

LO-Letters article Metadata

Table 1.

Title of dataset	Seabird and Plastic Ingestion Data Set
URL of dataset	Data, metadata, and computer code will be made available at the EDI data portal: https://portal.edirepository.org/nis/home.jsp
Abstract	<p>Plastic debris is a pervasive and critical environmental challenge that is being described as a world-wide crisis for marine life. Seabirds are sensitive to pollutants and are of critical conservation concern. Because seabirds are excellent bioindicators of marine ecosystem health, information about their plastic ingestion can serve as an indicator of plastic exposure across multiple marine trophic levels. Our study describes the prevalence of plastic ingestion for four seabird species: Great Black-backed Gulls (<i>Larus marinus</i>), Herring Gulls (<i>L. argentatus</i>), Common Terns (<i>Sterna hirundo</i>), and Roseate Terns (<i>S. dougallii</i>) nesting in the Gulf of Maine. Samples were collected opportunistically, including pellets, regurgitant, discarded fish, and deceased seabirds. Plastics were primarily found in pellet samples, and common types included fragments and sheets. Herring Gulls displayed significantly higher plastic exposure than the other three species across all metrics analyzed (p-value<0.0001 in all cases), with no significant differences observed amongst the other three species.</p>
Keywords	Gull, ingestion, plastic pollution, seabird, tern, marine debris
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Organization associated with the data	Shoals Marine Laboratory
Usage Rights	Publicly available and free to use.

Geographic region	Appledore and White/Seavey Islands in the Gulf of Maine, USA.
Geographic coverage	Appledore Island: 42.9891°N, 70.6142°W White/Seavey Island: 42.9880°N, 70.6135°W
Temporal coverage - Begin date	6/16/2016
Temporal coverage - End date	8/3/2018
General study design	Field/Laboratory study
Methods description	Samples were collected from seabird colonies on the islands. Samples included seabird pellets, discarded forage fish, deceased seabirds, and seabird regurgitant. All samples were bagged in the field and frozen until use in the laboratory.
Laboratory, field, or other analytical methods	<p>Seabird Pellet samples (labeled “diet-xxx” and “pellet” in data sheet): Pellet samples were collected opportunistically from the seabird colonies. Collection was standardized by retrieving every second or third pellet spotted (depending on the number of pellets available that day). Pellets were bagged individually and frozen until laboratory analysis. Pellet samples were thawed at room temperature before laboratory processing. Thawed samples were placed into stacked sieves (with mesh size arranged top to bottom of 3.0mm, 2.0mm, and 1.0mm, or 1.0mm, 1.0mm, and 0.84mm) and a sieve with mesh size of 0.5mm was stacked above the sample. The samples were washed through the mesh with a high powered hose until they were sufficiently broken apart. The samples were analyzed for plastics under the dissecting scope for 10 minutes minimum. They were then further picked until the time between each plastic find exceeded 1 minute. Plastics found during the initial 10 minute pick were stored separately.</p> <p>Discarded Forage Fish samples (labeled “diet-xxx” and “fish” in data sheet): Fish samples were collected from the tern colony on White/Seavey Island. They were bagged and frozen until laboratory processing. Fish samples were thawed at room temperature until processing. Fish samples that were intact (with GI tract specifically) were weighed and measured for fork length and standard length. The whole GI tract was dissected out and placed directly into stacked sieves as described above. The GI tracts were cut open to allow for easy removal of contents. The samples were washed and picked for plastics as described above. Fish without an intact GI tract (partially eaten or digested) were not weighed or measured. They were placed directly into the stacked sieves and washed and analyzed as described above.</p> <p>Deceased Seabird samples (labeled “adult-xxx” or “chick-xxx” in data sheet): Seabirds were collected from the tern colony on White/Seavey Island and the gull colony on Appledore Island. They were bagged and frozen until laboratory processing. Samples were thawed at room temperature (adult seabirds were thawed overnight) before processing. Dry weight, tarsus length, wing chord length, culmen length, culmen depth, and combined head plus bill length were recorded. Birds were sexed whenever possibly based on internal anatomy. The entire GI tract was dissected out of each sample and placed directly into stacked sieves as described above. The GI tracts were cut into smaller sections and flushed with fresh water. The GI tracts were then cut open and further removed of contents using water and dissecting tools. The GI tract was removed from the sieves before the wash step. The samples were analyzed under the dissecting</p>

	<p>scope as previously described.</p> <p>Regurgitant samples (labeled “diet-xxx” and “regurgitant” in data sheet): Regurgitant samples were collected during banding activities on White/Seavey and Appledore Islands. Regurgitated material was collected from a variety of substrates including rocks, clothing, and pillow cases. Samples were bagged individually in the field and frozen until processing. They were thawed at room temperature before being placed directly into stacked sieves and washed and analyzed as previously described.</p> <p>Plastic samples (labeled “plastic-xxx” in data sheet): Samples were removed from the original samples and placed into clean glass petri dishes during the 10 minute and post 10 minute picks. Particles that were not positively identified as plastic were dyed with Rose Bengal dye (0.25g RB dye/ 200mL DI water) which stains biological material. Particles that were still not positively identified as plastic were put aside for burn tests (in which the heated tip of a dissecting needle was touched to the particle to look for scent and melting characteristic of plastic) which were performed at a later time. Each particle was measured along its two longest sides and describes as sheet, fragment, line, fiber bundle, foam, or other. Color was also recorded for each sample. Plastics were dried in an oven (60°C) for 3 to 8 hours. Plastics were weighed; those from the 10 minute pick and post 10 minute pick were weighed separately. After drying and weighing, any particles still in need of identification were subject to burn tests. If a particle was identified as non-plastic, the original sample was reweighed. Plastic samples are stored in glass vials with cork plugs and labeled with the original sample ID code.</p>
Quality control	Careful and sterile dissection techniques were used during dissections. Plastics <1.0mm in size were not included in the study to lessen the chances of contamination interfering in the data set. Fibers were not included in the data set because they could not be controlled for in the field laboratory. Samples were placed directly into stacked sieves to minimize sample loss during multiple transfers between containers. A 0.5mm mesh was placed over the top of each sample before the wash step to minimize both outside contamination and sample loss.
Additional information	NA

Table 2.

Sample Inventory (Sheet 1):

Column name	Definition	Units
Collection date	Date of sample collection	
Original Sample ID	Sample IDs were split into “diet”, “adult”, and “chick”.	
Collected By	Name of individual or team that collected the sample.	
Sample Type	Sample types included “pellet”, “regurgitant”, “adult”, “chick”, and “fish”	
Species Collected	Species of the sample itself including various fish species and adult seabird species. Alpha codes were used for seabird species and common names for fish species.	
Species collected from	Seabird species each sample was associated with.	

Collection Location	General location of sample collection (Appledore Island, White Island, Seavey Island, or White/Seavey Island).	
Location Notes	Specific location of sample collection.	
Sample Disposition	Description of location of sample (described as “analyzed” or assigned location).	
Sample Notes	Metadata describing condition of the sample collected.	
Method Notes	Metadata describing procedures.	

Sample Descriptions (Sheet 2):

Column name	Definition	Units
Original Sample ID	Sample IDs were split into “diet”, “adult”, and “chick”.	
Weight	Sample weight measured using Pesola Scales or an Ohaus scale (model number: 16322197).	Grams
Tarsus	Measurement of the length from the depression at the inter-tarsal joint (“knee”) to where the “toes” begin. Measured on seabirds using calipers.	Millimeters
Head plus Bill	Measurement from the bump at the back of the skull to the tip of the bill. Measured on seabirds using calipers.	Millimeters
Culmen Depth	Measurement of the bill depth. For gulls the measurement was taken at the base of the bill and for terns it was taken at the wide point towards the center of the bill. Measured on seabirds using calipers.	Millimeters.
Culmen Length	Measurement from the top base of the bill to the tip. Measured on seabirds using calipers.	Millimeters
Wing Chord	Measurement of the length from the carpal joint of the wing to the tip of the longest feather. Measured on seabird wings (in relaxed/natural position) with a ruler with a stop at the end (which the carpal joint rests against during measurement).	Millimeters
Fork Length	Measurement of fish length from the bottom tip of the snout to the center of the tail fin.	Millimeters
Sex	Sex of sample based on internal anatomy.	
Sample Notes	Metadata describing original sample condition.	
Number of Fibers	Number of suspected plastic fibers found in sample.	
Number of Plastic Particles	Total number of plastic particles found in original sample from 10 minute and post 10 minute pick.	
10 Minute Pick Weight	Total dry weight of plastics found in each sample during the 10 minute pick.	Grams
Post 10 Minute Pick Weight	Total dry weight of plastics found in each sample after the 10 minute pick.	Grams
Pick Time >10 minutes	Number of minutes exceeding initial 10 minute pick.	Minutes
Original Sample Disposition	Location of original sample material after analysis/removal of plastic particles.	
Sample Processing Step	Metadata on progress of analysis for each sample.	
Method Notes	Metadata on processing methods.	

Plastics (Sheet 3):

Column name	Definition	Units
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Original Sample ID	ID of original sample from which particle was collected.	
Particle Sample ID	Individual ID for each particle; “p-xxx” for plastics, “u-xxx” for unknowns, “g-xxx” for glass, “m-xxx” for metal, and “o-xxx” for others.	
Classification	Particle classification.	
Color	Particle color.	
Length 1	Longest length of particle. Particles were not stretched or manipulated before measurement. Measurement were taken under the dissecting scope with a ruler.	Millimeters
Length 2	Second longest length of particle. Particles were not stretched or manipulated before measurement. Measurement were taken under the dissecting scope with a ruler.	Millimeters
Collected During 10 Min Pick?	Identification of whether particle was found during or post 10 minute pick.	
Sample Notes	Metadata describing condition/identity of the particle collected.	
Sample Disposition	Location of samples after processing. “B1” for storage box 1 and “B2” for storage box 2.	
Method Notes	Metadata describing procedures.	