Upland Sandpiper Research at Portsmouth International Airport at Pease
Final Report 2011

A report to the New Hampshire Fish and Game Department
Nongame and Endangered Species Program

Submitted by
New Hampshire Audubon

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UPLAND SANDPIPER RESEARCH AT PORTSMOUTH INTERNATIONAL AIRPORT AT PEASE
Summary Report 2010

Background

Portsmouth International Airport at Pease (PSM) is currently the only known nesting site for the state endangered Upland Sandpiper. As such, this site provides critical habitat for this species in NH. Recently, concerns have been raised regarding a long-standing agreement between the airport and the NH Fish and Game Department (NHFG) to manage habitat to protect Upland Sandpipers nesting at this site. As an airport certificated by the Federal Aviation Administration (FAA), PSM must comply with regulations relating to managing hazards to aviation caused by wildlife. A recent FAA Cert Alert 06-07 entitled "Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports" highlighted the importance of reviewing the existing management agreement. NHFG is responsible for ensuring compliance with state laws regarding wildlife, including RSA 212-A: Endangered Species Conservation Act. PSM must also comply with state laws. It is in the best interest of NHFG and PSM to ensure that management of the habitat for the upland sandpiper does not attract wildlife that poses a hazard to aviation.

PSM, NHFG, and New Hampshire Audubon (NHA) have been working cooperatively to monitor and protect the upland sandpipers at the airport since 1990. In addition, NHFG and NHA have worked with the airfield personnel and USDA Wildlife Services to identify wildlife hazards and attractants on the airfield and make recommendations to minimize these hazards. The location of the upland sandpiper habitat is adjacent to the runway at PSM. Maintenance of the habitat consists of not mowing those areas between the months of May and August except for the safety areas. Not mowing during these months allows the grass to mature, flower and seed and presents an attractant to a variety of bird and mammal species that are more hazardous to aviation than the sandpiper itself. Cognizant of the importance of this nesting population of upland sandpipers, PSM agreed to undertake a cooperative research project to determine the best course of action to accommodate the local population of upland sandpipers while reducing wildlife hazards on the airport.

It is important to note that habitat changes have been significant at the Pease Airfield since the decommissioning of the Air Force facility began in 1992. In response to changes in habitat as a result of construction or modifications in the mowing regime, upland sandpipers have shifted their usage of island habitats multiple times during the years of monitoring. This is important data as we work to minimize nesting in areas of concern. Although it has been well documented that upland sandpipers at Pease have moved around the infield areas in response to construction or mowing parameters, it

remains unclear why they have not settled in habitat areas further away from the runway such as along the North Apron or the grasses around the Vortac critical area on the west side. A more thorough analysis of the vegetation and habitat in current breeding areas may help to answer this question. In addition, this information is critical for informing management decisions for potential habitat outside of the airfield.

Objectives

The objectives of this project were to evaluate potential upland sandpiper habitat in close proximity to the Pease Airfield including historic habitat at the Strafford County Farm in Dover and fields around Rochester, Durham and Newington and the Great Bay National Wildlife Refuge; complete a thorough analysis of current nesting habitat to better understand the breeding needs of the Pease population; and work with airfield and land managers to develop a strategy that continues to provide nesting habitat for the endangered upland sandpiper in the Seacoast area but minimizes breeding in areas of concern at PSM.

Approach

In 2009 the project focused on evaluating historic and potential upland sandpiper nesting habitat in the seacoast region and in close proximity to the PSM using GIS technology and ground surveys, in addition to regular monitoring of the upland sandpiper population at Pease. In addition a detailed vegetation analysis of the current upland sandpiper breeding habitat at PSM was completed. Due to the timing of funding, these tasks could not be completed until well into the breeding season. To strengthen this data, the historic sites were revisited in 2010 and the vegetation analysis was replicated in 2010.

The second year (2010) continued the first year of observations and concentrated on habitat management recommendations and the start of enhancement of identified potential habitat away from the runways outside PSM. A pilot change to the mowing regime that removed some nesting habitat from near the runway at PSM was implemented and evaluated to see its effect on sandpiper nesting. Habitat enhancements and management at the Great Bay National Wildlife Refuge (GBNWR) were initiated.

Specific Tasks

Task A:

Determine current status of upland sandpipers in the seacoast region.

Conduct site visits to historic nesting areas in Dover, Rochester and Newington, including the GBNWR. Record observations of any upland sandpiper breeding activity. Determine if the site is still potentially suitable for sandpiper breeding. Conduct multiple visits during the breeding season to determine use and any nesting success both at PSM and other sites determined to be potential or current habitat.

Task B:

Evaluate potential upland sandpiper habitat in close proximity to PSM or in close proximity to other breeding sites that may be discovered during Task 1.

Task C:

Monitor the upland sandpiper breeding population at PSM to determine nesting locations and conduct a vegetation analysis of the identified nesting habitat.

Task D:

Participate in the design of a coordinated plan to encourage use of alternative breeding sites by sandpipers.

Expected Results and Benefit

The data collected through these tasks will generate a detailed understanding of the current and potential upland sandpiper nesting habitat, a more complete picture of the upland sandpiper breeding population in the seacoast region and allow for a management plan that continues to provide nesting habitat for upland sandpipers in the Seacoast region but minimizes wildlife hazards on PSM.

Historic and Potential Habitat: Task A and B

Determine current status of upland sandpipers in the seacoast region.
Conduct site visits to historic nesting areas in Dover, Rochester and Newington, including the GBNWR. Record observations of any upland sandpiper breeding activity. Determine if the site is still potentially suitable for sandpiper breeding. Conduct multiple visits during the breeding season to determine use and any nesting success both at PSM and other sites determined to be potential or current habitat.

Evaluate potential upland sandpiper habitat in close proximity to PSM or in close proximity to other breeding sites that may be discovered during Task A.

Methods
A list of historic upland sandpiper activity was generated using bird records data stored at ASNH (Appendix D: Figure 1). Potential habitat in the seacoast region was mapped using the National Land Cover Data (NLCD) habitat types with overlays of grassland, pasture/hay and cultivated land (Appendix D: Figure 2). Historic sites were visited and broadcast surveys using the following protocol were conducted from mid to late June in 2010 and July in 2009 (Appendix D: Figures 3-16).

The following protocol was used at each site visit.

Grassland Survey Protocol:
Surveys are taken using 5-minute point counts. Points should be around 300 meters apart and 100 meters from the edge of the field (this latter criteria can be reduced for fields of unusual shape, or if you're doing a quickie survey from along a road).

The five minute period is broken down into the first three minutes and the last two minutes, as shown on the data form. Only record ADDITIONAL birds during the last two minutes, the total of the four columns should equal the total number of birds detected.

Estimate whether each bird is within 100 meters of the point.

A grassland survey was completed for each site visited. Data collected at each site included location with GPS coordinates, current land use, abundance of grasses, forbs, shrubs, bare ground, and topography. A map was generated for each site (Appendix D). Photos were also catalogued for all sites visited (Appendix D).

No upland sandpiper activity was noted on any of the surveyed sites in 2009 and 2010.

The Great Bay National Wildlife Refuge continues to have the highest potential for habitat management and upland sandpiper nesting. Habitat plots were completed in the Weapons Storage Area in 2010 with details found in the Habitat Plot summary.

2009 and 2010 Upland Sandpiper Use at Pease International Tradeport: Task C

Monitor the upland sandpiper breeding population at PSM to determine nesting locations and conduct a vegetation analysis of the identified nesting habitat.

History of upland sandpiper

The upland sandpiper (Bartramia longicauda) has an interesting history in New Hampshire. After European settlement converted unbroken eastern forests to extensive agricultural lands in the late 1700's and early 1800's, the continent's upland sandpiper population expanded eastward from the prairie states into the newly available habitat (Harrison 1975, Silver 1957). At their peak in New England during the mid 1800's, these birds were abundant migrants and locally common during the breeding season in central and southern New Hampshire (Forbush 1912, Allen 1903). Silver (1957) surmised that they were probably most abundant in New Hampshire between 1860 and 1880.

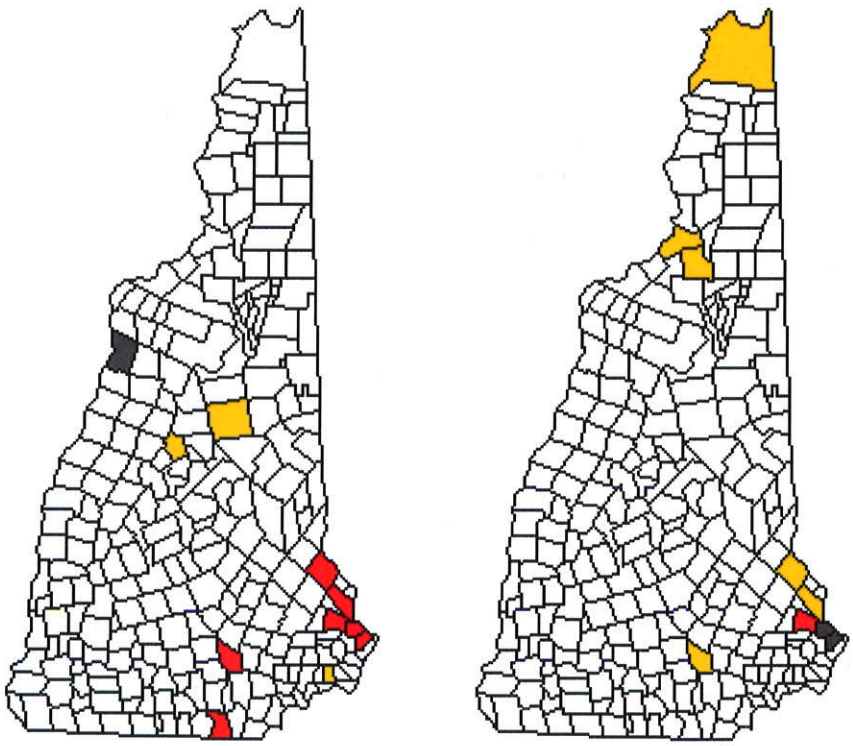
The population declined dramatically during the next several decades as gunners decimated this and other shorebirds species for market hunting (Forbush 1912, Allen 1903). The upland sandpiper was uncommon, rare, or entirely absent in former New Hampshire breeding areas by the early 1900's (Allen 1903, Silver 1957).

Pease International Tradeport, formerly the Pease Air Force base, currently supports the only confirmed nesting population in New Hampshire. Two pairs of upland sandpipers were confirmed to nest at the Great Bay Wildlife Refuge in 1997 and 1998 but have not been confirmed since. Sightings from Dover, Manchester, and southern Coos County in the last decade imply that birds are still visiting appropriate habitat elsewhere in the state.

Biologists conducted single status surveys of the Pease population during 1987 and 1988. A 1989 upland sandpiper project constituted the first effort to monitor this population throughout the breeding season, and also included an investigation of suitable nesting habitat elsewhere in the seacoast region. The 1990 through 1996 fieldwork allowed for the continued monitoring of this population throughout the breeding season. Less intensive breeding season visits occurred from 1997 through 1999, 2002 and 2003. With the potential for continued changes on the Pease Airfield upland sandpipers were once again monitored through the breeding season in 2006 and 2007. Pease continued to be monitored on a less intensive basis in 2008 and in 2009 weekly visits were conducted from May 6 through September 7.

Regionally, the upland sandpiper is of conservation concern in every northeastern state where it occurs, largely a result of population declines similar to that observed in New

Hampshire (Laughlin and Kibbe 1985, Andrle and Carroll 1988, Zeranski and Baptist 1990, Carter 1992, Veit and Petersen 1993). Many historic locations in New England were large dairy farms, and these have been gradually disappearing. Breeding Bird Survey data indicate population declines since 1966. Steeper declines since 1980 coincide with the period of greatest decrease in the New Hampshire breeding population as suggested in Figure 1. Correspondingly, there is evidence of significant decline on the wintering grounds as well (White 1988).



a. 1965-1984 b. 1985-2004

Figure 1. Distribution of breeding season (late May-July) records of upland sandpiper in New Hampshire 1965-2004. Towns are coded according to the number of years in each period when sandpipers were reported: yellow = 1, red = 2-5, black = > 5 (data from NHBR and De Luca 2002). Records of birds in late May but not later in the season are excluded as being possible migrants unless they were reported from a site with a consistent pattern of use by the species. *Graphic from the New Hampshire Fish and Game Wildlife Action Plan: Upland Sandpiper Species Profile authored by Pam Hunt and Diane De Luca.*

In Maine, Upland Sandpiper habitat is managed at the Brunswick Naval Air Station and the Sanford Municipal Airport. There are at least 7 known breeding locations on airports in Maine. In Massachusetts, five airports have regulatory conservation plans that include management for upland sandpipers, and one military base, Westover Air Force Base,

which also manages some habitat for upland sandpipers. Vermont's Wildlife Plans lists creating management plans at airports as a strategy to protect upland sandpipers, and are working toward management with airports and other owners of large grasslands.

Habitat

Upland sandpipers occupy a wide range of grassland habitats across their range. In the East, these include airfields, blueberry barrens (Maine), and mixed agricultural areas. The species needs a mix of short (< 20 cm) and tall (up to 60 cm) grasses, for foraging and nesting habitat, respectively. Another important habitat feature is the presence of taller structures that can be used as singing perches; these can include fence posts, runway lights or signs, and taller vegetation. Upland sandpipers tend to avoid grasslands with high densities of legumes or with a dense litter layer (Carter 1992, Houston and Bowen 2001).

Upland sandpipers require very large areas of grassland for breeding. Ideally, such fields should be over 60 ha (150 acres), and even fields as large as 120 ha (300 ac) may not necessarily support the species (Carter 1992, Vickery et al. 1994). Territories average 8-12 ha (20-30 ac), and the species is often loosely colonial where it reaches higher densities (Carter 1992).

Sites historically used by sandpipers in New Hampshire include large airfields (Pease, Manchester, and Nashua) and large agricultural mosaics (Dover, Rochester, and Haverhill).

Site Description

Portsmouth International Airport at Pease

Portsmouth International Airport at Pease lies in the towns of Newington and Portsmouth. The Airport is part of the former Pease Air Force Base. Upland sandpiper habitat at Pease exists on the airfield, including three grassy "islands" surrounded by the runway and connecting taxiways (Appendix A). The grassy islands are 800 ft. wide and vary in length, but collectively total 10,700 feet. Acreage of the islands is 60, 62 and 74 acres. Overrun areas in both the north and south ends of the runway add approximately 40 acres of grass. An additional grassy area between the runway and Lowery Lane is about 10,000 feet long and 150 to 200 feet wide.

The airfield is mowed annually in compliance with FAA requirements. In 2009, grass in the safety zones (250 ft from the runway and taxiway centerlines), including areas along the runway and all taxiways, was kept mowed throughout the spring and summer. Also, on the South Island a wide buffer around a site of test pits was mowed regularly to discourage upland sandpiper nesting and improve visibility of sandpipers that might use

the area. In 2007 through 2009, the grass along Lowery Lane from the runway up to the fence line was kept mowed throughout the field season. The glide slope on the south end remained unmowed until July 31 in 2007 and until June 23 in 2009. In accordance with earlier recommendations, mowing of the other areas was delayed until after 31 July, to minimize the chances of destroying nesting adults, eggs or pre-flight young.

In 2010, changes were made to the mowing protocol that included mowing the entire grassy areas on the North, Middle and South Islands, the North and South overrun areas and the safety area between the runway and Lowery Lane on a regular basis throughout the growing season. The grassy areas from Lowery Lane west to the perimeter fence were left unmowed until after July 31.

Methods

The airfield was surveyed twice weekly from April 24 through July 2 and weekly from the middle of July through September 1. The area regularly surveyed included north of the North Taxiway, down through the North, Middle and South Islands, south of Alpha Taxiway to the perimeter road, then west and north encompassing the South Overrun and Echo Taxiway to the Glide Slope area (Appendix A). The biologist was dropped by airfield operations personnel at the North Taxiway and proceeded south through the islands and around the South Overrun areas. The route then continued around the glide slope area and along Lowery Lane north to the 3000' marker across from the North Island. Scanning by eye, binoculars or spotting scope was conducted at observation points that provided good views or as sandpiper activity occurred. To obtain maximum coverage of the area, the biologist walked a broad zigzag pattern through the areas.

Field notes of upland sandpiper activity were made during each visit to the airfield. Field notes recorded each visit included date, time, weather, number, age class and behavior of upland sandpipers observed. During the nesting season, maps of known and probable sandpiper nesting and activity were updated and provided to airfield personnel.

All identified nesting and foraging areas were located and mapped using GPS (Appendix B). In 2010, three nest sites were located through dragging, one was located by a mower operator, and the additional four nest sites were identified through observational and behavioral cues.*

**Details of dragging and radio transmitter work included in NHFG summary*

The detailed methodology established in the 2004 Monitoring Protocol for upland sandpipers follows.

Monitoring Protocol
A map of the Pease Airfield is attached in Appendix A. On each visit to the site, the observer should record the date, time (beginning and end), observer name (so), and general weather conditions. Locations of upland sandpipers should then be mapped on the form as described in the following protocol.

The date, time, observers and weather should also be recorded in a field notebook. Each upland sandpiper (or group of upland sandpipers) encountered should be assigned a sequential number starting with "1". This number should be written on the map in the appropriate location (see protocol below). It should also be recorded in the field notebook, along with the following information about the observation:

a) Time
b) Weather
c) Number of birds
d) Location on airfield (island, overrun, etc.)
e) Location relative to map and airfield markers
f) Behavior observed (see details)
g) Vocalizations heard
h) Movement and direction

Thus, an entry in the field notebook might be as follows:
North Island
50% Cloud Cover, Winds W at 10mph.
74 degrees F.
0945: 2 UPSA in grass, center of island, at the 2000ft. marker, feeding, trilling.

At Pease, the area regularly surveyed includes north of the North Taxiway, down through the North, Middle and South Islands, south of Alpha Taxiway to the perimeter road, then west and north encompassing the South Overrun and Echo Taxiway to the Glide Slope area (Figure 1). The biologist is dropped by airfield operations personnel at the North Taxiway and proceeds south through the islands and around the South Overrun areas (reverse the direction on alternate weeks). Scanning by eye, binoculars or spotting scope is conducted at observation points that provide good views or as sandpiper activity occurs. To obtain maximum coverage of the area, the biologist should walk in a broad zigzag pattern through the areas. The addition of a second biologist to walk in tandem down opposite sides of the grassy areas helps to maximize upland sandpiper detection.

There is considerable habitat that exists at Pease along an access road that runs the entire length of the runway. When possible, this stretch should be walked or driven slowly with airfield personnel to check for upland sandpiper activity.

When upland sandpipers are detected, the location should be marked relative to the map and recorded as to proximity to airfield markers (1000ft. markers, building locations, access road proximity, etc.). For each observation, the following information should be recorded: time, number of birds, age if known, behavior observed, vocalizations heard, movement and direction of the movement (with arrows). All upland sandpipers detected should be recorded on the daily site map to establish patterns and help in the determination of nest site activity.

Vocalizations

Upland sandpipers have three distinct vocalizations. The most impressive vocalization is referred to as a long, mellow whistle or "wolf whistle". Palmer describes the vocalization as a "mellow, rather mournful, rolling trill on ascending scale, then altering to a prolonged clear whistle with descending scale and loudness." This vocalization is often heard during courtship flights and accompanied by a slow glide with outstretched neck. Wolf whistles can be heard throughout the breeding season, although female upland sandpipers will only use this vocalization prior to nest initiation and at the completion of breeding.

The "Tattler Call" is heard in two distinct forms. This call can be described as "an emphatic, bubble like and rapidly uttered quip-ip-ip-ip-ip-ip-ip-ip-ip" usually given in flight (Houston and Bowen). An even more insistent tattler call can be given in response to threat or disturbance. This trilled call is often heard when the birds are flushed from the ground, perches and nests; or when they are protecting young. Both the male and female will use the tattler calls throughout the breeding season.

Contact tattler call: A softer, mellow tattler call is used as a contact call between adults and young. This call can be heard with nest incubation exchange, as adults are leading their young to food sources or as a general contact call.

Breeding Behaviors

Nest Searching

To confirm nesting, fields can be searched on foot, with two or more individuals in close proximity to each other. In past years at Pease, a 50 ft. chain has been dragged between two biologists in an attempt to flush birds from the nest site (Higgins, 1977). Both of the above methods are extremely time consuming and pose a potential disturbance risk to the birds. However, if nest site protection is paramount, energy should be put into finding and protecting the actual nest site.

When it is feasible to locate the general area of nesting, indirect measures of breeding activity can be used. The following behaviors can help to establish breeding status for the upland sandpiper at a given location.

1. *Presence of a pair. A pair may be indicated in the following ways:*
    a. *Two upland sandpipers in close proximity at the same location on two or more site visits during the breeding season.*
    b. *Courtship flights or copulation.*
    c. *Perching in the same location on two or more site visits.*
    d. *Wolf whistles in the same location on two or more site visits.*

2. *Nesting Attempt.*
    a. *Perching in the same location on two or more site visits.*
    b. *Wolf whistles in the same location on tow or more site visits.*

c. *Tattler calls – especially if the upland sandpiper is flushed from the ground or continues to call as it flies back and forth over the same location.*
d. *Contact tattler calls with two birds on the ground.*
e. *Broken wing display*

3. *Hatch.*
   a. *Tattler call of a consistent nature by one or a pair of upland sandpipers on the ground.*
   b. *Continual tattler call in flight as they fly slowly back and forth over a particular location.*
   c. *Consistent distress behavior from a given area on two or more site visits after suspected hatch.*
   d. *Visual confirmation of chicks as they move through the grass.*

4. *Fledging*
   a. *Visual confirmation of flying chicks by careful discrimination of plumage while on the ground.*
   b. *Estimate of number of chicks fledged from buildup of upland sandpiper numbers and family groups on the airfield. Potential migrants need to be assessed when using this method of estimation. Family groups with fledged chicks are usually evident by mid-July. Migration movement typically occurs in late July and early August.*

Description of data analyzed/summarized

After each site visit at Pease, a map of all upland sandpiper activity and suspected nest locations should be completed. This map should be given to airfield personnel to help in protecting upland sandpiper sites of importance along the airfield. On the summary map each observation should be identified to location with the number of birds, behavior code, nesting status and arrows indicating any observed movement. At the end of the field season, all maps should be transferred to a composite map to help determine the number of suspected nesting attempts as well as any confirmed nesting locations.

At the end of the survey period for each field season, the following summary statistics should be compiled for each site:
   a. *High number of upland sandpipers – both for the breeding population and during the migratory period.*
   b. *Estimated number of pairs.*
   c. *Estimated number of nesting attempts.*
   d. *Estimated number of chicks fledged.*

Results

2010 Nesting Pairs

Surveys during the 2008 through 2010 breeding seasons continue to document upland sandpiper use of the Pease International Tradeport airfield. The less intensive surveys in 2008 showed decreased numbers from the 2006 -2007 estimates of 12-16 pairs and 11-14 pairs respectively in 2006 and 2007. Surveys during the 2009 breeding season estimated 9-12 pairs and in 2010 8-10 pairs continued to use Pease during the breeding season (Appendix A). Nesting activity in 2009 by area was North Island: 3-4 pairs; Middle Island: 2 pairs; South Island: 3-4 pairs; Lowery Lane (including the glide slope area): 1-2 pairs. Nesting activity in 2010 by areas was North Island: 2 pairs; Middle Island: 1 pair; South Island: 2 -3 pairs; Lowery Lane (including the glide slope area): 3 – 4 pairs. In 2009, approximate locations of the nesting sites were determined through regular observations and the behavior of the nesting pairs. In 2010, nests were determined through observation, dragging and one was found by a mower operator

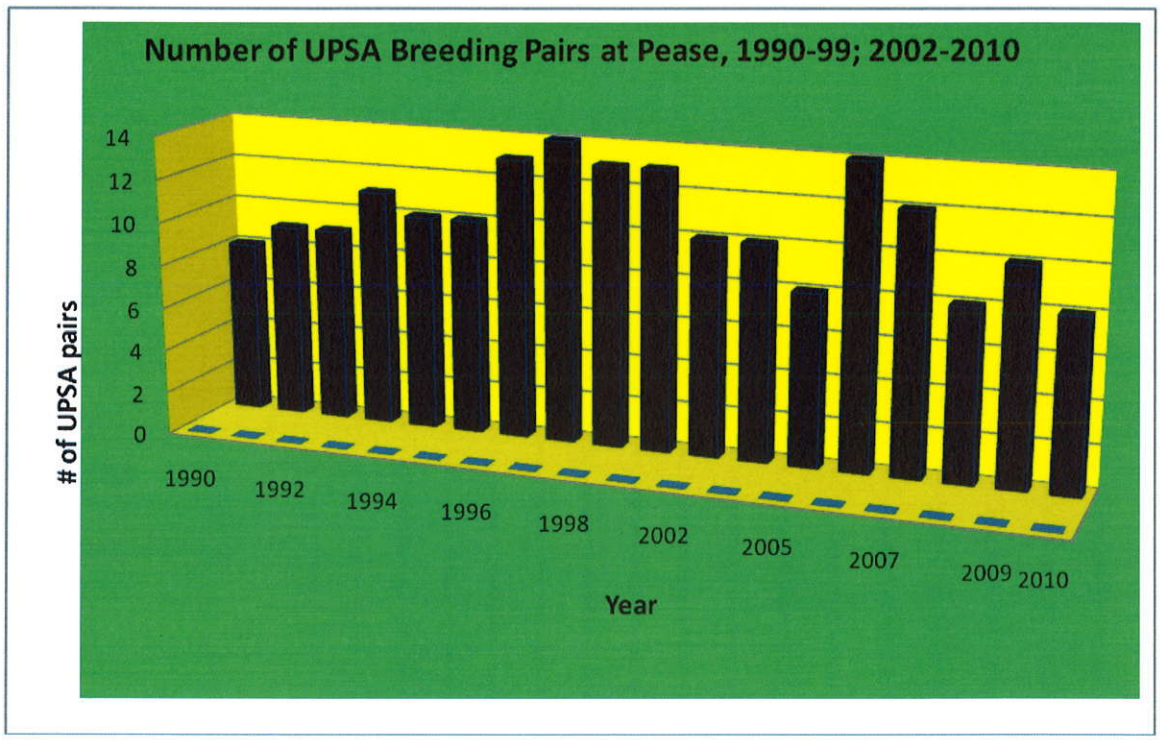


Figure 2. Number of upland sandpiper breeding pairs at Pease, 1990-99; 2000-2010

Unlike the cool, wet springs of 2006, 2007, and 2009, spring of 2010 was warm and dry. In 2009, June was particularly cool and wet and likely had a significant impact on the productivity of breeding upland sandpipers at Pease this year. The first suspected hatch

was on June 8, but the majority of nests did not hatch until after June 15. The estimated number of fledged chicks fell to 5-10 after a high of 20-25 chicks in 2006. The numbers of chicks observed through the field season was quite low and the total numbers of upland sandpipers recorded at the end of the breeding season also reflected these lower estimates.

In 2010, the warm and dry conditions allowed the upland sandpipers to return and initiate nests by the middle of May. First hatch was estimated to be around June 10 in areas that were not disturbed through mowing. The changes to the mowing regime did have an impact on nest initiation, and nesting asynchrony occurred at these sites. Hatch dates ranged from June 10 through the middle of July. Productivity was very low with estimates of 4-6 fledged chicks. The three nests that were located through dragging and one nest located by a mower operator all failed. The failures were likely from predation.*

**Details in NHFG summary report*

Breeding Use of Habitat Areas

As documented in previous years, upland sandpiper sightings were not evenly distributed among the island habitats on the airfield. In 2007, surveys documented 35% of the breeding season activity on the Middle Island. The North and South Islands both supported 24% of the upland sandpiper activity while the Lowery Lane glide slope area had 17% (Figure 3). In 2009 the activity shifted toward the north with the North Island supporting 29% of all breeding season activity (Figure 4).

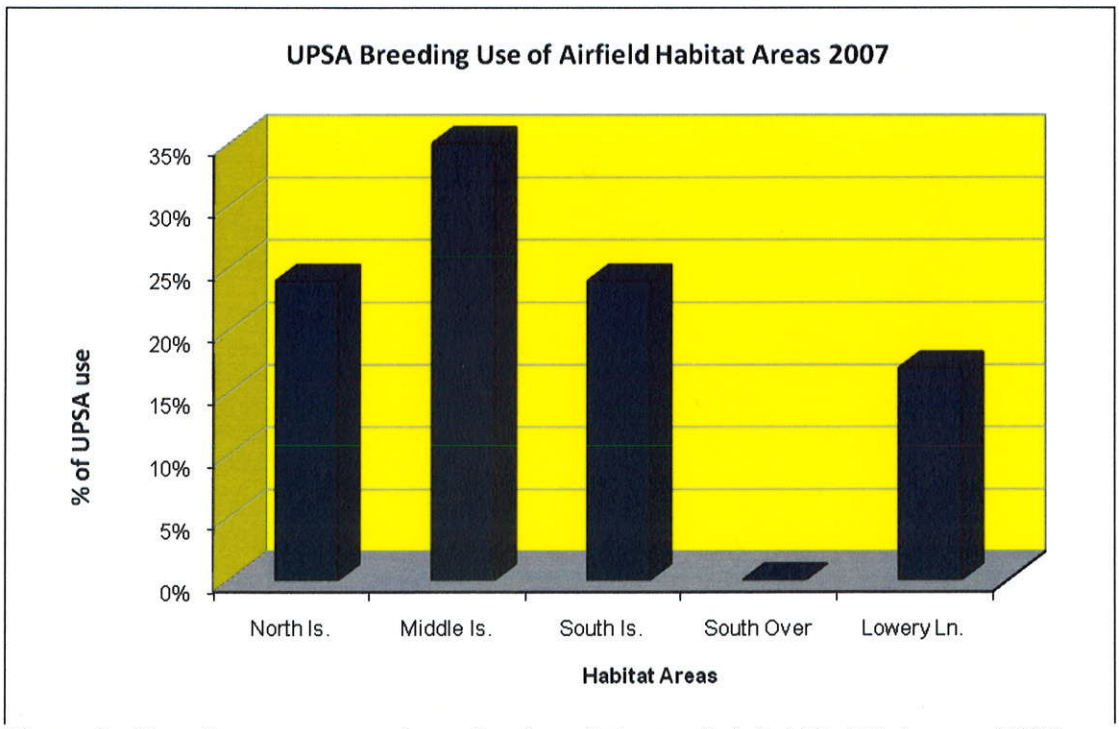


Figure 3. Breeding season use by upland sandpipers of airfield habitat areas, 2007

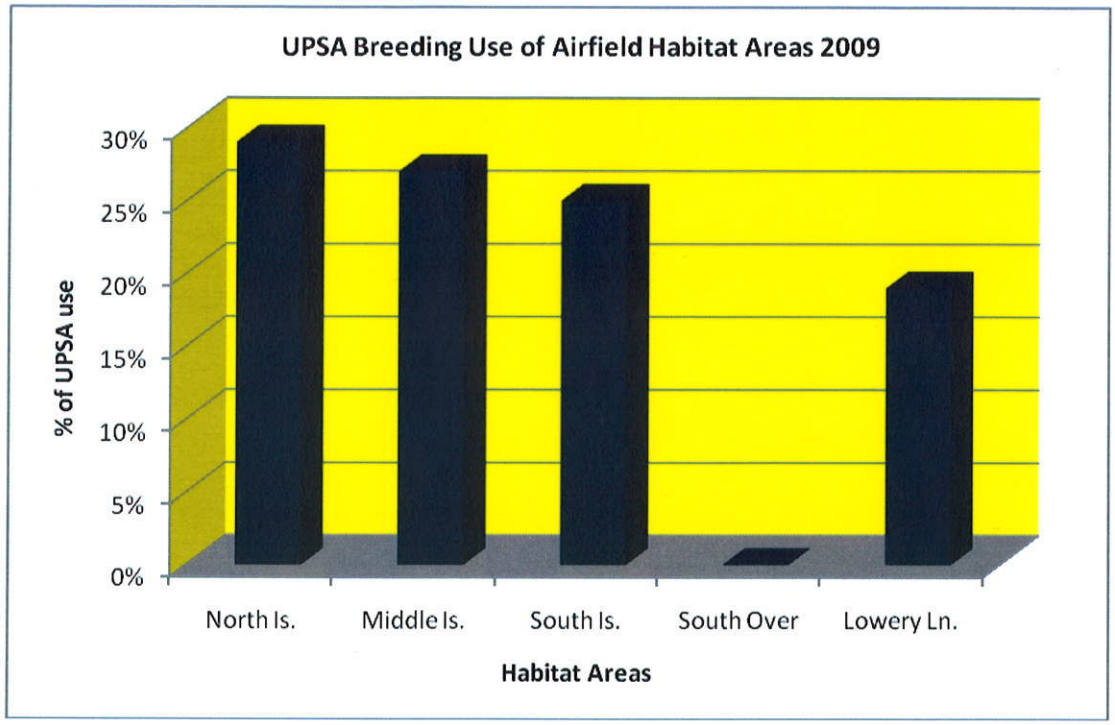


Figure 4. Breeding season use by upland sandpipers of airfield habitat areas, 2009

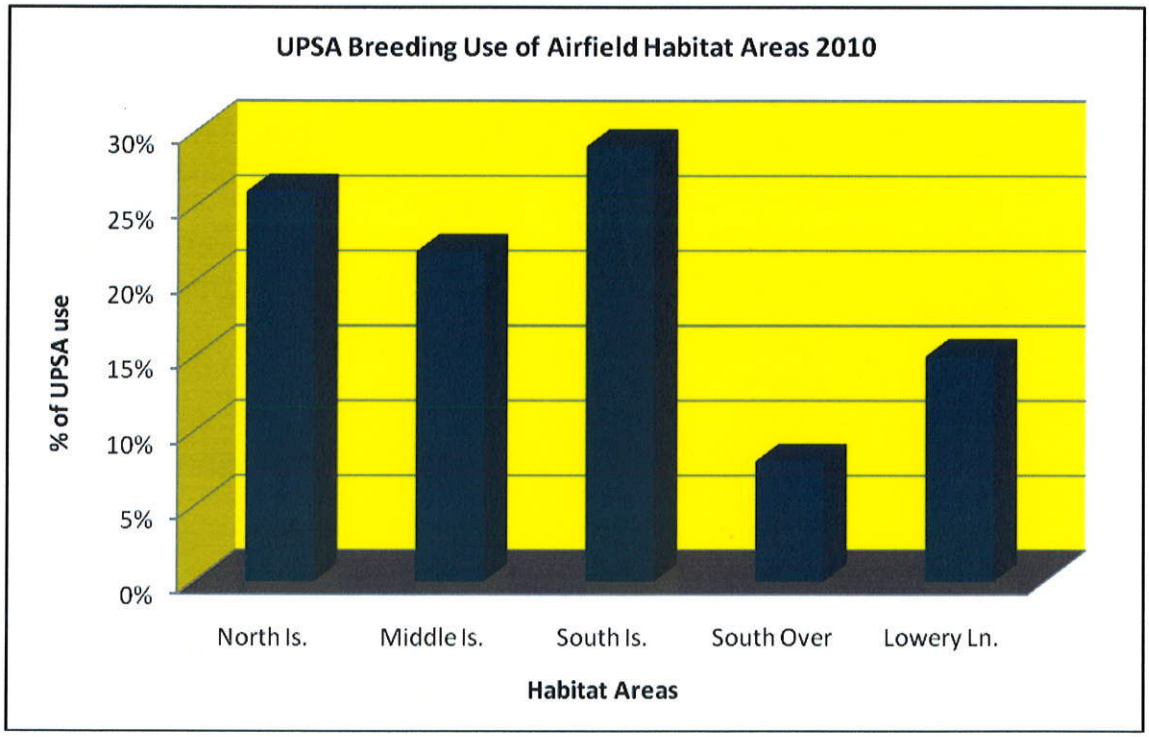


Figure 5. Breeding season use by upland sandpipers of airfield habitat areas, 2010

The frequency of upland sandpiper sightings on a monthly basis further delineates habitat use. The 2009 monthly data reflects that in May, the North and South Islands were used on an almost equal basis, while the Middle Island had the highest number of upland sandpipers observed. By June, the usage of the North Island outpaced all the other habitat areas. July saw a continued shift in habitat usage as the North and South Islands again showed similar numbers of upland sandpiper sightings, the glide slope area showed moderate usage and the Middle Island had the lowest usage (Figure 6). The usage of the islands also reflected the nest locations and chick observations with the North and South Island supporting the highest number of breeding pairs.

The 2010 monthly data shows that the Middle Island usage in May was higher than all other areas. In June, July and August the use of the Middle Island declined dramatically while the North and South Island usage increased significantly. By July, the usage of the South Island far outpaced all the other habitat areas with multiple observations of larger groups of upland sandpipers. Although the nest areas were spread across all habitat areas, the use of the North and South Islands remained highest over the entire season.

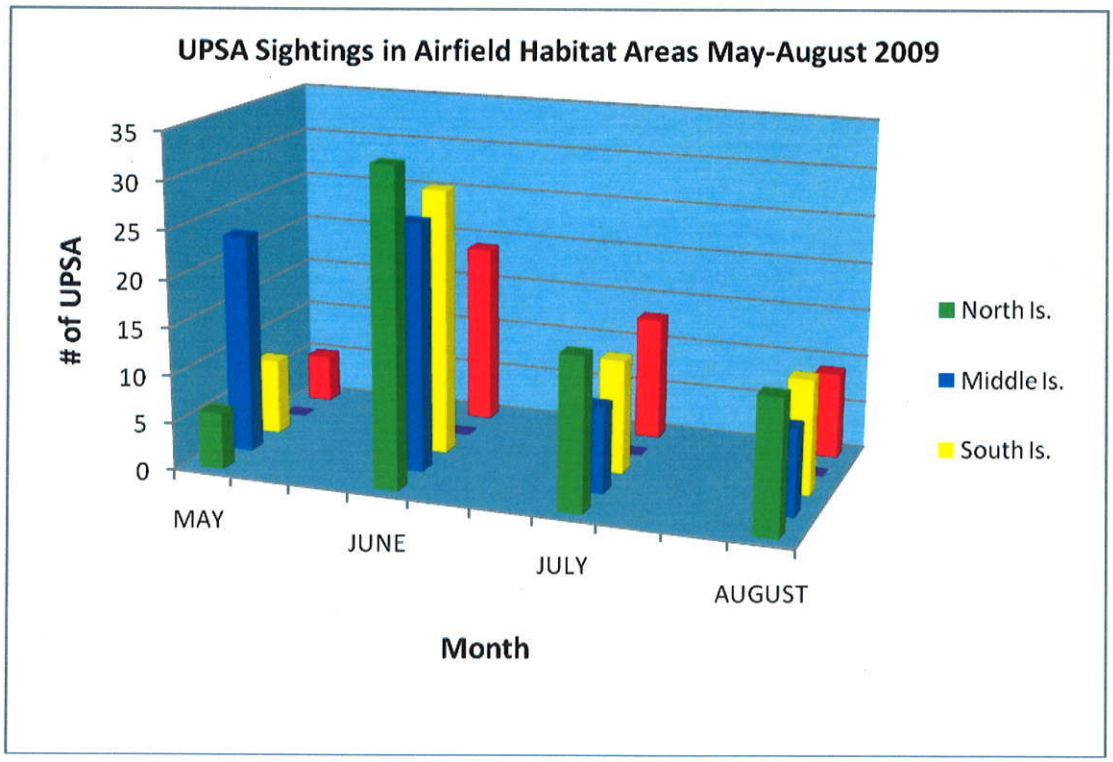


Figure 6. Upland sandpiper sightings in airfield habitat areas May – August 2009

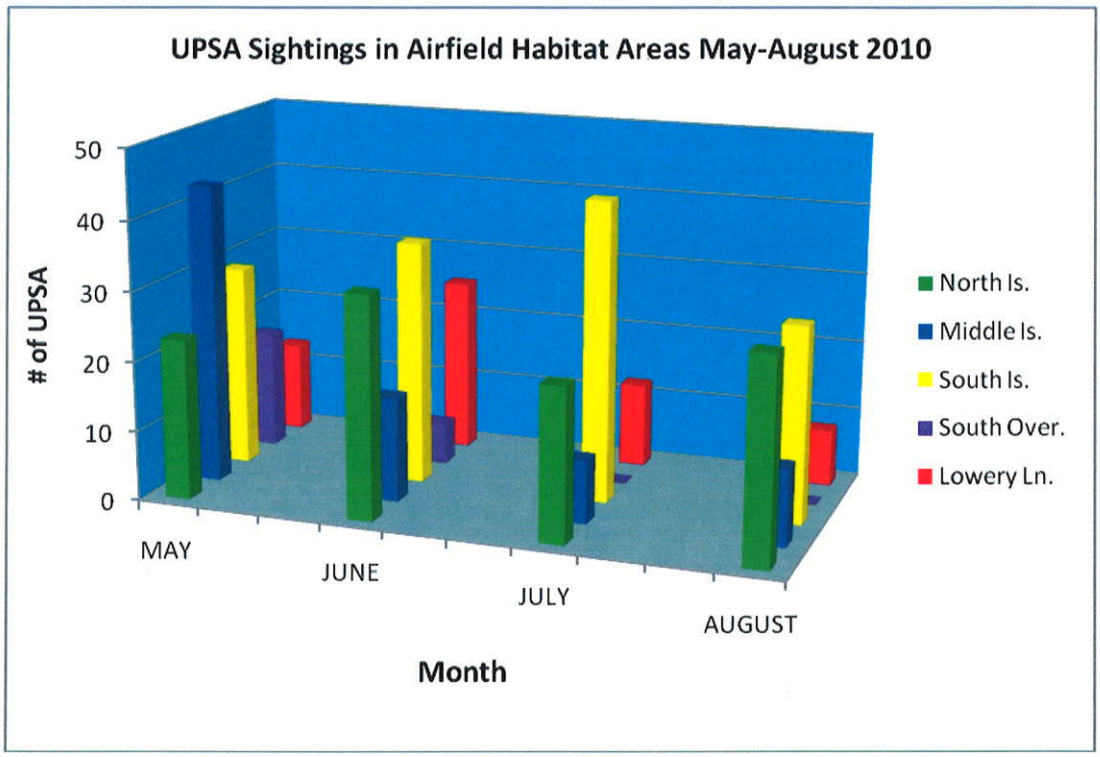


Figure 7. Upland sandpiper sightings in airfield habitat areas May – August 2010

Habitat changes have been significant at the Pease Airfield since the decommissioning of the Air Force facility began in 1992. Upland Sandpipers had gradually shifted their usage of island habitats from the Middle and South Islands to the North Island and overrun areas. This shift continued in 2006 with high breeding use along the south end of Lowery Lane. In 2007, with the Lowery Lane area kept mowed throughout the breeding season, the upland sandpiper pairs again shifted back to the Middle and South Islands (Figure 8).

The 2009 and 2010 upland sandpiper population at Pease continued to demonstrate a shift in breeding usage along the grassy areas (Figure 8). In 2009, The North Island had the highest breeding season usage with the Middle and South Islands supporting smaller numbers. With the exception of the south glide slope area, Lowery Lane was mowed through the breeding season in 2009. Two pairs did use the unmowed portions of the glide slope and Lowery Lane for nesting. In 2010 the South Island showed the highest breeding season use, but the North and Middle Islands continued to be used regularly. The most dramatic increase came in the South Overrun where two pairs were observed through the season.

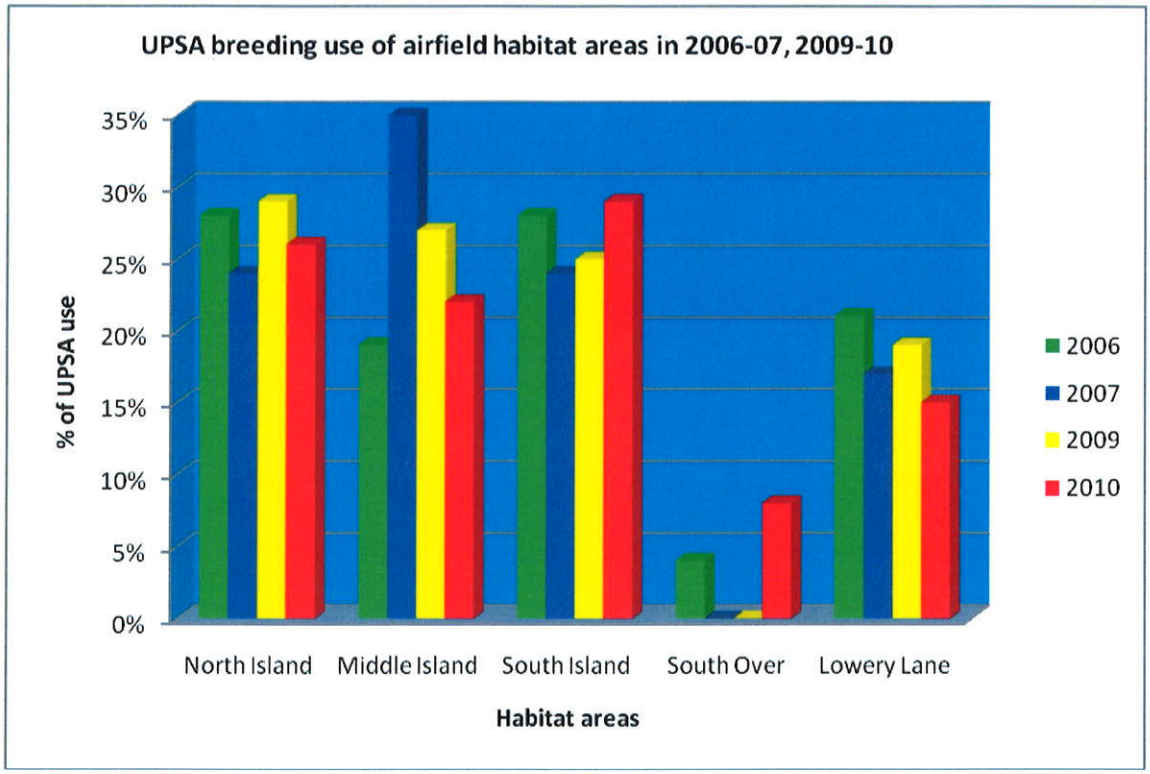


Figure 8. Total breeding season use by UPSA of airfield habitat areas 2006, 2007, 2009 and 2010

2010 Mowing

In 2010 the mowing protocol was changed in all grassy areas along the infield islands. Mowing began in early May and continued in somewhat irregular pattern through the breeding season. The goal was to keep the grass height at the recommended height of 6-12 inches throughout. The areas west of Lowery Lane were left unmowed until after August 1. The upland sandpiper response to the mowing changes are detailed in the sighting maps in Appendix B. In addition, the mowing chronology is detailed in Appendix C.

**Results will be detailed after NHFG data synthesis.*

Management

During the 1990s through 2009, the following agencies worked together to allow safe airfield operations to proceed with consideration for upland sandpiper breeding needs: New Hampshire Audubon, New Hampshire Fish and Game Department, Air Force Base Conversion Agency, New Hampshire Air National Guard, Department of Environmental Services, USDA –Wildlife Services and Pease Airfield Management. Coordination among these agencies, prior to and during the breeding season, provided protection for the upland sandpiper.

A long standing agreement between the Portsmouth International Airport at Pease (PSM) and New Hampshire Fish and Game (NHFG) provides for management of sandpiper nesting habitat. Habitat consists largely of not mowing nesting areas between May and August. This management plan was created and monitored through a partnership between PSM, NHFG and New Hampshire Audubon (ASNH), who has been monitoring the upland sandpiper population at PSM since 1989. Although the sandpiper is not considered to be a danger to aviation, the nesting habitat of the sandpiper may attract other bird and mammal species that are hazardous to aviation.

The 2009 and 2010 upland sandpiper monitoring at Pease was part of a research project to develop a strategy for reducing the risk of bird strikes while minimizing the impact on the upland sandpiper population in NH. This will be accomplished through the analysis of current sandpiper nesting habitat; evaluation of potential nesting habitat away from runways; and working with airfield and land managers to develop a strategy for enhancement and management of suitable alternate nesting sites.

Upland Sandpiper Habitat Analysis 2009 and 2010

Methods

Nesting and foraging areas were identified and mapped through GPS in 2009 and 2010 (Appendix E). A 50x50 meter grid overlay of all grassy areas at PSM was established. All mapped nesting and foraging areas were identified to the grid. Vegetation analysis was conducted at all identified areas in 2009 and 2010. Four plots were also analyzed at the Great Bay Wildlife Refuge weapons storage area in 2010. Data collected from the larger grid cell included the distance to the nearest barrier/field edge including vertical structure and nearest trees, the number of potential display perches within 400m of the grid center, the % of the grid that was mowed versus unmowed (to the nearest 5%), and the topography of the grid with a scale of 0 – 4 with 0 flat, 1 slight slope, 2 gradual up/down, 3 moderate and 4 steep.

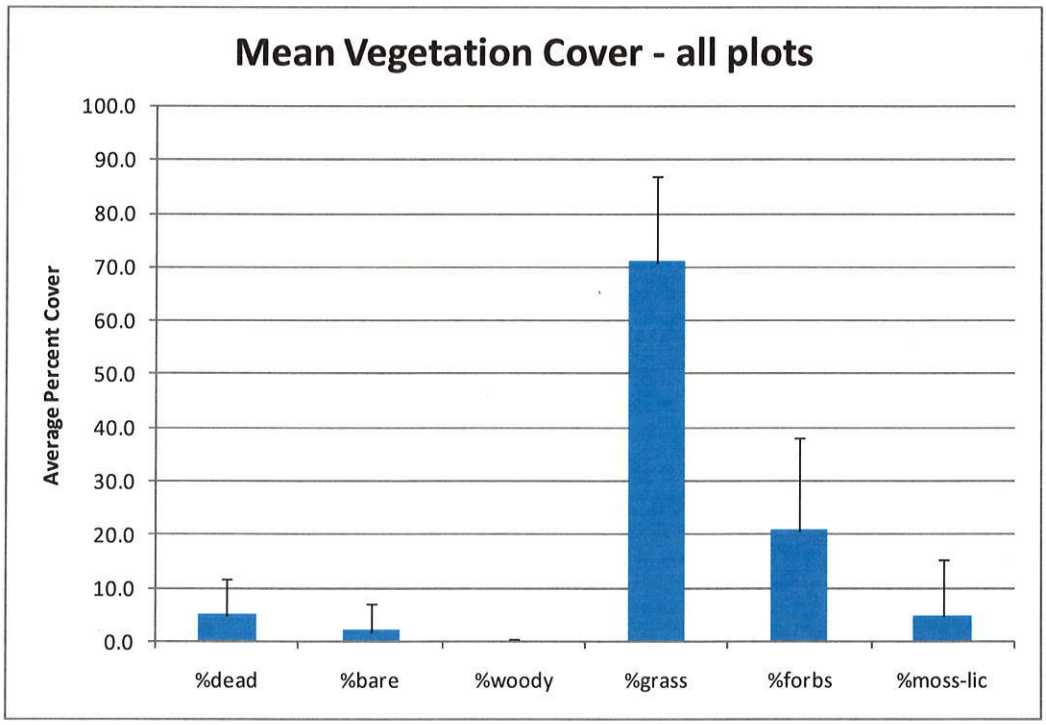
A modified circular plot method was used for the vegetation analysis at each mapped point. The plot was a 5 meter radius circle around the center of the grid (based on BBIRD methodology). Thirteen vegetation measurements were taken at each plot which included vegetation height at the center and the vegetation height at 1, 3 and 5 meters from the center of the plot in the four cardinal directions (N, S, E, and W). Vegetation height was measured to the top of the predominant/structural vegetation, not the maximum top of thin grass seed heads. The percent vegetation cover in each quarter of the circular plot (NW, NE, SE and SW – divided by cardinal lines) was estimated in 5% classes for grasses, forbs, moss/lichens, woody vegetation, dead or bare ground. A smaller subplot of 1 meter square, measured at 3 meters in each cardinal direction was used to determine the dominant 3 plant species in each plot. The dominant 3 plant species were identified in 5% classes. The number of dominant plant species was fewer if the percent coverage added up to 90% or greater and no other species was greater than 5% coverage.

Upland Sandpiper habitat data summary

The majority of plots were level (13 rated as flat, 16 with a slight slope) with only one plot gradually sloped and one moderately sloped. None were steeply sloped. For grassland species, trees or buildings can represent visual barriers that they avoid. The average distance to structures that represent a vertical "barrier" was 1665.81 meters (± 452.87 meters) The average distance to trees was 1061.29 meters (± 297.31 meters). Average number of perches within 400 m was 15 (±9).

Grass was the predominant vegetation cover on all plots, followed by forbs (Figure 1). The differences between foraging and nesting plots were only statistically significant for percent dead and bare cover but these make up such a small percentage of plot cover that they are not biologically significant.

Figure 1. Mean percent cover on Upland Sandpiper nesting and feeding plots at Pease International Tradeport in 2009 and 2010. Average values represent the mean of the plot means, n=31.



A minimum of 29 species was recorded on the plots (Table 1). Red fescue and little blue stem were by far the two most dominant species, both in percent cover (Figure 2) and the number of times they were recorded in the top three dominant species (Figure 3). The differences between foraging and nesting plots were only statistically significant for percent of dead cover (1.1% for feeding versus 9.8% for nesting; p=0.017).

Figure 2. Mean percent cover by species on Upland Sandpiper nesting and feeding plots at Pease International Tradeport in 2009 and 2010. Average values represent the mean of the plots means, n=31. Species with less than 2% mean cover were not included.

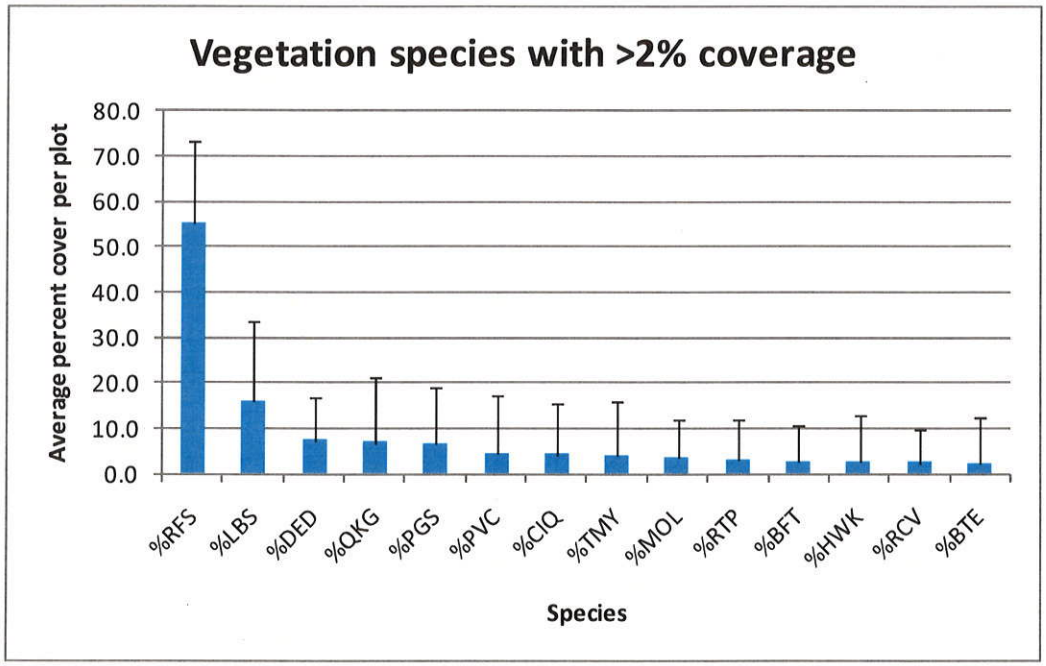
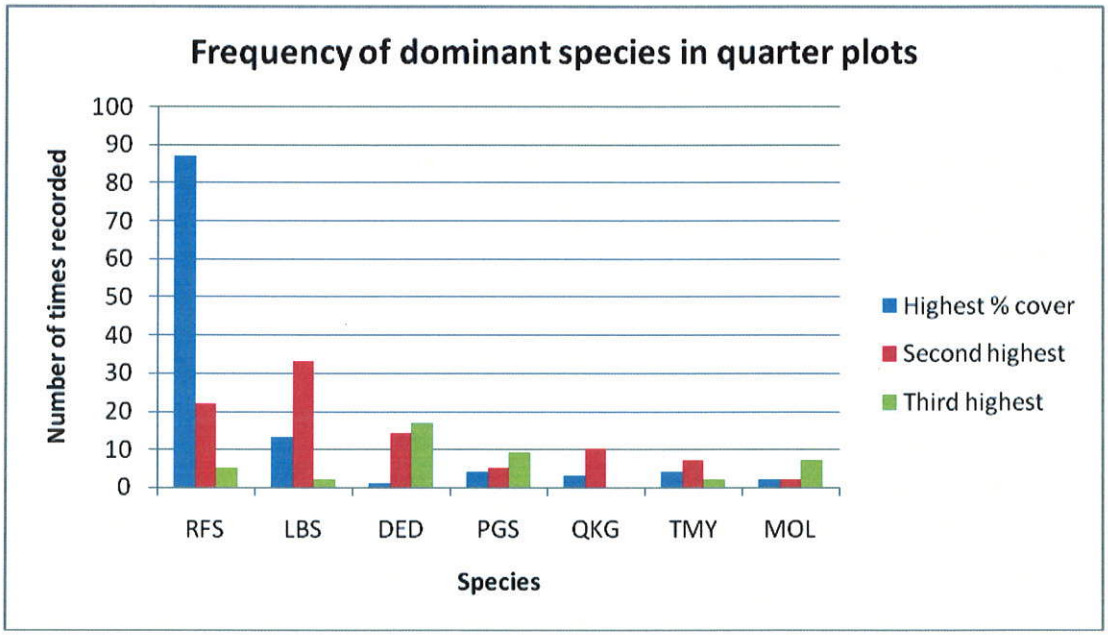
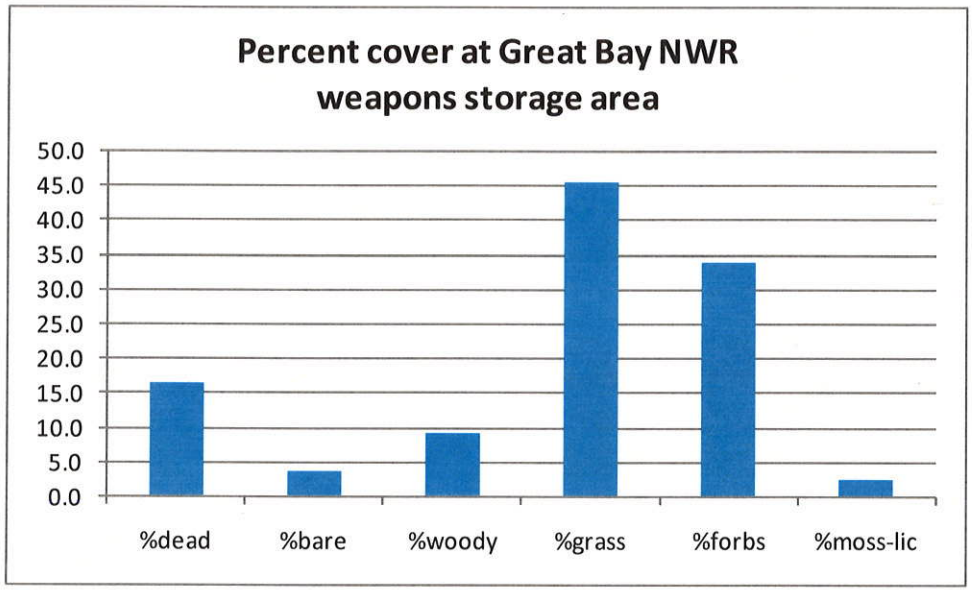


Figure 3. Frequency with which vegetation species were recorded in the top three by percent cover in quarter plots on Upland Sandpiper nesting and feeding plots at Pease International Tradeport in 2009 and 2010. Species with less than 10 occurrences in the top three were not included.



The Great Bay National Wildlife Refuge will need significant habitat work for the weapons storage area to be suitable for Upland Sandpipers. The upper section which was mowed in spring of 2010 has more woody vegetation, forbs, and dead sticks than the classic Pease habitat (Figure 4). These would have to be decreased and the percent of grass coverage increased to be attractive to Upland Sandpipers. The dominant species are red fescue (34.8% mean cover) and little blue stem (25.3% mean cover) so if given proper management these species could expand their coverage to something more attractive to Upland Sandpipers.

Figure 4. Mean percent cover on potential Upland Sandpiper habitat at Great Bay National Wildlife Refuge's weapons storage area 2010. Average values represent the mean of the plot means, n=4.



The area is primarily flat but buildings and trees are much closer (average of 124 feet and 77 feet respectively) which may present an additional obstacle for the birds at this location.

Table 1. Species recorded on vegetation plots at the Pease International Tradeport

Code	Name	Scientific Name
RFS	Red fescue	Festuca rubra
LBS	Little blue stem	Schizachyrium scoparium
QKG	Quack grass	Elymus repens
MOL	moss/lichen	
DED	dead	
BFT	Birds foot trefoil	Lotus corniculatus
RTP	Redtop, black bent	Agrostis gigantea
FPG	Few flowered panic grass	Dichanthelium oligosanthes
PGS	Panic grass species	Panicum species
TMY	Timothy	Phleum pratense
CBG	Crab Grass	Digitaria sanguinalis
PVC	Purple Vetch	Vicia cracca
BTE	Butter and Eggs	Linaria vulgaris
CIQ	Cinquefoil	Potentilla sp.
PRS	Pasture Rose	Rosa carolina
YAR	Yarrow	Achillea millefolium
RCV	Red Clover	Trifolium pratense
YCV	Yellow Clover	Trifolium aureum
SSR	Sheep Sorrel	Rumex acetosella
BBY	Blackberry	Rubus allegheniensis
HWK	Hawkweed	Hieracium caespitosum
PNK	Deptford pink	Dianthus armeria
GTB	Goat's Beard	Aruncus dioicus
GDR	Goldenrod	Solidago sp.
DWY	Dewberry	Rubus hispidus
BTC	Rabbit foot clover	Trifolium ravense
MKW	Milkweed	Asclepius syriaca
AMO	Autumn Olive	
DDN	Dandelion	Taraxacum officinale
SDG	Sedge	Sedge sp.
SBY	Strawberry	Fragaria virginiana

Recommendations for Management at Pease International Tradeport

Introduction

Portsmouth International Airport at Pease (PSM) is currently the only known nesting site for the state endangered Upland Sandpiper. As such, this site provides critical habitat for this species in NH. As an airport certificated by the Federal Aviation Administration (FAA), PSM must comply with regulations relating to managing hazards to aviation caused by wildlife. A recent FAA Cert Alert 06-07 entitled "Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports" highlighted the importance of reviewing the existing management agreement. NHFG is responsible for ensuring compliance with state laws regarding wildlife, including RSA 212-A: Endangered Species Conservation Act. PSM must also comply with state laws. It is in the best interest of NHFG and PSM to ensure that management of the habitat for the upland sandpiper does not attract wildlife that poses a hazard to aviation.

A Wildlife Hazard Assessment is being conducted at PSM and is scheduled to be completed in the fall of 2011. This assessment should help to determine management guidelines specific to PSM. The Wildlife Hazard Assessment coupled with the information generated in this two year study of the upland sandpipers at Pease will guide the development of a management plan that continues to provide nesting habitat for upland sandpipers in the Seacoast region but minimizes wildlife hazards on PSM.

Research that has been conducted on vegetation management at airports in the US, Canada and Europe highlight conflicting results as to the benefits of long vs. short grass management practices. Studies from the 1970's through 2010 suggest that the effect of vegetation management on airfields to bird usage and potential hazard to aircraft is still unclear (Blokpoel 1976, Dekker and Van der Zee 1996, Dekker and Van der Zee 2000, Dolbeer and Cleary 2000, Seamans, Barras et al 2007). A current three year study funded by the Department of Defense Legacy Fund (Kim Peters, et al 2010) recommends that further research involving experimental habitat manipulation is needed to fully understand the effects of vegetation management on airfield bird populations. In addition, all of the above researchers make the point that it is important for airfield bird management programs to use an integrated approach with all stakeholders part of the process. Cleary and Dolbeer (2005) in the FAA manual for Wildlife Hazard Management state that they do not provide general guidelines on grass height or vegetation type but encourage the development of a vegetation type and mowing schedule that is appropriate for the growing conditions and wildlife at each location.

Without the benefit of the results of the Wildlife Hazard Assessment or the NHFG interim report these management recommendations are all considered preliminary. Given the need to further study the long versus short grass management and the emerging consensus that management plans need to be specific to the growing conditions and

wildlife at each airport location, the following three options for upland sandpiper management at PSM are presented.

The following goals form the basis of the management options:

Goal #1: Avoid UPSA take
It is unrealistic to expect that UPSA will not return to Pease, even if adjacent habitat is available.

Goal #2: Minimize the need for management and impact to the airfield from upland sandpipers.

During a typical nesting season, upland sandpipers return to Pease at the end of April, nest in May, hatch by mid-June, and the chicks are flying by mid-July. Disturbance of upland sandpipers during nesting causes them to move and re-nest, extending the nesting season, and thus the management and monitoring activity, through the end of August. To prevent this it is most efficient to provide a mechanism whereby upland sandpipers can conduct a normal nesting cycle without disturbance.

Keep grass short once mowed or birds will re-settle in those areas, requiring monitoring and management. If it is too long between mowing it extends the nesting season

Goal #3: Minimal monitoring and disturbance to upland sandpipers
Monitoring needs to be manageable on a yearly basis.
Evaluate the time and personnel needed for nest drags.
Monitoring could be based on behavioral observations with buffers set up so that nest searches are not required

Goal #4: Consistent and manageable mowing regime
Allow for priority areas to be kept short. Safety areas must be mowed early and frequently through the UPSA breeding season.

Goal #5: Create UPSA habitat off the airfield
This goal needs to be incorporated in each option so as to maximize the potential for upland sandpiper breeding off the airfield.

Option 1

- Mow Safety areas immediately and keep at 4" or less
- Leave all other areas un-mowed until August 21

Justification

- Lowest cost
- Minimal/no time needed for management and monitoring
- Most feasible mowing schedule
- Allows priority to be given to safety areas so the airport remains in compliance

- This was the previous management option that was successful for many years with the military base.
- Keeping Safety areas consistently short will discourage UPSA use of those areas.
- Small birds that eat grass and weed seeds are less common in longer grass. Waiting until August 21 to mow can avoid concentrations of seed-eating birds by lessening seed dispersal. Large flocks of swallows are typically peak at Pease from July 21 through August 5-10 and will gather to feed on insects flushed by the mower. This can be avoided by waiting until the majority of swallows are gone – typically around August 15. The grass does not grow after August 1 and is typically brown and brittle.
- Least disturbance to UPSAs
- Based on studies that found that tall grass management deterred species hazardous to aircraft.

Resources needed

Yearly monitoring

Option 2

- Buffer past nest activity areas and leave un-mowed until August 1
- Mow Safety areas immediately and keep at 4" or less
- Leave 50 m buffer from center of wet area until August 21

Justification

- Low cost
- Keeping Safety areas consistently short will discourage UPSA use of those areas.
- Three years of GPS nest site data and many years of past observations indicate that UPSA nest in the same areas year after year if they are not displaced by disturbance (mowing, construction, etc.).
- It is unnecessary to mow wet areas until it is adequately dry.
- Allows most of the airfield to be mowed

Resources needed

- Monitoring to evaluate UPSA nesting in buffered areas
- Increased mowing needs from Option 1
- Less management and monitoring time than Option 3
- Map of buffered areas

Option 3

- Identify UPSA activity areas in late April-early May and mark a 50x50 meter no-mowing buffer around potential nesting areas.
- Mow Safety areas immediately and keep at 4" or less
- Wait to mow infield areas until grass is 6-12" (typically the end of May)
- Leave west side of Lowry Lane un-mowed until August 21.

- Install flushing bars on mower and raise mower deck to 8"
- Mower operators watch for birds flushing from nest site and mark a no-mowing 50x50 meter buffer around nest

Justification

- Recommended grass height at airports is 6-12". Waiting to mow infields until the grass is this high will allow UPSA potential nest areas to be buffered and avoid nest destruction, which causes the birds to move to other areas and extends the nesting season, requiring additional monitoring and management.
- Keeping Safety areas consistently short will discourage UPSA use of those areas.
- Allows most of the airfield to be mowed

Resources needed

Most time intensive option

- Highest cost option
- Intense monitoring early in the season to identify activity areas and continual monitoring during the nesting season
- Increased mowing needs from Option 1
- Train mower operators to recognize UPSA

Miscellaneous Bird Control

- Remove old buildings that European Starlings nest in
- Cut hedgerow along the west side border with golf course where birds roost.
- Monitor any nesting in hangars or on top of navigation or light structures.

Alternate Sites

Great Bay NWR

Most likely areas:

Weapons Storage Area

Thomas Field

Management – long term, intensive effort will be needed

Not realistic to expect that quality habitat will be there in the next 2-3 years.

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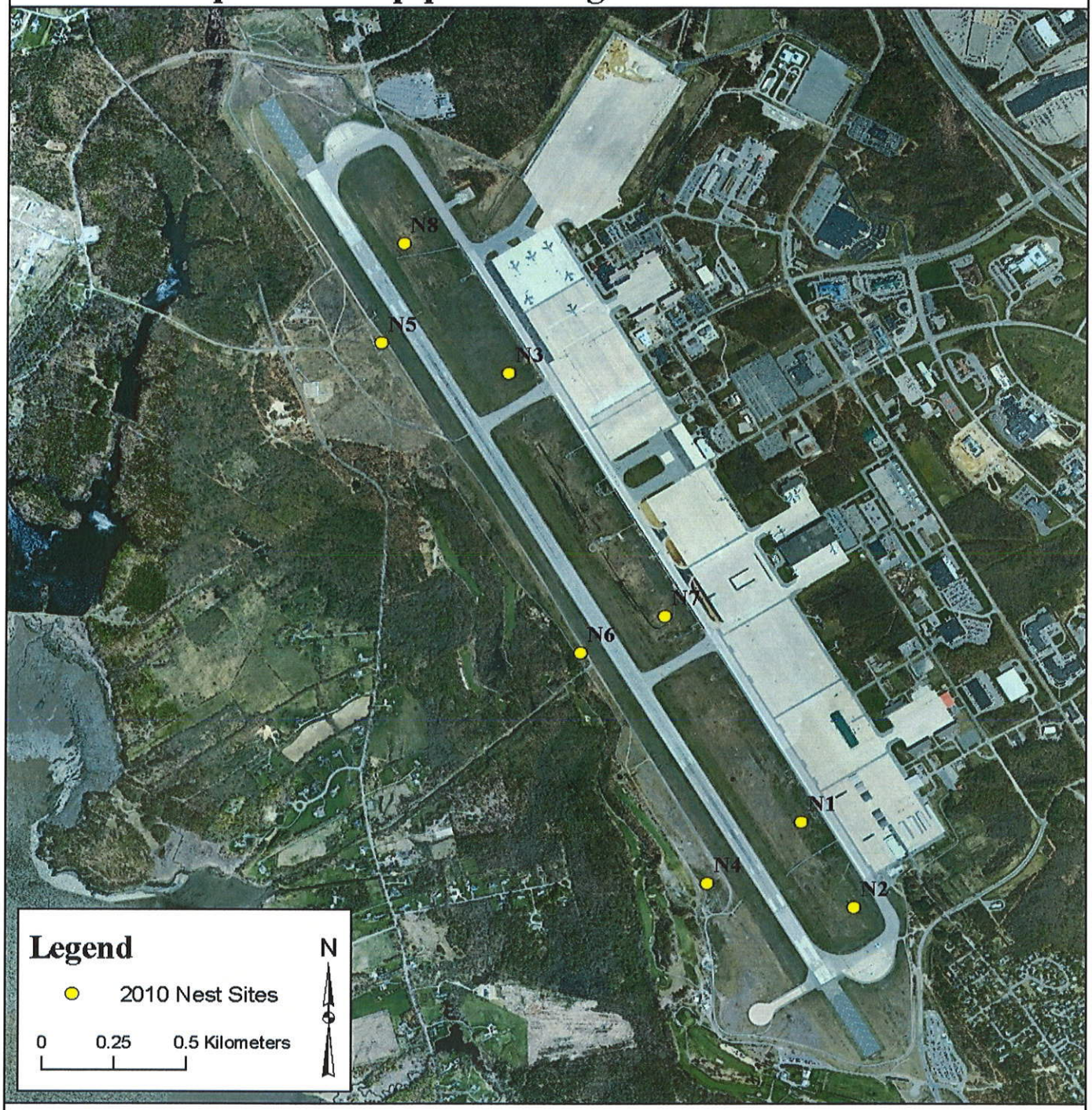
APPENDIX A
Upland Sandpiper Nesting Areas 2009 and 2010

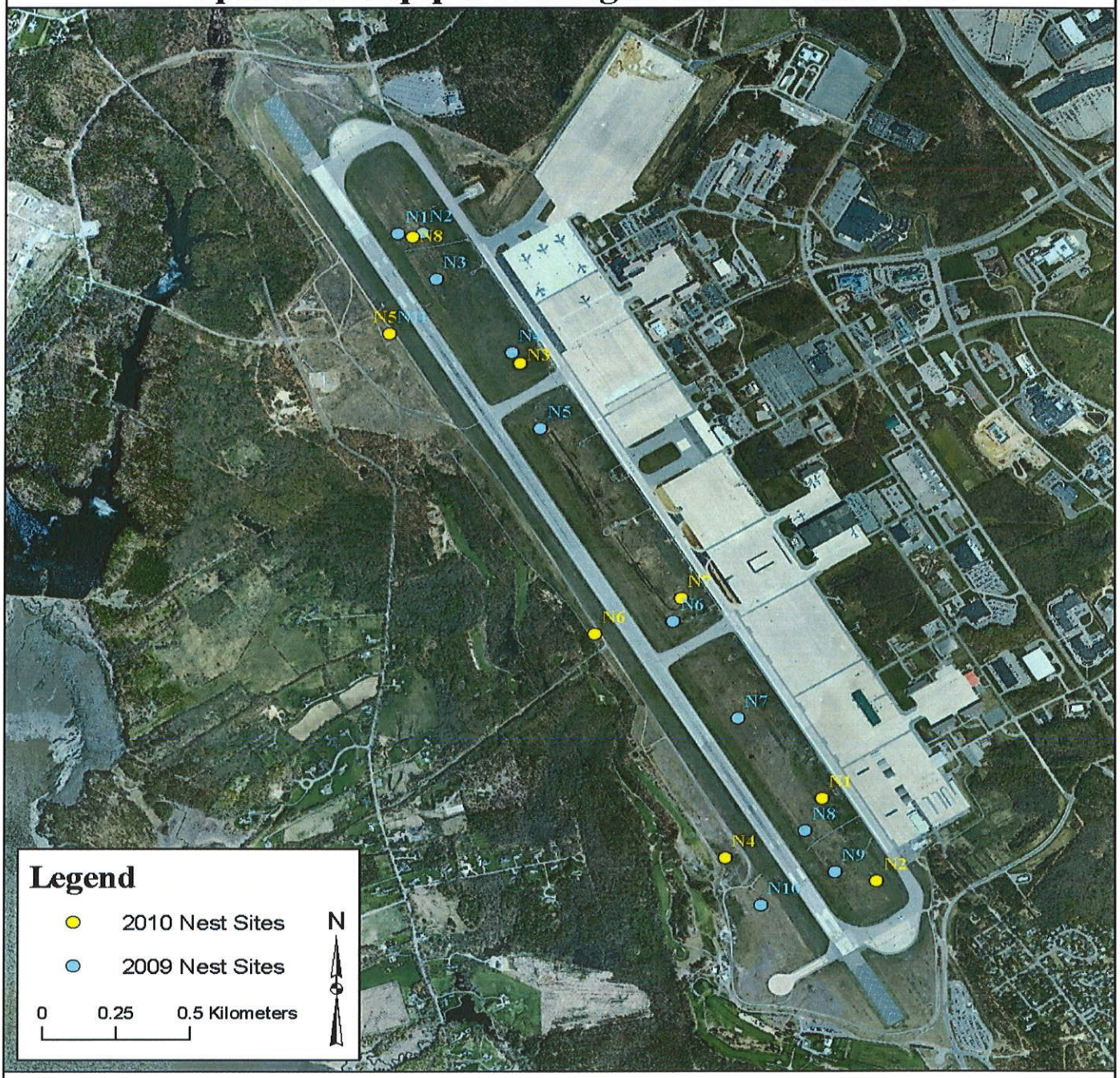


N.H. AUDUBON

Figure 1. Upland sandpiper 2010 nest sites

Map created by NH Audubon
September 2010
2006 Aerial Image (NH GRANIT)

APPENDIX A
Upland Sandpiper Nesting Areas 2009 and 2010



N.H. AUDUBON

Figure 2. Upland sandpiper 2009 and 2010 nest sites

Map created by NH Audubon
September 2010
2006 Aerial Image (NH GRANIT)

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