

PECONIC ESTUARY PROGRAM

(Abridged)

MARINE MAMMAL AND SEA TURTLE REPORT

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The Okeanos Ocean Research Foundation, Inc. (Okeanos) was contracted for an analysis of the presence and use of the Peconic Estuary system by marine mammals, sea turtles and sea birds. This report will only cover marine mammals and sea turtles, and is an abridged and incomplete report. It will also not cover seabirds as the we have removed these animals' data from any portion of this project due to funding circumstances.

The data used for this study represents analysis of surveys, recoveries, and direct research since the late 1970's, conducted by the author, and anecdotal and historical records prior to then. The data includes sightings surveys conducted on both dedicated vessels, platforms of opportunity, stranding records for New York State, and the results of specific research projects on seals, sea turtles, and harbor porpoises. The surveys include approximately 15,000 hours of survey time within the study area since 1977.

Stranding records involve 1,013 sea turtles, 436 seals, and 181 cetaceans, including date, time, position and relevant environmental information whenever possible. The position was recorded in either latitude, longitude, Loran C and or a beach numbering system created by the author. Species were recorded on those animals on which a specific identification could be made. This was the case in over 98% of all records. All data have been entered in a computer database using Dbase formats.

This report divides the presentation of its information based upon animal groups. At the end of the report we briefly address the overlap that these species demonstrate indicating specific important habitat areas.

MARINE MAMMALS

Cetaceans::

Four species of cetaceans and five species of pinnipeds have been found to inhabit the Peconic Estuary. Table One lists the species present in the Estuary with only two species of cetacean regularly occurring in this Estuary, the harbor porpoise *Phocoena phocoena*, and the bottlenosed dolphin, *Tursiops truncatus*. The killer whale, *Orcinus orca* has not been seen in the Estuary since the 1930's. However, prior to that time there are reports of their presence in these waters and a capture of one in Orient harbor. All other cetacean species' presence can be considered rare. Both the

harbor porpoise and the bottlenosed dolphin are located primarily in the eastern portions of the Estuary (Figure 2).

The bottlenosed dolphin occurs in the study area on a seasonal basis from May through September. The animals found in the area is small with groups of not more than 12 sighted. Each group's presence is very temporal in nature and probably within the limits of the Estuary for not more than a few days at a time. It appears that these animals may be feeding, based upon direct observations of feeding and recovery of prey items from stomach contents of stranded animals. The Estuary cannot at this time be considered a critical area for this species. Historic records indicate a greater presence for this species however, the greater numbers may simply relate to a large overall population at that time and the relative importance to the species may still have been limited. Almost all marine mammal populations are depleted world wide and this could certainly be a factor in the level of presence.

The harbor porpoise is presently being considered for listing under the endangered species act as either threatened or endangered. This is due to the dramatic decline in the species' population observed throughout the North Atlantic. In this region, however, the harbor porpoise has recently shown an increasing presence. Surveys conducted for this species and stranding records prior to 1990 indicated a very rare and infrequent presence of this species in our waters. Surveys during the last five years have demonstrated a dramatic increase in this species' occurrence. Present surveys indicate an average count of .2 animals per kilometer during times of peak times of occupancy. This would indicate a population of approximately 40 animals. Harbor porpoise are present in the Estuary system from November through May with a peak in abundance during February and March.

The harbor porpoise seems to occupy the eastern portions of the estuary system with a greater frequency. However, during the last two years stranding records indicate a possibly increasing presence in the Great Peconic Bay with animals being recovered from that area. Historical records do indicate a presence of this species in almost the entire Peconic Bay system depending upon ice cover. Duck hunting records frequently report sightings of porpoises and occasional takings of these animals from that area. No systematic analysis has been conducted on habitat usage of this system. However, examination of stomach contents does indicate some prey items. Stomach contents are largely composed of squid and herring. Those animals found within the more western portions seem to be either empty or contain otoliths of herring. The empty stomach does not necessarily mean they were not feeding since many stranded cetaceans regurgitate stomach contents upon stranding.

The harbor porpoise also does not demonstrate any age or sex distribution trends within this area. All age classes and sexes seem to be approximately equal. Although there are a few more males in the stranding records the difference is not statistically significant.

Pinnipeds:

There are 5 species of pinnipeds found within the Peconic Estuary (see Table I). The most common species is the harbor seal *Phoca vitulina*, with harp, *Phoca groenlandica*, and Grey, *Haliochoerus grypus* almost as numerous. The other two species, hooded *Cystophora cristata*, and ringed *Phoca hispida*, are infrequent and do not seem to have a regular occurrence or haul-out locations. Hooded seals have been increasing in numbers over the last few years, however, their numbers in this region still only occur in the tens of individuals. Ringed seals are extremely rare and are clearly an extralimital species.

Seals occupy specific areas and seem to have a very limited amount of movement from one area to another. These locations are focused around a primary haul-out location. There are ten primary haul-out locations within the Peconic Estuary. Seals are sighted outside these areas throughout the entire estuary system including the western most portions of the system. However, sightings outside the primary areas are usually of solitary individuals and do not recur on a regular basis. The areas of sightings outside primary areas have become areas of occupancy as the population increases. The largest haul-out locations are on Little Gull Island, Plum Island and Fishers Island. Great gull and Plum each have more than 100 animals occupying each site while Fishers Island has well over 300 animals. At each of these three sites the primary species is the Harbor seal. However all of these three sites include sightings of grey seals and harp seals. The seven other sites do not contain the numbers of these three however they do contain large numbers of animals (less than 100) and are stable with occupancy during the entire period of the species presence in the ecosystem. The three largest sights include all age and sex classes, however the smaller sites within the bay system itself often do not include adults. Some sites such as the site on Shelter Island include only animals less than 4 years of age. There does not appear to be any separation based upon sex at any of these sites, however, some have not been as completely studied.

Prey items for seals within the region appear to be the same for all species. Stomach contents and visual observations confirm that these animals feed on whatever species is locally abundant at that time. They have been observed to feed upon Flounder *Bothidae*, Atlantic Mackerel, *Scomber scombrus*, herring, *Clupea harengus*, *Brevoortia brevicaudata*, *Pomolobus aestivalis*, Cod, *Microgadus tomcod*, Whiting, *Merluccius bilinearis*, bluefish, *Pomatomus saltatrix* and a few species of invertebrates. Feeding is based largely upon concentration of prey rather than upon a particular species. The haul-out sites have been found to be adjacent to, or apart of areas where large concentrations of fish can be found.

Prior to 1988 and after the 1950's, seal populations were largely found in the region from December through April with the largest concentration of animals during February and March. Since 1988 this has no longer remained the case. Seal populations have been dramatically increasing to where occupancy in the estuary is on a year-round basis with peak abundance occurring from December through May. This appears to match a historical abundance prior to the 1950,s. In addition pups have been born within the confines of the Peconic estuary during the last few years. A

population estimate conducted by the Okeanos Ocean Research Foundation during 1985 indicated a total population for all of New York of approximately 400 individuals. The most recent estimate now indicates that more than 2000 animals occur within New York State and the number may be as high as 4,000. The Peconic Estuary includes more than 50% of the total population estimate which makes the region very significant to this group of animals in this region.

SEA TURTLES

There are four species of sea turtle found within the Peconic Estuary (Table I). One of the species, the leatherback *Dermochelys coriacea*, is found within the system on an irregular basis. Since this species is largely an oceanic species and only occasionally feeding in the estuary it is unlikely to be making wide use of the region.

The other three species found within the estuary make extensive use of, and in at least one case, the kemp's ridley, *Lepidochelys kemp*, the region has been determined to be a critical developmental habitat. The ridley is the smallest of all sea turtles and the most endangered. All Kemp's sea turtles found within the New York bight are of one age class. This age has been identified and will be discussed in the final report. However, all kemp's found here have a mean standard carapace length of 27.2 cm (+/- .7SD). Analysis of their movements and habits within the region indicate that all ridleys occurring in the region follow the same basic life cycle. Ridleys arrive in the region between May 15 - June 15 depending upon water temperatures. All animals that initially arrive come from the open ocean and stomach contents indicate they have been surface feeding. Animals appear to arrive in greater numbers in the eastern portions of Long Island. During July increasing numbers of Ridley sea turtles are found with over 75% of all captures or sightings occurring with the Peconic Estuary. However, analysis was conducted to look a finer scale details of this species distribution within the estuary system. This analysis found that five areas in the Peconic account for over 95% of all ridley data points. These are likely based upon the distribution of this species major prey item while located within the estuary.

The major component of fecal analysis and or stomach contents was found to be the spider crab. However, further analysis indicates a shift away from this prey item toward late September. The next prey item is the green crab with occasional blue claw crabs. Around the middle of October all sea turtles, including ridleys begin an easterly movement toward open waters. Bay late October or early November all sea turtles that will leave the area have done so. The ridley moves along the coast in a westerly and southern migration.

While in the Peconic estuary the kemp's ridley has a rapid growth rate. Mark recapture efforts of the Foundation indicate that some animals double their weight during the time within this estuary. At no other time in their life cycle has this type of growth been identified.

Utilization of the Peconic estuary is concentrated in a few areas as already discussed. These areas include eastern and western portions of the Peconic. However

two critical areas were found to be Orient Harbor and an area west of Jessups Neck. Captures of animals in these areas are frequent and comprise **% of all captures. In addition the few confirmed at sea sightings of this species also occur in these areas. The lack of at sightings is clearly understood based upon the size of the animals and studies we have conducted of their movements throughout the water column. Kemp's ridleys have been found to spend over 78% of their time at or near the bottom and surface only for brief times to breathe. Most bottom time was found to involve slow search-like swimming patterns and direct observations were made of feeding activities of individual ridleys outfitted with sonic transmitters. Animals were observed to move from one area to another however primary feeding areas tended to involve longer periods of occupancy.

In Orient Harbor ridleys were observed to remain in water of 3-15 meters in depth for the majority of time. Deeper forays occurred and were not uncommon however, movement into water shallower than 3 meters was rare. A similar pattern was observed at the Jessups Neck area. However animals did make more frequent forays into 2 meter water depths. This may be due to the type of bottom substrate or the distribution of crabs in that area.

The remaining use areas within the Peconic demonstrate a wide use of this ecosystem by the ridley. We do not consider our survey comprehensive yet it is clear that this ecosystem is of critical importance to this species. based upon stomach content analysis at different times of year and the behavior of individual turtles we believe that the Long island region and particularly the Peconic Estuary and some of the south shore bays are critical developmental habitats. they are clearly utilized by the ridley for learning how to switch from the juvenile planktonic feeding life style to the adult benthic feeding life style. As adults Ridley sea turtles are known to feed on blue claw crabs (ref). This prey item could be a formidable prey item and hence turtles appear to be learning how to hunt and eat crabs by learning on a "safer" prey item. This makes the region of critical importance to the recovery of this species.

The Loggerhead sea turtle has a very different life style in the region. This species occupies the region with both adults and juveniles. However, juveniles are more common. The Peconic Estuary is utilized only by juveniles and the occurrence of adults is on an extralimital basis. Utilization of the Peconic system by this species is widely distributed with less concentration as exhibited in the ridley. Loggerhead sea turtles are found throughout the system with slight concentration in five areas. These five areas are indicated in figure **. The loggerhead has been demonstrated to be feeding in the Peconic estuary are an array of crab species. However, the preferred prey item was found to be horseshoe crabs (sp) with green and spider crabs of lesser interest. Loggerhead turtles in the Peconic have a mean standard carapace length of ** cm (sd). Aging studies conducted for Okeanos demonstrate that these animals are of approximately 5-7 years of age. However there is a wider range with this species than that associated with the ridley. This is likely to represent return activity of individuals from one year to the next. Based upon our studies three areas within the estuary clearly are of a greater importance to this species with more animals sighted or captured within them The first area is orient harbor with animals caught here more than almost all other areas. However, Southold bay is almost as frequent in captures and the differences

here could relate to effort. A more dedicated study would need to be conducted in order to clarify this. Animals found in orient harbor are found in water with a mean depth of 4-7 meters and are often sighted in much deeper water. Those animals found in Southold bay are found in waters depths of 5-11 meters. The difference may be due to the types of currents in each of these areas. Those animals found in the Napeague location clearly prefer shallower water with animals caught in water as shallow as 2-3 meters.

Loggerhead were shown to have definite preferences for certain areas, particularly in Orient harbor and Southold bay. Some individuals were recaptured as much as four to six time in the same locations over almost a two month span. In all instances of this continuous locality selection the animals were found to have been feeding on horseshoe crabs based on fecal contents.

Growth rate data for this species will not be included with this report due to the brief nature of the report. However, this species did demonstrate positive growth during the time of occupancy.

The last sea turtle found to occur within the Peconic estuary is the green sea turtle. This species is less understood for the region and is clearly in need of much more study. However, the species has been found to be prevalent within the region and has been demonstrated to be feeding in the area. All animals found within the estuary of this species are juveniles with a mean standard carapace length of ** (sd). Many of the animals found in the estuary are very young and thought to be approximately 2.5 to 4.5 years of age. However accurate aging data for this species has not been completed.

All green sea turtles found within the estuary have been found to feed on submerged Aquatic Vegetation (SAV). The most common items found in fecal material or within the gut have been codium, ulva and eel grass. The most preferred item appears to be codium however the conclusion here must be made with some caution. The preference for this food item may simply relate to the sample size since some larger animals have been found to have consumed other food items.

The green turtle appears to be ***** in its distributions.

Conclusions

The distributions of marine mammals and sea turtles clearly demonstrate that certain habitat regions within the Peconic Estuary are very significant. Although the entire ecosystem is occupied by these species certain areas represent high use by these species, and in some instances by multiple species groups. An analysis of habitat use was conducted utilizing a cluster analysis. Figure ** represents a summary of the overlapping for important use areas. Based on this type of analysis and the point distributions of individuals six areas are very important to all species of marine mammals. Table ** list the relationship of these areas to the species present. However, this report does not cover the defining factors for the habitats in each of these regions. This can only be covered in a complete report as these are the critical factors in determine a species presence. They are also the factors that become important to provide some protection for. Additionally, based upon the increasing mortality associated with vessel traffic for all species, and particularly sea turtles these areas

should be considered for some type of restricted zone activities.

TABLE I

Scientific Name	Common Name
Cetaceans	
<u><i>Delphinus delphis</i></u>	Common dolphin
<u><i>Eubalaena glacialis</i></u>	Northern Right whale
<u><i>Orcinus orca</i></u> (historical)	Killer whale
<u><i>Phocoena phocoena</i></u>	Harbor porpoise
<u><i>Tursiops truncatus</i></u>	Bottlenosed dolphin
Pinnipeds	
<u><i>Cystophora cristata</i></u>	Hooded seal
<u><i>Halichoerus grypus</i></u>	Grey seal
<u><i>Phoca hispida</i></u>	Ringed seal
<u><i>Phoca groenlandica</i></u>	Harp seal
<u><i>Phoca vitulina</i></u>	Harbor seal
Sea Turtles	
<u><i>Carretta carretta</i></u>	Loggerhead sea turtle
<u><i>Chelonia mydas</i></u>	Green sea turtle
<u><i>Dermochelys coriacea</i></u>	Leatherback sea turtle
<u><i>Lepidochelys kemp</i></u>	Kemp's ridley