likely to use a wetland that is part of a larger wetland complex^{7,8,11}. Models predict that a 7% increase in wetland area across a 400 mi² area increases YHB abundance by 83%⁸. During the breeding season, YHB will use wetlands as well as surrounding prairies, grasslands, croplands, or savanna for feeding⁴. Development in the surrounding landscape does not appear to negatively impact abundance, but grassland and forest edge is correlated with lower YHB abundance^{8,11}. YHB seldom nest near heavily wooded shores. During migration and over the winter months, YHB are found in open fields, pastures, cultivated land, and wetlands⁵.

Taxonomy

Despite similarities with other blackbirds, genetic analysis shows that YHB is most closely related to bobolink (*Dolichonyx oryzivorus*) and the meadowlarks (*Sturnella*)¹⁴. There are no recognized sub-species of YHB¹⁵.

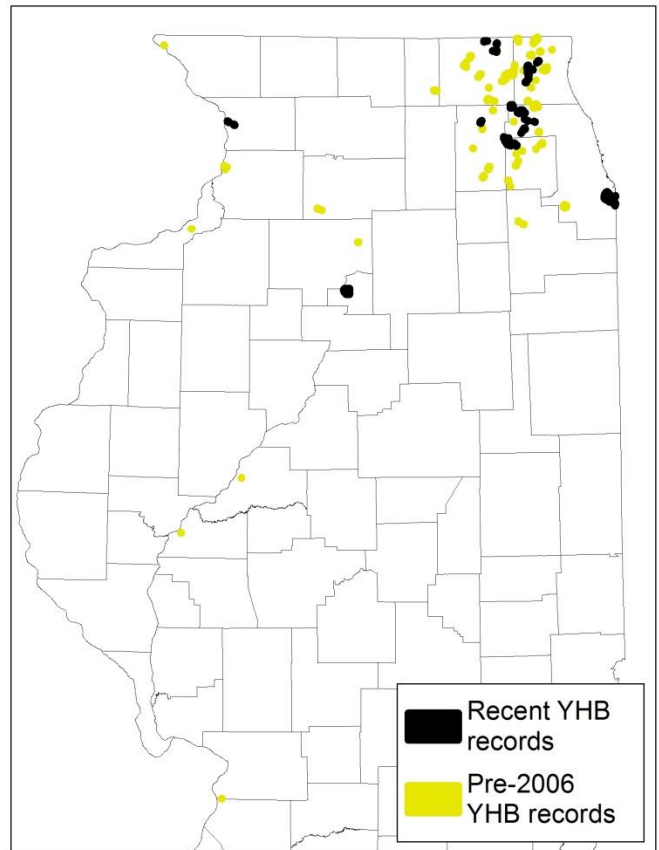
Distribution,

The breeding range of YHB centers on the prairie pothole region of the northern Great Plains, but extends across western and central U.S. and Canada in prairie wetlands and mountain meadows⁴. A contiguous population of YHB reaches as far east as Iowa and Minnesota, and isolated populations extend into Illinois, Ohio, and Ontario^{4,16}. YHB overwinter in Arizona, New Mexico, Texas and Mexico⁴.

YHB are rare migrants throughout Illinois, and rare and localized summer residents primarily in the northeastern part of the state, but there are also breeding records in the northwest and west-central parts of the Illinois¹⁷. The number of counties in Illinois with breeding YHB has declined by 75% since the late 1800s¹⁶.

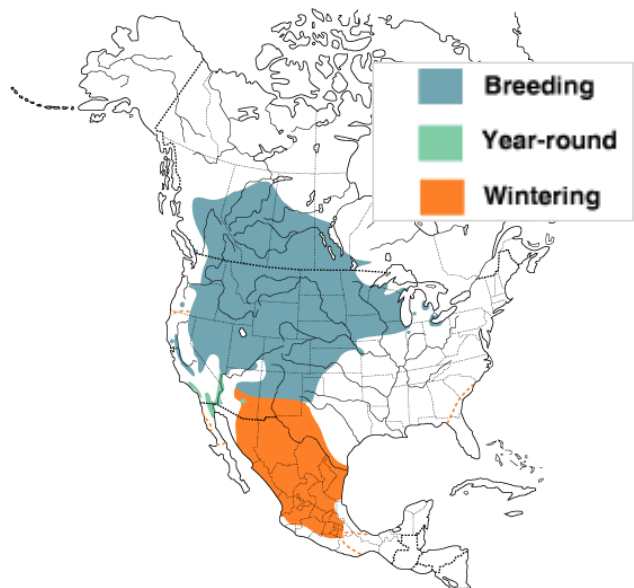
Status

The global population of YHB is relatively stable with an estimated 15 million birds^{18,19}. The Illinois



Yellow-head blackbirds records from the Illinois Natural Heritage Database⁷⁸

population of YHB has been estimated from 70 to 1200 birds^{20–22}. The global population of YHB declined by 9% from 1970 to 2014¹⁹ and the Illinois population shows similar rates of decline¹¹. YHB was listed as Endangered in Illinois in 1977 because of its restricted habitat and low population size in Illinois²³. There are 47 records of breeding YHB locations in Illinois, 11 of which have been observed active in the last ten years¹³.



Global distribution of YHB⁴

Natural History

YHB are highly social birds, exchanging information to enhance foraging, deter predators, and locate quality nesting sites^{4,10,24}. They form dense nesting colonies in the breeding season and flock in same sex groups of thousands of birds in the non-breeding season⁴. During the breeding season, average population densities of 0.1 and 0.2 males per acre, and 0.2 and 0.5 females per acre have been observed in Illinois²⁵.

YHB are opportunistic omnivores, eating whichever resource is most abundant at the time and place⁴. When available, emerging aquatic insects, especially dragonflies and damselflies (Odonata), are targeted; the emergence period coincides with the breeding season and provides an important food resource for young²⁶. YHB breeding-season diet in Iowa was found to also include high proportions of flies (Diptera) and moths and butterflies (Lepidoptera)²⁶. YHB readily utilize upland resources, such as cultivated grains, wild seeds, and insects, especially during the non-breeding season⁴.

YHB start arriving in Illinois at the beginning of April^{13,27}. Male YHB arrive first to establish and defend territories, and females arrive a few weeks after the males^{4,28}. About half of YHB will use a new breeding site each year¹⁰. Male territories are 0.01–1.5 acres in size depending on habitat quality^{4,9}. First year males rarely hold territories, rather they spend their first year on the edge of a colony⁴. YHB are polygynous, meaning a single male will mate with multiple females. Typically 1–5 females (but up to 10) will establish a sub-territory within a single male territory^{9,12}. YHB use social cues to select territories rather than habitat



Flock of Yellow-headed Blackbirds. Photo by Gary L. Clark. Creative Commons Attribution-Share Alike 4.0 International

conditions^{10,29}. Females nest in areas where they observed successful nests the previous year, which tend to have high interspersion and more open water^{9,10}. Although females have individual territories where they nest and forage, they are not competitive and move around freely³⁰. Males and females commonly mate with individuals from outside their territory²⁸.

Female YHB build nests soon after arriving on the breeding grounds⁴. The nests are made of firmly woven vegetation and placed at the edge of vegetation, over open water⁴. Nests are 1-2 feet above the water level^{31,32}. YHB lay clutches of 2-5 grayish white eggs^{9,17}. When more food is available, clutch size tends to be larger and nesting starts earlier³³.

Eggs are incubated by the female for 12-13 days⁹. Deep water (>2 ft) around nest sites excludes most nest predators^{33,34}. In addition, adult YHB will hover over potential predators giving scream calls and mobbing intruders⁴. Despite YHB defenses, nest predation can be a major cause of nest failure; however, in Illinois predation rates were found to be very low^{16,33}. If their first nest fails, females may nest again but they will not hatch two nests in a single year⁹.

YHB hatchlings are altricial, or relatively helpless, requiring parental feeding, temperature control, and defense⁴. After eggs hatch, females spend time brooding young, foraging, and observing other nests¹⁰. Male YHB also feed young, but at a much lower rate than females^{4,28}.

Young YHB move into the emergent vegetation surrounding the nest at around 9–12 days of age^{4,9}. They will continue to be fed by the adults for a few days⁴. After breeding, adults and juveniles congregate in large flocks in dense stands of emergent vegetation⁴. At two weeks of age young can make short flights, and by three weeks they are able to fly long distances⁴.

YHB leave Illinois from mid-July to September, soon after the young are independent^{5,10,13}. Large flocks of YHB migrate to the southwest during the daytime, traveling 30 to 70 miles per day³⁵. Non-breeding YHB frequently forage in agricultural

fields. After overwintering, most YHB from Illinois migrate to other areas for breeding, likely due to the absence of a suitable breeding habitat across much of the Midwest¹⁶.

Population Dynamics

Survival and reproductive rates for YHB in Illinois are high^{4,16}. Average annual survival rates of 66% and 61% have been observed in Illinois for adult males and females, respectively¹⁶. The oldest YHB observed in the wild was a nine year old male⁴. Female YHB breed in their first year⁴. YHB clutches have four eggs on average and nest failure rates from 32% to 52% have been recorded^{9,25,33}. Observed nest failure in Illinois was mostly due to severe thunderstorms, while nest failure in other regions was largely due to predation^{10,33}. In Illinois, 1.6 young were produced per nesting attempt and 2.4 young were produced per successful nest¹⁰. Despite high reproductive success, the population in Illinois is declining due to low recruitment (the addition of young birds to the reproductive population) because only 7% of YHB hatched in Illinois return to join the breeding population¹⁶.

Community Associations

YHB are a characteristic species of freshwater marsh communities³⁶. YHB are commonly found with red-winged blackbirds (*Agelaius phoeniceus*), which YHB displace to more shallow territories^{4,36}. Muskrats (*Ondatra zibethicus*) play an important role in maintaining suitable hemi-marsh conditions by creating open-water areas within emergent vegetation³⁶. Dominant plants in freshwater marshes include reed, cattail, bulrush, lake sedge (*Carex lacustris*), swamp loosestrife (*Decodon verticillatus*), and water smartweed (*Polygonum* spp.)³⁶.

Species in Greatest Conservation Need (SGCN) that can be found in similar habitat as YHB include: black tern (*Chlidonias niger*), Forster's tern (*Sterna forsteri*), common gallinule (*Gallinula chloropus*), pied-billed grebe (*Podilymbus podiceps*), least bittern (*Ixobrychus exilis*), and marsh wren (*Cistothorus palustris*). Other SGCN that are found in marshes include: American bittern (*Botaurus lentiginosus*), black rail (*Laterallus jamaicensis*), buff-breasted sandpiper (*Tryngites subruficollis*), Wilson's phalarope (*Phalaropus tricolor*), Wilson's snipe (*Gallinago delicatata*), yellow rail

(*Coturnicops noveboracensis*), king rail (*Rallus elegans*), sandhill crane (*Grus Canadensis*), and whooping crane (*Grus Americana*), Blanding's turtle (*Emydoidea blandingii*), and spotted turtle (*Clemmys guttata*)³. Potential predators of blackbird nests include raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), mink (*Mustela vison*), garter snakes (*Thamnophis* sp.), American crows (*Corvus brachyrhynchos*), and common grackles (*Quiscalus quiscula*)³⁷. Marsh wrens can also be major nest predators of YHB by pecking holes in eggs and killing small nestlings³².

Conservation and Management

Threats

Loss of wetland habitat across the Midwest and the associated lack of connectivity of remaining habitat is likely the greatest threat to YHB. Other threats include habitat degradation, pollution, climate change, and predators.

Habitat loss

The initial cause of YHB decline in Illinois was most likely widespread habitat loss. Between 1780 and 1980, it is estimated that nearly 7 million acres of wetlands in Illinois (85% of wetland area) were lost, largely due to drainage for agricultural production³⁸. However, habitat loss has slowed and there may have been a small increase in wetland area in Illinois since the mid-1980s³⁹. Presently, there are approximately 37,000 acres of deep-water emergent wetlands in Illinois³⁹.

Habitat fragmentation and connectivity

Currently, habitat connectivity is likely the greatest threat to the Illinois population of YHB¹⁶. There is suitable habitat available, but it is unoccupied due to isolation¹⁶. Although the Illinois YHB population has high reproductive rates, the birds that are hatched in Illinois emigrate to other locations and new birds do not frequently immigrate into Illinois¹⁶. In the spring when YHB migrate northeast back to their breeding grounds, they encounter Iowa and western Illinois, an area which has lost extensive marsh habitat. Biologists have suggested that this makes it less likely that migrants will continue across the region to locate the breeding habitat that is available in northeast Illinois²⁵.

Habitat degradation

Even when wetland area is retained, habitat degradation can be a threat to marsh birds^{11,40}. Wetland characteristics are dynamic and readily change due to altered water fluctuations, increased run-off rates, invasive plant species, siltation, nutrient loading, and contaminant runoff from the surrounding landscape. One study found that even when wetland area was not reduced, urban development of the surrounding area resulted in altered wetland structure consisting of either open water or dense monocultures of vegetation, in place of the hemi-marsh condition that is ideal for YHB¹¹.

Invasive species have been rated a ‘severe’ threat to YHB habitat in the Illinois Wildlife Action Plan³. Invasive species, such as reed canary grass (*Phalaris arundinacea*), narrowleaf cattail (*Typha angustifolia*), hybrid cattail (*Typha x glauca*), common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*) and others, can form dense, single-species stands, reducing habitat suitability by eliminating open-water areas⁴¹.

Pollution

Pesticides may be a threat to YHB. Since the early 2000s, the use of systemic insecticides, such as neonicotinoids, has become widespread across the agricultural and residential landscape^{42,43}. A large portion of corn and soybean seeds planted in the USA are now coated with insecticides, and consumption of treated seeds may cause direct bird mortality^{42,44}. Indirect impacts may be a greater concern, as neonicotinoids are persistent in the environment and efficiently target and devastate prey insect populations at very low doses^{42,44,45}. Models indicate that recent grassland bird declines are more closely correlated to agricultural insecticide use than agricultural area^{46,47}. In addition, insecticides are often applied to wetlands, especially in urban areas, due to concern about public health and mosquito-transmitted diseases. These insecticides greatly reduce the number of insect prey available to YHB, but one study found no impacts to reproduction, growth of young, or foraging of Red-winged Blackbirds, which may have been due to the abundance of untreated habitat in the surrounding area^{48,49}.

Although not specific to YHB, there is concern about the impacts of noise and light pollution on birds^{50,51}. YHB are very social birds with complex vocal communications that may be disrupted by noise pollution, such as from roadways^{52,53}.

Climate change

Climate change may be a threat to YHB. Indeed, YHB has been designated as Climate Endangered by National Audubon Society. Climate change may shift the YHB range and result in loss of both breeding and wintering habitat⁵⁴. Climate change projections predict that only 30–45% of both the current breeding range and current wintering range will remain suitable by 2080⁵⁴. In addition, YHB reproductive success is impacted by precipitation, water levels, and severe weather, which may be altered by climate change^{8,10,33}.

Predators

Predators pose a threat to YHB. Domestic and feral cats are responsible for high numbers of bird mortality⁵⁵. YHB are also the prey of medium-sized predators, such as raccoons, which are overly abundant in proximity to developed areas, due to the availability of food and shelter, and lack natural predators^{56–59}.

Other threats

Human activity and structures may also pose a threat to YHB. YHB is fairly tolerant of human presence, but human activity, such as trails within 15m of YHB occupied hemi-marsh, can disrupt normal activity⁶⁰. All birds have some risk of collision with human structures, such as buildings, towers, or turbines; however, YHB is deemed to be at lower risk than many other species⁶¹.

Regulations

In Illinois, it is illegal to “take” any threatened or endangered species, such as YHB. The Illinois Endangered Species Protection Act defines “take” as “to harm, hunt, shoot, pursue, lure, wound, kill, destroy, harass, gig, spear, ensnare, trap, capture, collect, or attempt to engage in such conduct”:
<http://ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1730&ChapterID=43>

The IDNR reviews proposed actions to assess potential impacts to listed species, using their online tool EcoCAT: <http://dnr.illinois.gov/ecopublic/>

IDNR can authorize the taking of listed species that is incidental to otherwise lawful activities. IDNR has authorized the “taking” of YHB for the construction and maintenance of a pipeline through a wetland. To receive Incidental Take Authorization, one must prepare a conservation plan and notify the public of the impact. See <http://www.dnr.illinois.gov/conservation/NaturalHeritage/Pages/ApplyingforanIncidentalTakeAuthorization.aspx>

Research, handling, and possession of listed species may require IDNR permits, including a Scientific Collector Permit and an Endangered and Threatened Species Possession Permit, and additional site permits if research takes place on IDNR land or a dedicated Nature Preserve/Land and Water Reserve: <http://www.dnr.illinois.gov/conservation/NaturalHeritage/Pages/ResearchPermits.aspx>. Risks and impacts of research methods on the species survival must be weighed against the benefits to justify the activity.

The Interagency Wetlands Policy Act requires any action conducted or funded by the State of Illinois to avoid impacts to wetlands providing habitat for listed species, or mitigation 5.5 times larger than the impact must be provided. In addition, impacts to federally jurisdictional wetlands, including management and restoration, are regulated under the Clean Water Act.

Species conservation goal

The 2005 Illinois Wildlife Action Plan set a goal of 500 YHB with an increasing population by 2025²², and the 2015 plan revision set a goal to achieve a net increase of 20% of marsh acres through restoration, enhancement, and management³.

Conservation efforts

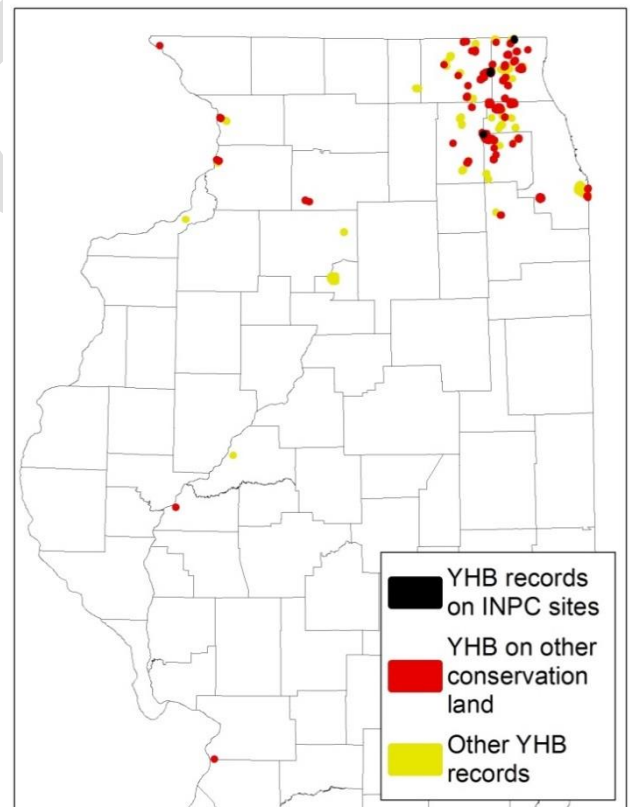
YHB was a focal species of the Wetlands Campaign in the original Illinois Wildlife Action Plan and is a focal species of the Green Cities Campaign in the revised plan^{3,22}. YHB habitat management and restoration has been prioritized for the Chicago Metropolitan Focus Area³

In 2007, the Upper Mississippi River and Great Lakes Region Joint Venture set a habitat restoration

goal of an additional 2,265 acres of shallow, semi-permanent marsh in Illinois and 190 acres of deep-water marsh, and as of 2013 had achieved 92% of this goal⁶². In 2016, there were nearly 26,000 acres of wetland restoration in the USDA’s Conservation Reserve Program in Illinois⁶³. In addition, nearly 23,000 acres in Illinois were enrolled in the Conservation Reserve Enhancement Program for wetland restoration. IDNR’s “Statewide Public Lands Native Wetland Wildlife Habitat Restoration Project” has carried out hydrology restoration, prescribed fire, woody plant control, invasive species control, erosion and sedimentation control, and planting of native plants on 17,000 acres of wetlands across the state.

The Illinois Nature Preserve Commission (INPC) has designated 3 of 47 known YHB breeding locations as Nature Preserves or Land and Water Reserves. Seventy two percent of YHB occurrences are on some form of conservation land as identified by Ducks Unlimited^{13,64}. Five areas in Illinois have been designated Important Bird Areas by Audubon Society for providing essential YHB habitat.

Survey Guidelines



YHB records from the Illinois Natural Heritage Database found on INPC sites (dedicated Nature Preserves and Land and Water Reserves), other “conservation” lands as identified by Ducks Unlimited, and non-conservation lands^{78,64}.

Monitoring trends

The Breeding Bird Survey (BBS) was established to detect large-scale trends in abundance of birds, such as YHB¹⁸. The BBS uses annual roadside surveys across the US, Canada, and Mexico to track the bird populations. However, the survey does not adequately sample wetlands to detect regional trends of YHB, such as in Illinois¹⁸. Large-scale surveys of YHB should incorporate additional wetlands not covered by the existing BBS routes to improve estimates^{65,66}.

Determining presence

The presence and abundance of YHB in wetlands of interest may be determined by conducting point count surveys. Because YHB are so conspicuous, detection probability is nearly 100%, requiring a single visit between May 15th and June 30th. Multiple survey points should be used to ensure that all habitat area is surveyed. Surveys should be conducted between sunrise and four hours after sunrise, during calm conditions (wind velocity <20 km/h) without precipitation⁶⁷. Survey reports should include species detected, estimated abundance, habitat characteristics, and detailed survey maps.

When surveying for the presence of YHB it may also be appropriate to survey for other endangered or threatened marsh birds that may be in the area, such as black rail, least bittern, American bittern, common gallinule, king rail, black tern, and Forster's tern. If so, broadcast calls should be used following the Standardized North American Marsh Bird Monitoring Protocol to increase detection^{65,68}.

Monitoring impacts

Surveys to monitor long-term impacts of conservation or development action should assess changes in abundance, nest success, and survival rates. Repeated observational surveys should track the birds' progress to ascertain nesting attempts, nest success, fledging, and survival rates. Habitat and environmental variables should be evaluated and installation of a water level gauge may be necessary for monitoring changes in hydrology. Ideally, a before-after-control-impact design would be used to assess such changes and responses⁶⁹. This design involves comparing conditions of an impacted area and un-impacted area, before and after the impact to control for natural variability.

Stewardship recommendations

Areas known or suspected of supporting YHB should be protected and managed to maintain suitable habitat. Management should target the hemi-marsh condition with water depths of 2–5 ft., but larger wetland complexes have the potential to provide the full range of habitat stages, from open water to dense vegetation. Management should include restoring and maintaining natural hydrologic fluctuations⁷⁰. Marsh ecology is dynamic and management will depend on understanding the current state of the marsh⁷¹. In wetland basins with water control structures, “hemi-marsh” conditions should be targeted by drawing down water levels to reestablish emergent wetland vegetation when it becomes sparse or by increasing water levels to disperse solid stands of emergent vegetation once established^{3,72}. Muskrats may also establish openings and maintain hemi-marsh conditions.

The growth of interspersed tall, robust emergent vegetation, such as bulrush and cattail, should be encouraged. Fluctuating water levels prevent single-species stands of vegetation and maintain plant diversity⁷³. Management methods, such as mowing, disking, burning, manual cutting, and herbicides, may also be necessary to prevent monotypic stands of invasive species and woody encroachment^{70,73}. These management activities should not take place while YHB are nesting (April through July). Mowing ditches and upland areas adjacent to marshes should also be avoided during this period. If necessary, mechanical and chemical removal of vegetation should follow INPC stewardship guidelines(<http://www.dnr.illinois.gov/INPC/Pages/INPCManagementGuidelines.aspx>).

Water quality should be monitored to ensure that pollution, such as from road, lawn, or agriculture run-off, does not reduce aquatic insect abundance.

As much of the landscape within 11 miles of YHB habitat should be maintained as wetland as is possible⁸. Alternatively, upland areas that provide seed and insect prey may also support YHB with supplemental resources. Adjacent land owners and local residents should be informed of the presence of YHB and of practices that they can perform to

minimize their impact on YHB habitat, such as natural landscaping, reducing the use of insecticides, reducing impermeable surfaces, eliminating mesopredator resources, preventing cats from roaming freely, and installation of bird-safe glass^{74,75}. Agricultural best management practices, such as constructed wetlands, cover crops, buffer strips, conservation tillage, and integrated pest management, should also be encouraged in the surrounding watersheds⁷⁶.

Avoidance, Minimization, Mitigation

Avoidance measures

Individual YHB may travel long distances from occupied wetlands to forage, however they are relatively insensitive to disturbance. Development that occurs at least 150m from an occupied wetland will avoid nearly all risk of impact, as long as hydrology of the wetland is not altered⁶⁰.

Minimization measures

Timing

If disrupting habitat cannot be avoided, timing of activities may minimize impacts. Destructive activities within breeding ponds should occur between September 1st and March 31st, outside the breeding season.

Compatible design

Development designs should be compatible with continued YHB occupation and survival by incorporating wetlands with natural water fluctuations, and interspersed emergent vegetation and water. Occupied wetlands should not be dredged, deepened, filled, unseasonably flooded, or drained. Hydrologic and soil surveys may be necessary to understand potential impacts on the existing hydrologic conditions⁷². If hydrological alterations will occur, a water control structure may be used to manage water levels to mimic naturally fluctuating wetland hydrology and target hemi-marsh conditions. Maintenance and management of the water control structure must be ongoing.

Runoff into wetlands should be reduced by minimizing impermeable surfaces and creating rain gardens or retention basins. All disturbed areas should be revegetated with native vegetation.

Wetlands and adjacent areas should not be mowed during the breeding season. Chemical use should be minimized, and all chemicals used should be aquatic and wildlife safe. Mosquito control efforts should avoid YHB habitat. Artificial lighting should be used sparingly, at low intensity, and directed towards the ground⁵⁰. Installation of bird-safe glass or other measures that prevent birds from colliding with structures should be used⁷⁵.

Construction practices

Construction and maintenance practices should be sensitive to impacts to YHB and their habitat. Clearing of native vegetation should be limited. Staging areas should be located far from wetlands. Erosion and sediment controls should be strictly implemented, monitored, and maintained for the duration of the project. Debris and excess materials should be removed and properly disposed. All project personnel should be informed of the sensitive nature of the project. Areas that are not to be disturbed (within 150m of habitat) should be flagged or fenced to alert construction personnel.

Past minimization efforts from projects with potential YHB impacts have included reducing the area impacted, preventing wetland drainage, maintaining the soil profile, controlling erosion and sedimentation, and educating site personnel of the sensitive nature of the project.

Mitigation and Conservation Opportunities

Mitigation opportunities include protection, stewardship, or restoration of YHB breeding areas and migratory corridor, as well as coordination of conservation actions.

Protection

Unprotected YHB breeding locations should be a priority for habitat protection. Thirteen out of forty-seven known breeding locations are not under conservation ownership⁶⁴. In addition, 44 out of 47 are not protected in the Illinois Nature Preserve Commission system, which provides the highest level of protection¹³.

Land protection may consist of acquisition or conservation easement. Acquired land may be donated to a conservation agency or local conservation organization. Conservation easements

may provide a level of protection without acquisition. Illinois Nature Preserves Commission permanently protects high quality areas and habitat for listed species on both private and public lands in the Illinois Nature Preserve System. Conservation easements on agricultural land can also protect habitat through retirement of farmed and previously converted wetlands. Land trusts or conservation organizations that may be interested in partnering on conservation efforts can be located through the Prairie State Conservation Coalition: <http://www.prairiestateconservation.org>

Habitat stewardship

Beyond protection of YHB habitat, there is considerable stewardship work that may be required to maintain habitat. Vegetation management may be required to prevent monocultures of invasive species or encroachment by woody species. YHB habitat stewardship opportunities exist on public property, various forest preserve/conservation districts, and private properties. One project using cutting, herbicide treatment, and follow-up treatment to control woody vegetation on 35 acres of marsh habitat was estimated to cost \$123,000⁷⁷.

Restoration

YHB habitat restoration opportunities exist in large areas across Illinois. Wetland restoration efforts should target areas in Illinois and surrounding states that will increase connectivity and re-establish a migratory corridor. Specifically, establishing habitat across northwestern Illinois and Iowa will be important for improving connectivity with the rest of the YHB range¹⁶. In addition, the Illinois Wildlife Action Plan has prioritized restoration of basin marshes in the Northeastern Morainal natural division and stream-side marshes in floodplain areas³.

Constructed wetlands should aim to mimic suitable habitat conditions (see Habitat section). The most important step in restoration is restoring natural hydrology. This may be as simple as breaking existing drainage tiles in agricultural areas to allow altered wetlands to hold water, but it may require intensive management in other areas. If habitat destruction will be followed by restoration, sediment and vegetation can be saved from the original wetland to produce comparable conditions.

The “Illinois Wetland Restoration and Creation Guide” may provide guidance for restoring YHB habitat⁷².

The Natural Resource Conservation Service (NRCS) provides practice standards and estimated costs on various wetland restoration practices that may be of benefit to YHB. Restoration of wetlands by removing or disabling drainage tiles (NRCS practice 657 and 649) costs around \$600/ac. Creating wetlands (NRCS practice 643 and 658) costs \$1800-4500/ac. Mitigation sites should be monitored for effectiveness (see Survey Guidelines section).

Coordination

In addition, coordination and promotion of beneficial actions may provide conservation benefit to YHB. Coordination of multiple agencies and interests will be necessary to augment the migratory corridor of YHB. It may be possible to partner with active waterfowl hunting organizations to provide wetland habitat conservation that can benefit both YHB and waterfowl hunters. Coordination and promotion of watershed stewardship activities is also important for maintaining habitat suitability.

Research needs

What is the current distribution and abundance of marsh habitat suitable for YHB in Illinois?

- Assess the hydroperiod, water depth, vegetation cover, and vegetation complexity of wetlands identified on the National Wetlands Inventory across Illinois. Develop models to estimate annual changes in YHB habitat.

What are the migratory habits of YHB that breed in Illinois?

- Determine habitat use, range, and behavior during winter and migration to better understand limitations to migration and recruitment in Illinois. Identify corridors for targeted habitat restoration that would most benefit YHB recruitment in Illinois.

What is the status of the YHB population across Illinois?

- Monitor occupancy, survival, reproduction, and recruitment rates across Illinois.

What are the effect of insecticides, especially neonicotinoids, on YHB and their prey?

- Determine the presence and pathways of various insecticides in migratory and breeding YHB habitat. Assess the effects of various insecticides on YHB and their prey.

Additional information

Species profiles:

- <http://www.inhs.illinois.edu/collections/birds/ilbirds/78/>
- https://www.allaboutbirds.org/guide/Yellow-headed_Blackbird/id
- http://explorer.natureserve.org/servlet/NatureServe?s_earchName=Xanthocephalus%20xanthocephalus

Conservation planning

- <https://www.dnr.illinois.gov/conservation/IWAP/Pages/default.aspx>
- <http://www.uppermissgreatlakesjv.org/index.htm>

Habitat restoration

- <https://www.dnr.illinois.gov/conservation/CSP/Documents/WetlandHabitatManagement%20-%20CSP%20-%202016.pdf>
- [Illinois Wetland Restoration And Creation Guide⁷²](#)
- National Wetland Inventory
<http://www.fws.gov/wetlands/Data/Mapper.html>

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