

Southeast Coast Network

National Park Service
Inventory & Monitoring Program



Standard Operating Procedure (SOP) #1.4.29

Sampling Schedule for Migratory and Wintering Shorebird Monitoring at Cape Hatteras National Seashore

Version 2.0

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Summary

This Standard Operating Procedure (SOP) presents the sampling schedule and survey dates at Cape Hatteras National Seashore implementation of the Southeast Coast Network (SECN) Methods for Monitoring Migratory and Wintering Shorebirds in Southeast Coast Network Parks (Byrne et al. 2009), updated for the 2013 field season. The sampling schedule consists of a rotating panel design and includes all beachfront areas at the park.

Revision Log

Previous Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #
	2/2009	M. Byrne	Original version		1.0
1.0	3/2013	M. Byrne	2013 sampling schedule	Park staff requested an additional sampling schedule to those presented in original protocol	2.0

Overview

This SOP presents the survey schedule and dates for 2013; however, a detailed explanation of the temporal and spatial sampling design of this monitoring protocol, including two options, can be found in Byrne et al. (2009). This schedule entails a rotating panel design, with all panels complete within four weeks.

Because use of shorebird habitat types on park lands by shorebirds varies as a function of tidal stage, it is important to ensure all tidal stages are adequately characterized and survey effort is distributed evenly across all tidal stages. Stratifying a survey schedule by tidal stage results in a practically and logistically unrealistic schedule because a typical work day does not correspond to tide. A systematic and consistent survey schedule, however, if temporally arranged in accordance with the characteristics of any known oscillatory process such as tide, will characterize multiple stages within a tidal function over time.

Schedule

The 2013 survey schedule is presented in Table 1. Surveys are to be conducted each Thursday, on the dates presented in Table 2.

Deviations

Although all efforts should be exerted to adhere to the sampling schedule and deviations should be avoided, occasionally weather conditions do not allow data collection or data would be biased. Situations that could potentially affect maintaining the sampling schedule include winds categorized as Beaufort Wind Speed Codes of 5 or 6 (i.e., wind speed ≥ 19 mph).

In instances where a deviation from sampling schedule must occur, sampling should be conducted on the day prior to the scheduled day or the day immediately following the scheduled sampling event. Occasionally, a reasonable weather forecast can allow the field crew to conduct the survey one day prior to the scheduled event. Best professional judgment should be employed, and any and all necessary scheduling and rescheduling actions are taken to ensure the adherence to the sampling schedule or a defensible facsimile.

What if a survey cannot be completed in one day?

If the survey of a sampling unit that contains multiple subsamples (i.e., transects) or only one subsample (i.e., transect) cannot be completed in its entirety during one sampling effort (i.e., at one visit), then it should not be surveyed on that particular day. To maintain statistical independence and dataset integrity, the unit should be (a) surveyed either on the day preceding the scheduled survey or (b) the day after the scheduled survey, or (c) on the next scheduled survey event for that particular sampling unit. Options (a) and (b) are preferable because it maintains the order of the sampling schedule, whereas option (c) prolongs the time for which a survey is conducted in that sampling unit, therefore reducing our knowledge of bird-use patterns of the unit.

Several variables affect the presence of the target taxa (e.g., weather, tidal stage, activity at the site), and incomplete surveys would bias the dataset. Because the index derived from these

surveys is based upon counts-per-unit-of-efforts, partial surveys invalidate the estimate for each incomplete sampling unit. Further, despite the highly mobile characteristics of the target taxa during the migratory period, a high probability exists that individuals detected during one incomplete or partial survey would also be detected in the consecutive partial survey, thereby biasing the dataset.

What if surveys cannot be completed within the day before or the day after?

If the survey of a sampling unit cannot be completed in its entirety on the day immediately before or after the scheduled survey, then it should be skipped during that particular rotation and surveyed on the next planned rotation. This solution is obviously less preferred than the solution presented for the preceding question because it prolongs the time for which a survey is conducted in that sampling unit, therefore reducing our knowledge of bird-use patterns of the unit.

Literature Cited

Byrne, M. W., J. C. DeVivo, J. M. Maxfield, C. J. Wright, and E. Thompson. 2009. Methods for monitoring migratory and wintering shorebirds in Southeast Coast Network parks. Natural Resource Report NPS/SECN/NRR-2009/107. National Park Service, Fort Collins, Colorado.

Table 1. Survey-schedule matrix for migratory and wintering shorebird monitoring at Cape Hatteras National Seashore, 2013.

		Location			
		Ocracoke	South Hatteras	North Hatteras	Bodie
Week	1	PM 59 (T1-3) (North Ocracoke)	PM 58 (Hatteras Spit)	PM 45 (East Cape Point)	PM 4 (T1 & T2)
		PM 74 (T1-5) (Ocracoke Spit)	PM 47	PM 46 (West Cape Point)	PM 5 (T1)
		PM 60	PM 50	PM 32	PM 0
		PM 63	PM 55	PM 36	PM 3
		PM 68		PM 38	PM 19
		PM 72			
	2	PM 59 (T1-3) (North Ocracoke)	PM 58 (Hatteras Spit)	PM 45 (East Cape Point)	PM 4 (T1 & T2)
		PM 74 (T1-5) (Ocracoke Spit)	PM 44	PM 46 (West Cape Point)	PM 5 (T1)
		PM 64	PM 48	PM 35	PM 2
		PM 65	PM 49	PM 37	PM 20
		PM71	PM 53	PM 41	PM 23
	3	PM 59 (T1-3) (North Ocracoke)	PM 58 (Hatteras Spit)	PM 45 (East Cape Point)	PM 4 (T1 & T2)
		PM 74 (T1-5) (Ocracoke Spit)	PM 43	PM 46 (West Cape Point)	PM 5 (T1)
		PM 62	PM 52	PM 29	PM 21
		PM 66	PM 56	PM 33	PM 22
		PM 67		PM 34	PM 25
				PM 40	PM 27
	4	PM 59 (T1-3) (North Ocracoke)	PM 58 (Hatteras Spit)	PM 45 (East Cape Point)	PM 4 (T1 & T2)
		PM 74 (T1-5) (Ocracoke Spit)	PM 42	PM 46 (West Cape Point)	PM 5 (T1)
		PM 61	PM 51	PM 30	PM 1
		PM 69	PM 54	PM 31	PM 24
		PM70	PM 57	PM 39	PM 26
		PM73			PM 28

Table 2. Survey dates for migratory and wintering shorebird monitoring at Cape Hatteras National Seashore, 2013.

		Survey Dates													
Week	1	-----	17-Jan	14-Feb	14-Mar	11-Apr	9-May	~~6-Jun~~	4-Jul	1-Aug	29-Aug	26-Sep	24-Oct	21-Nov	19-Dec
	2	-----	24-Jan	21-Feb	21-Mar	18-Apr	16-May	~~13-Jun~~	11-Jul	8-Aug	5-Sep	3-Oct	31-Oct	28-Nov	26-Dec
	3	3-Jan	31-Jan	28-Feb	28-Mar	25-Apr	23-May	~~20-Jun~~	18-Jul	15-Aug	12-Sep	10-Oct	7-Nov	5-Dec	-----
	4	10-Jan	7-Feb	7-Mar	4-Apr	2-May	30-May	~~27-Jun~~	25-Jul	22-Aug	19-Sep	17-Oct	14-Nov	12-Dec	-----

