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**Observations of the North American Herring gull
(*Larus argentatus smithsonianus*)
and the
North American Laughing gull
(*Larus atrialla megalopterus*):
A Comparative Analysis**

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Abstract

During the summer of 1998, Herring gulls (*Larus argentatus smithsonianus*) and Laughing gulls (*Larus atrifrons megalopterus*) were observed on the Assateague Island National Seashore. These observations were conducted over four observation weekends, culminating in a total of fifteen observation hours. A total of twelve avian characteristics were observed and documented. Eleven of these characteristics were behavioral and one was morphological. The observations took place at different times of the day in order to encompass as many of the daylight hours as possible. Once the observations were completed, a large-scale literature search ensued. The observational data collected along with the results of the literature search confirm that Laughing gulls seem to be more aggressive and vocal than are Herring gulls. The reasons for this could be differentiated interspecific predation rates and/or intense food competition between the two species.

Introduction

Assateague Island is a barrier island located in the southern portion of Maryland's Eastern Shore and the northern portion of Virginia's Eastern Shore. The Atlantic Ocean borders the island's eastern beach while the Sinepuxent and Chincoteague Bays border the western beach. All 38 miles (Amos, 1980) of the island is contained within the National Seashore boundary and the southern most 36 miles is known as Assateague Island National Seashore. We visited the island on previously selected weekends between May 29, 1998 and August 9, 1998 to observe two different species of seagulls. This paper reports field observations made entirely from locations within the Maryland side of the National Seashore.

The Herring gull, one of the species observed, is a medium sized, white-headed shore bird whose range is immense. The species has been divided into nine subspecies in the Family Laridae (Pierotti and Good, 1994) of which only one breeds in North America. All data reported here are based on observations made of the North American Herring gull (*Larus argentatus smithsonianus*). This gull inhabits lakes, seas, large rivers and shorelines of oceans. Due to the efforts of plumage hunters in the nineteenth century, this species was nearly extirpated (Pierotti and Good, 1994). Protective efforts have allowed for a recovery of the gull and in recent years the species has extended its range into Maryland (White 1989), Virginia and even North Carolina. It is thought that the Great Black-backed gull (*Larus marinus*) has been responsible for the continuing southern movements of the Herring gull (Burger, 1996).

The Laughing gull (*Larus atriella megalopterus*) is a medium sized gull, also of the Family Laridae, whose broad range and distinctive markings make it a nearly ideal subject for study. This bird now common on Assateague Island and Maryland's Ocean City (White 1989) was extirpated from many coastlines in the early part of the century. This combined with fierce competition from larger displaced gulls had greatly reduced their population size. Recently Laughing gulls were found nesting in New York for the first time in 100 years indicating they are adapting to their situation (Burger, 1996).

The Laughing gull's distinctive black head and orange beak make it easy to identify in breeding plumage. It is comparatively smaller than its island mate, the Herring gull, and seems to travel in large groups.

One of only two subspecies, *L. a. megalopterus* was first recognized in 1957 and occurs only in North America while the nominate species *L. a. atriella* was described by Linnaeus in 1758 and occurs in the West Indies (Burger, 1996).

Populations of Herring gulls and Laughing gulls were observed on the Maryland side of Assateague Island National Seashore, Sinepatuxent District. The section to follow describes the observational methods used.

Methods

Observations were made over certain weekends, which commenced on July 11, 1998 and ceased on August 9, 1998. There were a total of four observational weekends, each weekend containing up to four observation hours culminating in a total of fifteen

observation hours. The dates and times of said observation hours are as follows:

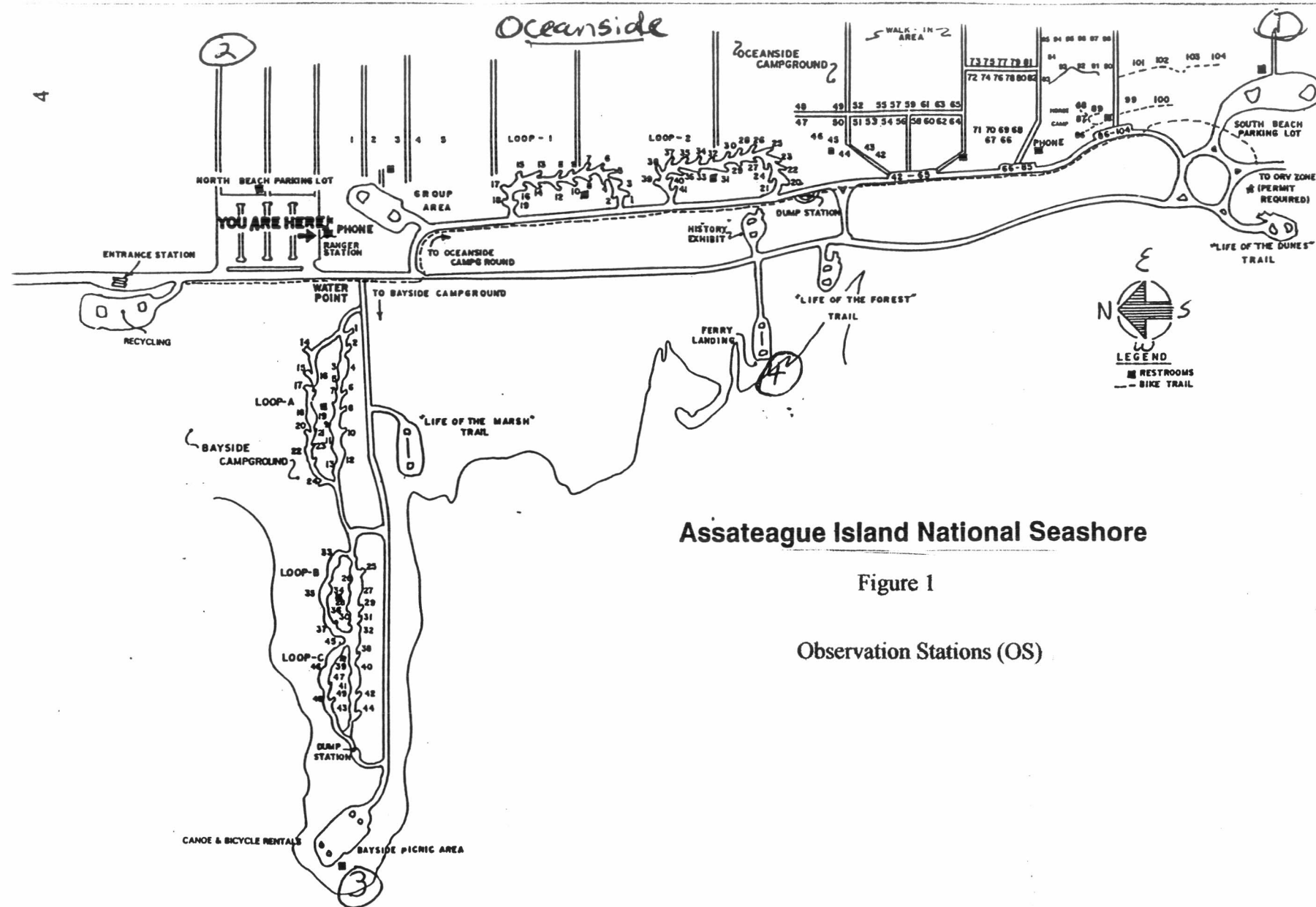
7/11	15:00 h – 16:00 h
7/12	06:00 h – 07:00 h
7/18	14:30 h – 15:30 h
7/18	08:30 h – 09:30 h
7/19	06:30 h – 07:30 h
7/19	09:30 h – 10:30 h
8/01	08:00 h – 09:00 h
8/01	10:15 h – 11:15 h
8/01	14:45 h – 15:45 h
8/01	18:45 h – 19:45 h
8/02	07:00 h – 08:00 h
8/08	15:15 h – 16:15 h
8/08	19:15 h – 20:15 h
8/09	05:45 h – 06:45 h
8/09	08:45 h – 09:45 h

Four observational sites were designated prior to the commencement of the observations. These sites were chosen in order to cover the maximum amount of area to which we had access. The sites were each numbered geographically counterclockwise beginning with the number one (South Beach) and ending with the number four (Old Ferry Landing) (Fig. 1). All four observation sites allowed for a 360° viewing field. Each site is known as an Observation Station (OS).

Ms. Lueth was responsible for all Herring gull observations, while Ms. Petrick along with various assistants was responsible for all Laughing gull observations. For each observation hour, both species of gull were observed simultaneously via the use of similar binoculars. For all but two of the observations, each species of gull was observed separately and from a different OS. For the most part, OS rotations were made in a counterclockwise fashion given that Herring gulls were observed at an OS that was numerically one ahead of the Laughing gull.

During each observation hour, twelve predetermined and defined avian characteristics were noted. Eleven of the characteristics were behavioral, and one was morphological. In order for the observers to maintain the reporting consistency of the characteristics viewed at different times and places, and by different observers, the twelve characteristics were operationally defined. Each observer was fully aware of each definition, and was not to record the characteristic unless it could, in its entirety, be described exactly as it had been previously defined. For each new observation hour, a new and separate observed-characteristics data sheet was used for each of the two species. The observed characteristics and their operational definitions are as follows:

- **Confrontational Situation:** any situation in which two animals come within an approximate three foot radius of each other, either in flight or on the ground, maximizing the chances of interaction between the animals.



Assateague Island National Seashore

Figure 1

Observation Stations (OS)

- **Drinking:** any observed consumption of water confirmed by the throwing back and shaking of the head
- **Eating:** the observed act of food consumption.
- **Foraging:** confirmed by the actual attainment of food by the gull allowing for the assumption that the behavior preceding the further attenuation of food was indeed foraging
- **Injured Flight Appendage:** any visible damage to a functional flight appendage of a gull such as a wing or the tail feathers
- **Intraspecific Aggression:** any visible invasive/evasive act of a gull toward a conspecific member(s) in a confrontational situation
- **Interspecific Aggression:** any visible invasive/evasive act of a gull toward a heterospecific member(s) in a confrontational situation with the aggressor being either a Laughing gull or a Herring gull. The gull receiving the aggressor being either a Herring gull or a Laughing gull
- **Panting:** characterized by a stationary position of both the bird and its open beak, accompanied by labored breathing
- **Preening:** a behavior characterized by the straightening and/or removal of a gull's own feathers most likely involving the placement of a wax-like substance gathered in the beak from a preen (uropygial) gland located at the rump of the gull
- **Vocalization (aggressive):** characterized by a gull's loud calls or cries towards another animal or inanimate object in a confrontational situation
- **Vocalization (other):** any audible calls or cries which can not be described as aggressive vocalization
- **Weak flight:** any detrimental deviation from the most often observed flight pattern (These definitions were simulated through the use of similar definitions found in Gill, 1995 and Stokes, 1979)

Within the fifteen minutes prior to the start of a new observation hour, the current temperature (°F), wind speed (mph), wind direction, cloud cover, estimated bird traffic and estimated human traffic were recorded on a separate data sheet for each species and new observation hour. Also recorded were the predicted high and low tides for the specific observation day (24:00 –23:59) from the tide predictions for Sandy Hook, New Jersey found through the World Wide Web on the NOAA website (<http://www.opsd.nos.noaa.gov/tides/midatISH.html>, address current as of 11/18/1998).

Results

The results listed below are the data collected during the observations and have been condensed into four time periods for easy interpretation. Observational data recorded during an overlap of time periods of one half hour or less will be included in the time period in which the observation hour began. Observational data recorded during an overlap in time periods of more than one half hour will be included in the time period in which the observation hour ended. The condensed time periods are as follows:
Early Morning: 05:30-08:30, Mid Morning: 08:30-11:30, Late Afternoon: 14:30-17:30 and Evening: 17:30-20:30.

For all reported observation data, the mean temperature, mean bird traffic and mean human traffic were calculated using data collected for each observation hour from both Laughing gull and Herring gull observation locations.

Early Morning Observations

Mean Temperature: 78.3°F

Mean Bird Traffic: Light (<5)

Mean Human Traffic: Light (<10)

Laughing gull observations

Signs of Illness or Stress

Panting: 0

Injured Flight Appendage: 0

Weak Flight: 0

Stationary Approximately

Half Observation Hour (SAHOH): 2

Stationary Approximately Whole

Observation Hour (SAWOH): 0

Feeding

Foraging: 7

Eating: 15

Drinking: 0

Vocalization

Aggressive: 21

All Other: 20

Aggression

Intraspecific: 22

Interspecific: 18

Preening: 59

Herring gull observations

Signs of Illness or Stress

Panting: 0

Injured Flight Appendage: 0

Weak Flight: 0

Stationary Approximately

Half Observation Hour (SAHOH): 1

Stationary Approximately Whole

Observation Hour (SAWOH): 1

Feeding

Foraging: 18

Eating: 12

Drinking: 0

Vocalization

Aggressive: 0

All Other: 2

Aggression

Intraspecific: 5

Interspecific: 0

Preening: 20

Mid-Morning Observations

Mean Temperature: 77.5°F

Mean Bird Traffic: Light (<5)

Mean Human Traffic: Medium (10-50)

Laughing gull observations

Signs of Illness or Stress

Panting: 0

Injured Flight Appendage: 0

Weak Flight: 0

Stationary Approximately

Half Observation Hour (SAHOH): 0

Stationary Approximately Whole

Observation Hour (SAWOH): 0

Feeding

Foraging: 0

Herring gull observations

Signs of Illness or Stress

Panting: 0

Injured Flight Appendage: 0

Weak Flight: 0

Stationary Approximately

Half Observation Hour (SAHOH): 4

Stationary Approximately Whole

Observation Hour (SAWOH): 0

Feeding

Foraging: 0

Eating: 3
 Drinking: 0
 Vocalization
 Aggressive: 5
 All Other: 22
 Aggression
 Intraspecific: 6
 Interspecific: 0
 Preening: 12

Eating: 0
 Drinking: 5
 Vocalization
 Aggressive: 1
 All Other: 2
 Aggression
 Intraspecific: 0
 Interspecific: 0
 Preening: 13

Late Afternoon Observations

Mean Temperature: 79.6°F
 Mean Bird Traffic: Light/Medium ((<5) – (5-15))
 Mean Human Traffic: Light/Medium ((<10) – (10-50))

Laughing gull observations

Signs of Illness or Stress
 Panting: 0
 Injured Flight Appendage: 1
 Weak Flight: 2
 Stationary Approximately
 Half Observation Hour (SAHOH): 6
 Stationary Approximately Whole
 Observation Hour (SAWOH): 0
 Feeding
 Foraging: 17
 Eating: 17
 Drinking: 4
 Vocalization
 Aggressive: 16
 All Other: 55
 Aggression
 Intraspecific: 24
 Interspecific: 11
 Preening: 22

Herring gull observations

Signs of Illness or Stress
 Panting: 0
 Injured Flight Appendage: 0
 Weak Flight: 0
 Stationary Approximately
 Half Observation Hour (SAHOH): 7
 Stationary Approximately Whole
 Observation Hour (SAWOH): 0
 Feeding
 Foraging: 8
 Eating: 5
 Drinking: 2
 Vocalization
 Aggressive: 7
 All Other: 20
 Aggression
 Intraspecific: 2
 Interspecific: 10
 Preening: 31

Evening Observations

Mean Temperature: 78.1°F
 Mean Bird Traffic: Medium (5 – 15)
 Mean Human Traffic: Medium/Heavy ((10-50)-(50))

Laughing gull observations

Signs of Illness or Stress
 Panting: 0
 Injured Flight Appendage: 0

Herring gull observations

Signs of Illness or Stress
 Panting: 0
 Injured Flight Appendage: 0

Weak Flight: 0
 Stationary Approximately
 Half Observation Hour (SAHOH): 0
 Stationary Approximately Whole
 Observation Hour (SAWOH): 0
 Feeding
 Foraging: 5
 Eating: 23
 Drinking: 3
 Vocalization
 Aggressive: 96
 All Other: 148
 Aggression
 Intraspecific: 37
 Interspecific: 23
 Preening: 31

Weak Flight: 0
 Stationary Approximately
 Half Observation Hour (SAHOH): 1
 Stationary Approximately Whole
 Observation Hour (SAWOH): 0
 Feeding
 Foraging: 25
 Eating: 33
 Drinking: 0
 Vocalization
 Aggressive: 0
 All Other: 0
 Aggression
 Intraspecific: 4
 Interspecific: 4
 Preening: 3

Discussion

One of the stipulations of doing any type of research within national park boundaries is that no animals can be marked, trapped or contained in any way, unless doing so results in the attainment of information that specifically relates to that particular national park. Even in such cases, a permit must be obtained prior to the handling of any wildlife (Butcher, 1995, personal electronic communication from a representative of the National Park Service, Mr. Jack Kumer, 1998). It can prove very difficult to track clearly an individual bird's behavior if that bird can not be marked for identification in any way. The two species observed in this study have distinct plumage characteristics that make it easy to distinguish one species from the other. Those same characteristics also aid in differentiating both gulls from any other species that has been reported as seen on the island since 1984 (unpublished national seashore gull population data courtesy of Mr. Carl Zimmerman, 1998). The observed species were in breeding plumage for the duration of the study. No notations of behavior were made about any gull unless it was abundantly clear to the observers that the observed gull was the correct gull in breeding plumage. There were minute possibilities that a Great Black-backed gull was misidentified as a Herring gull or that a hybrid of some type was misidentified as either a Herring gull or a Laughing gull. The chances of misidentifying a Laughing gull were very slim considering that it is "unlikely to be confused with any other North American gull except (the) Franklin's gull (*Larus pipixcan*)" but the "breeding ranges of the 2 species are non-overlapping and widely separated" (Burger, 1996).

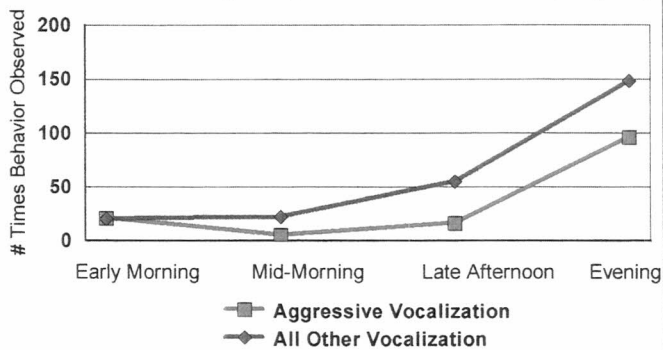
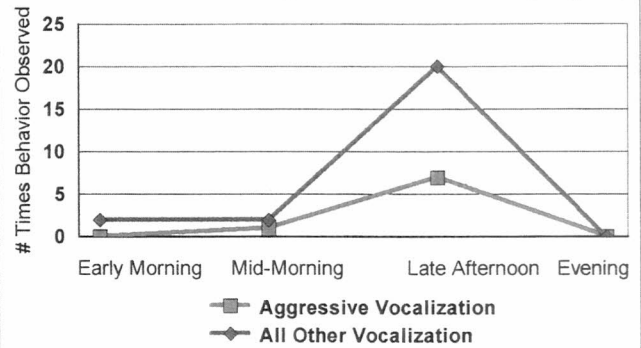
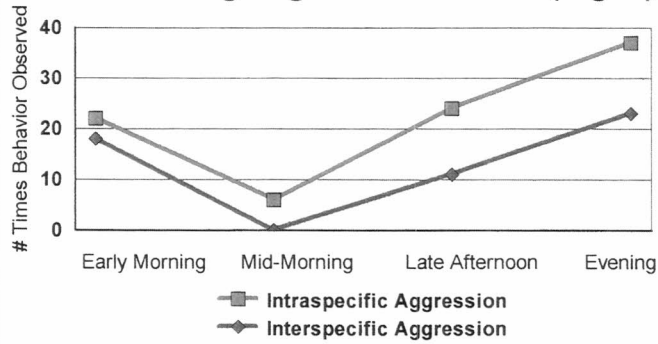
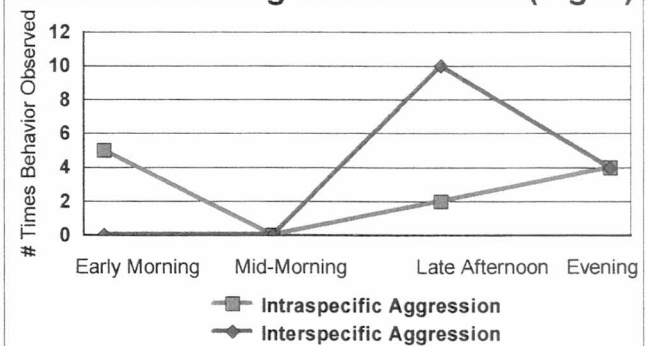
Perhaps what is most noticeable about the presentation of information thus far, is the fact that no formal hypothesis has been clearly stated. This was done intentionally in an attempt to avoid as much expectation bias on the part of the observers as possible while recording the actual observations. The observed characteristics were not chosen based on a previous knowledge regarding either of the gull species observed. Instead, the characteristics were chosen based on a generalized knowledge of avian behavior. The non-behavior based data were collected based on the possibility that environmental factors present on the island may influence the behavior of the subjects observed (Bent,

1963, Wilson, 1975). It was our intention to collect the same behavioral data from two sympatric species. Once the data were collected, an extensive gull-behavior literature search ensued. With the aid of the information found during the literature search, it was possible to make informed comparisons between both species from the gull data recorded during the summer of 1998. These comparisons will be discussed later.

When comparing and contrasting the raw data of the Laughing gull with the raw data of the Herring gull, we discovered several problems which made it necessary to discard some of the data collected. While conducting and discussing our observations, it came to our attention that due to the difference in numbers of Laughing gulls vs. Herring gulls being observed during each observation hour, Laughing Gull data seemed to be based on population trends while Herring Gull data seemed to focus on individual characteristics. These differences do not necessarily negate the comparisons, they simply add to the list of contrasts. Due to the nature of several definitions, the following observed characteristics were not used while comparing the two species: both categories of feeding, drinking and all three categories of signs of stress or illness. Although the definitions seem clear on paper, while attempting to note them in the field, it became clear to all observers that several other behaviors were very similar, therefore making it almost impossible to accurately note the observed behavior as one or another behavior. Out of the remaining behaviors observed, our comparisons will focus mainly on both the two types of vocalization and the two types of aggression observed.

Herring and Laughing gulls have not only their family in common, they share life histories which, at one point, included times when each bird experienced displacement from their habitat by another gull (Burger, 1996). According to Pierotti and Good (1994), it is highly possible that Great Black-backed gulls displaced Herring gulls. Herring gulls seem to have been forced to move south, extending their range into the breeding range of the Laughing gull. Much research has indicated that the southern movement of the Herring gull is responsible for the displacement of the Laughing gull (Burger, 1996, Pierotti and Good, 1994). We were not able to gain access to the breeding grounds to accurately observe the behaviors of either gull while on the breeding grounds. We were however, able to observe the gulls on the main island as it was highly probable that the gulls we observed left the breeding grounds and had come to the island in search of food (Tinbergen, 1961). Because of this, it was highly unlikely that we observed few, if any behaviors associated with breeding. Since, according to Burger (1996) and Pierotti and Good (1994), Laughing gulls and Herring gulls are opportunistic feeders, it was more likely that we observed behaviors associated with food attainment, perhaps for breeding purposes.

The comparisons discussed are based on the assumption that any behaviors defined as occurring within the context of a confrontational situation are a result of competition and avoidance of predation as seen from a Herring gull vs. Laughing gull perspective. According to Burger (1979), the displacement of the Laughing gull by the Herring gull seems likely due to the types of terrain preferred by both gulls when selecting their breeding grounds. Although the Laughing gull traditionally nests in salt marshes, the southward movement of the displaced Herring gull made it difficult for the Laughing gulls to maintain the same breeding grounds each year as they historically have not had the competitive edge over the Herring gull (Burger, 1979, 1981). Our observational data revealed that for almost every observation hour, the Laughing gulls

Observed Laughing Gull Behaviors (Fig. 2)**Observed Herring Gull Behavior (Fig. 4)****Observed Laughing Gull Behaviors (Fig. 3)****Observed Herring Gull Behaviors (Fig. 5)**

not only exceeded the Herring gulls in both types of vocalization, but also in both types of aggression. It is also clear from our observations that Laughing gulls were much more vocal and aggressive during the Evening hours than at any other assigned time period, while the Herring gulls were much more vocal and aggressive during the assigned Late Afternoon time period (Figs. 2 – 5).

Our observations are supported by past observations supplied by Burger (1979, 1981, 1996) which indicate that indeed Laughing gulls are more aggressive as well as more vocal than Herring gulls. Burger has shown on two separate occasions (1979, 1981) that that even when mobbed by as many as four or five Laughing gulls, a Herring gull usually prevails in the confrontational situation. There is strong evidence in both Burger's work and our own observations to support the idea the Laughing gull is more active both aggressively and vocally than the Herring gull. An example of this includes observations (Burger, 1979) by Montevecchi in 1977 during which he stated that Herring gulls were seen preying on Laughing gull chicks and eggs, taking as many as 20 eggs per day. On these occasions, Laughing gulls were unable to defend their nests using the usual "mobbing" technique due to decreasing population numbers. Mobbing includes charging a threat and is accompanied by loud, aggressive calls or cries (Drickamer, Vessey and Meikle, 1996). Being a colonial nesting bird, the Laughing gull uses mobbing techniques to defend its territory against predators, including the Herring gull (Burger, 1979). This evidence may be used to explain why the Laughing gull appears to be more aggressive and vocal than the Herring gull. Another example illustrating the directional difference between the aggression and vocalization shown by Laughing gulls towards Herring gulls is described by Burger (1981). She suggests that Herring gulls interfere with the feeding of Laughing gulls in garbage dumps, even going so far as to pirate food from the Laughing gulls. It would therefore seem to be advantageous for the Laughing gull to attempt to thwart the efforts of the Herring gull through aggression and aggressive vocalization (Tinbergen, 1965, Trivers, 1985).

Although no formal hypothesis was introduced into this study and no statistical manipulations were used to show the alpha level of the results, our observational research still produced results that were useful when combined with previous literature on the subject of gull social behavior. As previously acknowledged, this study did not use a typical research design which includes a hypothesis. We, the observers, wanted to reduce the amount of expectation bias present in our observations. We also wanted to observe the gulls in their natural habitats interacting in natural way. Only by utilizing these observation techniques could we gain insight about the gulls' true behaviors. Based on what we have learned about the nature of the two gull species and Assateague as specific environment, we are hopeful that we are more able to understand the gulls' natural behavior in such a way as to formulate one or more viable hypotheses for future observational study. At least one of the observational team members is planning to return to Assateague in the summer of 1999 to repeat the observations, this time with a better understanding and a more specific focus.

Seagull Acknowledgments

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An Extra Tasty Crispy Thanks to Mrs. Maryann "You Want To Do What?!" Young (Marcy's mommy") for supplying all that yummy grub (and for the necessities, CD player, Sleeping Bag, Bug Repellent, etc.).

Three cheers to the makers of DEET (It may kill us but at least we'll die mosquito free!)

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This paper was originally entitled The Seagull Diaries: Bird to your Mamma but, due to the extremist protests and threats of terrorism, it was renamed for the sake of the free world and gull chicks everywhere.

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