

The Upland Sandpiper, *Bartramia longicauda*, Breeding Area in South Bend, Indiana

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Introduction

The Upland Sandpiper (*Bartramia longicauda*) is a migratory bird which originally bred throughout the grasslands of the United States and Canada. It winters in the southern South American countries of Surinam, Argentina, Uruguay and Brazil (8). Since the turn of the century, declines in their number have been attributed to two factors: hunting pressure in the early 1900's (3) and destruction of native grasslands particularly in the eastern United States (11). Osborne and Peterson (14) reported significant declines in distribution and numbers in Ohio. Upland Sandpipers were common in Indiana 100 years ago (6), but are rare today (13). Tate (17) attributes declines in their eastern range to the maturation and replacement of old field habitats. Continuation of breeding populations in the eastern United States depends on the preservation of adequate breeding habitat.

In Wisconsin (18) and North Dakota (9,11) pastures, hay fields and small grain crop fields are the preferred habitats. The short grass fields of airports are now important habitat for the Upland Sandpiper in eastern states like Indiana where row crops are common (13,14) and tall grass prairies are practically gone. Osborne and Peterson (14) estimate that almost 75 percent of the Upland Sandpipers in Ohio use airports as breeding areas; they describe airports as "critical refuges for this endangered species." Beck (2) reported that from 1921 to 1954 Upland Sandpiper sightings increased at the Lancaster Municipal Airport (in southeastern Pennsylvania). From 1900 to 1921 numbers in the county had fallen from 500 to only 21, but in 1954 the airport held 140 of the 156 birds in the county. In Wisconsin 2 percent of nests are found on airfields (18). Brock (4) reported sighting 7 Upland Sandpipers in the grassy areas adjacent to the Gary Airport in northwestern Indiana on July 26, 1980. The region around South Bend has lost considerable grassland habitat, making the airport a prime site for breeding. Since native and non-native grassland habitats are disappearing in many mid-western states, properly managed airports may provide local areas for stable breeding populations of Upland Sandpipers.

The Upland Sandpiper is on the Indiana state endangered species list and since 1975 has been on the Blue List of *American Birds*, National Audubon Society's list of birds of concern due to declining populations (17). In Indiana, two agencies of the Department of Natural Resources, the Nongame Wildlife and the Heritage Programs, have identified only five nesting populations in Indiana. The largest and best documented area is located in northern Indiana on the property of the Michiana Regional Airport (MRA) and adjacent industrial park (Personal communication with Brian Abrell, Indiana Divi-

sion of Natural Resources, 1986). Parts of this breeding area are included in planned expansion of the industrial complex and airport in 1987.

In order to maintain this breeding area, the Michiana Regional Airport Authority (MRAA) has agreed to preserve part of their property through the Indiana Natural Areas Registry Program. Now called Bendix Meadow, this area of approximately 35 hectares was once a county landfill and is not part of any future airport expansion. The South Bend Audubon Society (SBAS) has entered into an agreement with the MRAA to manage Bendix Meadow as an Upland Sandpiper breeding area. From April to July of 1986 the SBAS examined the Upland Sandpiper's use of Bendix Meadow, the MRA and the industrial park in order to design a management plan for maintenance of the breeding area.

Methods

Records from the SBAS were examined for Upland Sandpiper sightings prior to 1980. Observations made during 1983, 1984 and 1985 were used to estimate timing, numbers and habitat use prior to 1986. USDA aerial photographs from 1951 and 1980 were used to estimate land use changes in the MRA and the surrounding area and the size of each site in the breeding area. Vegetative cover in the tall grass sites was identified in 1986 according to species, and percentage cover was estimated for each species.

In 1986, preliminary attempts were made to alter Bendix Meadow to increase Upland Sandpiper use. These birds habitually perch on posts and often use telephone poles and light poles within the study area. Therefore, in March, 20 posts were set at six evenly-spaced sites in two parallel lines, approximately 600 meters long and 100 meters apart. At most sites a single 10 cm by 10 cm wooden post stands 1.2 m above the ground. However, at three sites three or four posts were set at five meter intervals.

Observations began in April 1986 to record the first arrivals. Beginning on May 29, a census route covering the entire breeding area was traversed by car five evenings a week. One night a week the perimeter of the Bendix Meadow site was walked by a single observer. Sightings were recorded on a map together with time and behavior. Behavior was generally divided into foraging, perching, flying and special behavior patterns. Excited flying and whistling around an observer was used as an indicator of a nesting site (5). Observations continued until July 16, when no birds could be found. In addition, sightings of other tall grass prairie birds were recorded.

Results

The current breeding area (see Figure 1) covers 319 hectares: 200 ha in the airport (areas 2 and 3), 84 ha in the industrial park (area 1) and 35 ha in Bendix Meadow. The airport area comprises 152 ha of short, frequently cut grass surrounding the airfield (area 3); a prime breeding area of 48 ha of tall grass fields (not cut during the summer) is within 50 yards of the airfield (area 2). Area 2 will be destroyed by airport expansion in 1987. The industrial park area is about evenly divided between short grass lawns and a tall grass area that borders the railroad. Approximately 20 ha of the industrial park were planted in oats. The tall grass sites were composed mostly of meadow fescue, alfalfa, orchard grass and smooth brome (Table 1).

Table 2 gives the visual land use changes from 1951 to 1980 in the 981 ha area that includes the MRA and adjacent areas. The most obvious changes were the urbanization southeast of the airport, the development of the industrial park northeast of the airport, the decrease in cropland and the increase in open water areas. The growth in commercial/industrial land and expansion of the airport increased the mowed grass areas. Although the percentage of residential area remained the same, housing density increased due to the loss of farmsteads and the increase in urban development. Most of the abandoned farmland is now dominated by grass and other old field herbaceous species.

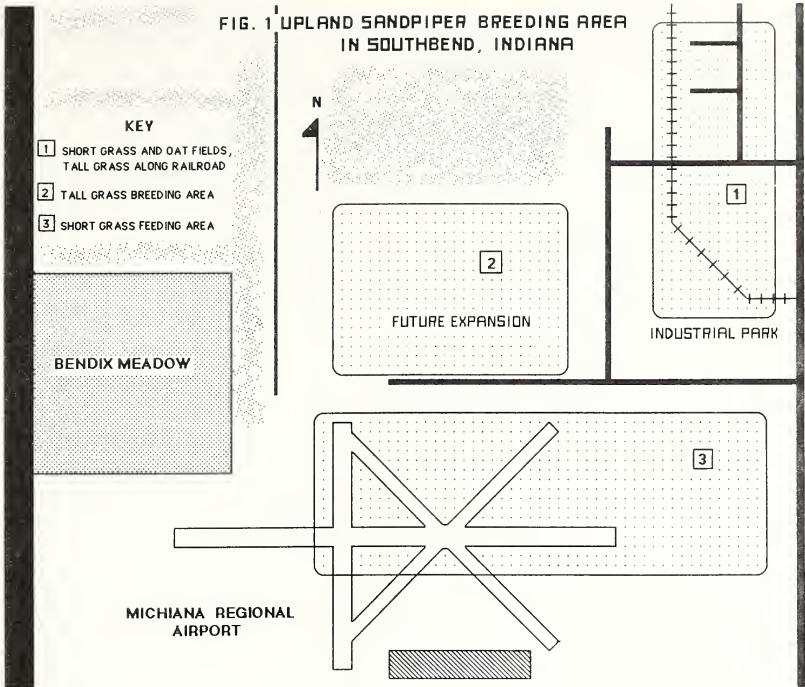


FIGURE 1. Upland Sandpiper Breeding Area in South Bend, Indiana

TABLE 1. Flora of Bendix Meadow at Michigan Regional Airport

Species	Common Name	Estimated Cover
DOMINANT SPECIES:		
1. <i>Festuca elatior</i> L.	Meadow Fescue	60%
2. <i>Medicago sativa</i> L.	Alfalfa	30
3. <i>Dactylis glomerata</i> L.	Orchard Grass	20
4. <i>Bromus inermis</i> Leyss.	Smooth Brome	10
ASSOCIATED SPECIES*:		
5. <i>Aster (ericoides)</i> L.)	Heath Aster	5
6. <i>Phleum pratense</i> L.	Timothy	5
7. <i>Agropyron (trachycaulum)</i> (Link) Malte)	Wheat Grass	2
8. <i>Trifolium pratense</i> L.	Red Clover	2

* There were 22 other associated species with an estimated cover of less than one percent. Species and common names are from F. Swink and G. Wilhelm (1979). Species epithets in parentheses are uncertain.

SBAS records show that the airport supported a small number of Upland Sandpipers in 1972. Prior to 1972 some birds were seen in farm fields outside South Bend, but today these farms are gone or planted in corn. Regular sightings in 1983, 1984 and 1985 show that the first Upland Sandpipers arrive at the airport in the middle of April,

TABLE 2. Land Use in the Michiana Regional Airport and Surrounding Area, 1951 and 1980, from USDA Aerial Photographs.

Land Use	1951		1980	
	Hectares	%	Hectares	%
Residential*		7		7
Rural	64		28	
Urban	0		38	
Commercial/Industrial	0	0	100	10
Transportation				
Roads/Runways	42	4	61	6
Cropland/Hay Fields	500	51	211	22
Woodlands/Orchard/ Pine Plantations*	21	2	9	1
Woody Old Fields/Gravel Pits*	176	18	175	18
Grassland Old Fields/(mown and unmown)	178	18	344	35
Ponds/Sewage Lagoons	0	0	10	1
Totals	981	100	976	100
Fence Rows (meters)		18,656		14,292

The scales of the aerial photographs were 1:7920 for 1951 and 1:12000 for 1980. A 10 cm by 10 cm modified acreage grid with 32 rows and columns of dots was used to determine land area.

* Areas not used by Upland Sandpipers.

courtship and breeding are in early May, young are seen in early June and all birds have left by late July. Peak numbers varied from year to year. They were: in 1983, 21 adults and 12 young on July 3; in 1984, 10 on June 21; in 1985, 25 adults on June 15.

The first sighting of 1986 was a group of four birds seen in area 3 on April 14. Between May 29 and June 7, the largest daily sighting was 11. On June 7, the first young were observed. Increasing numbers of birds were seen between June 7 and June 23 with a high of 44 birds on June 15. No more than 12 birds were observed from June 24 to July 11 when sightings ended. In late May and early June the majority of sightings were in and near the oat fields of area 1. Sightings in area 1 ended on June 25 when the oats were cut for hay. Sightings in areas 2 and 3 began to increase on June 7. A majority of all sightings were recorded in areas 2 and 3 from June 20 to July 11. On July 5 the only sighting was 12 birds using the airfield. The last sighting (5 birds) was made in the same location on July 11. The tall grass site adjacent to the airfield (area 2) was an active breeding area; the first young were seen at this site. Based on the number of birds exhibiting breeding behavior, there were approximately 15 nests in the study area, a density of 1 nest/21.3 ha. Judging from the maximum number of birds seen on various sites, there were approximately 52 individuals including young in the study area by late June. The Bendix Meadow site was used by only a single breeding pair. The grass on this site was over a meter high by early May and was unsuitable for breeding.

Behavior patterns were divided into three broad classes: foraging, perching and flying. Two distinct calls, an excited distress call given while flying and a melodic but mournful call commonly used while perching, were noted. In area 1, Upland Sandpipers were most often seen foraging in the short grass and oat fields surrounding the buildings of the industrial park or perched on telephone and light poles. A strip of tall grass which was used for nesting bordered the railroad tracks which stretched along the length of area 1. Utility poles along the railroad were a favorite perch. Young were often seen along the tracks while adults perched on the poles. Area 2 had no posts suitable for Upland Sandpiper perches. Observations were limited to birds foraging and moving through the grass or flying. We frequently heard melodic calls from birds hidden in the tall grass, or saw birds using the distress call while flying. The majority of birds in area 3 were

seen foraging. Numerous young were seen with the adults in this area. Perching was limited to the short runway lights and a few runway light towers. Melodic calling from perches was common in area 3. Many birds would fly in from other areas, perch on the runway lights and give their distinct calls.

Other species frequently seen in the study area were Eastern Meadowlarks, Bobolinks, Red-winged Blackbirds and Grasshopper Sparrows. Meadowlarks were seen primarily in areas 1, 2, and Bendix Meadow. The Bobolinks and Red-winged Blackbirds were only seen in Bendix Meadow, where the males used the artificial posts in April and May. The Grasshopper Sparrow was fairly common in area 2 and Bendix Meadow. Two species which are now rare in northern Indiana, the Dickcissel and the Henslow's Sparrow, also were found in Bendix Meadow. A breeding pair of Dickcissels were seen from May through June and a pair of nesting Henslow's Sparrows was seen in July.

Discussion

Reports from Wisconsin (18), Illinois (7), North Dakota (11) and South Dakota (10) indicate that Upland Sandpipers prefer pasture and prairie-grassland for nesting. Grazed and burned pasture was more heavily used than ungrazed or unburned areas in the North Dakota study. The South Dakota study suggested that 20 to 40 percent of the current year's plant growth could be removed without restricting nesting. In South Dakota, nests were found in native prairie grasslands associated with four common species: Kentucky bluegrass, native forbs, western wheatgrass and green needlegrass (10). The bluegrass had invaded the native prairie. In North Dakota bluegrass together with quackgrass and smooth brome grass had also invaded the native prairie used by Upland Sandpipers for nesting (11). Though the grasses of the Bendix Meadow and MRA sites do not correspond to those in North and South Dakota, they do offer similar cover. In Wisconsin the uplands use agricultural land, mostly green pastures and hay and oat fields (18).

Vegetative height is also an important consideration in nest site selection by Upland Sandpipers. Kirsch and Higgins (11) and Kaiser (10), in North Dakota and South Dakota respectively, found no nesting in grass taller than 63.5 cm. Since Bendix Meadow was higher than this critical level by early May, the Upland Sandpipers may have avoided this area for breeding. Buss and Hawkins (5) and Ailes (1) state that short grass areas under 15 cm are preferred for foraging for insects. After hatching, the young are immediately taken to these fields. The short grass lawns of the MRA and industrial park seem to serve this purpose. Nest densities in good quality grassland (both native and non-native) were reported for central Wisconsin as 1/13.1 ha (1); North Dakota 1/16.0 ha (11); and South Dakota, 1/15.6 ha (10). Nesting and total numbers at MRA have changed little during the years 1983 to 1986. With better management of the tall grass areas, especially Bendix Meadow, the nesting density (1/21.3 ha) and total numbers could be increased.

The behavior patterns and calls of the Upland Sandpipers we studied are similar to those reported in Wisconsin by Buss and Hawkins (5) and Ailes (1). Adjacent areas for foraging, nesting and perching were also seen in those studies. The Wisconsin and South Dakota studies mention the use of fence posts and telephone poles but not artificial posts. A study on the Kansas prairies showed that artificial posts would attract Upland Sandpipers as well as numerous other birds (12). Though few uplands were seen using the posts in Bendix Meadow, Red-winged Blackbirds, Bobolinks, Eastern Meadowlarks and Grasshopper Sparrows regularly used them.

In addition to the Upland Sandpiper, the Dickcissel, the Grasshopper Sparrow, and the Henslow's Sparrow are on the Blue List of *American Birds* (17). These birds were common in northern Indiana in early years (6), but today SBAS records show that Dickcissel, Grasshopper Sparrow, and Henslow's Sparrow numbers have declined in re-

cent years. Maintaining the MRA's tall grass habitat will benefit these species.

Airports within the eastern range of the Upland Sandpiper may be the only sites where enough open, high quality grassland exists for breeding. Therefore the study of these sites is important if breeding populations are to be maintained. Management techniques such as grass cutting, post placement and reseeding to native prairie grasses can be examined at Bendix Meadow. Eventually, this portion of airport property may become ideal for prairie bird breeding and help to maintain a stable local breeding population in northern Indiana.

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Literature Cited

1. Ailes, I.W. 1976. Ecology of the Upland Sandpiper in central Wisconsin. M.S. Thesis. The University of Wisconsin-Stevens Point. 63 pp.
2. Beck, H.H. 1956. Status of the Upland Plover in Lancaster County, Pennsylvania. *Auk* 73:202-204.
3. Bent, A.C. 1929. Life histories of North American shorebirds (Part 2). *Bull. U.S. Nat. Mus.* 146:1-412.
4. Brock, K.J. 1986. Birds of the Indiana Dunes. Indiana Univ. Press, Bloomington. 68 pp.
5. Buss, I.O. and A.S. Hawkins. 1939. The Upland Plover at Faville Grove, Wisconsin. *Wilson Bull.* 51:202-220.
6. Butler, A.O. 1898. The birds of Indiana. 22nd Ann. Report Indiana Dept. Geol. and Nat. Res., Indianapolis, p. 727-728.
7. Graber, R.R. and J.W. Graber. 1963. A comparative study of bird populations in Illinois, 1906-1909 and 1956-1958. *Illinois Nat. H. Surv. Bull.* 28:468-469.
8. Haverschmidt, F. 1966. The migration and wintering of the Upland Plover in Surinam. *Wilson Bull.* 78:319-320.
9. Higgins, K.F. 1975. Shorebird and game bird nests in North Dakota croplands. *Wildlife Soc. Bull.* 3:176-179.
10. Kaiser, P.H. 1979. Upland Sandpiper nesting in southeastern South Dakota. *Proc. S.D. Acad. Sci.* 58:59-68.
11. Kirsch, L.M. and K.F. Higgins. 1976. Upland Sandpiper nesting and management in North Dakota. *Wildlife Soc. Bull.* 4:16-20.
12. Knodel-Montz, J.J. 1981. Use of artificial perches on burned and unburned tallgrass prairie. *Wilson Bull.* 93:547-548.
13. Mumford, R.E. and C.E. Keller. 1984. The birds of Indiana. Indiana Univ. Press, Bloomington. 376 pp.
14. Osborne, D.R. and A.T. Peterson. 1984. Decline of the Upland Sandpiper (*Bartramia longicauda*) in Ohio: An endangered species. *Ohio J. Sci.* 84:8-10.
15. Powell, D.J. 1981. Michigan bird survey, spring, 1981. Jack-Pine Warbler 59:105-112.
16. Swink, F. and Wilhelm, G. 1979. Plants of the Chicago region. Morton Arboretum, Lisle, IL. 922 pp.
17. Tate, J., Jr. 1986. The blue list for 1986. *Amer. Birds* 40:227-236.
18. White, R.P. 1983. Distribution and habitat preference of the Upland Sandpiper (*Bartramia longicauda*) in Wisconsin. *Amer. Birds* 37:16-22.