

Incidental Harassment Authorization Report
US Fish and Wildlife Service, Eastern Massachusetts NWR Complex
Covering period from April 1, 2019 to March 31, 2020

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Submitted to:
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A. Summary of dates, times, and weather during all research activities.

At Monomoy National Wildlife Refuge (NWR), seal encounters were recorded from April 2, 2019 through July 29, 2019. Staff encountered seals on 24 days during this period, however this is not likely indicative of the number of days seals were present on Monomoy NWR. Instead, it is more likely days on which no seal encounters were recorded, research and monitoring activities were occurring outside of regular seal haul-out sites. Research activities at Monomoy NWR also extended beyond July 29, but no seal encounters were documented after that date. As is common on Cape Cod, weather varied throughout the season, with some periods of high winds and fog. Weather data for each seal encounter event can be found in the attached spreadsheet on the Monomoy NWR data tab.

At Nomans Land Island NWR, seal encounters only occurred on 5 of the 9 days that staff were on the island. During the first trip on April 9, 600 seals were documented. All encounters occurred at the north shore area when during arrival and departure of our boat.

At Nantucket NWR, seal encounters (or potential encounters) occurred from May 16, 2019 through October 6, 2019 (when a USFWS seasonal technician was onsite). Nantucket NWR is very different than Monomoy NWR in that it is almost impossible to be on Nantucket NWR and not observe seals (though often the disturbance is Level 0), as Nantucket NWR is only 20 acres. At this site, seal numbers are counted every time staff is present, and seal haul-outs are often repeatedly monitored (to ensure they aren't harassed and to record if numbers change) during the course of the day. At Nantucket NWR, weather varied seasonably as would be expected for Cape Cod with temperatures gradually rising from late May through August, and then declining again. Periods of high winds and fog were also recorded. Weather data for each day seals were encountered can be found in the attached spreadsheet on the Nantucket NWR data tab.

B. Species, number, location, and behavior of any marine mammals observed throughout all monitoring activities.

Monomoy NWR was divided into 5 different zones, labeled A through F, as shown on the attached maps. Zone A runs from the north tip of South. Monomoy Island (41°37'10") to a

latitude of 41°36'21". Zone B runs from of 41°36'21" to 41°35'58". Zone C runs from 41°35'58" to 41°34'43". Zone D runs from 41°34'43" to 41°33'50". Zone E runs from 41°33'50" to 41°33'04". Lastly zone F runs from 41°33'04" to the south tip of South Monomoy Island (41°32'23"). Each zone stretches the entire width of the island in its respective zone.

Table 1 summarizes the number of seal encounters (6,201) and the behavioral responses following each encounter across South Monomoy Island. All seal encounters occurred south of Zone B and involved only gray seals. Staff did not encounter harbor seals on South Monomoy Island in 2019. The number of gray seal takes, for which an encounter resulted in movement of the seal away from the disturbance, totaled 5,375. This is a great deal less than the limit (39,280 gray seals) provided under our Incidental Harassment Authorization.

Table 1. Summary of total seal encounters and behavioral response at Monomoy NWR. Zones are outlined in the attached maps. Levels refer to the behavioral response by seals, in which 0=no response, 1=alert, but no movement otherwise, 2=short-distance movement away from disturbance (1-3 meters), and 3=long-distance retreat or flushing into the water. The totals are derived from the number of seal encounter visits multiplied by the number of seals present at each visit. It is not the total number of individual seals affected overall, as it is likely that the same seals were disturbed on subsequent visits.

Level	Gray seal encounters	Zone A	Zone B	Zone C	Zone D	Zone E	Zone F
0	826	0	526	100	200	0	0
1	1,801	0	20	1,091	437	16	237
2	1,123	0	4	870	248	1	0
3	2,451	0	147	699	149	75	1381

At Nomans Land Island NWR, a maximum of 600 seals were seen on April 9, and during the last several visits to the island, no seals were seen. All of the seal interactions this year occurred along the north shoreline and north cove, when the boat was landing or departing from the island. We made efforts to land the boat as far away from the seals as possible, but were sometimes limited by wind and sea conditions.

Nantucket NWR is only 20 acres, and seals mostly use the very northern tip (both east and west sides) of the NWR to haul out (see attached map). However, seal counts were done daily when staff was on the island and a total of 2,839 seals (which includes the same seals likely counted on subsequent days) were counted during the time frame (see attached data sheet) on the beach. These were probably all, or nearly all, gray seals. We maintain this area as closed to vehicles and pedestrians year round, and even our staff very rarely enters this area, except when sign maintenance is needed or to occasionally conduct bird surveys. Of the total 2,839 seal use days recorded, 19% exhibited no response to our presence, and 27% only exhibited Level 1 disturbance (raising their heads).

C. An estimate of the number (by species) of marine mammals that are known to have been exposed to visual and acoustic stimuli associated with the research activities.

We estimate approximately 6,201 gray seal exposures to visual and acoustic stimuli on Monomoy NWR, 940 exposures on Nomans Land Island NWR, and 2,839 exposures on Nantucket NWR as a result of our research activities.

D. A description of the implementation and effectiveness of the monitoring and mitigation measures of the IHA and full documentation of methods, results, and interpretation pertaining to all monitoring.

We believe that the monitoring was adequate and effective at reducing disturbance as much as possible, while still allowing us to conduct priority work. We developed a protocol based on the requirements set forth by NMFS, which is attached. Anytime we encountered seals we did our best to estimate numbers, sex ratios, age ratios, and harassment levels. It was sometimes challenging to get accurate counts of seals when hundreds were present on haul-out sites in tight bunches with low topographic relief. We also found it difficult at times to maintain disturbance at Level 0. On South Monomoy there are long stretches of haul-out beaches that may extend for hundreds of meters and contain hundreds of seals, yet are very narrow from tide line to beach dune and thus don't provide enough room for us to pass without disturbing a portion of the seals. At Nomans Land Island NWR, it is also nearly impossible to pass hauled out seals along the narrow rocky shoreline, or to land our boat, without causing some disturbance.

We do think the protocol could be improved by determining a distance threshold that counts as an "encounter", triggering us to record our activities as a potential disturbance. Of course, a research activity at any distance will be recorded if any seals in the group exhibit a change in behavior. But at what distance can we stop recording activities that don't elicit any change in behavior in any of the seals? For example, we are often within 100m of seals, and there may be no reaction by any of the seals in the group. Should we record all of these research activities as potential encounters? At Monomoy NWR, not all staff consistently recorded these if there was no change in behavior. If 100m isn't a good threshold / trigger distance, than what is appropriate?

We took several actions to reduce disturbance as much as possible (see attached protocol for details). At all sites, we maintained a distance of at least 50 meters from seals whenever possible, while traversing the habitat on foot and while approaching the sites (especially at Nomans NWR) by boat. Additional mitigation measures included staying out of sight of seals and downwind from the seal haul-outs as often as possible. We used the topography of the sites (especially at Monomoy NWR) to remain hidden from hauled out seals. As often as possible, we would traverse the island behind the dunes when it was necessary to pass hauled out seals. When we were forced to pass seals at a close distance, we tried to pass quickly together and took careful notes of the seals' disturbance. At Nantucket NWR, we were also able to completely avoid disturbing seals by taking counts of seals in low topographical relief areas from the lighthouse look out.