APPENDIX 1

Bird Collection

We extracted bird scents from bird species that are typically found occupying southern Rhode Island coastal areas (Table 1). Uropygial glands were removed from the carcass by a local taxidermist and were left whole. We obtained the gull carcasses from a wildlife rehabilitation clinic in Rhode Island and the duck carcasses and waterfowl glands were donated by hunters. All carcasses we processed were freshly killed and frozen promptly until needed. We thawed bird carcasses for 12-24 hours prior to the soaking process.

Soaking process

Following Norbury et al. (2021), we submerged thawed bird carcasses in a 1:1 solvent mixture of acetone and dichloromethane manufactured by Honeywell. We used approximately four liters of solvents per batch (two liters of each solvent) (2-3 gull carcasses or five to six ducks per batch), or enough liquid to completely submerge the birds. For gland batches, we soaked 36-70 glands in one liter of solvent (0.5 liter of each solvent), or enough liquid to submerge the glands. We soaked carcasses/glands overnight for 12-16 hours in a sealed five-gallon high density polyurethane (solvent-proof) bucket under a fume hood. After the soaking period, we removed the bird carcasses/glands from the solvent mixture and squeezed them until most of liquid dripped off. Throughout the extraction process with solvents, we wore at least 10 mil thick butyl gloves or “Silver Shield” gloves. We then poured the solvent mixture through 18.5 cm diameter filter paper (pore size 25.0 um) to strain out any particles such as feathers. Once filtered, the solvent mixture had a relatively clear appearance, although it did have a color tint.

Rotary evaporation process

We used a Buchi R-Rotavapor system for the rotary evaporation process. The submersible centrifugal pump (115V AC, 7 ft Max Head, ¼ in Intake and Disch), which feeds into the evaporator, sat in an ice bath that was continuously replenished. There was enough water in the ice bath for the pump to intake water. We poured the filtered solvent mixture into a one L sized round bottom flask, which was only filled halfway so the solvent did not get sucked up into the rotary evaporator from the vacuum seal. The vacuum utilized was a 115 VAC 60 Hz 3.3 A. The evaporator was set at a mild vacuum with the round flask in a water bath of 40-42 °C (104-107.6 °F). We set the rotation speed of the flask to a three out of nine at a medium speed. Usually, it was important to keep the flask spinning to prevent the solvent from bubbling up and getting drawn up into the rotary evaporator. If the bird-solvent mixture was sucked into the evaporator, we reduced the temperature of the water bath and/or the rotation speed of the flask. We evaporated the solvents until there was a thick brown/yellow colored liquid (bird concentrate) sticking to the sides of the flask. We re-used remaining evaporated solvents one to two times for another round of carcass soaking. We retained all the accumulated bird concentrate in the flask until all solvents were processed for the batch.

To remove the bird concentrate from the round bottom flask, we poured it into a 0.2 L glass beaker, making sure to record the weight of the empty beaker first. To ensure all bird concentrate was emptied into the beaker, we placed a small quantity of dichloromethane into the flask and swirled it around the flask to help remove all extra material from the flask walls. In addition, we placed the mixture under a fume hood and swirled it occasionally to evaporate off the added

dichloromethane. We continued to circulate the mixture until it was a thick consistency and wafted the scent to our noses (note: we did not put my nose directly next to the dichloromethane) to ensure it smelled similar to a bird and not solvent.

Each batch produced different amounts of bird concentrate. The gull carcasses (two to three gulls) typically made 4-5 g, duck carcasses (five to six ducks) created 20-25 g, and preen glands (36-70 glands) yielded 20-25 g. We reconstituted the bird concentrate with Vaseline on a hot plate at 80 °C, which was hot enough to bring it to a liquid state. We used a 40:60 ratio of bird concentrate to Vaseline (i.e., 0.4 g of bird to 0.6 g of Vaseline) to create the mixture placed in the field at scent stations. While still in a liquid state, we distributed the mixture into 1g/mL plastic syringes. We then stored the bird odor mixtures in a freezer until we used them, and assumed that odors could retain their odor properties for up to a year in the freezer.

Table A1.1 Bird species used in the bird odor extraction process and the method in which they were made. The carcass included the full body of the bird, whereas the glands were only the extracted uropygial gland.

Common Name	Scientific Name	Method	Year Used
American Black Duck	*Anas rubripes*	Carcass & Glands	2022, 2023
American Wigeon	*Mareca americana*	Glands	2022, 2023
Atlantic Brant	*Branta bernicla*	Carcass & Glands	2023
Bufflehead	*Bucephala albeola*	Carcass	2022
Cackling Goose	*Branta hutchinsii*	Glands	2023
Canada Goose	*Branta canadensis*	Glands	2022, 2023
Canvasback	*Aythya valisineria*	Glands	2023
Cinnamon Teal	*Anas cyanoptera*	Glands	2023
Common Eider	*Somateria mollissima*	Glands	2022
Gadwall	*Mareca strepera*	Glands	2023
Great Black-backed Gull	*Larius marinus*	Carcass	2022
Greater Scaup	*Anas marila*	Glands	2022, 2023
Green-winged Teal	*Anas carolinensis*	Carcass & Glands	2023
Herring Gull	*Larus argentatus*	Carcass & Glands	2022, 2023
Hooded Merganser	*Lophodytes cucullatus*	Carcass & Glands	2022, 2023
Lesser Scaup	*Aythya affinis*	Carcass & Glands	2022, 2023
Long-tailed Duck	*Clangula hyemalis*	Carcass & Glands	2022, 2023
Mallard	*Anas platyrhynchos*	Carcass & Glands	2022, 2023
Northern Pintail	*Anas acuta*	Glands	2023
Redhead	*Aythya americana*	Glands	2023
Ring-billed Gull	*Larus delawarensis*	Carcass	2022, 2023
Ring-necked Duck	*Aythya collaris*	Glands	2022, 2023
Surf Scoter	*Melanitta perspicillata*	Glands	2022
Wood Duck	*Aix sponsa*	Glands	2022

Table A1.2 Annual summary of bird odor batches and the number of bird carcasses and glands used in 2022 and 2023.

Year	Batches	Number of Carcasses	Number of Glands
2022	8	13	40
2023	8	12	91