

Summary of 2017 Field Season



Figure 1. The 2017 crew: L to R, Mark Baran, Collette Lauzau, Mark Dodds

A stable and abundant food source throughout the chick provisioning period allowed for a successful summer for all monitored species on MSI this year, particularly puffins after their very poor breeding season in 2016. Larval sandlance was the most commonly observed prey item for all species except common murre for the duration of the season. Puffins were still bringing in fish on the day the crew departed (August 15). Arctic terns successfully fledged chicks for the fourth successive year; however hatching success was very low, likely due to high egg predation by gulls early in the season.

Breeding success was exceeded by only five years in the 23-year record of puffins, and was slightly above average in razorbills; Arctic tern success overall was lower than the previous two years, biased down by high gull predation of eggs in the intermediate or transition habitat between the vegetated interior and bare rocky margin of the island. Tern nesting numbers were up, to around 300 pairs, more of which nested outside the permanent plots in the vegetated interior and so were exposed to higher predation from gulls. Monitoring of Leach's storm-petrels began with marking 59 burrows and following their fate through the season; this is our contribution to an Atlantic Canada-wide monitoring coordinated by Bird Studies Canada.

The crew of Mark Dodds (Supervisor), Mark Baran and Collette Lauzau arrived on May 13 with Captain Andy Patterson from Cutler ME. Ed Czerwinski and Chris Ward helped set up research blinds and recorded puffin burrow locations with GPS coordinates. Lauren Scopel provided guidance on the setup process and contributed a great many resights of banded Arctic Terns on what will likely be her last time on the island before completing her PhD. These records revealed not only some very old birds – one from 1992! – that had been undetected for many years, but an influx of young birds banded as chicks on *all* other islands in the Gulf of Maine metapopulation, no less than 30 from five islands in addition to four from recent years on MSI. This is very heartening news for the future of the colony.

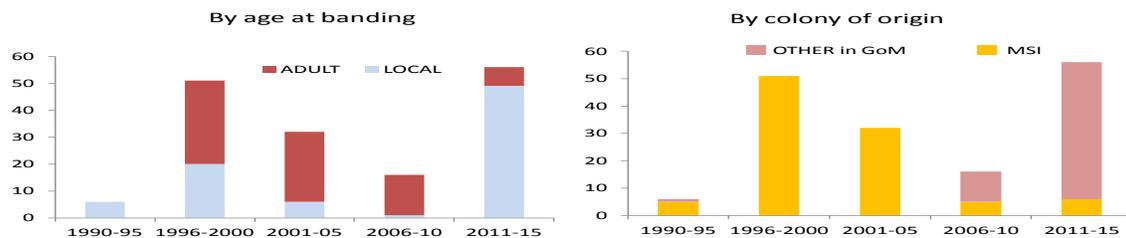


Figure 2. Arctic terns resighted in 2017, by age at banding and colony of origin. Many 2016 chicks from other colonies were prospecting.

Terns

Terns breeding on MSI had another successful season, fledging chicks for the fourth successive year since the colony collapse in 2006. Terns were already present on MSI when the crew arrived on May 13. A total of 86 Arctic tern nests were monitored this season, and we estimated that island-wide there were approximately 300 tern nests. It is likely that a significant number of the unmonitored nests fledged chicks, as we observed numerous unbanded fledglings flying around the island towards the end of the season. 139 individual Arctic terns were resighted this summer including numerous birds banded as fledglings on each of the other major colonies in the Gulf of Maine. Common terns were seen consistently on the island throughout the summer, although no nests were observed in our productivity plots.

Table 1. Estimated Number of Tern Nests on MSI (formal census in 2014 only).

2010	2011	2012	2013	2014	2015	2016	2017
175	75	50	90	187	150	175	300

Productivity

86 tern nests with a total of 163 eggs were monitored this season. The first egg was encountered on May 25, and mean lay date was June 4. Mean hatch date was July 2, and hatching success was 0.39 (the lowest since 2004). Low hatching success was likely caused by high egg predation early in the season. 62 of 163 monitored eggs (38%) were taken, compared to 10% in 2016. A possible explanation for the increase in predation rate is that more nests in the rocky outer habitat of the island were monitored this year than in previous years. Most egg predation occurred in this exposed habitat, particularly in the southern part of the island, as opposed to the vegetated interior. From the 86 monitored nests (163 eggs), 64 chicks hatched (0.74 chicks/nest, 0.39 chicks/egg) of which 30 fledged (46.9% fledge success, 34.9% nest

success, 18.4% egg success). 22 monitored nests raised 1 chick to fledge and 4 monitored nests raised 2 chicks to fledge.

Although prey availability seemed stable throughout the season, inclement weather in mid and late June resulted in the loss of many ‘B’ and ‘C’ chicks from our monitored nests. By June 30, 11 chicks had died. 2 chicks were found with dried blood around the nares and 1 with a partially crushed skull, likely the result of aggressive behaviour from nest mates or competing adults. No observable injuries were confirmed on the other 8 chicks; chicks likely died from exposure, food competition, or unknown causes. By the end of the summer, an additional 7 chicks were found dead. 4 were found with no observable injuries and 1 had a broken leg. Only 2 chicks were confirmed to have been depredated by gulls, however it is very likely that more were taken and not observed/confirmed.

Table 2. Breeding Success of Arctic terns on MSI in 2004, 2005, 2014, 2015, 2016, 2017.

Year	n	Clutch Size	Hatching Success	Chicks/nest alive at Day 15	Chicks/nest alive at Day 20	Fledglings/nest
2004	170	1.42 (0.50)	0.84	0.38	0.30	0.05
2005	183	1.42 (0.50)	0.57	0.03	0.02	0.01
2006-13	<i>Zero productivity</i>					
2014	69	1.68 (0.53)	0.57	0.11	0.08	0.08
2015	51	1.69 (0.55)	0.56	0.72	0.66	0.66
2016	54	1.52 (0.60)	0.68	0.55	0.46	0.44
2017	86	1.88 (0.74)	0.39	0.52	0.47	0.35

Tern Provisioning

We completed 65.4 hours of tern chick provisioning stints on a total of 9 nests in 3 separate plots. No common tern chick provisioning stints were conducted. Prey composition remained consistent throughout the season, with larval sandlance and hake as the predominant prey items.



Figure 3. Arctic tern delivering small sandlance to chick. Note the bands on the adult! Photo by Nick Hawkins.

Table 3. Diet (% by number, not biomass) of Arctic terns on MSI.

	n	A	E	H	HD	LA/S	S	T	M/I	Other	Unk
ARTE	632	1.11	3.32	13.92	1.58	53.64	5.85	0.95	1.90	0.95	16.77

*“Other” includes lumpfish, polychaete, herring, stickleback, and fish scraps.

Predator Control

Non-lethal gull control was continued this year, using paintball guns and hazing of loafing individuals. A contracted predator control specialist conducted lethal gull control three times: May 29-June 1, June 14-16, and July 9-10. A total of 14 gulls were removed; 9 herring and 5 great black-backed gulls. Gull Rock, an adjacent island with a persistent breeding colony of herring and great black-backed gulls, was visited four times during the season: June 4, June 15, July 14, and August 11. A total of 13 gull nests, all herring gulls, were found and destroyed by shaking and poking eggs (50 in all). No gull nests were found on MSI this year.



Figure 4. Remains of banded tern fledgling in herring gull stomach (photo by Marie Collette Lauzau)

Alcids

No formal puffin census was conducted this year. A total of 134 burrows were monitored for productivity. A comparatively stable and abundant food source this season allowed for a very successful puffin breeding season, particularly in comparison to last season. Linear growth rate was 7.6 g/day, much higher than that of 1.8 g/day in 2016. A total of 147.28 hours of chick provisioning stints were conducted with 7713 prey items recorded (in 2016 only 1053 prey items were recorded in 177.15 hours of observation). Hake characterized the early part of chick rearing with larval sandlance predominating throughout, with a slight increase in haddock and hake towards the end of the provisioning period. In late May and early June, we re-sighted 3 prospecting puffins, banded as fledgers on Seal Island and Petit Manan 2013-2015. A prospecting adult was observed on May 24 and June 4, originally banded on Petit Manan in 2015 as an ATY. Mark Baran began the preliminary work for his MSc project by deploying 29 GLS tags on adults with chicks.

No formal razorbill census was conducted this year. A total of 72 burrows were monitored for productivity. Linear mass growth rate was 5.32 g/day, a 22.6% increase from 2016 (4.34 g/day). A total of 86.75 hours of chick provisioning stints were conducted with 1645 prey items recorded, compared to 61 hours and 339 prey items in 2016. Chick provisioning consisted predominantly of larval sandlance, with an increase of hake in the early and later parts of chick rearing. On June 11, one prospecting RAZO was re-sighted, banded as a fledger on Matinicus Rock in 2014. Mark Dodds began preliminary work for his MSc project by deploying 21 GLS tags on adult razorbills with chicks.

The overlap in phenology between puffins and razorbills was almost perfect this year, with mean lay dates of 8 and 6 June, respectively, and peak hatch dates of 24 and 23 June.

Common murre numbers remain high, with an increase in occupied nesting area observed this year; 3 new “caves” were added, with one “cave” observed to be inactive. On July 3 at least 325 active “nests” were estimated. A total of 58 chicks and 10 adults were banded this year; GLS tags were deployed on all 10 adults. A total of 69.33 hours of COMU chick provisioning stints were conducted with 458 prey items recorded.

Table 4. Breeding success of alcids on MSI in 2017.

	Monitored Burrows	Mean Lay	Mean Hatch	Burrow Occupancy	Hatching Success (hatch/active nest)	Nest Success (fledge/active nest)	Linear Growth Rate (mass)
ATPU	134	May 14	June 24	0.80	0.74	0.68	7.6
RAZO	72	May 19	June 23	0.77	0.74	0.57	5.32

Table 5. Diet (% by number, not biomass) for ATPU, RAZO, and COMU on MSI.

	n	H	HD	LA/S	Q	R	S	T	Other	Unknown
ATPU	7713	22.95	11.46	32.72	0.31	0.27	17.04	0.47	0.79	13.99
RAZO	1645	5.78	0.18	80.36	0.06	4.19	4.32	0.30	0.55	1.58
COMU	458	1.09	14.19	5.90	5.68	14.63	1.09	8.30	6.11	43.01

*“Other” includes Euphausiid, pollock, rock eel, polychaete, lumpfish, larval hake, redfish, and fish scraps.



Figure 5. Puffin with sand lance (photo by Nick Hawkins).

Other Species

Northern Gannets were observed on the island the day of arrival (May 13) and were seen regularly throughout the summer. The highest recorded count was 21 on June 16. Main loafing areas appeared to be consistent with reports from previous years, and appear to be prospective nesting areas with at least one pair occupying each area. May 15 was the first confirmed sighting of nesting material being brought to a loafing spot. Nesting material was brought to all three loafing areas and was observed on most days early in the season. The first confirmed egg was observed on June 11.

Where possible we avoided work in that area of the colony in order to mitigate disturbance. An adult was observed on the nest every day until June 14, and the nest was confirmed to be empty on June 15; the egg was found cracked at the base of the rock. There were no signs of depredation; the egg was likely rolled out of the nest accidentally. Gannets were subsequently observed loafing, displaying, and even copulating at the nest site, however they did not relay. Two pairs were consistently seen sitting on nesting material and copulating in the other loafing areas, however no eggs were observed. No other active gannet nests were observed this season.



Figure 6. Gannet with friends (photo by Marie Collette Lauzau).



Figure 7. Ancient murrelet with razorbills (photo by Marie Collette Lauzau).

The highest count of adult common eiders this season was 211 (106 males, 105 females) on May 25. Ducklings were first seen in mid-June, and were still present around the island in early August, both small, newly-hatched ducklings and pre-fledgers. The highest count was 50 ducklings on July 14.

In June an Ancient Murrelet was photographed offshore by a passenger on a tourist boat, and by Collette.