

# **Status of Grassland and Heathland Birds at Cape Cod National Seashore, Massachusetts**

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and  
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## ABSTRACT

The grasshopper sparrow (*Ammodromus savannarum*) and the vesper sparrow (*Pooecetes gramineus*) are grassland and heathland dependant bird species undergoing population declines throughout the Northeastern United States. They are currently listed as Threatened Species by the Commonwealth of Massachusetts, and are similarly listed by other states in the region. Their decline is the result of habitat loss due to a number of factors. One component of habitat loss is the succession of agrarian landscapes back to their pre-colonial, forested condition. A second component is the loss and fragmentation of naturally-occurring grassland and heathland habitats to development and modern fire suppression. Thus, while the initial decline of these species represents a decline from an anthropogenically enhanced peak, since there is ample evidence that populations of these species were present at the time of European colonization, total decline would represent extirpation of a native species.

In a mid-1990's survey of Massachusetts grassland/heathland birds, Cape Cod National Seashore was found to have a significant nesting population of vesper sparrow, accounting for 25% of the state total. A repeat of this survey was conducted in 2000 at Cape Cod National Seashore.

Whereas 34 singing males were recorded from four sites in the mid-1990's, a total of 17 were recorded from two sites in 2000. Grasshopper sparrow was not observed, and may be extirpated from the park. While not quantified, the Massachusetts Threatened Northern Harrier (*Circus cyaneus*), was frequently observed, and nesting confirmed. This survey indicates that, while Cape Cod National Seashore continues to support regionally significant populations of grassland/heathland birds, their decline continues.

## INTRODUCTION

Grasshopper sparrow and Vesper sparrow are listed as Threatened Species by the Commonwealth of Massachusetts (Frey 1996). They occur in dry fields of short clumping grasses mixed with forbs, with up to 40% sandy/bare ground, and a scattering of small bushes or other woody vegetation (Vickery 1990, Veit and Petersen 1993, Swanson 1996, Bent 1968, Forbush 1929). Their respective use of this habitat however, is distinct. Both forage primarily in the areas with very sparse vegetation and bare ground, but Vesper sparrows seek out the patches of forbs and vertical vegetation to hide their nests, while Grasshopper sparrows usually establish their territories away from forbs (Swanson 1996). Vesper sparrows utilize woody vegetation for singing and courting, while Grasshopper sparrows keep their courtship rituals hidden within the grass (Swanson 1996, Bent 1968, Forbush 1929).

The use of woody vegetation by the Vesper sparrow, and evidence that the bird may enter adjacent wooded areas up to 50-60 yards (Bent 1968) may account for its greater tolerance to grassland habitat fragmentation. Grasshopper sparrows are more sensitive to the total area of the grassland. They prefer tracts larger than 100 ha, and usually are not found in areas less than 30 ha, while Vesper sparrows can occur in grasslands as small as 20 ha (Vickery et al 1994). Their respective concentration on these fields during the breeding season differs as well. Vesper Sparrows have a larger territory size, seldom exhibit flocking behavior, and are consequently more sparsely located across the grassland (Forbush 1929, Bent 1968, Jones and Vickery 1997), whereas Grasshopper sparrows nest in semicolonial breeding groups of 3-12 pairs (Erlich et al. 1988).

Although Grasshopper sparrows nest in large numbers, they are easily overlooked. They stay hidden in the depths of the grasses, running along the ground like rodents, only rarely flying, usually when nearly trampled upon. At the end of May, the first arrivals of this late migrant sing primarily early in the morning until other migrants arrive and territorial activity escalates into the afternoon and even into the night (Bent 1968, Forbush 1929). Usually laying double clutches, they can be heard in their territories through mid August (Vickery 1990). Although their song is persistent, it is as cryptic as their behavior, resembling that of a grasshopper, and is often

overlooked even by birders (Bent 1968, Forbush 1929). Their song also can be, and has been, confused with the Savannah sparrow's (Vickery 1990).

Conversely, Vesper sparrows are more conspicuous, with their white outer tail feathers providing an excellent identifying field mark as they fly away from their frequent dust baths on dirt roads. Their song is resonant especially early in the morning, or on calm evenings following a rain. This sparrow is an early migrant and can be heard as it arrives in late April and lays its first clutch by mid May and again after mid June through its second clutch as late as August (Bent 1968, Vickery 1995). However, like the Grasshopper sparrow, it can also be overlooked because of its sparse distribution on the landscape and its song, which closely resembles the Song sparrow's (Bent 1968, Forbush 1929).

## **HISTORICAL STATUS AND DISTRIBUTION**

The occurrence of grassland and heathland birds in New England is the product of conditions that existed prior to European contact here, as well as landscape changes wrought by European settlement. It is clear that historical European settlement, through extensive forest clearing, agricultural practices, and grazing, expanded open habitat for grassland birds. This allowed some species, such as Horned Larks, to expand their range from the mid-west to New England. Other species, likely already present in New England, expanded their range and numbers at the regional level. Grassland generalists, such as Savannah Sparrows and Bobolinks benefited the most in this agrarian landscape, whereas grassland specialists, including the Vesper Sparrow, made only limited use of the anthropogenic habitats (Vickery and Dunwiddie 1997, Askins 1997). Along the Cape Cod coastline, forest clearing allowed heathlands to expand and persist with the aid of salt spray to prevent quick succession (Vickery and Dunwiddie 1997).

Though the activity of Europeans increased grassland and heathland habitat, there is also considerable evidence from paleological records that heath and grasslands were present before forest clearing, as part of the native vegetation mosaic controlled by fire and natural hydrological changes (Vickery and Dunwiddie 1997). There are many widespread accounts by pre-settlement explorers describing open grasslands, meadows, and heaths, some apparently the

result of fires set by native Americans. Moreover, the Heath Hen, a once-widespread and abundant sub-species of the Greater Prairie Chicken endemic to New England and the Northeast, could not have evolved in the short time since European contact. The last population persisted on Martha's Vineyard and went extinct in 1932. The only reasonable explanation for its existence is that grasslands and heathlands were a part of the landscape of New England and Cape Cod long before the arrival of European settlers. Moreover, other eastern grassland birds, such as Upland sandpiper, Grasshopper sparrow, Bobolink, and Eastern Meadowlark were also likely part of the native, pre-European contact fauna of New England (Askins 1997, Vickery and Dunwiddie 1997). Thus, these birds and the habitats that support them are part of the natural history of Cape Cod and New England.

## **CURRENT STATUS AND DISTRIBUTION**

Grassland habitat in New England and New York has declined by 60% during the past 60 years, as a result of abandoned agriculture, succession, and more recent development (US Dept. of Agriculture, cited in Vickery et al. 1997, Askins 1993). Concurrent with this loss of native and anthropogenic grasslands has been a decline in grassland-dependent species, such that grassland birds now constitute a disproportionate number of State-Listed Endangered, Threatened, and Special Concern species (Vickery 1992). With habitat disappearing, the Grasshopper and Vesper sparrows are now regionally jeopardized (Vickery et al. 1997). Due to concern over their declining numbers, the Massachusetts Audubon Society conducted a regional (i. e. New York and New England) survey of grassland birds during the 1997 breeding season. Both Vesper and Grasshopper sparrows were considered very uncommon, detected in <15% of points surveyed. Of the seven states surveyed, Massachusetts was second to Maine in numbers of Vesper Sparrows, and was also important for Grasshopper sparrows (Shriver et al. 1997).

Although Massachusetts plays a major role in the regional maintenance of grassland birds, grasslands in this state have met the same fate as those of the Northeast region. Grassland birds are now generally reduced to nesting in airports, small remnant hayfields and pasture meadows (Jones and Vickery 1997). The remaining significant grassland habitat is found mainly in the Connecticut River Valley and the coastal sandplains of Cape Cod, which includes the islands of



Martha's Vineyard, Nantucket, and the Elizabeth Islands (Shriver et al. 1997, Jones and Vickery 1997). The status of Grasshopper and Vesper sparrow in Massachusetts was determined in an intensive statewide survey conducted from 1993 to 1995. Grasshopper sparrows were found to be in a major longterm decline across the state, with 75% of the detected birds found at only 2 areas; Westover Air Base in Chicopee and Nashawena Island (Jones and Vickery 1997). Vesper Sparrows were found to be widely distributed, but in small numbers across the state (Jones and Vickery 1997).

Based on the statewide surveys, Cape Cod, with its expanses of heathlands and coastal sandplains, emerges as important in the regional survival of these grassland- nesting birds. Grasshopper Sparrows are rare and local nesters on the Cape, confirmed only at the Crane Wildlife Management Area in Falmouth, and Otis Air Force Base (Veit and Petersen 1993). Though it once occurred here, breeding Grasshopper Sparrows have not been recorded recently on Cape Cod National Seashore or the Outer Cape. In 1963, at least 10 pairs nested at Fort Hill, with scattered pairs in Truro and Wellfleet (Bailey 1968). In 1965 their distribution was recorded in suitable habitat over the entire Cape out to North Truro, although numbers indicated decline since the 1930's (Hill 1965). Grasshopper Sparrows are secretive birds with a cryptic call that could be easily overlooked (Bailey 1968, Bent 1968, Forbush 1929). The habitat of these sparrows is also transitory, and loose colonies of the birds tend to appear and disappear abruptly (Veit and Petersen 1993, Bailey 1968).

Vesper Sparrows are also rare and local nesters on Cape Cod (Veit and Petersen 1993). In 1965 they were recorded as scattered pairs of about 20 in Chatham-Orleans and 20-25 in North Truro, but they had been decreasing in numbers since the 1930's, paralleling the eastward extension of the forest (Hill 1965). In the recent Massachusetts grassland bird survey, Cape Cod National Seashore was found to have significant nesting habitat for these birds, accounting for 25% (34 of 132) of all Vesper Sparrows recorded statewide. Important areas were the sand dunes that run from Provincetown to Truro, Provincetown Airport, Marconi Barrens in Wellfleet, and Griffin's Island in Wellfleet (Massachusetts Audubon Society 1995, Jones and Vickery 1997). Not only are populations of these sparrows declining, but ironically most of their primary habitat is now dependent on human intervention for its creation and maintenance (Shriver et al. 1997). Such

dependence on human intervention, however, is fairly recent, and is largely the result of modern fire suppression efforts. Of the coastal grassland /heathland habitat in Cape Cod National Seashore, 450 ha (62%) of heathland have disappeared between 1962-1985 (Carlson et al. 1992). This loss of habitat seems to be increasing in rate due to the encroachment of pitch pine and scrub oak. Management options suggested by Carlson et al. (1992) include no action, burning, mowing, clipping followed by herbicide treatment, and grazing. "No action" is the management option that has led to the observed succession from heathland to forest over the past 30 years. Heathlands are relatively rare in the United States, and are mentioned in the General Management Plan for Cape Cod National Seashore as important plant communities to be preserved (NPS 1996). Several heathland plants are endemic, rare or endangered species (Carlson et al. 1992).

## **SURVEY PURPOSE**

Given the documented declines in grassland birds and their habitats at the regional, state, and local level, and the documented importance of Cape Cod National Seashore for supporting populations of some grassland dependant bird species, this survey was undertaken to provide an update on the distribution and abundance of grassland/heathland birds at Cape Cod National Seashore.

## **METHODS**

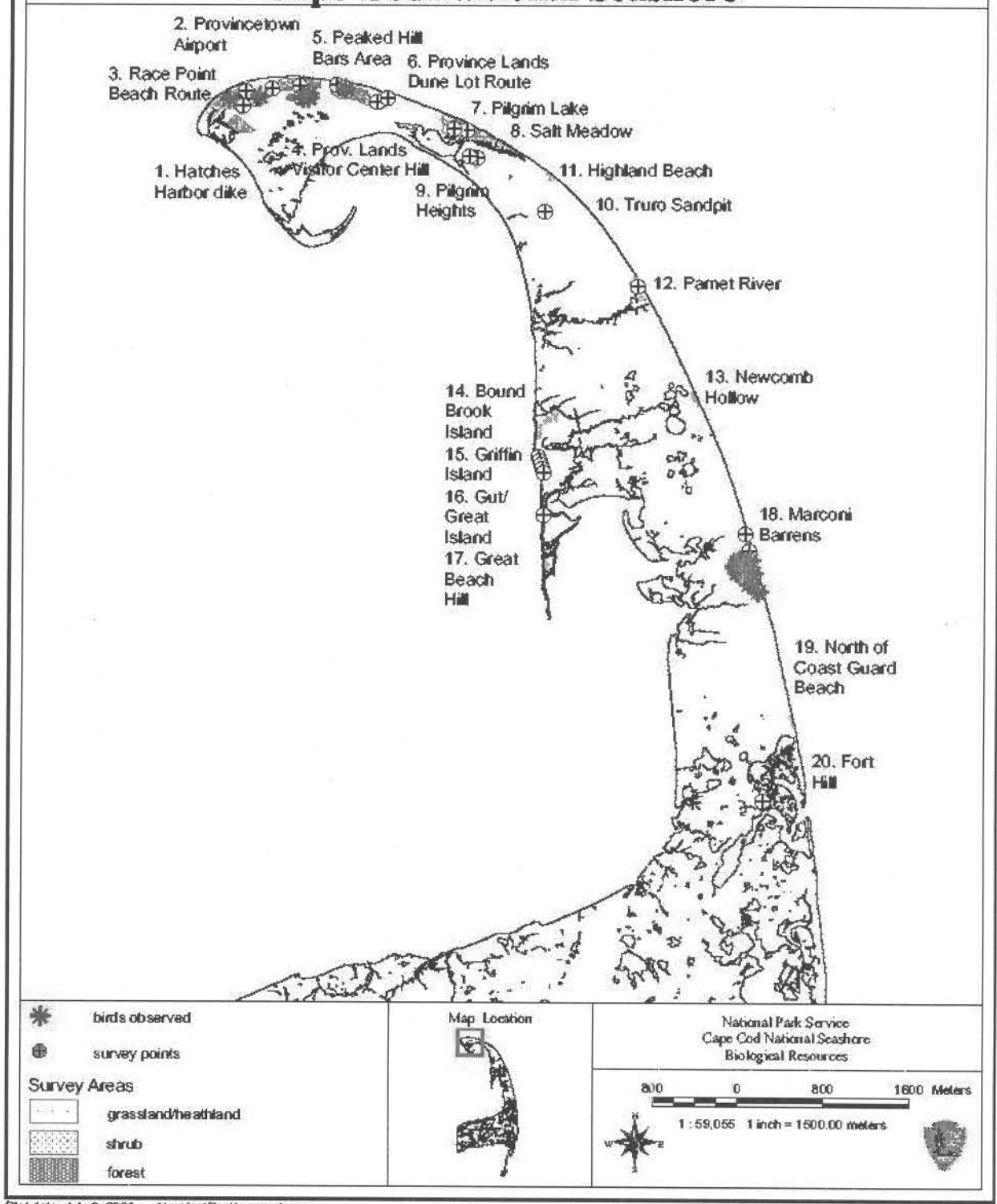
Between April 20 and August 10, 2000, 13 heathland/grassland areas were surveyed within Cape Cod National Seashore for grassland birds (Figures 1-7). These areas were chosen based on examination of aerial photographs and vegetation maps from 1991, were previously identified as persistent heathland locations (Carlson et al. 1992), or were surveyed previously for grassland birds (Massachusetts Audubon Society 1995). Areas in the Province Lands Dunes included the entire dune system extending from Provincetown to Truro, and were separated into sub-areas for record keeping purposes (Table 1).

Initial reconnaissance was conducted by walking transects through the areas. Where multiple transects through an area were necessary, transects were spaced approximately 100m apart.

Beginning on May 4, 2000, callback surveys using tape recordings of Vesper Sparrow, Eastern Meadowlark, and Savannah Sparrow were used at approximately 200m intervals to increase these species' detectability (Vickery 1995). All 13 areas were visited at least once between May 4 and July 18, 2000 (Table 2) to assess their potential as grassland bird habitat and select areas for point counts. Five areas were rejected based on subjective vegetation observations. Highland Beach, Great Beach Hill, Newcomb Hollow, and North of Coast Guard Beach were rejected because habitat was primarily beach grass and was very narrow. The Bound Brook area was also rejected because it had complete ground cover, thick leaf litter, and encroaching pitch pine.

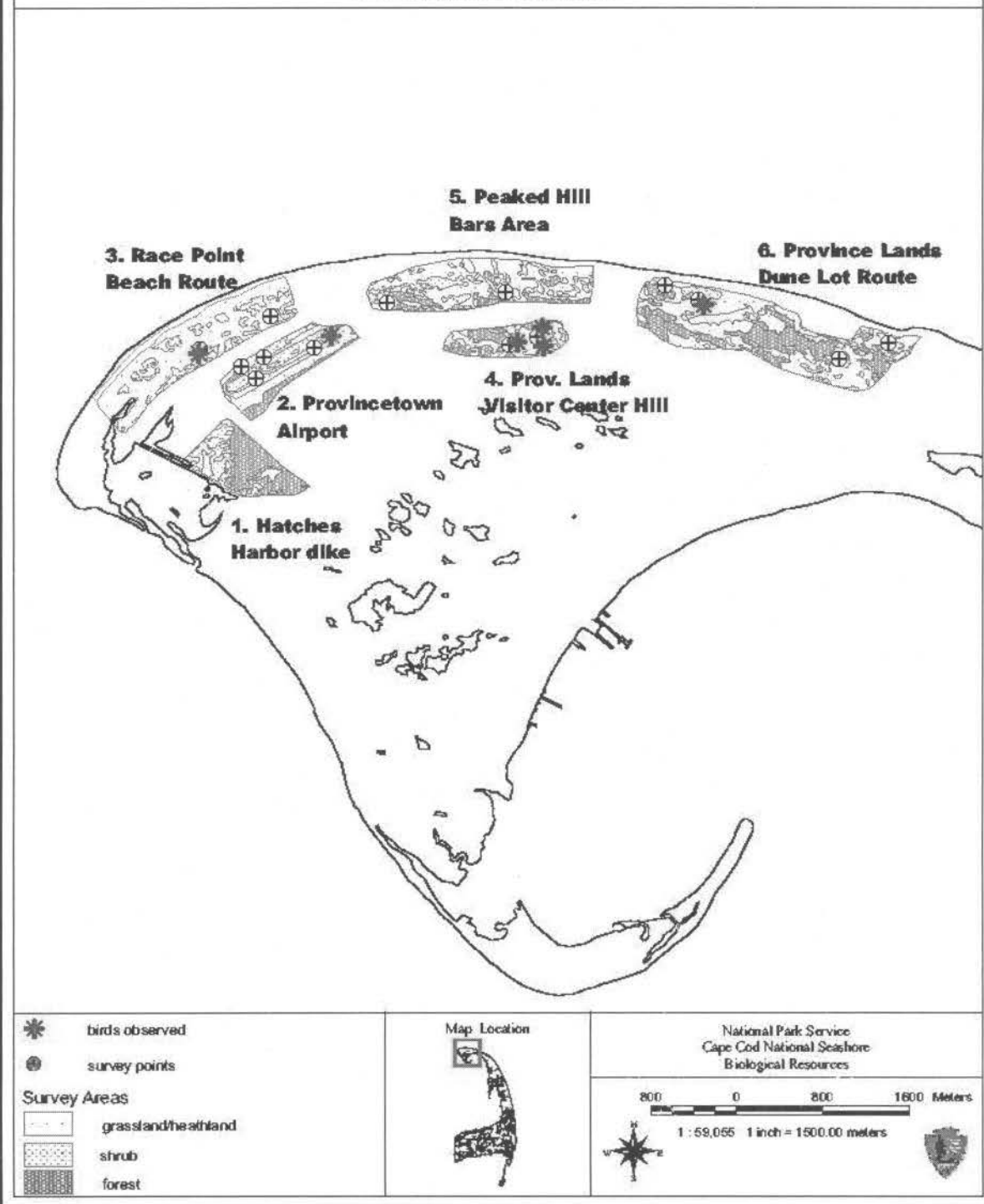
A total of 36 points for callback surveys were established at the remaining eight areas, which included all areas previously surveyed for grassland birds. Points at the Provincetown Airport and Griffin Island were previously used in surveys conducted by Massachusetts Audubon Society, and all other points were located in the center of areas subjectively determined as potential Vesper sparrow habitat. Points were visited on two separate dates, between the hours of sunrise and 1100. Birds were observed in silence for 5 minutes for Massachusetts Audubon Society regional survey data, and the callback tape was used after this silent observation. All birds detected were recorded to determine the presence of other uncommon species such as Northern Harriers, Horned Larks, American Kestrels, and Short-eared owls (Shriver et al. 1997). Although all grassland species observed were recorded, effort was focused on Vesper Sparrows, since the presence of Grasshopper sparrows seemed improbable. Where Vesper Sparrows were observed, the birds were followed to the edges of their territories (Reed 1985) in order to determine a more accurate number of individuals in the area. (See Appendix 1 for details of area visits).

**Figure 1. Overview of grassland bird survey areas (2000)  
Cape Cod National Seashore**



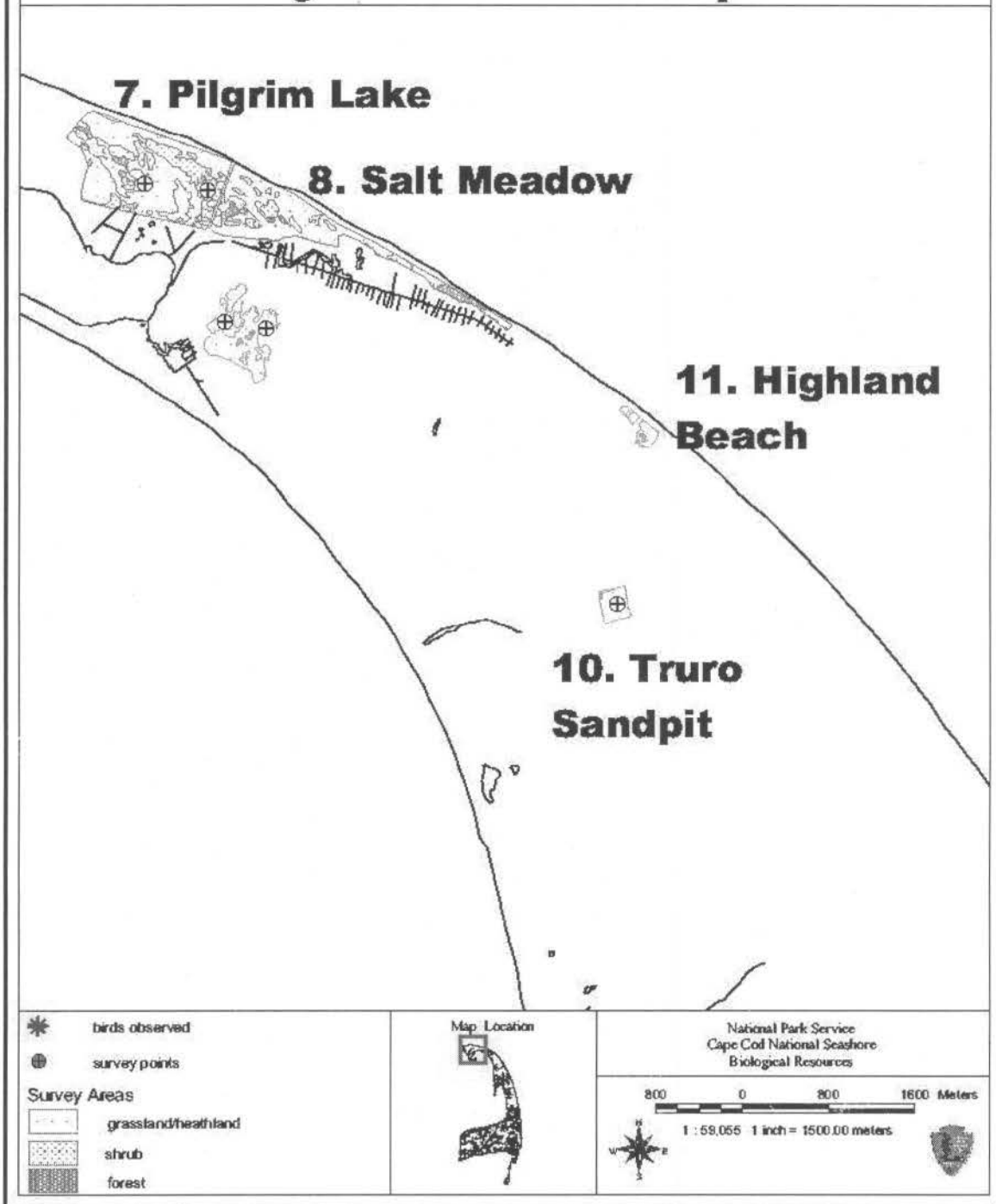
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**Figure 2: Grassland bird survey areas (2000)  
Province Lands**



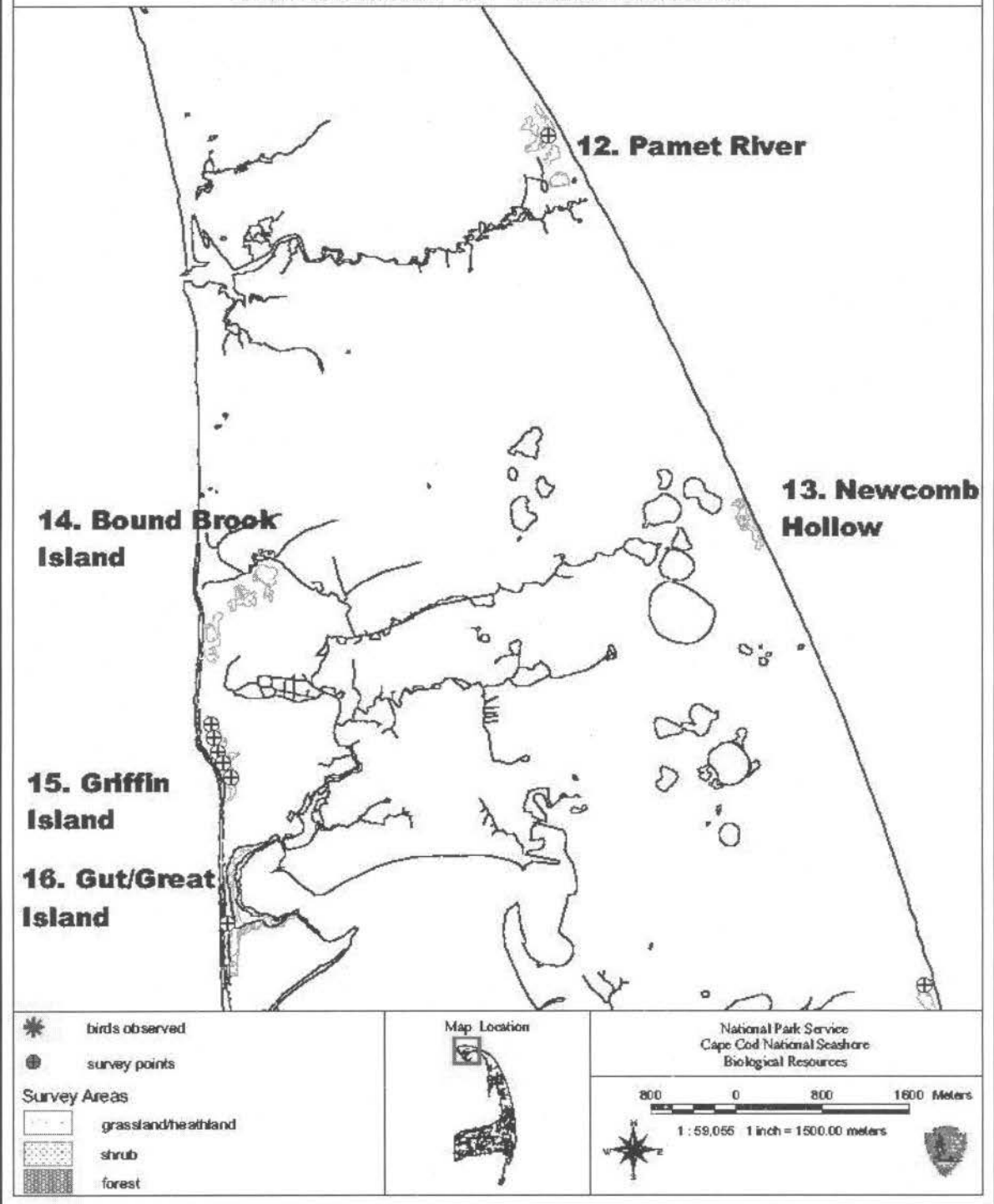
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**Figure 3. Grassland bird survey areas (2000)  
Pilgrim Lake to Truro Sandpit**



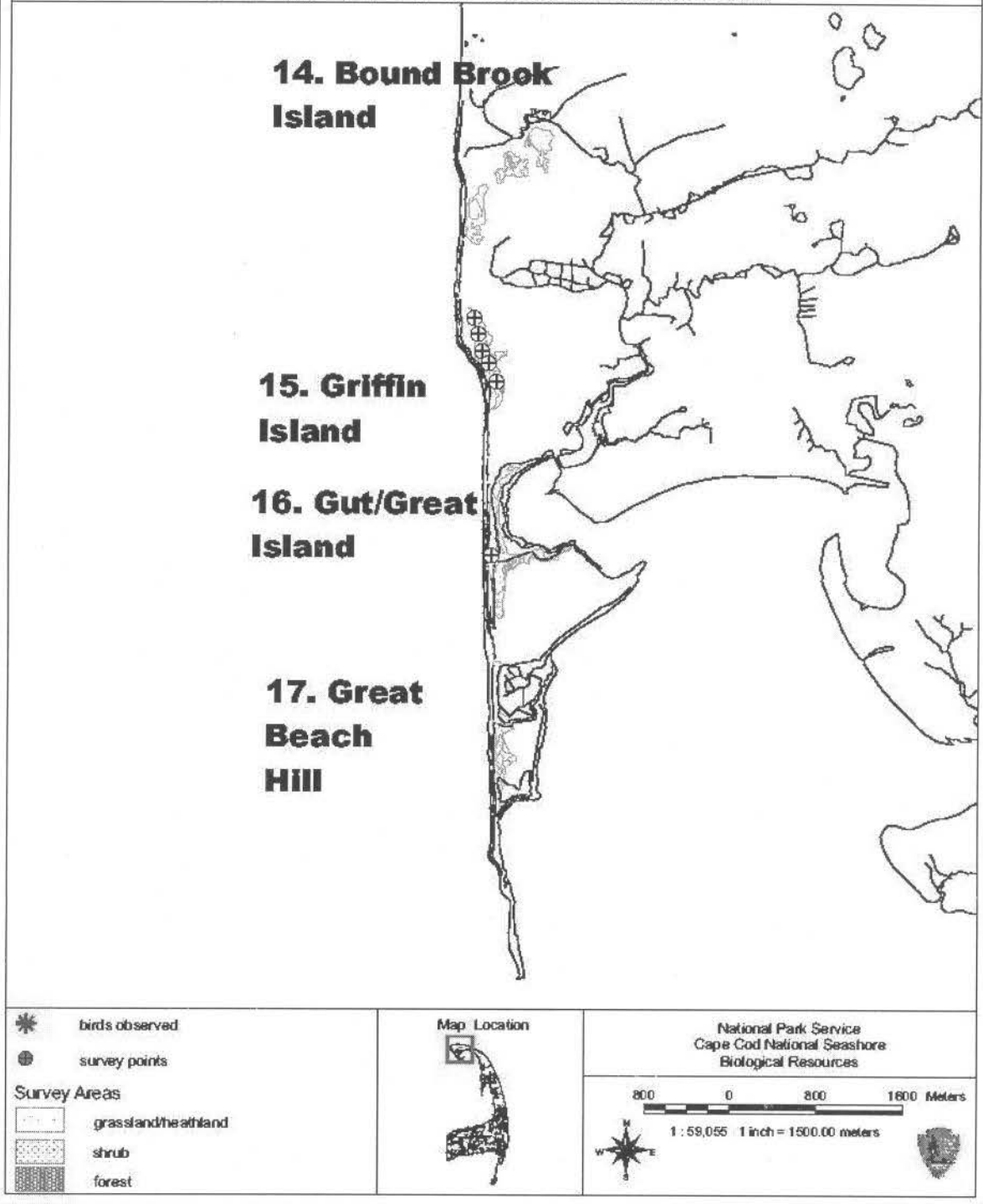
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**Figure 4. Grassland bird survey areas (2000)  
Pamet River to Griffin Island**



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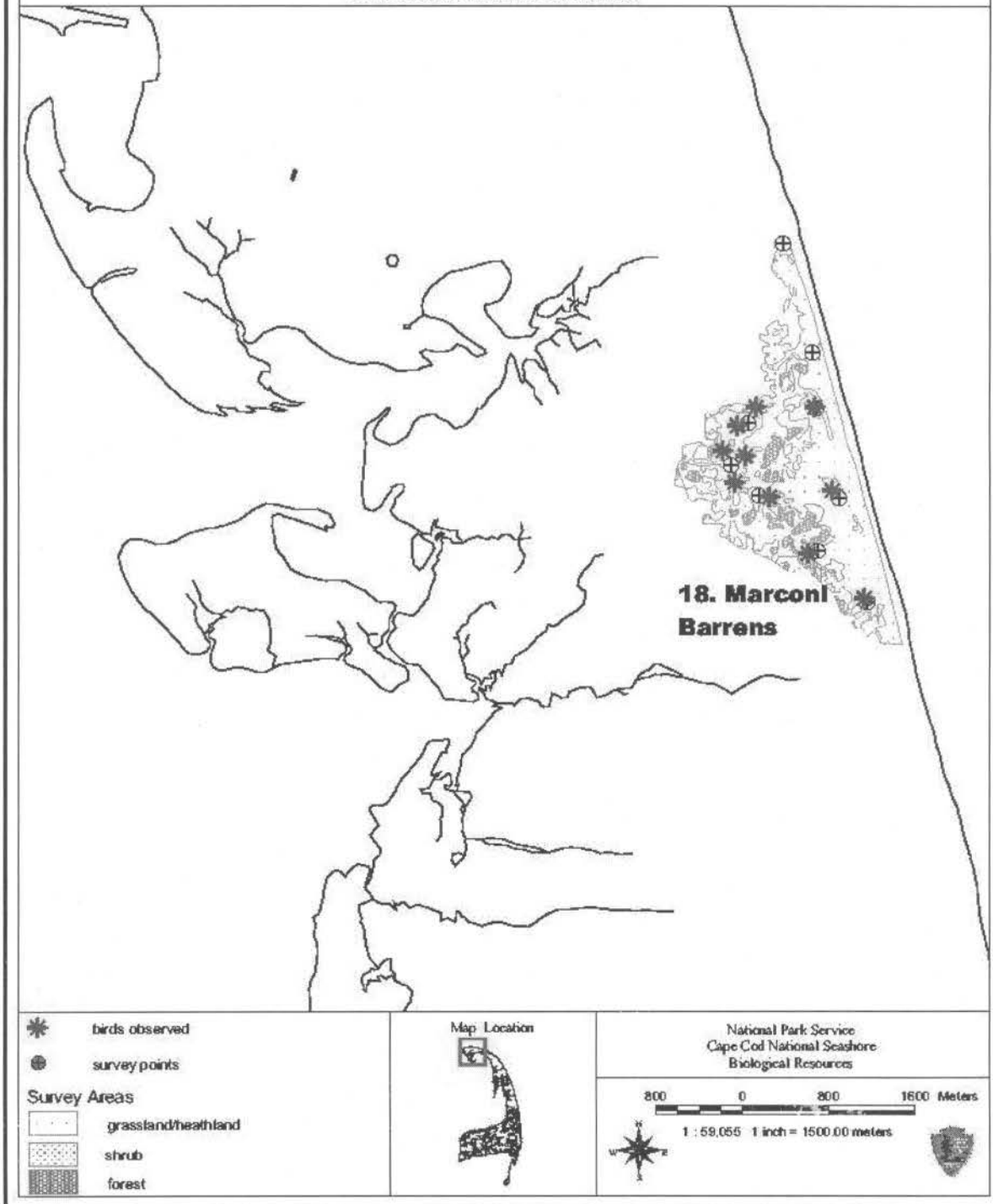
**Figure 5. Grassland bird survey areas (2000)  
Griffin Island to Great Beach Hill**



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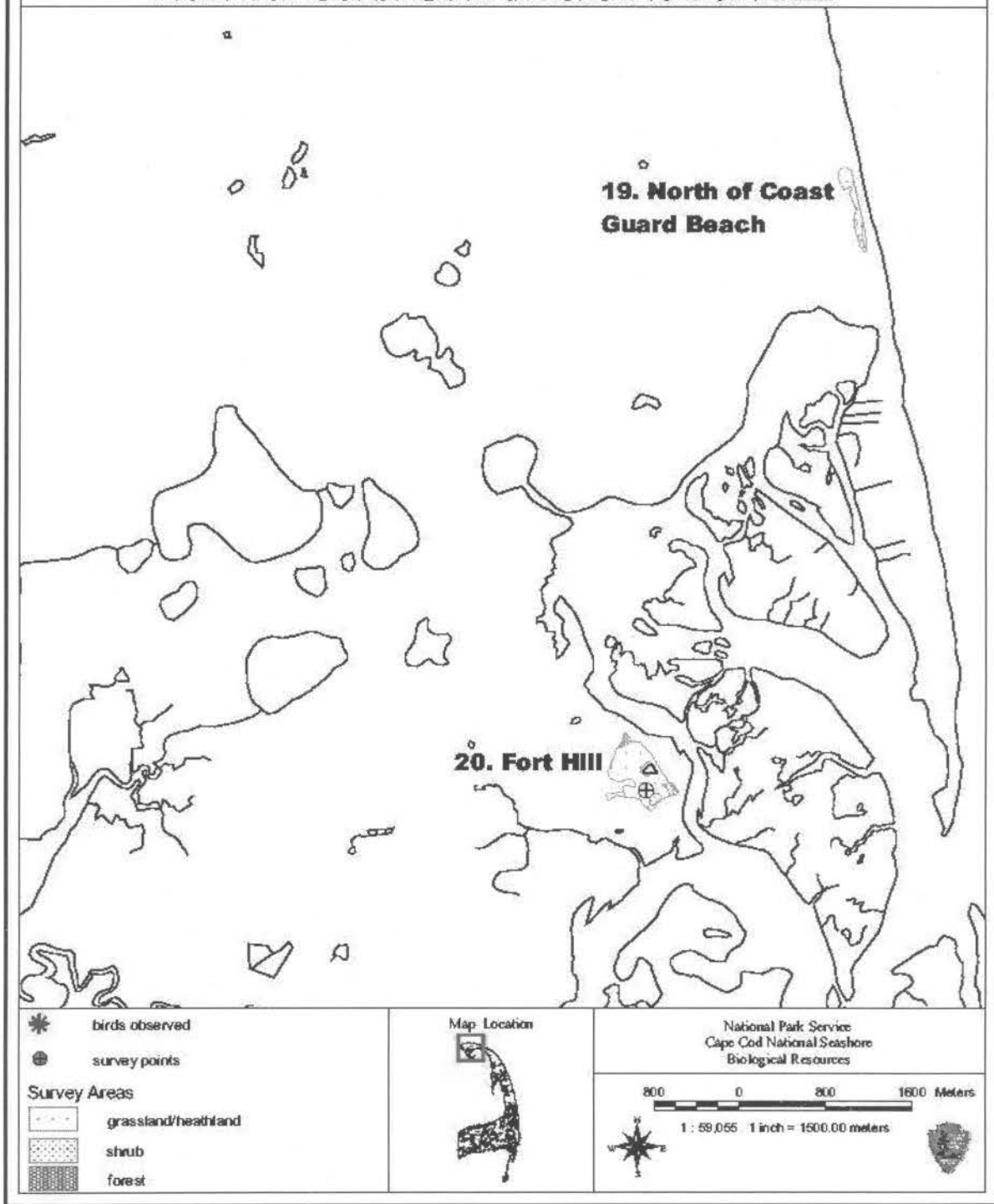


**Figure 6. Grassland bird survey areas (2000)  
Marconi Barrens**



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**Figure 7. Grassland bird survey areas (2000)  
North of Coast Guard Beach to Fort Hill**



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Table 1. Habitat characteristics at areas surveyed for grassland/heathland birds in 2000. Habitat data from 1991 Cape Cod National seashore vegetation map. Classification from Carlson et al. 1992.

Area	Sub-Area	Size (ha)	Bear berry	Hair grass	Beach grass	Mixed grass	Other	Classification
Province Lands Dunes		396.3						Beachgrass Dunes, Arcto, Arcto/Huds
	1. Hatches Harbor Dike	12.2		43%	14%		42%	
	2. Provincetown Airport	29.3	1%	3%	61%		35%	
	3. Race Point Beach Route	92.2			73%		27%	
	4. Province Lands VC Hill	21.1		44%	23%		33%	
	5. Peaked Hill Bars	61.4	1%		75%	6%	18%	
	6. Province Lands Dune Lot Route	81.2		2%	76%	8%	13%	
	7. Pilgrim Lake	59.6	1%	5%	73%	13%	8%	
	8. Salt Meadow	39.3			84%	10%	6%	
9. Pilgrim Heights		40	88%	12%				Arcto/Corema
10. Truro Sandpit		10				100%		Arcto/Corema
11. Highland Beach		6	63%		13%		24%	Arcto/Corema
12. Pamet River Area		24	72%	1%	18%	9%		Arcto
13. Newcomb Hollow		22	29%		47%	25%		Arcto/Corema
14. Bound Brook		57	75%		10%	13%	2%	Arcto/Corema
15. Griffin Island		29	33%		24%	43%		Arcto, Arcto/Huds
16. Gut/Great Island		26	30%		70%			Beachgrass Dunes, Arcto, Arcto/Huds
17. Great Beach Hill		16	13%		83%	4%		Arcto/Huds
18. Marconi Barrens		169	39%		60%		1%	Arcto/Corema
19. Coast Guard Beach		22	20%		76%	4%		Arcto/Huds
20. Fort Hill		15				100%		Mixed meadowgrass
Total		833						

Table 2. Summary of survey effort. Bold face indicates areas with survey points. Shading indicates where Vesper sparrow were observed.

Area	Sub-Area	#Points	#Visits	Hours	Size(ha)	Hours/ha
<b>Province Lands Dunes</b>		16		32.25	396.3	<b>0.08</b>
	1. Hatches Harbor Dike	0	1	2	12.2	<b>0.16</b>
	<b>2. Provincetown Airport</b>	4	2	3.5	29.3	<b>0.12</b>
	<b>3. Race Point Beach Route</b>	2	2	4.5	92.2	<b>0.05</b>
	<b>4. Province Lands Visitor Center Hill</b>	2	2	3	21.1	<b>0.14</b>
	<b>5. Peaked Hill Bars</b>	4	3	5.5	61.4	<b>0.09</b>
	<b>6. Province Lands Dune Lot Route</b>	2	3	6	81.2	<b>0.07</b>
	<b>7. Pilgrim Lake</b>	2	2	4.5	59.6	<b>0.08</b>
	8. Salt Meadow	0	1	3.25	39.3	<b>0.08</b>
<b>9. Pilgrim Heights</b>		2	2	3.5	40	<b>0.09</b>
<b>10. Truro Sandpit</b>		1	2	1.5	10	<b>0.16</b>
11. Highland Beach		0	1	1	6	0.16
<b>12. Pamet River Area</b>		1	2	2.75	24	<b>0.12</b>
13. Newcomb Hollow		0	1	0.5	22	0.02
14. Bound Brook Island		0	1	3.5	57	0.06
<b>15. Griffin Island</b>		5	3	4.5	29	<b>0.15</b>
<b>16. The Gut/Great Island</b>		1	2	1.5	26	<b>0.06</b>
17. Great Beach Hill		0	1	0.5	16	0.03
<b>18. Marconi Barrens</b>		9	6	19.25	169	<b>0.11</b>
19. North of Coast Guard Beach		0	1	0.5	22	0.02
<b>20. Fort Hill</b>		1	2	1.5	15	<b>0.10</b>
Total		36		72.75	833.24	0.09

## RESULTS

A total of 17 singing male Vesper Sparrows were present at two of the 13 areas surveyed, Province Lands Dunes and Marconi Barrens (Figures 1-7). Of the 36 points established, Vesper Sparrows were detected at 12. In the Province Lands Dunes, singing male Vesper sparrows were found at the Provincetown airport (2 males), the Race Point Dune Route (1 male), the Province Lands Visitor Center Hill (3 males), and the Province Lands Dune Lot Route (1 male). The largest concentration was near park headquarters at Marconi Barrens, where 10 singing males were recorded. No Grasshopper sparrows were observed anywhere. Other grassland birds of interest include the Massachusetts Threatened Northern Harrier, observed at Marconi Barrens, Pilgrim Heights, North Pamet Road, Salt Meadow, Pilgrim Lake, Province Lands Visitor Center hill, and Province Lands Dune Lot Route. Horned larks seem to be abundant in dune grass cliffs all along the Atlantic edge of the park, as well as the stump dump at Marconi. American Kestrels were found at Marconi Barrens, Pilgrim Heights, Salt Meadow, Highland Beach, and Pilgrim Lake. Savannah sparrows were found at Marconi Barrens, Bound Brook, the Truro Sandpit, Salt Meadow, Great Island, Provincetown airport and Race Point Beach Route. Since Savannah sparrows nest in barrier beach dune habitats, they likely are more widespread. There were no Eastern Meadowlarks observed.

## DISCUSSION

The distribution and abundance of Vesper sparrows at Cape Cod National Seashore declined from 1995 to 2000. In 1995, a total of 34 singing males were recorded from four different areas (Massachusetts Audubon Society 1995). In 2000, a total of 17 singing males were present at two of these areas (Table 3). These differences appear to be real rather than an artifact of sampling effort. In 2000, all points were surveyed with callback tape twice, coverage was more extensive, and many areas were visited two to three times. In 1995, with the exception of Griffin and Great Island, most areas were visited only once (Andrea Jones, pers. comm.). Thus, in comparison to the 1995 survey, the 2000 survey recorded half as many birds for roughly twice as much effort. While demonstrating reasons for the Vesper Sparrow's decline is beyond the scope of this survey, a number of observations suggest their disappearance is related to habitat change through

Table 3. Comparison of Vesper Sparrows detected at Cape Cod National Seashore in 1995 and 2000. Data from 1995 obtained from Massachusetts Audubon Society. Sampling effort in 2000 was nearly double that in 1995.

Vesper Sparrows Detected On Cape Cod National Seashore		
<u>Area</u>	<u>1995</u>	<u>2000</u>
Griffin Island	6	0
Marconi Barrens	10	10
Pilgrim Heights	1	0
Provincetown Dunes	17	7
Total	34	17

vegetation succession. At Griffin Island and Pilgrim Heights, where Vesper Sparrows have disappeared, the vegetation lacks bare ground, which is necessary for this species' foraging (Swanson 1996). In addition, Vesper sparrow singing male locations recorded in 1996 in the Province Lands (Jones 1996) were, by 2000, overgrown by Pitch Pine. As Hall (1965) noted the decline of this species on Cape Cod as a result of grasslands succeeding into woodlands, this seems the most plausible reason for their continued decline. However, there was not a decline in Vesper Sparrows breeding in the Marconi Barrens. The areas at Marconi where they breed are the old parking clearing east of headquarters and the stump dump area, along with a few scattered in the barrens where the heathland meets the dune grass. The habitat at the stump dump is kept clear from use, and the old parking clearing is just starting to undergo succession. Although the numbers of breeding Vesper Sparrow in the Marconi Barrens has not declined, continued plant succession in this area is likely to bring about a decline.

In addition to a 50% decline of Vesper Sparrows from 1995 to 2000, Grasshopper Sparrows appear to have become extirpated from Cape Cod National Seashore. None were recorded in 1995 (Massachusetts Audubon Society 1995) nor in 2000.

## RECOMENDATIONS

Given the Vesper Sparrow's status as a State Threatened species and Cape Cod National Seashore's importance to it, continued monitoring of its numbers and habitat condition is called for. In particular, points identified Figures 1-7 should be monitored and the dunes north and west of Pilgrim Lake should be surveyed further to ensure that breeding areas have not been overlooked. Vegetation monitoring should pay particular attention to the amount of woody and ground vegetation succession.

Beyond monitoring, the National Park Service should consider its options vis-à-vis Vesper Sparrows and grassland/heathland birds and their habitats in general. In their most general form the options are two.

1. Continue with the present management (no action). Plant succession would continue to occur throughout the park, and result in increased populations of woodland and shrubland wildlife, with corresponding decreases in grassland/heathland species. Populations of State Threatened grassland species would continue to decline, as would species diversity at the park and regional level.
2. Conduct some form of habitat management (e.g. cutting, mowing and/or burning) to maintain grassland/heathland habitats. There are numerous options within this broader one, varying in terms of amount of habitat managed as well as the methods and frequency of management. Detailing all of these sub-options is beyond the present scope. If the habitat management option were to be pursued, its goal should be to emulate as much as possible the mosaic of habitat types and seral stages that occurred on the outer Cape Cod landscape at the time of European contact. Oak-dominated woodlands would regenerate to once again dominate, but grassland and heathland habitats would be managed to maintain populations of native grassland/heathland - dependant wildlife. Under this option, both woodland-dependant wildlife and populations of State-Threatened grassland wildlife would be maintained. Native habitat and species diversity would be retained at both the park and regional level.

## ACKNOWLEDGEMENTS

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## APPENDIX 1-Field Survey Notes

**May 4, 2000.**

Start 730- 1030

Yesterday, I walked Marconi Area 1 and 2. I had no callback tape, but heard no VESP either. Grassland birds of interest were:

Merlin

**Nothern Harrier**- male and female

Start 730-1000

Today I walked half of Marconi Area 5, the portion closest to the water. There was construction around areas 3 and 4. Using the CD intermittently I had 4 responses. I estimate this would be no more than 2 birds given the area I covered.

Problems...

The boombox is very cumbersome to pull out of my pack- need to rig up some kind of carrying device or maybe use portable CD player with speakers. Need AA batteries.

Need flagging so I can mark where I hear the birds to come back and GPS them.

Birds:

**American Kestrel** – male and female

**Northern Harrier**

**Vesper Sparrow**- 4 answers- not more than 2 birds.

May 5, 2000

Start 700-1030 AM

Today I walked area 5 Marconi West and into area 8.

Most of area 5 West had a good amount of pitch pine and a lot of litter on the ground except the area right by the stump dump. This area is very dry with lots of open sand and more grass. I spent a good amount of time by the stump dump and got one **VESP** to answer and run away into area 4- the grassy area next to the stump dump piles. There was a plethora of sparrows in this area- 2 sosp, 2 wcsp (most likely migrating), and 2 chsp. The rest of 5 West seemed too wet for VESP and too high veg, and there were no answers to callback CD.

The southern portion of area 8 was similar to 5 West, and I received no responses. When I approached the blacktop square just before headquarters, I heard a **VESP** without having to use my CD. I chased it around and then couldn't get a visual on it. It started raining, but I walked along the road back to my vehicle and heard what sounded like a **VESP** on my left in area 8 answering to a **VESP** on my right in area 3 (by headquarters). I will need to go back and determine how many there were.

Equipment:

I used a portable CD with speakers... much easier to use. I will need AA batteries now.

The box gives a range of about 110.

The CD player gives a range at about 110 as well- although it seems a little quieter – doesn't hurt my ears- probably will do.

Birds:

FISP heard lots! But didn't see any...

BRCO- lots-

EABL

AMRO

WTSP – in bear oak

**SASP**- didn't call, but I saw it in stump dump area

**VESP**- 1 in 5West, 1 in 8 , and maybe 1 in both 3 and 4

Andrea sent me article on VESP territories- maybe I should flush the birds to find out exactly how many and how big their territories are- later in the season. Right now I am just trying to find out where they are.

May 9, 2000

730-945 AM

I was in Marconi 4 east this morning-

Over the beach grass there was a pair of American Kestrels, a Merlin and a flyby Horned Lark

West towards the hills there were 2 pairs of Bobwhite (in same transect as VESP, just over the grassy hill)

2 **VESP**

one just north-east of Water tower, between patches of Bear oak.

Other just west of beach heather barren area, just north of dirt road at the first grassy hill

Both sang before I played the call, but answered the call later when I checked back with them.

I chased the concrete pillar **VESP** around a bit, and it didn't cross over the dirt road into 5 east.

Other birds:

**NOBob**

AMKE

SOSP

HOLA

SSHA

YEWA

CHSP

**PRWA** in bear oak borders

NOMO

NOFL

BRTH

And one black racer!

May 10, 2000

I started by Headquarters walking transects north and south through **block 3 in Marconi**. It was a windy 40-50 deg, with sprinkling rain. I heard a **VESP** as I passed through the parking lot behind HQ. It was sighted just East of parking lot, about 50m- singing in a pine. There was another **VESP** singing at the NE corner of the "sand ring" that was answering back to this first VESP. There also was the VESP across the road in plot 2 that was singing as I walked along the road edge of plot 3.

I am noticing distinctly that VESP are found in the areas with at least 30% dry sand opening in the vegetation, and sparse woody vegetation- as descriptions in natural history predicted. These areas correspond to what is depicted as beach grass on the veg maps from the early 90's (GIS maps). It appears as though these areas have undergone some succession making them a sparse bear-berry/ pitch pine mix of vegetation. I will concentrate my callbacks to these types of sites. Areas that are designated as bear-berry from the GIS maps often have also undergone succession, making them have full ground cover with moister soil, and more litter and woody growth- which have not had any VESP in them.

I also walked North- South transects through the **Western portion of Block 4 in Marconi**.

I heard one **VESP** in a big pine tree West of the concrete block and grassy hill that I heard a VESP yesterday- it flushed west, so probably is a different bird. There was another **VESP** about 500 m E and slightly N of the stump dump area- about equal to the hill just east of stump dump that answered my callback. A **VESP** sang just S of the black top and N of the pink flagged area- after I had played a callback about 3 minutes earlier- probably didn't answer the tape. A pair of **VESP** flushed up from the sand clearing NE of stumps, but didn't call. Another **VESP** feeding N of there, but not answering CD.

I walked through **area 8** on my way back to the car, and found a sand clearing just across the street from HQ where there were about 20 FISP, 15 AMGO, and 1 **VESP**- who did not answer my callback.

Birds:

Block 3: AMGO, CHSP, AMRO, FISP, RSTO, PIWA, BOBWHITE, NOFL, NOMO, **AMKE**, BCCH

BLOCK 4W: **AMKE**, NOMO, AMGO, SSHA, FISP, BHCO, RSTO, CHSP

BLOCK 8: FISP, AMGO, PIWA, RSTO, BHCO

I am planning on doing the last 2 sections... 6 and 7 later on a day I don't have much time.

## May 11, 2000

800-1030

**Pilgrim Heights.**- overcast, 40 deg, breezy until sprinkling started at about 930.

The vegetation overall at this site is very dense- only bare sandy area is that made by the dirt road. I heard no VESP's. There were FISP, a pair of **AMKE**, a pair of **NOHA**. It was very quiet overall.

birds I have seen at other times there: Short eared owl during hawkwatch 2 weeks ago, EAML during surveying in the fall.

I conducted 2 point counts for Audubon: one in first grassy valley, one within dirt road ring. - no birds.

## May 12, 2000

700-1030

**Bound Brook** – sunny 60 deg, no wind.

I started at Sunset Hill- which is off West off the old RR bed overlooking the marsh. The habitat had a sandy opening at the bottom of a valley in addition to the dirt road, but there were no VESP. Birds: PRWA, AMRO, EAKI, CHSP, RSTO

Road Hill east of RR tracks was too thick and densely vegetated- no VESP.

Bound Brook hill- reached by taking the road that passes the Atwood Higgin's house and first right- was thick and densely vegetated- no VESP.

Valley- just south west of BB hill also has a thick mat, but has some sparse areas with lichen, and lots of tall pines, NO VESP, SOME: BCCH, PIWA, CHSP, BHCO, RSTO, FISP, PRWA

Duck Creek Hill- reached from parking lot at end of Atwood Higgins's road- has a grassy valley surrounded by bearberry, on the east and beach grass on the west. I placed one Audubon point in this grassy valley

Birds: PRWA- lots!!, FISP, EAKI, AMGO, RSTO, **SASP**.

The **SASP** was perched in a red cedar- did not call.

On the north side of the patch of locust I found an Eastern Box Turtle!!!

## May 15, 2000

630-1000

**North Pammet Rd** – sunny, 50-60 deg. wind 10-15 on hills.

most of the vegetation on the hills was very dense, and there were no VESP's. The veg. in the crossroads valley was good- open, sandy, and more lichen. I placed an Audubon point count here.

birds: PRWA, SOSP, COYE, AMGO

there was one flyover male **NOHA**.

### Truro Sandpit - 830

seemed like great vegetation at far north end near the water heater- but no VESP's

birds: EABL, CHSP, **SASP**, AMGO

### Highland Beach

920

pretty windy- no VESP- very small patch of habitat- did see **SASP** flush from sand opening into shrubs and a female **AMKE** flyover, a SOSP, COYE, PRWA, GRCA, CHSP, RSTO

maybe will revisit on less windy day, but it doesn't seem that important

## May 17, 2000

700-1015, sunny, cloud cover burned off by end of survey, slight breeze, between 55-65 deg.

### Head of the Meadow/High Head Dunes north of Salt Meadow

It was extremely quiet except for the SOSP's I heard and saw at almost every bog between dunes or Pitch pine stand. There was one male **NOHA** circling over the marsh, an **AMKE** in the dunes and one **SASP** in the far East pine patch- it didn't call, just sat at the top of a tree. I also saw one black racer and one immature bald eagle- migrating through.

### May 25, 2000

Yesterday- May 24, 2000- I walked through **Griffin Island**- but it was way too windy to be sure if anything was really there- but I heard no VESP, and none answered my callback.

**700-1000 Pilgrim Lk dunes- East.** (the first 2 valleys and the fire road)

very foggy at the start, and then burning off and becoming sunny and windy by last half hour- temp between 50-65. For the most part- I heard a lot of SOSP's – almost one for each bog I passed. It was frustrating- because they sound so similar to VESP- but I think that the wetness of the bogs may be too wet for VESP habitat- other birds heard were COYE, GRCA, NOMO, BLJA, AMCR

I flushed one **NOHA** male from the far east area of the first valley- by the peak. There was also an **AMKE** male in the NE ridge of this same valley. Other than the boggy areas, these valleys produced no birds.

On my way back south on the fire road- by the dune shack I heard PRWA.

### May 30, 2000

**Griffin Island, Great Island** – 730-1030, full cloud cover, minimal wind, 50-60 deg. clouds burned off by end.

I surveyed each of Audubon's points- there were no VESP at any- although in 94 there were a few pairs there. The vegetation overall seemed thick- may have gone through too much succession since 94. Birds heard/seen on Griffin Island were: PRWA, SOSP, RSTO, FISP, EAWP, CEWA, AMGO, CHSP, EAKI, AMRO, BASW, NOMO, BCCH, COYE.

On Great Island trail, just as I was passing the NO Pets sign as you come onto the actual island area- towards Wellfleet Bay, in the grasses was a singing **SASP**. I heard and saw it there, and then used my tape to call it in closer. There were also **HOLA** calls- I misidentified them – but realized on 6/8 that was the call I was hearing. I did not hike all the way to Jeremy point- it seemed pointless, since there were no VESP anywhere else, and I would be leaving the primary heath/grass habitat- I may return later if time allows.

### June 1, 2000

**Fort Hill**- 800-930, breezy, 60 deg. sunny

I heard a ton of RWBL, and NOBO, some SOSP, but no grassland sparrow species -

the vegetation was about up to my knee, and thick- with mixture of multiflora rose and briar in with the grasses I tried to do the p-town airport today- but it was too windy down there- will try tomorrow

### June 2, 2000

**Ptown Airport** – 730-1000, breezy, 60deg, started sunny, more overcast by end

Many RWBL at all points, a NOBO as passed airplanes parked.

PT 1- no grassland birds of focus

PT 2- SOSP, and 2 EAKI, no grassland birds of interest

Pt 3- **SASP**- 50 m east of crossover runway, AMRO x 2, RWBL, EAKI

pt 4- **SASP**- between end of parked airplanes and sightseeing shed, and west end of single line just after painted "S" on runway.

maybe there could be a point at the end of the runway- but nothing there but EAKI

Pt 5- **SASP**- in far large grassy corner bordering the bayberry/beach plum area-it was answering the **SASP** at pt 3

BOBO- calling from west- more than 100m away

FISP- calling from forest direction

i walked into bayberry area to the grassy opening- there were some FISP, no other grassland birds

no VESP answered any calls

### June 8, 2000

**Airport Dunes** – 700-1000, slight breeze, 55-60 deg, sunny, wisps of clouds

I started at the dike road and walked NE next to marsh- there were a lot of SOSP and COYE. I heard BOBO after the first big sandhill to my left- calling from the marsh. There was a **SASP** as the marsh extends and cuts off the grassy flat area, and more BOBO as you hit the phrag stands to your right. A BRTH was calling from the top of the 3<sup>rd</sup> peak down (set back further than the others)- almost opposite the monument in a bush at the top. I crossed over the dunes just after the BRTH where the marsh came up to the high dune peak about even to the end of the airport runway- and just over this dune was a **VESP** singing in a bush in the grassy valley (kind of near pt 2 for Audubon- may explain why they heard VESP other years- moved??). The vegetation here was patchy hairgrass, some bushes,

solid ground, but sandy with lichens.- Bob Cook located a VESP in approximately this location on 5/12. Could be same one could be different- will determine later. There was also a NOBO calling from this same area- will revisit as Audubon point. I continued along this valley until the ranger station when I moved over to the fire road- at that point I heard **HOLA**'s – I followed their call over the dune to the flat grassy plateau and heard at least 3. As I returned walking along the fire road back to the vehicle- I heard many **HOLA** calls coming from the beach grass dunes toward the ocean.

June 12, 2000

Herring Cove Points –700-900, breezy (5-10mph), 50 deg, drizzle

Scientific Study area- south of Herring cove parking lot, the fenced off area- there was a lot of barren sand- more than areas I have seen VESP in before- there were no answers to the callbacks. I heard RWBL, TUTI, SOSP, PRWA, NOMO, GRACKLES

X-street from Scientific Study area- ground cover had more grass- more like usual VESP habitat- but none there either. I stood at the corner of the grassy L that is raised. Heard RSTO, NOMO, GRCA, GCFL, FISP, PRWA

X from Parking lot- Hairgrass with lichen and poison ivy with about 40% shrubs- seemed like good cover for VESP- none there. Heard- GRCA, BCCH, CHSP, SOSP (answered callback), FISP from parking lot direction.

Hatches Dike

Forest Side of Dike- sparse hairgrass with intermittent bog dips. I heard NOBO, COYE, RWBL, AMGO, PRWA, FISP, AMRO, and a personal favorite – INBU!

Hairgrass hill- this had much of nothing bird wise- very barren with pitch pine- I drove around to the hairgrass location at the intersection up by the visitor center, and it was very barren except for pitch pines up there as well- I am not going to spend a lot of time looking in these more barren areas anymore- the more vegetated grassy areas in the dune swells seem the only locations I may find VESP in the dune areas.

June 13, 2000

**Ptown VC Hairgrass Hill** – 700-930, very breezy (10-15 with gusts up to 20), 75% cloud cover, 55 deg. the first portion you hit coming 120 deg. from the VC had about 40-50% bare sand area, trees averaging at 6ft, the grass spaced itself at about 1 foot increments- no grassland birds as you move following 120 deg, you hit the large opening hairgrass field- - has about 40% shrubs, 30% grass, 15% lichen, and 15% bare sand. I flushed a **NOHA** male as I entered this area as I walked through I heard, 2PRWA, CHSP, NOMO, RSTO, and AMGO- I thought I heard a VESP at the far NE corner of the hairgrass patch bordering the barren area just over the ridge- but would not answer my callback- there were some strong wind gusts at this point- worth coming back to check out.

June 14, 2000

**Race Point Fire Road** – 700-900, breezy (5-7 mph), full clouds, 50 deg.

I walked the inner dune road along the grassland areas until the first dune shack. The vegetation in these areas was barren hairgrass- with spacing of at least a foot between clumps, with 80% grass and 10% bare ground- there were no answers to my callbacks- I placed a temporary point at the first dune shack to be returned- can place others along dune road as you drive in- no grassland birds that I was looking for. On the way back I walked the beach grass closer to the water- this area was devoid of birds except the calls of **HOLA**'s and some tree swallows. After walking many beach grass areas like this one- with the same results, I am going to conclude that the only birds represented in this area would be the **HOLA**'s and TRSW's.

In the air station parking lot I saw an ermine!

June 15, 2000

**Race Point Fire Road** – 700-900, very breezy (10-15 mph), full clouds, 50 deg.

I drove to the first dune shack and left the Jeep there to continue on foot along the hairgrass areas until I reached exit 8. This will be an Audubon point- that should be driven to. At that point a female **NOHA** flew over. No VESP would answer call as I moved along this transect, there were a lot of SOSP's though. I traveled back to the car on a transect on the N side of the Pitch pine- there were no VESP's here either although I saw and heard a EABL. I am

going to take a look at maps and figure out the best way to describe where I walked and where the Audubon points will be located.

### June 16, 2000

**Ptown parking fire Road-** 700-930, 10-15 wind, full fog, 55-60 deg.

I drove to exit 8 on the dune trail and walked along the road until the intersection with the trail from snail road. I spent a good deal of time in the grassy patch by exit 8 and there were: **NOHA**, **SOSP**, **RSTO**(about 100m away), **PRWA**, **NOMO**, **HOLA**, AND **VESP!!!** It was singing by a fallen pole on the dune track, a bit west of the spot with the four poles in a line with one pole to the north like this- .

. . . .

the rest of the area was mostly pitch pine, or too barren grass to have VESP

### June 23, 2000

**Ptown parking fire road-** 730-930, 10-15 wind, 80% fog cover, 70 deg.

I drove to the snail road trail intersection- walked along the road until the end of the hairgrass patch, continued through along southern route back to snail road trail intersection with cranberry bogs- played callbacks at many grassy patches, and no grassland birds answered. It got progressively windy as the morning moved on, so on my second visit I will concentrate on these areas again.- these areas also are where there were VESP when Kyle and Andrea looked for them and found them.

### June 27, 2000

**Pilgrim Heights-** 730-830, 15+wind, 10% clouds, 70 deg.

I visited the 2 points I had placed as Audubon points.

#1 had **NOBO**, **RSTO**, **FISP**, **CHSP**, **AMGO**, **GRFL**, **PRWA**, **PIWA**, **AMCR**, a **NOHA** flew over as I left the site on my way back to the car

it's vegetation was 35% shrubs, the rest grass, about waist high, - the grass is full cover, and there is no barren sand patches

#2 had **FISP**, **NOBO**, **CEWA** (fly over)- and the same vegetation characteristics of the last point.

Pilgrim Heights historically (1995) had one nesting pair (see 93-95 regional data from Audubon).

**North Pammet Road** - 845-930, 15+wind, 5% clouds, 78deg.

Crossroads point- **SOSP**, **FISP** (2), **PRWA**, **COYE**, **TRSW**, **RSTO**

vegetation here had lichen/bare ground= 20%, shrubs = 35%, grass=45% about knee height  
no answer to callbacks

### June 28, 2000

**Marconi Site** - 700-1100, wind 0-3, 80% clouds- thinning by the end, 70 deg,

I set up point sites to visit as point count surveys for Audubon, and as I found VESP's followed them to see how many, and exactly where their territories end.

1.1- no VESP answers, there were: **RSTO**, **LETE**, **PRWA**-

this point is located just at the hills about 50 m into the plot

2.1- **PRWA**, **AMGO** (4), **RSTO**, **CHSP**, **NOMO**, **EAKI**, **LETE** (4 flyover)

you find this point by hiking in at the second fence from the parking lot- into the open area - vegetation here and at

1.1 is about 30% shrubs, 30% dune grass, 40% lichen/sparse bearberry

3.1- this is the valley North east of the water tower: my first visit in birds were: **CHSP**, **PRWA**, **RSTO**, **TRES**(3),

**FISP**, **BRTH**, **SOSP**(4)- one of the song sparrows resembled a VESP greatly- prompting me to do further

investigation after I had finished the old parking clearing point:

I saw one **VESP** chipping at me (maybe female) and another singing and traveling around- he moved between the isolated hill in the valley towards the hills north. The first bird chipping stayed at the isolated hill.

old parking clearing- I stood at the sandy runway center line- and listened around me.

there were: **NOBO** (2), **CHSP**, **AMGO**, **FISP**, **BCCH**, **NOMO**, **MODO**, **NOFL**, and **VESP** (2). there was one in the center of the clearing that moved south towards marconi site road, and one to the north that I heard answer the first one, but could not get a sight on to figure out full territory.

**X-headquarters-** I stood at the paved road, a little west of it. **This is the hotspot for VESP!!** I saw: NOHA, FISP, BCCH, NOBO, AMGO, CHSP, **VESP** (3?) that were separate of the VESP heard near the old parking clearing (I could hear that one too)

one came from stump dump area road the most western entrance

one came from HQ direction

one came from N of stump dump-

this area should be distinctly surveyed after all other places have been visited once to determine how many, where their territories are, and where a monitoring point should be placed.

July 5, 2000

**Griffin Island, Great Island-** 700-900, 5-10mph wind, no clouds, 70 deg.

I decided that point one was too overgrown to census- and just censused the other Audubon points (2-6). There were no grassland birds of concern out on Griffin, and only a SOSP answered the callback on the point just before Great Island. Very quiet over all.

**Truro Sandpit-** 930-1000, 5-7 mph, no clouds, 70 deg.

this point is in the middle of the heathland- the only grassland bird was a FISP coming from the North about 100m away- other than that, the field was very quiet, and nothing answered the callback cd.

July 6, 2000

**Marconi** – 730-930, 5-10 mph, no clouds, 65-70 deg.

I started in the stumpedump area- and heard the VESP from the x-headquarters location- this area is too close to that location- I will combine data into one point- see maps for Marconi information.

**grasshill North of Dirt Circle-** VESP, CHSP, NOBO, NOMO, SOSP (singing around the dirt circle), FISP when I used the callback to follow the VESP- it would not answer- not sure why?

This area has 35%shrubs at 3ft, very sparse grass (~10%), the rest was heath/lichen/bare ground

**section 5 Valley-** CHSP, SOSP, RSTO, TRES, REBL, PRWA, EAPH

This area seemed quiet.

**Stake on bare hill-** FISP (4), **VESP(2)**, RSTO, AMGO, NOBO, BHCO (2), EAKI, PRWA

one of the VESP was not singing- female?, one of the NOBO's was doing a type of broken wing display?

the stake for this location is on a small hill (no more than 3ft) with a barren patch at the top, the area in general here gets hilly to the south and west about 25m, there is also more PP here- 45% at 4-5ft tall

July 7, 2000

**Ptown Airport-** 700-800, 3-7mph, 80%clouds, 64 deg.

I revisited the 4 points placed by Audubon- the 5<sup>th</sup> point that I surveyed had been completely mowed down- so it is not a good addition for a point.

**pt. 1-** NOBO (2), RWBL (4), COYE(4), SOSP

**pt. 2-** COYE, NOBO, RWBL (2), GRCA, YEWA, **VESP**

the VESP was not sighted, but I heard it and it moved up over the dunes

**pt. 3-** NOBO(2), COYE, **SASP** (singing on top of red lights)

half of this area has now been mowed for airplanes

**pt. 4** – RWBL (2), GRCA, RSTO, COYE, **VESP** – was singing on top of red boxes at east end of runway

**Airport Dunes-** 800-930

**Dune 2 (race point ranger station 4 poles)-** HOLA, NOMO, COYE, SOSP, RWBL, COGR, EAKI

to get to this point you walk down the offroad access road until you reach the grassy valley- the pullout area has 4 wooden poles and a worn out sign

the veg here is 25%shrubs<1m tall, sparse grass- half and half grass and sand for 75%.

**Dune 1-** HOLA(2), SOSP, TRES(6)flyover, NOBO

to get to this point- you keep walking East from point 2 down the grassy fields- you will pass the break in the dunes and keep walking- the point is in the field just over the dunes from the east end of the airport runway

there used to be a VESP here, but not this time- maybe the one I heard over at airport point 2



July 12, 2000

**Pilgrim Lake east-** 730-900, wind 7-10mph, 0 clouds, 65-70 deg.

**Pt 1-** Lots of SOSP (3), AMGO, COYE

This area's veg has 50% 1meter shrubs, 25% hairgrass/25% barren dry and sandy ground- except for the boggy areas with cranberry- no VESP

**Pt 2-** MODO, NOHA (female flying over), RSTO, AMGO

This area's veg. has a 10% stand of pitch pine forest >3m tall, 20% 1m shrubs, 5% bearberry, 65% grass/barren (half and half)

The area east of the point has sparse grass, and is dry sandy soil- may be good vesp habitat when grass thickens.

July 13, 2000

**P-town Parking Fire Road-** 730-900, wind 7-10 mph, 0 clouds, 65-70 deg.

**exit 8-** SOSP, BCCHx3 (from pp), COYE, CHSP, TRES

area here is 30%shrubs- 10% of which is 6ft trees, 20% < 1 m.- the rest is dry sandy with half/half grass/barren.

this may be exit 8? I forget which is the one right next to the dune shack exit 8 or 9?- I am going to call it exit 8.

**fallen log-** .... location- same veg as above, part of the same hairgrass patch

**VESP, TRES, SOSP x2** answering VESP, BLJA, **NOHA** female- perched in snag in middle of field

**Snail rd. intersection-** NOMO, RSTO, AMGO

this area has 30%pp forest averaging 5ft- 70% half/half grass/barren, dry except where the cranberry bog is.

**2shacks hairgrass-** PRWA x2, COYE, SOSPx2, RSTO, TRES, there was another sparrow singing far off to the south of where I was standing- like a song sparrow- but I couldn't find it.

veg: 30%pp forest at 6ft, 20% shrubs <1m high, 25% grass, 25% barren- dry

revisions- for these points- the first two- near exit 8 have very similar veg, and can be grouped together for audubon, and the last 2 are very similar- along the growing Pitch pine area in the dune swell. I should also note that the snail road intersection had 2 VESP in 1996- and there was no trace of them this year.- I will look for them one more time after I finish all of my sites.

July 14, 2000

730-930, wind 7-10mph, 50% clouds, 67 deg.

**Race Point Fire Road**

**pt. 1-** located just south in the mixed grass as the fire road splits off to the right.

NOBO, RSTO, RWBL, MODO, AMCR, SOSPx2-farther than 100m away and very faint to the east of my point this patch has 40% pitch pine at about 6ft tall, and 30/30% barren/beach grass

**pt. 2-** first dune shack corner

SOSP, BCCH, NOMO, RSTO

veg has 25% shrubs at less than 1m, and half grass/barren for the remaining 75 percent.

As I was driving back after my surveys, I stopped in the hairgrass patches along the side of the fire road to listen for birds- none in these patches- the veg here is more barren than the veg up at the VC hairgrass patch- pictures of the sites would help people identify good locations and bad ones as vegetation continues succession in these locations.

Visitor Center Hairgrass Patch

**pt. 2-** at this point I could hear a **VESP** which was directly on point one, but could also hear another **VESP** who was NW of the site- coming from the steeply sloped area covered with hairgrass. There was also a faint **VESP** call from SW of this point, but it was more than 100m away- if it was there at all. (I couldn't find it).

Point 1- should be combined with point 2- because they are too close together to separate, and I could hear the birds from point 1 at point 2.

July 18, 2000

**Fort Hill-** 830, no wind, full clouds, 70 deg.

no grassland birds I was looking for.



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*NPS D-184*