



Credit: Rebecca Field

Louisiana Waterthrush Minnesota Conservation Summary

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The *Blueprint for Minnesota Bird Conservation* is a project of Audubon Minnesota written by Lee A. Pfannmuller (leepfann@msn.com) and funded by the Environment and Natural Resources Trust Fund. For further information please contact Mark Martell at mmartell@audubon.org (651-739-9332).

Louisiana Waterthrush

Priority for Minnesota's Bird Conservation Plan:

- Prairie Hardwood Transition: High Level Priority

Other Status Classifications:

- Officially classified as a Special Concern Species in Minnesota
- Minnesota Species in Greatest Conservation Need
- On Audubon Minnesota's Action List
- A Focal Species for the Upper Mississippi River/Great Lakes Joint Venture Region
- Identified by Partners in Flight (PIF) as a Stewardship Species (PT=4; possible or moderate population decline); Stewardship Responsibility: Eastern Forest Region; Conservation Action: Long-term Planning and Responsibility
- PIF BCR22: Regional Concern Species: Action is Management

Population Information:

- U.S. and Canada population estimate: 260,000 (U.S. PIF Plan)
- Continental Population Objective: Maintain
- Minnesota Population Estimate: Unknown

Minnesota BBS Data:

- Not adequately monitored by the Federal Breeding Bird Survey in Minnesota
- Minnesota does not include one of the species centers of highest abundance
- 1.41% of the species' North American breeding range occurs in Minnesota.

Minnesota Residency:

- Breeds locally in southeastern, east-central and south-central Minnesota
- Louisiana Waterthrushes are very uncommon in Minnesota, primarily occurring in two regions. In southeastern Minnesota, the species is most frequently found along swiftly flowing streams in forested, steep-sided valleys. In east-central Minnesota, they are largely associated with the St. Croix River and its tributaries. In general, the St. Croix is a larger river, flowing through more level terrain than streams in southeastern Minnesota. (MNDNR Species Profile).
- Historically, Louisiana Waterthrushes occurred in the Twin Cities metropolitan area, along tributaries of the Minnesota River, but they disappeared from this region in the 1950s (Janssen 1987).
- The species was first reported in Minnesota in Fillmore County in the 1880s; it subsequently extended its range north and northwest along the Mississippi and its tributaries, so that by 1930 it occurred as far north as Anoka and southern Pine counties, and as far west as eastern Carver County. It was most numerous along the Mississippi River from Goodhue County south, and along the St. Croix north to Pine County, where "hundreds" were reported as early as 1908. It now occupies much of the range described above, as well as the Minnesota River Valley in the east-central region, but is believed to have declined in numbers. (Eliason and Fall 1989)

Habitat Requirements: River/Stream

Most frequently breeds along medium to high-gradient, first to third-order, clear, perennial streams flowing through closed-canopy, hilly, deciduous or mixed-evergreen forest. (Birds of North America)

From MNDNR Species Profile:

- In southeastern Minnesota, the species is most frequently found along swiftly flowing streams in forested, steep-sided valleys. In east-central Minnesota, they are largely associated with the St. Croix

River and its tributaries. In general, the St. Croix is a larger river, flowing through more level terrain than streams in southeastern Minnesota.

- The Louisiana Waterthrush is almost exclusively found in mature riparian forests. Typical habitat consists of steep-sided valleys with swiftly flowing streams that have rocky stream beds and riffles. In southeastern Minnesota, Louisiana Waterthrushes are most frequently found in this typical habitat. In this region, important microhabitat features such as small hollows or cavities within eroded stream banks, or exposed root masses immediately adjacent to streams, may be used as potential nest sites. Other crucial habitat components include adequate foraging sites of exposed/emergent rocks at the edge of water or within a stream; submerged leaf litter; and areas of water less than 3-5 cm (1.2-2.0 in.) deep.
- Many of the Louisiana Waterthrushes along the St. Croix River occur along small streams flowing through steep-sided ravines, as well as in seepage areas at the bases of steep slopes.
- However, a significant number of Louisiana Waterthrushes occur in level, silver maple floodplain forest, particularly along the Kettle River, in Pine County. These floodplain areas are characterized by small channels with slow-moving water.
- In Minnesota, Louisiana Waterthrushes return to breeding areas in mid-April and nesting is well underway by early May. This is one of the earliest nesting warblers in the state, consequently it has probably been overlooked in many areas because singing activity has largely ceased by late May and early June, when most surveys are conducted.
- Stream valleys with insufficient canopy cover (less than 80-90%) and a resultant dense herbaceous layer dominated by graminoids or weedy forbs, are unsuitable for this species.

From the UMVGL JV LBCP Species Profile:

- Breeds most commonly along gravel-bottomed streams flowing through deciduous forest and less commonly in floodplain forests.
- Considered area-sensitive with minimum forest blocks of >100 ha.
- Territories are linear along streams with reported distances ranging from 188-1,200 meters long.

From Wisconsin Bird Conservation Initiative (WBCI) Species Profile:

- The Louisiana Waterthrush inhabits mature deciduous, mixed floodplain, and swamp forests near swiftly flowing water (Hanowski et al. 2003). The presence of breeding Louisiana Waterthrush is an indicator of a habitat condition consisting of relatively pristine headwater streams in extensive unfragmented forests. It prefers steep ravines along small brooks where the water's current rapidly flows over rocks.
- Disturbed second growth habitat and riparian corridors <10 m wide usually are unsuitable for this species.
- Nests are located in small cavities along a stream bank, such as under an upturned tree or fallen log. The lack of foliage needed to construct and hide the nest allows the waterthrush to arrive and breed earlier than any other woodland warbler.

Migration: Neotropical

Area Sensitivity: Considered to demonstrate medium sensitivity to forest size and fragmentation

Climate Change Vulnerability: Medium (3)

Threats/Issues:

From MNDNR Species Profile:

- Because the Louisiana Waterthrush requires mature forest in riparian areas, it is sensitive to disturbance of forest cover and streambeds and associated microhabitat features, as well as water quality.

- Brood parasitism by brown-headed cowbirds is also negatively impacting Louisiana waterthrush productivity.
- Louisiana waterthrushes require mature deciduous forest adjacent to streams. In southeastern Minnesota most stream valleys have been disturbed by grazing, logging and/or cultivation.
- When habitat management for trout is proposed in occupied or high quality Louisiana waterthrush habitat, care should be taken to maintain microhabitat elements important to this rare species.

From New York Department of Conservation Species Profile:

- Forest destruction and fragmentation due to suburban and commercial development
- Actions that result in muddying of water, including use of ATVs
- Destruction of understory from over-browsing by white-tailed deer
- Nest predation by snakes, shrews, red squirrels, Blue Jays, raccoons, and opossums.

OVERALL MINNESOTA GOAL: Protect current habitat area and quality; continue to protect areas surrounding streams and maintain water quality.

BEST MANAGEMENT PRACTICES

From UMVGL JV LBCP Species Profile:

- Stream buffers should be at least 100 m wide either side of the stream and mature forest that shades streams is preferred.
- Additional buffer widths may be needed to protect surface and ground water flow into streams.

From MNDNR Species Profile:

- Maintain mature stream-side forests, providing or maintaining nesting habitat in steep, eroding stream banks, and increasing riffle areas and shallow stream edges.
- Louisiana Waterthrushes also require relatively large tracts of forest. Although the minimum width of forest corridors necessary for waterthrushes is unknown, a suggested buffer of 100 m (328 feet) should be protected around the species' core riparian habitat.
- If habitat improvement projects for trout in poor waterthrush habitat include considerations for waterthrush nesting and feeding areas, they can actually benefit waterthrush populations.

From New York Department of Conservation Species Profile:

- Preserve forest tracts over 250 acres in size and minimize edges.
- Manage forests to create or maintain a dense understory of shrubs and saplings
- Maintain understory by limiting over-browsing by white-tailed deer through herd culling or other methods.

From WBCI Species Profile:

- Management for the Louisiana Waterthrush should focus on maintaining riparian systems, including natural vegetation and opportunities for nest sites (fallen streamside logs and stumps) within its breeding range.
- Because management recommendations for this species are sometimes at odds with trout, efforts are needed to balance the needs of both. Where Louisiana Waterthrushes occur, managers should consider retaining water in feeder streams at least until mid-June.
- Finally, methods for reducing forest fragmentation, which opens up riparian habitats to invasion by Brown-headed Cowbirds, are necessary.

From Stucker (2000)

Conservation of Louisiana Waterthrushes in southeastern Minnesota is most broadly an issue of habitat management and conservation. Following are listed those recommendations that appear to be most important for successful reproduction by Louisiana Waterthrushes:

- Louisiana Waterthrushes require riparian forests for habitat and food. Mature and maturing riparian streamside forests are limited. Consequently, protection of contiguous riparian forests adjoining ephemeral – 3rd order streams is a priority for Louisiana Waterthrush conservation. Human resource use that disturbs the integrity or processes of either the forest or stream threatens the continued presence and productivity of Louisiana Waterthrushes.
- Stream quality is important as foraging habitat for Louisiana Waterthrushes. Good water quality and relatively high amounts of riffle and accompanying exposed rock and stream edge provide not only food, but foraging habitat for Louisiana Waterthrushes.
- Brown-headed Cowbird parasitism of Louisiana Waterthrush nests has a dramatic impact on their annual reproduction. By protecting contiguous forest habitat and limiting the creation of openings, particularly near streams, Brown-headed Cowbirds will not be "encouraged" to penetrate larger tracts of forest.
- Nest locations for Louisiana Waterthrushes in southeastern Minnesota are typically positioned within meters of the stream on a bank that is steep (69° slope), and relatively free of vegetation. These locations are inherently at risk. If nest site quality is a primary factor for the Louisiana Waterthrush in determining habitat use, as for the American Dipper (Price and Bock 1983), then protection of these microhabitat components is critical. Unstable stream banks should be evaluated as part of a dynamic, fluvial landscape. In this context, occasional slumped banks and erosion are part of the fluvial process and the sediment load should be managed at the watershed rather than reach or valley segment scale.

Conservation of Louisiana Waterthrushes and avian communities associated with riparian forests in southeastern Minnesota is most broadly an issue of habitat management and conservation. Following are listed those recommendations that appear to be most important for consideration in conserving the avian communities of forested trout streams.

- Trout habitat improvement appears to come into conflict with forest interior bird management when these projects are either requested or established in intact tracts of mature forests that coincide with cold-water streams. Mature and maturing riparian streamside forests are limited. Consequently, protection of contiguous riparian forests adjoining ephemeral - 3rd order streams is a priority for forest bird and Louisiana Waterthrush conservation in southeastern Minnesota: Human resource use that disturbs the integrity or processes of either the forest or stream threaten the continued presence and productivity of Louisiana Waterthrushes and other forest birds.
- Riparian forests surrounding trout habitat improvement projects have more openings than the surrounding forest. These openings introduce disturbed habitat and grassland bird species into forests. Additionally, openings encourage Brown-headed Cowbird parasitism of Louisiana Waterthrush nests in addition to the other forest nesting. By protecting contiguous forest habitat and limiting the creation of openings, particularly near streams, Brown-headed Cowbirds will not be "encouraged" to penetrate larger tracts of forest.
- Although some avian species responses are most attributable to vegetation structure, Louisiana Waterthrushes require several stream related physical microhabitat features necessary for completion of their life history (see Chapter 1). Habitat improvement may locally eliminate the availability of several of these features required for nesting.

Conservation of forested trout streams in southeastern Minnesota is most broadly an issue of management cooperation. Following are recommendations that appear most important for the integrity of riparian zones along forested trout streams.

- Wildlife habitat includes the stream. Influence on the stream extends from outside of the riparian zone. Protection of riparian zones and critical upland habitat will begin to restore the integrity of these riparian ecosystems, leading ultimately to stream health. Synthesizing all facets of a natural resource agency toward holistic ecosystem management of riparian zones requires integrating larger spatial and longer time scale planning.

- Southeastern Minnesota has 960 km of designated trout streams. Habitat requirements of Louisiana Waterthrushes coincide with fewer than 5-6% (56 km) of those streams, most of these miles in forested headwaters, or where small tributaries feed larger streams. Serious consideration should be given to experimentally restoring and maintaining these streams as brook trout habitat by managing the watershed and riparian zone in cooperation with other natural resource managers. Low order forested streams were once good habitat for both brook trout and Louisiana Waterthrushes in southeastern Minnesota. There is no reason why brook trout and Louisiana Waterthrushes could not coexist along these streams again.
- Habitat improvement and any other riparian management projects should be initiated in situations deemed appropriate after consultation with other natural resource managers. Proposals should include an evaluation of suspected secondary impacts of proposed projects: plant elimination, vegetation structure, avian communities, aquatic macro invertebrates, non-game fish, effects of increased visitation and angler use (trampling in particular) for these same components, and what efforts need to be made to reduce or mitigate impacts and protect the integrity of the system. Particular focus should continue on those species included in the State list of Endangered, Threatened, and Special Concern Species and their habitat requirements. These efforts could be made in the context of "experimental" or adaptive management leading to a greater understanding of the impacts of projects on the ecosystem.

From A Land Manager’s Guide to Improving Habitat for Scarlet Tanagers and other Forest-interior Birds; as the publication notes, the Louisiana Waterthrush is expected to also benefit from these recommendations. The following minimum area recommendations are specific to the Midwest region:

Minimum area required to provide high, moderate or low habitat suitability for Scarlet Tanagers based on analysis of 298 study sites in the Midwest region.

Percentage of Forest in 2,500 acre block	Minimum area (acres) Required for:		
	High Suitability	Moderate Suitability	Low Suitability
70	66	11	1
60	141	23	3
50	292	47	6
40	605	97	12
30	NA	208	27
20	NA	481	62
10	NA	NA	173

High Suitability: Habitats of this size have the same probability of supporting breeding tanagers as an unfragmented forest.

Moderate Suitability: Habitats of this size are 25% less likely to support breeding tanagers relative to unfragmented forest

Low Suitability: Habitats of this size are 50% less likely to support breeding tanagers relative to unfragmented forest.

MONITORING RECOMENDATIONS

The Breeding Bird Survey is not adequate for monitoring population trends of the Louisiana Waterthrush in Minnesota as streamside corridors where the species is found are not covered well by the BBS routes. Focused surveys, such as spot-mapping and point count surveys, are needed for more precise population estimates. (WBCI) Minnesota Audubon should consider monitoring Louisiana Waterthrushes on Important Bird Areas that support these species.

The BBS is considered inadequate due to avoidance of streams by roadside routes and peak singing activity earlier in the breeding season. Suggested stream side surveys during the early part of the breeding season when males are more vocal.

CONSERVATION ACTIONS

- Identify and target high priority landscapes and habitats for conservation action

Action: Identify Important Bird Areas that are a priority for this species in Minnesota

- **Upper Mississippi Valley/Great Lakes Joint Venture**

Note: Because the Louisiana Waterthrush is on the northwestern edge of its range in Minnesota, the UMVGL JV Landbird Conservation Plan does not provide a specific habitat protection or restoration goal for Minnesota.

Action: Consider the Cerulean Warbler Conservation Model to protect large tracts of mesic deciduous woods that contain riparian corridors that meet Louisiana Waterthrush habitat requirements.

Background: The Cerulean Warbler is a high priority forest-nesting species with exceptional habitat requirements. It represents an umbrella forest-nesting species in PIF16 because it requires large forest tracts of mature or old-growth forest (Hamel 1992, Hamel 2000b, a, Rosenberg et al. 2000), a resource relatively rare within PIF16. In some physiographic areas a minimum tract size of 1600-1700 ha (4,000-4,200 acres) is needed for occupancy (Hamel 2000b, Rosenberg et al. 2000). Cerulean Warblers may be present in tracts <100 ha (250 acres) (Rosenberg et al. 2000), but many studies indicate that mature, unfragmented forests ranging from hundreds to thousands of hectares are needed to support stable populations.

The species is found breeding in bottomland and riverine forests and also in dry ridge-top forests (Rosenberg et al. 2000). Large, mature trees, a multilayered canopy, and canopy gaps from small-scale disturbances also seem to be important habitat features. Therefore, existing large forested tracts within PIF16 should be identified and their habitat value for Cerulean Warblers assessed.

Cerulean Warbler populations continue to decline precipitously, even though little is known about the specific habitat requirements that support populations. We propose a Cerulean Warbler Conservation Area (CWCA) model, similar to the GBCA for grassland birds, based on existing syntheses of the literature (Hamel 2000b, a). The following guidelines will focus conservation efforts in PIF16 until new research refines our understanding of habitat requirements for Cerulean Warblers and other high priority forest-nesting birds. Over browsing by deer can have similar negative impacts on forest-dwelling birds that require dense understory vegetation (Alverson et al. 1988, Alverson et al. 1994).

Cerulean Warbler Conservation Area (CWCA) Model

We estimate that sustainable breeding populations of Cerulean Warblers in PIF16 require >700 ha (1730 acres) core blocks of mature, mesic hardwood forest, with low edge-to-area ratio (Robbins et al. 1989, Hamel 2000b) within an approximately 4,000 ha (10,000 acre) matrix. The surrounding matrix should be >50% forested, with >25% mature forests and <15% hostile habitat (cowbird feeding sites such as short-grass, intensive animal grazing or feed lots) (Thompson 1994). Within the core block, at least 25% of the canopy trees should be mature trees >20 m in height and 25-55 cm diameter at breast height (dbh) with canopy cover from 65-85% (Hamel 1992, Robbins et al. 1992, Oliarnyk and Robertson 1996, Robbins et

al. 1998). Management should emphasize long rotations, and strategies that produce a varied 3-dimensional stand with extensive development of vertical diversity and canopy gaps (Hamel 2000b). In addition, observers note that Cerulean Warblers have better nesting success with an open forest understory (Oliarnyk and Robertson 1996). Uneven aged management and old-growth or wilderness management are most likely to achieve these goals. An alternative, higher quality prescription, from the perspective of the Cerulean Warbler, may be achievable in some heavily forested subsections of PIF16. This alternative model calls for a landscape matrix of 8,000 ha (20,000 acres) where >70% of the land is forested and managed according the principles outlined above (Hamel 2000b). Woodlots within CWCAs should not be grazed by domestic livestock, and deer populations should be kept at a minimum.

Restoration of CWCAs will also benefit a number of other area-sensitive forest and riparian associated bird species. Therefore, additional considerations for these species are appropriate. For example, sufficient numbers of large canopy trees should remain to create large snags for woodpecker populations. Maintain >20 cavity trees X rotation age per 40 ha (100 acres) within stands, with a mean minimum size of 30 cm dbh to provide adequate habitat for cavity-nesters (Green 1995). The rotation age factor is necessary because woodpeckers excavate new sites each year. Disturbance to forests should focus on units in the 10-15 ha (25-40 acre) range, to accommodate the spatial preference of the Golden-winged Warbler (Confer 1992).

Restored streams and rivers should retain a high quality vegetated riparian zone five times the width of the normal stream channel to restore meanders, oxbows, and the full range of native riparian vegetation, including tree species richness (Large and Petts 1994, Knutson et al. 1996). This width would also meet the habitat needs of a diverse suite of riparian forest-nesting birds.

RESEARCH NEEDS

From MNDNR Species Profile:

- Breeding bird surveys by the Minnesota County Biological Survey and research in southeastern Minnesota have greatly increased our knowledge of the distribution, habitat use, ecology and management of Louisiana waterthrushes in Minnesota. Stucker (2000) identified microhabitat features important to this species, and investigated the effects of trout habitat improvement on waterthrushes in southeastern Minnesota.

From WBCI Species Profile:

- The reproductive success of individuals subjected to differing intensities of cowbird parasitism needs study.
- Also, more study is needed on the ecology of this species in the wintering range.

From UMVGL JV LBCP Species Profile:

- Habitat, behavioral, and population ecology studies are needed for the wintering range.
- Survival, dispersal, and other demographic information are desirable as well as identification of source populations.
- More information is also needed on the minimum riparian buffer widths needed for nesting.

From PIF Plan for Physiographic Region 16 (BCR23); general research recommendations for forest species:

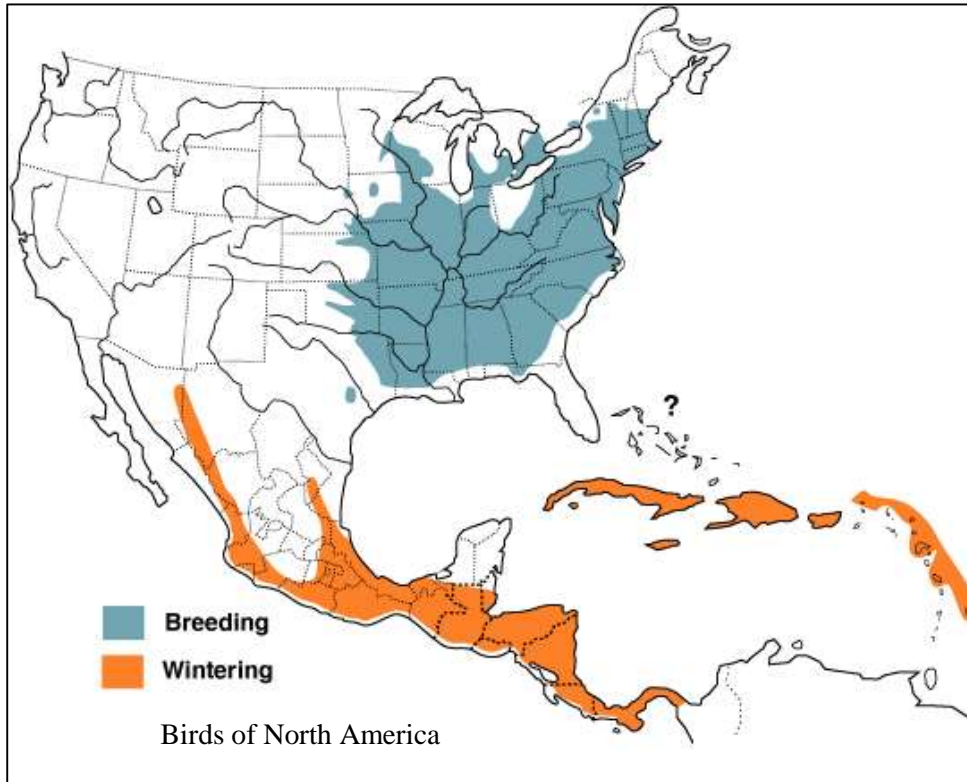
- Little is known about the breeding biology and species-specific responses to management of forest-nesting species within PIF16.
- Habitat factors limiting reproductive success, such as thresholds of forest size, landscape context, and forest plant community characteristics should be identified to avoid population declines in the future. Changes in timber management, economics, and the demographics of private landowners may also influence habitat quality in the future. Identifying and monitoring the large-scale factors that limit

regional populations of forest-nesting birds is necessary, even for species with currently stable populations.

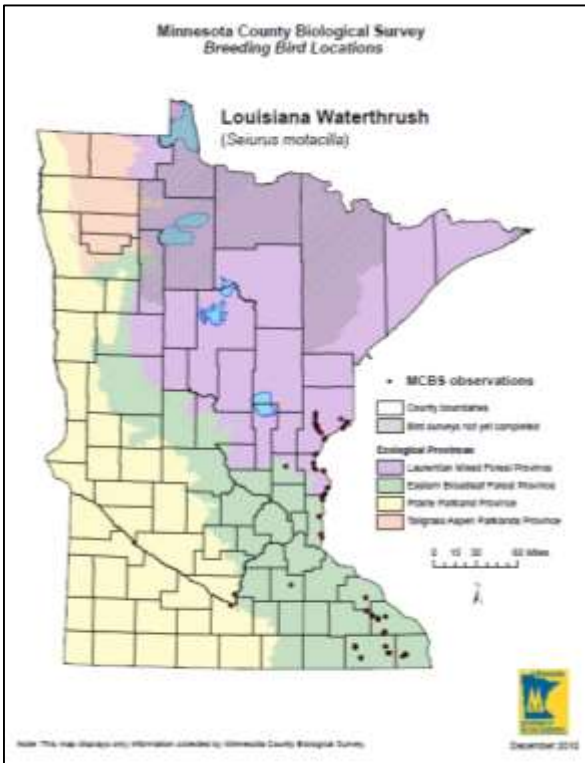
- Model forest habitat quality using GIS to enhance science-based management of bird habitats in PIF16. Identify large tracts of forest habitats in PIF16 as a basis for conservation planning, including all forest tracts >4000 ha (10,000 acres), all ecoregional subsections with >50% forest cover, and high quality riparian corridors.
- Research factors contributing to forest and riparian bird population stability, including associations between landscape factors and indices of reproductive success and the effectiveness of the CWCA model in sustaining populations of high priority species.
- Identify cost-effective methods for identifying bird population sources in forested habitats.

Effectiveness Measure: The population is at its goal level and it should continue to be monitored to track trends.

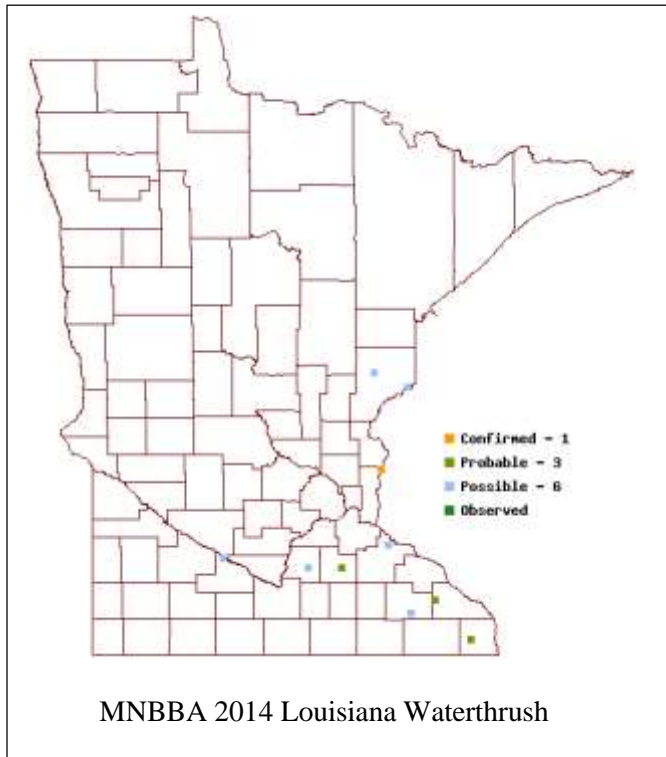
Louisiana Waterthrush Distribution Maps



Birds of North America <http://bna.birds.cornell.edu/bna/>



MN DNR http://www.dnr.state.mn.us/eco/mcbs/bird_map_list.html



MN Breeding Bird Atlas <http://www.mnbba.org/>