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## **American Oystercatcher productivity monitoring, breeding survey and banding in Virginia: 2004 report**

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**AMERICAN OYSTERCATCHER  
PRODUCTIVITY MONITORING, BREEDING  
SURVEY AND BANDING IN VIRGINIA  
2004 REPORT**



**CENTER FOR CONSERVATION BIOLOGY  
COLLEGE OF WILLIAM AND MARY**

# **American Oystercatcher Productivity Monitoring, Breeding Survey and Banding in Virginia 2004 Report**

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**Cover Photo:** Breeding adult American Oystercatcher. Photo: Alex Wilke.

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# TABLE OF CONTENTS

|                                     |    |
|-------------------------------------|----|
| <b>Executive Summary</b> .....      | iv |
| <b>BACKGROUND</b> .....             | 1  |
| Context .....                       | 1  |
| Objectives.....                     | 1  |
| <b>METHODS</b> .....                | 3  |
| Productivity monitoring.....        | 3  |
| Virginia Coast Survey.....          | 4  |
| Banding.....                        | 4  |
| <b>RESULTS and DISCUSSION</b> ..... | 5  |
| Productivity Monitoring.....        | 5  |
| Virginia Coast Survey.....          | 11 |
| Banding.....                        | 13 |
| <b>ACKNOWLEDGEMENTS</b> .....       | 14 |
| <b>LITERATURE CITED</b> .....       | 15 |
| <b>APPENDIX 1</b> .....             | 16 |
| <b>APPENDIX 2</b> .....             | 21 |
| <b>APPENDIX 3</b> .....             | 22 |
| <b>APPENDIX 4</b> .....             | 24 |
| <b>APPENDIX 5</b> .....             | 25 |
| <b>APPENDIX 6</b> .....             | 26 |

## EXECUTIVE SUMMARY

Biologists along the east coast of the United States have recently expressed concern about the conservation status of the American Oystercatcher (*Haematopus palliatus*). The species has a relatively small population size and depends on coastal habitat that is under pressure from humans for development and recreation. Several studies of American Oystercatcher productivity have suggested that the species is inherently intolerant to human disturbance and experiences low productivity rates in areas where their breeding habitat is also used for human recreation. As a beach-nesting bird, their nesting attempts are also very vulnerable to destruction by mammalian and avian predators, which have been known to experience population increases because of human influenced factors. The undeveloped barrier islands and marshes of Virginia's Eastern Shore support over 500 pairs of breeding American Oystercatchers and provide a unique opportunity to study their productivity in the relative absence of disturbance from direct human activity. Some of the islands are, however, inhabited by high numbers of common raccoons (*Procyon lotor*). The Nature Conservancy's Virginia Coast Reserve (TNC), in cooperation with The Center for Conservation Biology at The College of William and Mary (CCB) and other partners, currently supports several efforts aimed at investigating the population status and breeding and wintering ecology of the species. These efforts include annual studies of oystercatcher productivity on the barrier islands and in the lagoon system, annual surveys of breeding and wintering populations and a banding program for oystercatcher adults and chicks. The primary objective of productivity monitoring has been to compare productivity in habitats managed for mammalian predators and those that are not in order to assess the effectiveness of the predator removal as a management strategy for increasing the reproductive success of beach nesting shorebirds and waterbirds. The annual breeding and wintering surveys provide consistent and precise counts of oystercatchers along the Virginia coast so that managers can track changes in population numbers and distribution. Finally, the banding program will increase the number of color-banded birds in the population so that researchers may examine questions concerning migration and dispersal, survival rates and habitat use.

One hundred and fifty-three pairs of American Oystercatchers were monitored for productivity during the 2004 breeding season. Eighty-one nested on Metompkin Island, which is managed by TNC for mammalian predators. Twenty-five nested on Wreck Island Natural Area Preserve, which is not managed for mammalian predators but did not have any predator activity during the 2004 breeding season. Forty-seven nested in the marshes of the lagoon system located adjacent to Wachapreague, Virginia. American Oystercatchers experienced high productivity on Metompkin Island and Wreck Island (0.79-1.18 young fledged per pair) for the third and second consecutive years, respectively. These productivity levels continue to be well above what is typically recorded for this species in other parts of its range, and our results suggest that the absence of mammalian predators on these islands allows for the higher productivity of pairs nesting there. American Oystercatchers breeding in the marshes off of Wachapreague also experienced high productivity in 2004 – 0.85 young fledged per pair. Productivity of oystercatchers in this habitat is very vulnerable to flooding events and appears to be highly variable from year to year depending on the timing of egg-laying, spring tide events, storms and storm influenced tide events.

A total of 706 adult American Oystercatchers (327 pairs and 52 single adults) were recorded during the 2004 Piping Plover, Wilson's Plover and American Oystercatcher survey, a 26.1% increase from 2000 when oystercatchers were first systematically surveyed along the coast of Virginia. Breeding pairs were documented on every barrier island along the Eastern Shore of Virginia except for Walllops Island. Only seven pairs were documented west and south of the Chesapeake Bay.

Sixty-two American Oystercatcher chicks and two adults were banded during the 2004 breeding season. At least fifty-seven of the chicks fledged. We will continue to work with other states to further develop Virginia's banding program, upon which researchers, managers and students can build in the future.

## BACKGROUND

### CONTEXT

In recent years, local scientists and wildlife managers on Virginia's Eastern Shore have recognized the importance of Virginia as a population stronghold for the American Oystercatcher (*Haematopus palliatus*), one of six shorebird species of HIGHEST regional conservation priority according to the Northern Atlantic Shorebird Plan (Clark et al. 2000). American Oystercatchers have a highly restricted year-round range, consisting only of fragile coastal habitat that is under intense pressure from humans for recreation and development. This increasing pressure introduces issues affecting coastal waterbirds, such as loss of habitat, increased pollution, increased human disturbance and increased numbers of mammalian and avian predators (Erwin 1980; Nol and Humphrey 1994; Davis et al. 2001). In Virginia, the barrier islands and marshes of the lagoon system of the Eastern Shore are essentially uninhabited and undeveloped and provide important breeding and wintering habitat for many waterbirds and shorebirds, including American Oystercatchers. Overall, Virginia supports the largest number of breeding oystercatchers (Wilke et al., unpubl. data) and the second largest number of wintering oystercatchers on the east coast of the United States (Nol et al. 2000). The Nature Conservancy's Virginia Coast Reserve (TNC), in cooperation with The Center for Conservation Biology at The College of William and Mary (CCB) and other partners, currently supports several efforts aimed at investigating the population status and breeding and wintering ecology of the species. These efforts include annual studies of oystercatcher productivity on the barrier islands and in the lagoon system, annual surveys of breeding and wintering populations and a banding program for oystercatcher adults and chicks. The results of these efforts will help to better assess the current status of American Oystercatchers in Virginia and will provide information to guide the development of effective conservation and management strategies. A detailed explanation of the rationale and objectives of these efforts is given in Wilke 2003. This report summarizes the results of the productivity monitoring, Virginia coast survey and banding efforts conducted during the 2004 breeding season.

### OBJECTIVES

**Productivity monitoring:** Researchers have monitored American Oystercatcher productivity on the barrier islands of Virginia since 2001. The primary objective of the monitoring has been to compare productivity in habitats managed for mammalian predators and those that are not. This will enable managers to determine the effectiveness of predator removal as a management strategy for increasing productivity of beach nesting birds and will help guide local management and conservation strategies for these species. In 2004, we monitored oystercatcher productivity on two barrier islands, Metompkin Island and Wreck Island Natural Area Preserve. As in previous years, TNC worked in cooperation with the United States Department of Agriculture's Wildlife Services Program to remove mammals from Metompkin Island prior to the beginning of the bird breeding season. Wreck Island currently has no management program for mammalian



American Oystercatcher clutch. Photo: Alex Wilke.

predators but did not appear to have raccoon or fox activity in 2004. We did not monitor oystercatcher productivity on a barrier island with predator activity in 2004. Because of this, we are unable to make direct within year comparisons of productivity in managed and unmanaged habitats, but our results will contribute to baseline, long-term documentation of oystercatcher productivity levels on 'predator free' islands and of factors affecting nesting success.

We also monitored oystercatcher productivity in the lagoon system located adjacent to Wachapreague, Virginia (referred to as Wachapreague). Many researchers and managers have suggested that American Oystercatchers, throughout their breeding range, may be choosing non-traditional nesting habitats (eg. marsh islands, dredge-spoil islands) because of various factors making more traditional habitats (eg. barrier island beaches) either unavailable or unsuitable (Frohling 1965; Lauro and Burger 1989; Shields and Parnell 1990; Toland 1992). The Virginia barrier islands are separated from the Eastern Shore mainland by an extensive lagoon system that provides non-traditional nesting habitat for several species of colonial nesting waterbirds, as well as American Oystercatchers (Rounds 2003, unpubl. M.Sc. thesis, B. Truitt pers.comm.). Information on numbers and productivity of American Oystercatchers breeding in this lagoon system is lacking. This is only the second year that oystercatcher breeding activity has been systematically documented and monitored in these areas, and these results will provide important insight into the quality of the lagoon system as 'non-traditional' breeding habitat for the species.

**Virginia Coast Survey:** Annual surveys of breeding American Oystercatchers on the Virginia coast have been conducted since 2000. Beginning in 2001, these surveys have been done in conjunction with the annual Piping Plover (*Charadrius melodus*) and Wilson's Plover (*Charadrius wilsonia*) survey of the Virginia coast, coordinated by the Virginia Department of Game and Inland Fisheries (VDGIF). The survey focuses only on plovers and oystercatchers and provides consistent and precise counts of the three species along the Virginia coast so that managers can track changes in population numbers and distribution.

**Banding:** In 2003, we initiated a color-banding program for oystercatcher chicks in Virginia. The primary objective of the program is to increase the number of color-banded birds in the population so that researchers may examine questions concerning migration and dispersal patterns, survival rates and habitat use. We continued banding efforts in 2004 using a new banding scheme that has been developed in coordination with research groups from other states. The scheme includes a standardized protocol for the types of bands to be used and placement of the bands. We also began banding oystercatcher adults in 2004 using a protocol devised by researchers and students from North Carolina State University. We anticipate further developing Virginia's banding program, upon which researchers, managers and students can build in the future.



## METHODS

### PRODUCTIVITY MONITORING

We began surveys for breeding oystercatchers on the barrier islands in April: Metompkin Island – April 10; and Wreck Island – April 30. Metompkin Island was monitored as frequently as possible, usually every 2-7 days, through 17 August. Because of logistical constraints, Wreck Island was monitored approximately once every month through July. This restricted visitation to Wreck Island was prohibitive for determining productivity endpoints such as clutch size and hatching success. However, it is instructive for evaluating the feasibility of determining oystercatcher productivity estimates (number of young fledged per pair) with minimal time commitment. We made the assumption that pairs observed on a particular territory more than twice were active, breeding pairs, even though we may have never observed a clutch or brood. We surveyed Metompkin Island 35 times and Wreck Island 5 times. Metompkin Island required two days to survey and Wreck Island required only one day to survey.

We began surveying Wachapreague for breeding pairs on 26 May and continued monitoring the area approximately once per week (16 times total) through 20 August. Because we began surveys of this area late relative to when oystercatchers begin nesting in Virginia, we found many of the nesting attempts already at the chick stage and may have missed several first nesting attempts. We made the assumption that pairs observed on a particular territory more than twice were active, breeding pairs, even though we may have never observed a clutch or brood.

Productivity monitoring consisted of locating breeding oystercatcher pairs and their nests or broods and following the nesting attempts until the broods fledged or the attempts failed. Oystercatcher nests with eggs were found by locating incubating adults at the nest from a distance or by following adult tracks to the nest. We recorded the location of each nest with a



Monitoring an oystercatcher nest. Photo: Jerry Uhlman

Garmin 12 XL Global Positioning System (GPS) unit. We also marked each nest with a 12-inch unpainted paint-stick, dug into the sand approximately 10 meters to the east of the scrape. The nest number and species were marked on the paint-stick with black permanent marker. In cases where prominent landmarks were present to mark the location of nests, we did not use paint-sticks. For nesting attempts found during the chick stage, we marked the chicks' location with a GPS unit and continued to monitor them as with other nesting attempts. During each subsequent visit, we checked the status of the eggs in the scrape or located chicks by observing from a distance. The presence of young was sometimes assumed based on adult behavior rather

than visual confirmation. Every effort was made to determine causes of failure during the egg and chick stages. Nesting attempts were monitored through fledging or until the attempt failed. Young were considered fledged 35-40 days after hatching or when observed flying (Nol and Humphrey 1994). The time spent within any one nesting or feeding territory was limited to 20 minutes to avoid excessive disturbance to the birds. We report the productivity estimate (number of young fledged per pair), hatching success percentages and causes of nesting failure for Metompkin Island and productivity estimates only for Wreck Island and Wachapreague.

## VIRGINIA COAST SURVEY

For the fourth consecutive year, TNC and VDGIF combined resources in order to survey Piping Plovers, Wilson's Plovers and American Oystercatchers along the Virginia coast. The survey was conducted between 1 June and 9 June and covered the Virginia barrier island chain extending from Chincoteague National Wildlife Refuge at the Virginia/Maryland border to Fisherman Island National Wildlife Refuge at the southern tip of the Delmarva Peninsula. The survey also covered sites located on the western shore of the Chesapeake Bay (Grandview Beach, Craney Island and Plum Tree Island National Wildlife Refuge) and on beaches south of the Chesapeake Bay (Back Bay National Wildlife Refuge and False Cape State Park). Groups of two or three people walked the length of each island or site and surveyed all suitable nesting habitat for American Oystercatchers. Participants were asked to record the following: observations of pairs, single adults, nests and broods, the location of each observation using a GPS unit, territorial behavior and signs of predators or human activity. Oystercatcher pairs were assumed to be breeding birds. Due to time constraints, we did not ask participants to spend time searching for nests or broods, but only to report them when observed.

## BANDING

Oystercatcher banding was conducted on an opportunistic basis during regular productivity monitoring. We did not attempt to band during wet or excessively windy or hot weather conditions. We targeted chicks that were 25-35 days old and adults that were actively rearing small young. Chicks were captured by hand, after their location was determined by observing from a distance. We captured adults by using an oystercatcher decoy surrounded by a set of noose carpets. Our methods followed protocol developed by researchers at North Carolina State University (C. McGowan pers. comm.). We placed the decoy within the targeted pair's breeding territory and arranged three noose carpets, camouflaged with sand, wrack and vegetation, in a triangular pattern around it. We hid at a distance and watched as the adult oystercatchers reacted to the 'intruder' in their territory. As soon as an adult was successfully noosed, we



American Oystercatcher decoy used to trap adults. Photo: Alex Wilke.

quickly retrieved it from the trap and banded it. We did not spend more than 30 minutes targeting a particular pair. Each chick and adult received a size 5 incoloy U.S. Fish and Wildlife Service (USFWS) band on their right tarsometatarsus (lower right). We did not encounter any individuals that required a size 6 USFWS band. In addition, each chick and adult received two identical size 6 black color bands each engraved twice with white, field-readable two-digit numeric codes. One band was placed on each tibiotarsus (upper left and right) and secured using PVC cement before the birds were released. The bands are 15 mm high and made of a triple-layer, UV-resistant darvic plastic. All chicks from a brood were released at the same time in the same area where they were captured as long as appropriate cover (i.e. vegetation) was

available. Adults were released on their breeding territory.



Engraved color band. Photo: Deniz Aygen.

## RESULTS AND DISCUSSION

### PRODUCTIVITY

We monitored 81 oystercatcher pairs on Metompkin Island, 25 pairs on Wreck Island and 47 pairs at Wachapreague. We recorded a total of 151 fledged young (Table 1). See Appendices 1-3 for results of individual nesting attempts. Fifty-four pairs fledged at least one young on Metompkin, seventeen pairs on Wreck and twenty-two at Wachapreague (Figures 1-3).

Table 1. Summary of American Oystercatcher breeding activity by site in 2004.

| SITE         | NO. PAIRS MONITORED | NO. NESTING ATTEMPTS <sup>1</sup> | NO. YNG FLEDGED | PRODUCTIVITY ESTIMATE <sup>2</sup> |
|--------------|---------------------|-----------------------------------|-----------------|------------------------------------|
| Metompkin    | 81                  | 96                                | 93              | 1.18                               |
| Wreck        | 25                  | -                                 | 19              | 0.79                               |
| Wachapreague | 47                  | -                                 | 39              | 0.85                               |

<sup>1</sup> Includes re-nesting attempts

<sup>2</sup> No. young fledged/no. pairs. Calculated based on pairs with known success (i.e. whether they fledged chicks or not). Success of 2 pairs on Metompkin, 1 pair on Wreck and 1 pair at Wachapreague was unknown.

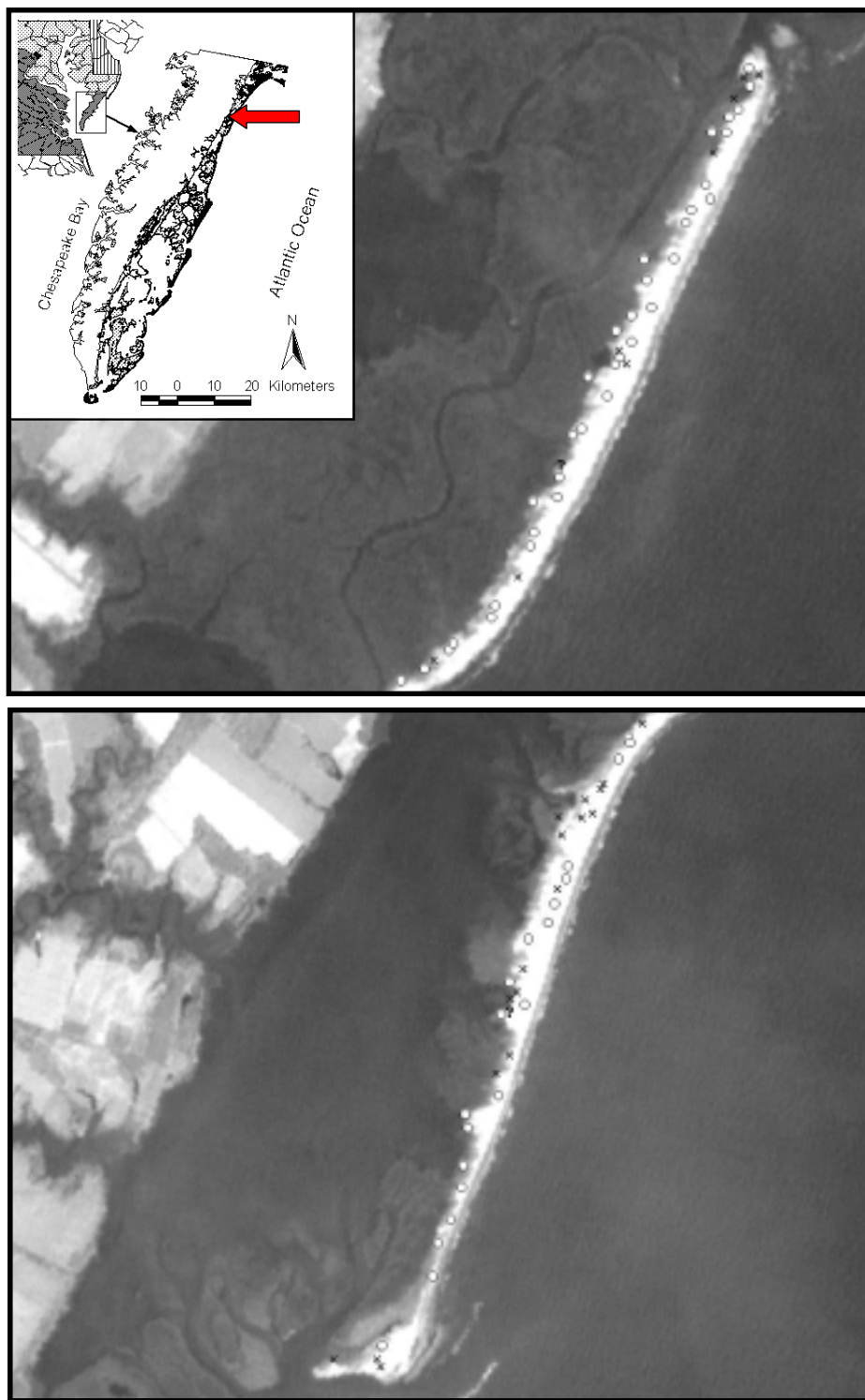


Figure 1. Distribution of breeding American Oystercatcher pairs on Metompkin Island in 2004. Top figure shows the northern half of the island and bottom figure shows the southern half. White dots indicate successful pairs (fledged at least one chick), black Xs indicate unsuccessful pairs and question mark symbols indicate pairs with unknown outcome. Satellite imagery source: [www.modis-land.gsfc.nasa.gov/val/core-site.asp?SiteID=27](http://www.modis-land.gsfc.nasa.gov/val/core-site.asp?SiteID=27). Inset map source: [www.vcrlter.virginia.edu/gisimages.html](http://www.vcrlter.virginia.edu/gisimages.html).

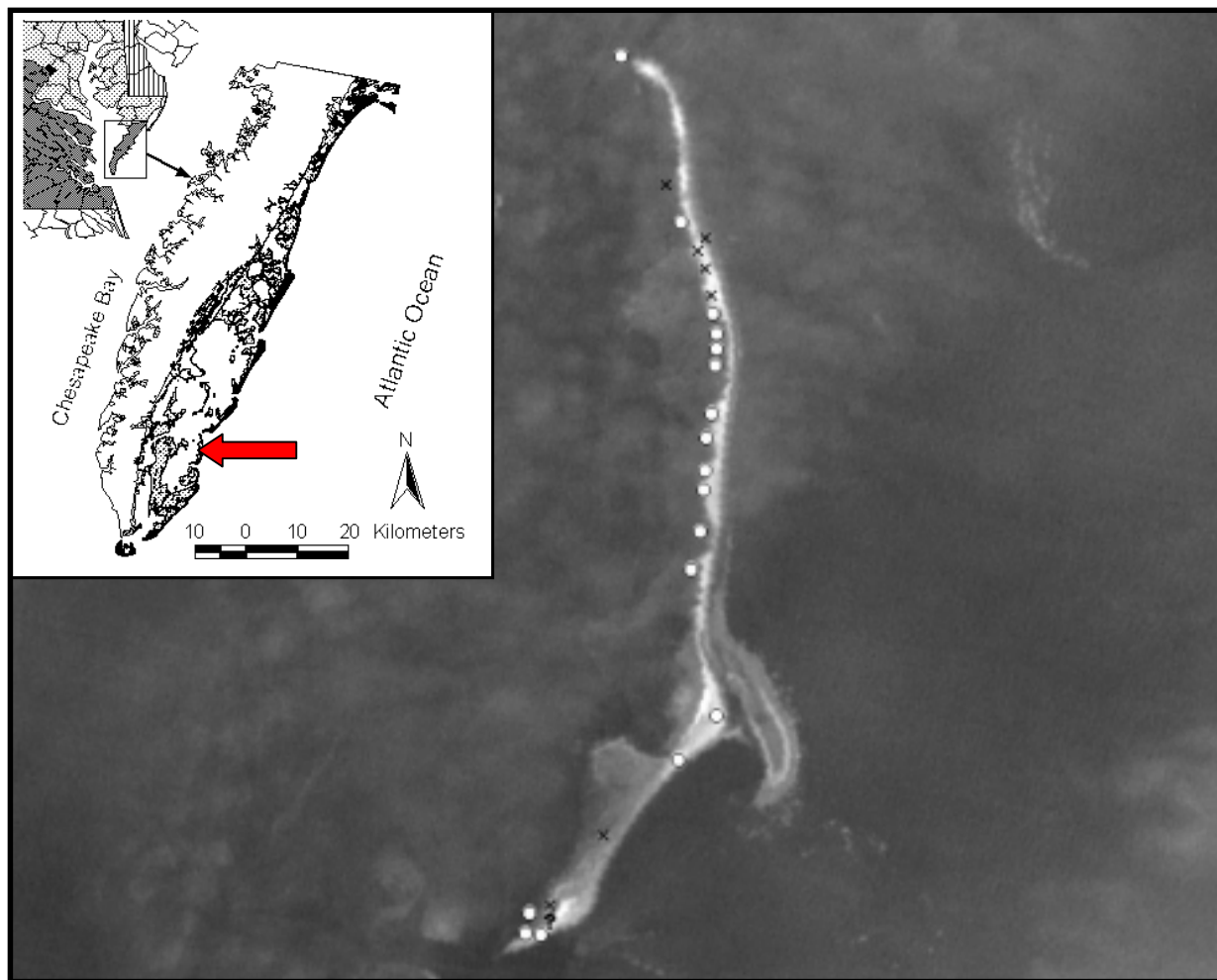


Figure 2. Distribution of breeding American Oystercatcher pairs on Wreck Island Natural Area Preserve in 2004. White dots indicate successful pairs (fledged at least one chick), black Xs indicate unsuccessful pairs and question mark symbols indicate pairs with unknown outcome. Satellite imagery source: [www.modis-land.gsfc.nasa.gov/val/coresite.asp?SiteID=27](http://www.modis-land.gsfc.nasa.gov/val/coresite.asp?SiteID=27). Inset map source: [www.vcrlter.virginia.edu/gisimages.html](http://www.vcrlter.virginia.edu/gisimages.html).

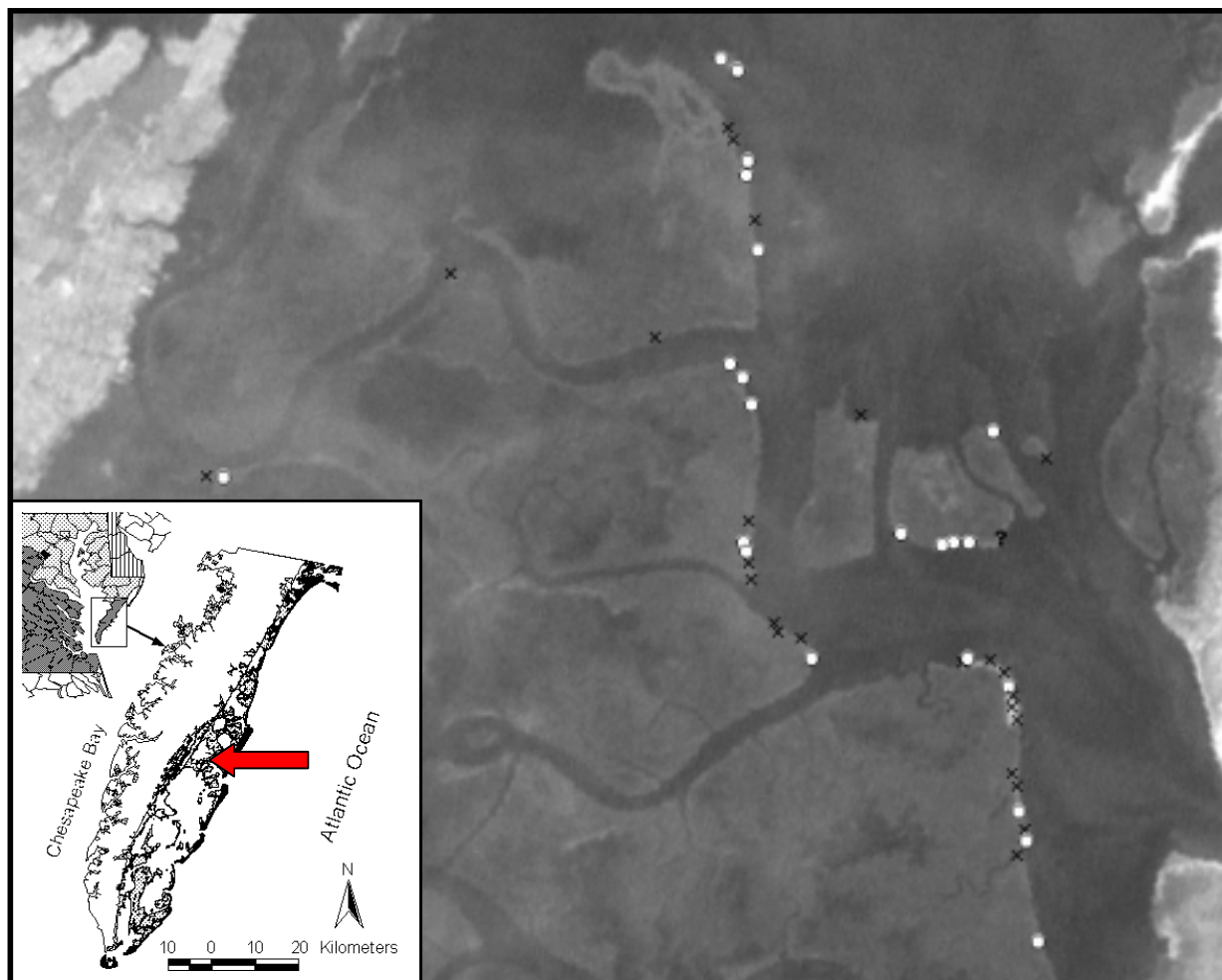


Figure 3. Distribution of breeding American Oystercatcher pairs in marshes off of Wachapreague, Virginia in 2004. White dots indicate successful pairs (fledged at least one chick), black Xs indicate unsuccessful pairs and question mark symbols indicate pair with unknown outcome. Satellite imagery source: [www.modis-land.gsfc.nasa.gov/val/coresite.asp?SiteID=27](http://www.modis-land.gsfc.nasa.gov/val/coresite.asp?SiteID=27). Inset map source: [www.vcrlter.virginia.edu/gisimages.html](http://www.vcrlter.virginia.edu/gisimages.html).

American Oystercatchers experienced high productivity on Metompkin Island and Wreck Island for the third and second consecutive years, respectively (Tables 1-2). These productivity levels continue to be well above what is typically recorded for this species in other parts of its range where predators and human disturbance are chronic problems (see Wilke 2003 for summary). As in previous years, our results suggest that the absence of mammalian predators on these islands allows for the higher productivity of pairs nesting there. Only fifteen cases of clutch loss were documented on Metompkin Island including only five cases of known depredation (Tables 3-4).

We did not collect productivity data from sites with mammalian predators in 2004. In previous years, we monitored breeding pairs on Fisherman Island National Wildlife Refuge as a comparison since that island had raccoon activity throughout the oystercatcher breeding seasons. In 2004, the refuge implemented a program to remove raccoons from parts of the island, and the refuge biologist continued to monitor productivity throughout the breeding season. She documented an increase in hatching success from 2003, however productivity remained very low suggesting that pairs are experiencing losses at the chick stage (Table 2). A more detailed examination of the effects of predator removal on hatching success and productivity of oystercatchers is underway, and further investigation into the reproductive constraints of oystercatchers nesting on Fisherman Island is scheduled for 2005.

Table 2. Summary of American Oystercatcher breeding activity by island, 2002 – 2004.

|                                    | METOMPKIN | WRECK | FISHERMAN <sup>3</sup> |
|------------------------------------|-----------|-------|------------------------|
| 2002                               |           |       |                        |
| No. pairs monitored                | 65        | -     | 41                     |
| No. nesting attempts <sup>1</sup>  | 73        | -     | 53                     |
| No. yng fledged                    | 57        | -     | 17                     |
| Productivity estimate <sup>2</sup> | 0.88      | -     | 0.41                   |
| 2003                               |           |       |                        |
| No. pairs monitored                | 71        | 23    | 48                     |
| No. nesting attempts <sup>1</sup>  | 92        | 27    | 84                     |
| No. yng fledged                    | 66        | 29    | 10                     |
| Productivity estimate <sup>2</sup> | 1.05      | 1.26  | 0.21                   |
| 2004                               |           |       |                        |
| No. pairs monitored                | 81        | 25    | 50                     |
| No. nesting attempts <sup>1</sup>  | 96        | -     | 60                     |
| No. yng fledged                    | 93        | 19    | 5                      |
| Productivity estimate <sup>2</sup> | 1.18      | 0.79  | 0.1                    |

<sup>1</sup> Includes re-nesting attempts

<sup>2</sup> No. young fledged/no. pairs

<sup>3</sup> 2004 data provided by P. Denmon, Fisherman Island National Wildlife Refuge

Our results suggest that predator removal on Metompkin and Wreck Islands results in consistently high productivity of oystercatchers nesting on those islands. In addition, the level of productivity recorded on these islands continues to be higher than what is typically recorded in other parts of the species' breeding range and emphasizes the importance of Virginia for the breeding population. We recommend continuing productivity monitoring of oystercatchers on both managed and unmanaged barrier islands in order to document long-term productivity levels and to continue to assess the effectiveness of predator removal for increasing reproductive success of beach-nesting birds.

Table 3. Summary of documented causes of American Oystercatcher clutch loss on Metompkin Island in 2004.

| CAUSE OF FAILURE   | METOMPKIN (n=15) |
|--------------------|------------------|
| PREDATOR (RACCOON) | -                |
| PREDATOR (AVIAN)   | -                |
| PREDATOR (UNKNOWN) | 4                |
| GHOST CRAB         | 1                |
| WASH OUT           | -                |
| ABANDONED          | 2                |
| UNKNOWN            | 8                |

Table 4. Summary of American Oystercatcher hatching success on Metompkin Island in 2004.

| SITE                           | HATCHED YNG | DID NOT HATCH YNG | UNKNOWN <sup>2</sup> | HATCHING SUCCESS (%) <sup>3</sup> |
|--------------------------------|-------------|-------------------|----------------------|-----------------------------------|
| Metompkin (n=96 <sup>1</sup> ) | 72          | 15                | 9                    | 75.0 – 84.4                       |

<sup>1</sup> Includes re-nesting attempts

<sup>2</sup> Refers to nesting attempts that failed during an interval between nest visits when the eggs could have hatched. Hatching success in these cases is unknown.

<sup>3</sup> Successful nests are those that hatched at least one young. Range indicates a lower limit if all unknown attempts did not hatch, and an upper limit if all unknown attempts did hatch.

Our results from Wreck Island were obtained through only five visits to the island during the breeding season. As stated previously, this restricted methodology is instructive for evaluating the feasibility of determining oystercatcher productivity estimates with minimal time commitment. We believe that this methodology has very good potential for providing accurate productivity estimates in certain situations. First, the general distribution of breeding pairs on the island should be known prior to the breeding season. Oystercatchers tend to occupy the same breeding territories year after year, and knowing the location of these territories facilitates identifying active breeding pairs and successfully determining whether or not they produce young, even with infrequent monitoring. This also requires identifying the feeding territories of breeding pairs (i.e. where the adults feed the young) since these areas are often separate from the actual nest scrape location. Adults tend to use the same feeding territories year after year as well. Second, the habitat on the island that is used by the oystercatchers needs to be accessible enough so that the presence of fledged broods can be visually confirmed at some point late in the breeding season. The middle portion of Wreck Island has extensive marshes on the lagoon side of the island. These areas are difficult to access, and although we were able to determine whether or not certain pairs were successful in fledging young based on adult behavior, we most likely underestimated the number of young produced by pairs in this area because we could not get visual confirmations of the entire brood. Third, monitoring should be planned in order to



document critical stages during the nesting cycle, i.e. incubation of first and second clutches and presence of fledged chicks. This is especially important when broods approach fledging age so that the observer does not miss the opportunity to document the young before they move off their breeding territories. Family units tend to stay on their breeding territories for 4-6 weeks after the chicks have fledged, but this time decreases towards the end of the breeding season. We believe that in these particular situations, oystercatcher productivity can be accurately estimated with surveys every 2-4 weeks.

American Oystercatchers breeding in the marshes off of Wachapreague also experienced high productivity in 2004 (Table 1). This is in sharp contrast to oystercatcher productivity documented in the marshes of the lagoon system in 2003. Of 154 nesting attempts monitored in 2003, only 5 produced chicks. One hundred and forty-nine nests were flooded by high spring tides in mid June of that year (B. Truitt, pers. comm.). Productivity of oystercatchers in this habitat is very vulnerable to flooding events and appears to be highly variable from year to year depending on the timing of egg-laying, spring tide events, storms and storm influenced tide events. We recommend that productivity monitoring continue in the lagoon system in order to better assess the long-term variability of oystercatcher breeding success in this habitat and the quality of the marshes of the lagoon system as breeding habitat.

American Oystercatcher chick  
hiding in a horseshoe crab shell.  
Photo: Alex Wilke.



## **VIRGINIA COAST SURVEY**

A total of 706 adult American Oystercatchers were recorded during the 2004 Piping Plover, Wilson's Plover and American Oystercatcher survey, a 26.1% increase from 2000 when oystercatchers were first systematically surveyed along the coast of Virginia (Table 5, Figure 4). Notable changes in site totals since 2000 include the following: 29.8% decrease on Assateague Island, 58.8% increase on Cedar Island, 107.1% increase on Cobb Island, 42.1% decrease on Little Cobb Island, 133.3% increase on Myrtle Island and 150% increase on Fisherman Island.

Table 5. Results of the 2004 American Oystercatcher survey of the Virginia coast.

| SITE                  | 2004 PAIRS | 2004 SINGLES | 2004 TOTAL ADULTS |
|-----------------------|------------|--------------|-------------------|
| Assateague            | 15         | 3            | 33                |
| Wallops               | 0          | 0            | 0                 |
| Assawoman             | 11         | 1            | 23                |
| Metompkin             | 84         | 13           | 181               |
| Cedar Island/Sandbar  | 76         | 10           | 162               |
| Parramore             | 3          | 6            | 12                |
| Hog                   | 14         | 1            | 29                |
| Cobb                  | 14         | 1            | 29                |
| Little Cobb           | 5          | 1            | 11                |
| Wreck                 | 21         | 9            | 51                |
| Myrtle                | 5          | 4            | 14                |
| Ship Shoal            | 13         | 1            | 27                |
| Smith                 | 9          | 2            | 20                |
| Fisherman             | 50         | 0            | 100               |
| Craney Island         | 0          | 0            | 0                 |
| Grand View Beach      | 5          | 0            | 10                |
| Plum Tree Is. NWR     | 2          | 0            | 4                 |
| Back Bay NWR          | 0          | 0            | 0                 |
| False Cape State Park | 0          | 0            | 0                 |
| <b>TOTALS</b>         | <b>327</b> | <b>52</b>    | <b>706</b>        |

Breeding pairs were documented on every barrier island along the Eastern Shore of Virginia except for Wallops Island. Ninety-eight per cent of the survey total was recorded on the barrier islands, and only 7 pairs were documented west and south of the Chesapeake Bay. Four hundred and forty-three adults (62.7%) were recorded on only three of the islands (Metompkin Island – 181; Cedar Island and Cedar Sandbar – 162; Fisherman Island – 100). Metompkin Island and Cedar Island/sandbar have consistently maintained the two highest concentrations of oystercatchers on the Virginia coast from 2000-2004 (Terwilliger and Cross 2000, Kroll and Beck 2001, this report). Unlike Piping Plovers, of which 92% are found on the northern barrier islands (Cedar Island to Assateague Island) (R. Boettcher, pers.comm.), the distribution of oystercatchers along the barrier island chain in Virginia is relatively even with 56.5% of the population from Cedar Island north to Chincoteague NWR and 41.5% from Parramore Island south to Fisherman Island NWR.

### Virginia Coast American Oystercatcher Survey Results 2000-2004

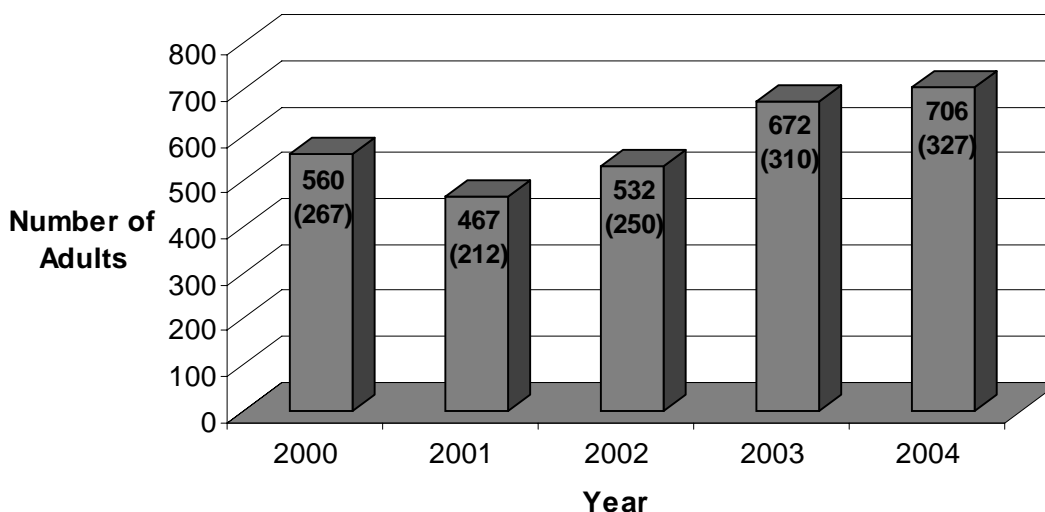


Figure 4. Results of American Oystercatcher surveys, 2000-2004. Data for 2000 from Terwilliger and Cross 2000 and data for 2001 from Kroll and Beck 2001. Parentheses indicate number of pairs within survey total.

#### BANDING

We banded a total of 62 chicks and 2 adults during the 2004 breeding season (Table 6 and Appendices 4-6). Our efforts to target adult birds were delayed until early July, and consequently we were able to band only two individuals. Following the advice of researchers from other states with well-established oystercatcher banding protocols, we targeted adults with very small young because of the adults' aggressiveness towards the trapping decoy at this stage. By early July, only a few breeding pairs still had small young. We were successful in two out of five attempts.

On one occasion towards the end of the breeding season, we 'spotlighted' for fledged oystercatcher young and adults on Metompkin Island. This involved traveling to the island at dusk on a day when high tide fell a few hours after dark. After dark, we walked the beach 'spotlighting' for roosting birds using high-powered headlamps. We captured stunned birds either by hand or with long-handled nets. This method proved very effective for trapping fledged juveniles, and we anticipate using this method in the future to target pre-fledged birds as well as adults.

Table 6. Summary of American Oystercatcher banding by site in 2004.

| SITE         | NO. YNG BANDED | NO. BANDED YNG FLEDGED | NO. ADULTS BANDED |
|--------------|----------------|------------------------|-------------------|
| Metompkin    | 39             | 38                     | 0                 |
| Wachapreague | 17             | 17                     | 2                 |
| Fisherman    | 6              | 2                      | 0                 |

## ACKNOWLEDGMENTS

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**APPENDIX 1. Results of individual American Oystercatcher nesting attempts on Metompkin Island, 2004. Black text indicates successful pairs (fledged at least one young) and red text indicates unsuccessful pairs.**

| PAIR ID | ATTEMPT | DATE FOUND | NEST ID | LATITUDE | LONGITUDE | CLUTCH SIZE | # EGGS HATCHED | REASON FOR EGG LOSS             | # YNG FLEDGED | REASON FOR CHICK LOSS | # Banded YNG | # Banded YNG Fledged | NOTES                       |
|---------|---------|------------|---------|----------|-----------|-------------|----------------|---------------------------------|---------------|-----------------------|--------------|----------------------|-----------------------------|
| 1       | 1       | 17-Apr     | M0304   | 37.74020 | -75.56036 | 3           | 3              | .                               | 0             | unknown               | 0            | 0                    | North                       |
| 1       | 2       | 8-Jun      | M8804   | 37.74128 | -75.55976 | 2           | assumed 2      | .                               | 0             | unknown               | 0            | 0                    | North                       |
| 2       | 1       | 10-Apr     | M0204   | 37.77576 | -75.53508 | 3           | assumed 3      | .                               | 0             | unknown               | 0            | 0                    | North                       |
| 2       | 2       | 8-Jun      | M8504   | 37.77590 | -75.53576 | 3           | 3              | .                               | 0             | unknown               | 0            | 0                    | North                       |
| 3       | 1       | 18-Apr     | M1204   | 37.74120 | -75.5596  | 3           | 3              | .                               | 3             | .                     | 1            | 1                    | North                       |
| 4       | 1       | 18-Apr     | M1304   | 37.74130 | -75.55892 | 3           | 0              | unknown; not washed out         | 0             | .                     | 0            | 0                    | North                       |
| 4       | 2       | 7-Jun      | M8404   | 37.74186 | -75.55797 | 3           | assumed 3      | .                               | 2             | unknown               | 0            | 0                    | North                       |
| 5       | 1       | 18-Apr     | M1404   | 37.74232 | -75.55732 | 2           | 0              | depredated                      | 0             | .                     | 0            | 0                    | North                       |
| 6       | 1       | 18-Apr     | M1504   | 37.74481 | -75.55319 | 2           | 1              | 1 egg partially pipped but dead | 1             | .                     | 1            | 1                    | North                       |
| 7       | 1       | 18-Apr     | M1604   | 37.74890 | -75.55045 | 3           | assumed 3      | .                               | 2             | unknown               | 1            | 1                    | North                       |
| 8       | 1       | 18-Apr     | M1704   | 37.74967 | -75.55014 | 3           | 3              | .                               | 1             | unknown               | 1            | 1                    | North                       |
| 9       | 1       | 18-Apr     | M1804   | 37.75279 | -75.54838 | 3           | 2              | 1 egg infertile                 | 1             | unknown               | 0            | 0                    | North                       |
| 10      | 1       | 18-Apr     | M1904   | 37.76508 | -75.54075 | 3           | 0              | depredated                      | 0             | .                     | 0            | 0                    | North                       |
| 10      | 2       | 29-Jun     | M9104C  | 37.76522 | -75.54236 | .           | .              | .                               | 2             | .                     | 3            | 2                    | North; found at chick stage |
| 11      | 1       | 18-Apr     | M2004   | 37.76954 | -75.53803 | 3           | 3              | .                               | 2             | unknown               | 0            | 0                    | North                       |
| 12      | 1       | 18-Apr     | M2104   | 37.77128 | -75.5375  | 3           | 3              | .                               | 0             | unknown               | 0            | 0                    | North                       |
| 13      | 1       | 18-Apr     | M2204   | 37.77579 | -75.5349  | 3           | 0              | unknown; not washed out         | 0             | .                     | 0            | 0                    | North                       |
| 14      | 1       | 25-Apr     | M3504   | 37.74547 | -75.55295 | 3           | 3              | .                               | 1             | unknown               | 0            | 0                    | North                       |
| 15      | 1       | 25-Apr     | M3604   | 37.74709 | -75.55129 | 3           | 1              | 2 eggs infertile                | 0             | dead in scrape        | 0            | 0                    | North                       |
| 15      | 2       | 18-Jun     | M9004   | 37.74655 | -75.55162 | 2           | assumed 2      | .                               | 0             | unknown               | 0            | 0                    | North                       |
| 16      | 1       | 25-Apr     | M3704   | 37.75521 | -75.54744 | 3           | assumed 3      | .                               | 2             | unknown               | 0            | 0                    | North                       |
| 17      | 1       | 25-Apr     | M3804   | 37.75558 | -75.54677 | 3           | 2              | 1 egg infertile                 | 2             | .                     | 0            | 0                    | North                       |
| 18      | 1       | 25-Apr     | M3904   | 37.75934 | -75.54407 | 3           | assumed 3      | .                               | 0             | unknown               | 0            | 0                    | North                       |
| 19      | 1       | 25-Apr     | M4004   | 37.76253 | -75.54184 | 3           | 3              | .                               | 3             | .                     | 0            | 0                    | North                       |
| 20      | 1       | 25-Apr     | M4104   | 37.76869 | -75.5389  | 3           | assumed 3      | .                               | 0             | unknown               | 0            | 0                    | North                       |
| 20      | 2       | 5-Jul      | M9204C  | 37.76871 | -75.5377  | .           | .              | .                               | 2             | .                     | 2            | 2                    | North; found at chick stage |

## APPENDIX 1 (cont.)

| PAIR ID | ATTEMPT | DATE FOUND | NEST ID | LATITUDE | LONGITUDE | CLUTCH SIZE | # EGGS HATCHED | REASON FOR EGG LOSS             | # YNG FLEDGED | REASON FOR CHICK LOSS | # YNG Banded | # Banded YNG Fledged | NOTES                                       |
|---------|---------|------------|---------|----------|-----------|-------------|----------------|---------------------------------|---------------|-----------------------|--------------|----------------------|---|
| 21      | 1       | 25-Apr     | M4204   | 37.77275 | -75.53735 | 3           | 0              | unknown; not washed out         | 0             | .                     | 0            | 0                    | North                                       |
| 21      | 2       | 8-Jun      | M8604C  | 37.77252 | -75.53756 | .           | .              | .                               | 3             | .                     | 0            | 0                    | North; found at chick stage                 |
| 22      | 1       | 25-Apr     | M4304   | 37.77339 | -75.53634 | 3           | assumed 3      | .                               | 1             | unknown               | 0            | 0                    | North                                       |
| 23      | 1       | 25-Apr     | M4404   | 37.77442 | -75.53601 | 3           | 0              | unknown; not washed out         | 0             | .                     | 0            | 0                    | North                                       |
| 24      | 1       | 25-Apr     | M4504   | 37.77618 | -75.53492 | 3           | 2              | 1 egg partially pipped but dead | 2             | .                     | 1            | 1                    | North                                       |
| 25      | 1       | 6-May      | M4604   | 37.74296 | -75.55633 | 1           | 0              | abandoned                       | 0             | .                     | 0            | 0                    | North                                       |
| 25      | 2       | 5-Jul      | M9304C  | 37.74296 | -75.55618 | .           | .              | .                               | 2             | .                     | 2            | 2                    | North; found at chick stage                 |
| 26      | 1       | 6-May      | M4704   | 37.74332 | -75.55589 | 3           | 2              | 1 egg infertile                 | 1             | unknown               | 0            | 0                    | North                                       |
| 27      | 1       | 6-May      | M4804   | 37.75143 | -75.55026 | 3           | assumed 3      | .                               | 2             | unknown               | 0            | 0                    | North                                       |
| 28      | 1       | 6-May      | M4904   | 37.75168 | -75.54852 | 3           | assumed 3      | .                               | 1             | unknown               | 0            | 0                    | North                                       |
| 29      | 1       | 6-May      | M5004   | 37.75350 | -75.54832 | 2           | assumed 2      | .                               | unknown       | unknown               | 0            | 0                    | North; lost track of chick; unknown outcome |
| 30      | 1       | 6-May      | M5104   | 37.76407 | -75.54215 | 3           | assumed 3      | .                               | 1             | unknown               | 0            | 0                    | North                                       |
| 31      | 1       | 6-May      | M5204   | 37.76529 | -75.54025 | 3           | assumed 3      | .                               | 1             | unknown               | 0            | 0                    | North                                       |
| 32      | 1       | 6-May      | M5304   | 37.76733 | -75.53942 | 3           | 3              | .                               | 3             | .                     | 3            | 3                    | North                                       |
| 33      | 1       | 6-May      | M5404   | 37.76808 | -75.53902 | 3           | assumed 3      | .                               | 3             | .                     | 0            | 0                    | North                                       |
| 34      | 1       | 12-May     | M6304   | 37.77513 | -75.53485 | 3           | 3              | .                               | 1             | unknown               | 1            | 1                    | North                                       |
| 35      | 1       | 12-May     | M6404   | 37.77382 | -75.53573 | 3           | assumed 3      | .                               | 2             | unknown               | 1            | 1                    | North                                       |
| 36      | 1       | 12-May     | M6504   | 37.77196 | -75.53678 | 3           | 3              | .                               | 0             | unknown               | 0            | 0                    | North                                       |
| 36      | 2       | 8-Jun      | M8704   | 37.77252 | -75.53656 | 2           | 1              | 1 egg infertile                 | 1             | .                     | 0            | 0                    | North                                       |
| 37      | 1       | 12-May     | M6604   | 37.76057 | -75.54326 | 2           | 2              | .                               | 2             | .                     | 0            | 0                    | North                                       |
| 38      | 1       | 16-May     | M7504   | 37.75746 | -75.54497 | 3           | assumed 3      | .                               | 1             | unknown               | 0            | 0                    | North                                       |
| 39      | 1       | 16-May     | M7604C  | 37.75927 | -75.54441 | 3           | 3              | .                               | 3             | .                     | 0            | 0                    | North; found at chick stage                 |
| 40      | 1       | 16-May     | M7704   | 37.75967 | -75.54412 | 3           | assumed 3      | .                               | 1             | unknown               | 1            | 1                    | North                                       |

## APPENDIX 1 (cont.)

| PAIR ID | ATTEMPT | DATE FOUND | NEST ID | LATITUDE | LONGITUDE | CLUTCH SIZE | # EGGS HATCHED | REASON FOR EGG LOSS                         | # YNG FLEDGED | REASON FOR CHICK LOSS          | # YNG BANDED | # BANDED YNG FLEDGED | NOTES |
|---------|---------|------------|---------|----------|-----------|-------------|----------------|---|---------------|--------------------------------|--------------|----------------------|-------|
| 41      | 1       | 16-May     | M7804   | 37.76003 | -75.54414 | 2           | unknown        | unknown if eggs hatched or not              | 0             | unknown if eggs hatched or not | 0            | 0                    | North |
| 42      | 1       | 7-Jun      | 10      | 37.75854 | -75.54632 | .           | .              | .   | 1             | .                              | 0            | 0                    | North |
| 43      | 1       | 7-Jun      | 13      | 37.76117 | -75.54439 | .           | .              | .   | 3             | .                              | 1            | 1                    | North |
| 44      | 1       | 7-Jun      | 14      | 37.76202 | -75.54327 | .           | .              | .   | 2             | .                              | 0            | 0                    | North |
| 45      | 1       | 10-Apr     | M0104   | 37.73919 | -75.56159 | 3           | 2              | 1 egg infertile                             | 1             | unknown                        | 0            | 0                    | South |
| 46      | 1       | 17-Apr     | M0404   | 37.73536 | -75.56414 | 3           | unknown        | unknown if eggs hatched or not              | 0             | unknown if eggs hatched or not | 0            | 0                    | South |
| 47      | 1       | 17-Apr     | M0504   | 37.73460 | -75.56555 | 3           | 0              | unknown; not washed out                     | 0             | .                              | 0            | 0                    | South |
| 47      | 2       | 4-Jun      | M8204   | 37.73459 | -75.56454 | 1           | 0              | abandoned                                   | 0             | .                              | 0            | 0                    | South |
| 48      | 1       | 17-Apr     | M0604   | 37.71906 | -75.57304 | 3           | assumed 3      | .   | 1             | unknown                        | 1            | 1                    | South |
| 49      | 1       | 17-Apr     | M0704   | 37.71082 | -75.57603 | 3           | 3              | .   | 3             | .                              | 0            | 0                    | South |
| 50      | 1       | 17-Apr     | M0804   | 37.70804 | -75.57642 | 3           | 3              | .   | 3             | .                              | 0            | 0                    | South |
| 51      | 1       | 17-Apr     | M0904   | 37.70668 | -75.57654 | 2           | unknown        | unknown if eggs hatched or not              | 0             | unknown if eggs hatched or not | 0            | 0                    | South |
| 51      | 2       | 15-May     | M6904   | 37.70649 | -75.57657 | 3           | 3              | .   | 3             | .                              | 2            | 2                    | South |
| 52      | 1       | 17-Apr     | M1004   | 37.70246 | -75.57872 | 3           | 3              | .   | 2             | unknown                        | 0            | 0                    | South |
| 53      | 1       | 17-Apr     | M1104   | 37.69385 | -75.58815 | 3           | unknown        | unknown if eggs hatched or not              | 0             | unknown if eggs hatched or not | 0            | 0                    | South |
| 53      | 2       | 8-May      | M6204   | 37.69388 | -75.58883 | 3           | assumed 3      | .   | 0             | unknown                        | 0            | 0                    | South |
| 54      | 1       | 24-Apr     | M2304   | 37.73884 | -75.56145 | 3           | assumed 3      | .   | 1             | unknown                        | 0            | 0                    | South |
| 55      | 1       | 24-Apr     | M2404   | 37.73333 | -75.56795 | 3           | assumed 3      | .   | 0             | 1 chick dead in scrape         | 0            | 0                    | South |
| 56      | 1       | 24-Apr     | M2504   | 37.72985 | -75.56705 | 3           | assumed 3      | .   | 2             | unknown                        | 0            | 0                    | South |
| 57      | 1       | 24-Apr     | M2604   | 37.72894 | -75.56725 | 3           | assumed 3      | .   | 1             | unknown                        | 1            | 1                    | South |
| 58      | 1       | 24-Apr     | M2704   | 37.72809 | -75.56799 | 3           | 0              | 1 egg remained in scrape, others depredated | 0             | .                              | 0            | 0                    | South |
| 59      | 1       | 24-Apr     | M2804   | 37.72712 | -75.56826 | 3           | 2              | 1 egg infertile                             | 1             | unknown                        | 1            | 1                    | South |
| 60      | 1       | 24-Apr     | M2904   | 37.72573 | -75.56887 | 3           | 3              | .   | 2             | unknown                        | 0            | 0                    | South |



## APPENDIX 1 (cont.)

| PAIR ID | ATTEMPT | DATE FOUND | NEST ID | LATITUDE | LONGITUDE | CLUTCH SIZE | # EGGS HATCHED | REASON FOR EGG LOSS                                | # YNG FLEDGED | REASON FOR CHICK LOSS          | # YNG BANDED | # BANDED YNG FLEDGED | NOTES                                       |
|---------|---------|------------|---------|----------|-----------|-------------|----------------|--|---------------|--------------------------------|--------------|----------------------|---|
| 61      | 1       | 24-Apr     | M3004   | 37.72138 | -75.57232 | 3           | assumed 3      | .  | 1             | unknown                        | 1            | 1                    | South                                       |
| 62      | 1       | 24-Apr     | M3104   | 37.71978 | -75.57095 | 3           | assumed 3      | .  | 1             | unknown                        | 1            | 1                    | South                                       |
| 63      | 1       | 24-Apr     | M3204   | 37.71472 | -75.5735  | unknown     | 0              | unknown; not washed out                            | 0             | .                              | 0            | 0                    | South                                       |
| 64      | 1       | 24-Apr     | M3304   | 37.70484 | -75.5776  | unknown     | 0              | unknown; not washed out                            | 0             | .                              | 0            | 0                    | South                                       |
| 64      | 2       | 25-May     | M8004   | 37.70416 | -75.57757 | 2           | 2              | .  | 1             | unknown                        | 0            | 0                    | South                                       |
| 65      | 1       | 24-Apr     | M3404   | 37.69915 | -75.57975 | unknown     | 0              | unknown; not washed out                            | 0             | .                              | 0            | 0                    | South                                       |
| 65      | 2       | 25-May     | M8104   | 37.70001 | -75.57918 | 3           | assumed 3      | .  | 1             | unknown                        | 0            | 0                    | South                                       |
| 66      | 1       | 8-May      | M5504   | 37.73831 | -75.56244 | unknown     | 0              | ghost crab   | 0             | .                              | 0            | 0                    | South                                       |
| 66      | 2       | 25-May     | M7904   | 37.73766 | -75.56253 | 3           | 3              | .  | 2             | unknown                        | 2            | 2                    | South                                       |
| 67      | 1       | 8-May      | M5604   | 37.73207 | -75.56761 | 3           | unknown        | unknown if eggs hatched or not                     | 0             | unknown if eggs hatched or not | 0            | 0                    | South                                       |
| 68      | 1       | 8-May      | M5704   | 37.72451 | -75.5706  | 3           | 3              | .  | 2             | unknown                        | 2            | 2                    | South                                       |
| 69      | 1       | 8-May      | M5804   | 37.72226 | -75.57108 | 3           | 0              | 1 egg partially pipped but dead; others depredated | 0             | .                              | 0            | 0                    | South                                       |
| 70      | 1       | 8-May      | M5904   | 37.72061 | -75.57167 | 3           | assumed 3      | .  | 0             | large chick found with no head | 0            | 0                    | South                                       |
| 71      | 1       | 8-May      | M6004   | 37.71603 | -75.57227 | 1           | unknown        | unknown if eggs hatched or not                     | 0             | unknown if eggs hatched or not | 0            | 0                    | South                                       |
| 72      | 1       | 8-May      | M6104   | 37.69391 | -75.5842  | 3           | assumed 3      | .  | 0             | unknown                        | 0            | 0                    | South                                       |
| 73      | 1       | 12-May     | M6704   | 37.73360 | -75.56487 | 2           | unknown        | unknown if eggs hatched or not                     | 0             | unknown if eggs hatched or not | 0            | 0                    | South                                       |
| 74      | 1       | 15-May     | M6804   | 37.69339 | -75.5839  | unknown     | unknown        | unknown if eggs hatched or not                     | 0             | unknown if eggs hatched or not | 0            | 0                    | South                                       |
| 75      | 1       | 15-May     | M7004   | 37.71319 | -75.57322 | 3           | 3              | .  | 1             | unknown                        | 0            | 0                    | South                                       |
| 76      | 1       | 15-May     | M7104   | 37.71922 | -75.57276 | 3           | 2              | 1 egg infertile                                    | unknown       | unknown                        | 0            | 0                    | South; lost track of chick; unknown outcome |

## APPENDIX 1 (cont.)

| PAIR ID | ATTEMPT | DATE FOUND | NEST ID | LATITUDE | LONGITUDE | CLUTCH SIZE | # EGGS HATCHED | REASON FOR EGG LOSS            | # YNG FLEDGED | REASON FOR CHICK LOSS          | # YNG BANDED | # BANDED YNG FLEDGED | NOTES                       |
|---------|---------|------------|---------|----------|-----------|-------------|----------------|--------------------------------|---------------|--------------------------------|--------------|----------------------|-----------------------------|
| 77      | 1       | 15-May     | M7204   | 37.72011 | -75.57226 | 3           | 2              | 1 egg infertile                | 0             | half of small dead chick found | 0            | 0                    | South                       |
| 78      | 1       | 15-May     | M7304   | 37.73329 | -75.56587 | 3           | 2              | 1 egg infertile                | 0             | unknown                        | 0            | 0                    | South                       |
| 79      | 2       | 15-May     | M7404   | 37.73577 | -75.56391 | 3           | unknown        | unknown if eggs hatched or not | 0             | unknown if eggs hatched or not | 0            | 0                    | South                       |
| 80      | 1       | 9-Jun      | M8304C  | 37.69496 | -75.58373 | .           | .              | .                              | 2             | .                              | 0            | 0                    | South; found at chick stage |
| 81      | 1       | 9-Jun      | M8904C  | 37.71176 | -75.57628 | .           | .              | .                              | 1             | .                              | 0            | 0                    | South; found at chick stage |

**APPENDIX 2. Results of individual American Oystercatcher nesting attempts on Wreck Island, 2004. Black text indicates successful pairs (fledged at least one young) and red text indicates unsuccessful pairs.**

| PAIR ID | DATE FOUND | PAIR ID | LATITUDE | LONGITUDE | FOUND WITH PAIR / EGGS / YOUNG | # YNG FLEDGED | NOTES                          |
|---------|------------|---------|----------|-----------|--------------------------------|---------------|--------------------------------|
| 1       | 30-Apr     | WI01    | 37.29527 | -75.80396 | eggs                           | 1             | Bone Island                    |
| 2       | 30-Apr     | WI02    | 37.28511 | -75.79932 | eggs                           | 1             | North end                      |
| 3       | 14-Jun     | 48      | 37.28734 | -75.80054 | eggs                           | 0             | North end                      |
| 4       | 30-Apr     | WI03    | 37.28333 | -75.79803 | eggs                           | 0             | North end; near colonies       |
| 5       | 14-Jun     | 49      | 37.28408 | -75.79740 | pair                           | 0             | North end; near colonies       |
| 6       | 30-Apr     | WI04    | 37.28224 | -75.79741 | eggs                           | 0             | North end; near colonies       |
| 7       | 30-Apr     | WI05    | 37.27826 | -75.79650 | eggs                           | 1             | Shell wall                     |
| 8       | 30-Apr     | WI06    | 37.27735 | -75.79654 | eggs                           | 1             | Shell wall                     |
| 9       | 30-Apr     | WI07    | 37.27636 | -75.79663 | eggs                           | 1             | Shell wall                     |
| 10      | 30-Apr     | WI08    | 37.27340 | -75.79686 | eggs                           | 1             | Shell wall                     |
| 11      | 30-Apr     | WI09    | 37.26990 | -75.79735 | eggs                           | 1             | Shell wall                     |
| 12      | 30-Apr     | WI10    | 37.26873 | -75.79741 | eggs                           | 1             | Shell wall                     |
| 13      | 30-Apr     | WI11    | 37.25482 | -75.79628 | eggs                           | 1             | End of gut at middle of island |
| 14      | 30-Apr     | WI12    | 37.25210 | -75.79914 | eggs                           | 1             | North end of main gull colony  |
| 15      | 30-Apr     | WI13    | 37.24737 | -75.80489 | eggs                           | 0             | Middle of gull colony          |
| 16      | 30-Apr     | WI14    | 37.24173 | -75.80956 | eggs                           | 1             | South tip                      |
| 17      | 30-Apr     | WI15    | 37.24216 | -75.80900 | eggs                           | unknown       | South tip                      |
| 18      | 14-Jun     | 54      | 37.24195 | -75.80984 | young                          | 1             | South tip                      |
| 19      | 14-Jun     | 55      | 37.24264 | -75.81043 | young                          | 3             | South tip                      |
| 20      | 14-Jun     | 56      | 37.24308 | -75.80889 | eggs                           | 0             | South tip                      |
| 21      | 14-Jun     | 57      | 37.26375 | -75.79831 | young                          | 1             | Middle overwash area           |
| 22      | 14-Jun     | 61      | 37.27186 | -75.79721 | young                          | 1             | Shell wall                     |
| 23      | 14-Jun     | 67      | 37.27948 | -75.79678 | young                          | 1             | Shell wall                     |
| 24      | 14-Jun     | 70      | 37.28060 | -75.79695 | pair                           | 0             | Shell wall                     |
| 25      | 30-Jun     | 78      | 37.26616 | -75.79770 | young                          | 1             | Shell wall                     |

**APPENDIX 3. Results of individual American Oystercatcher nesting attempts at Wachapreague, Virginia, 2004. Black text indicates successful pairs (fledged at least one young) and red text indicates unsuccessful pairs.**

| PAIR ID | DATE FOUND | PAIR ID | LATITUDE | LONGITUDE | FOUND WITH PAIR / EGGS / YOUNG | # OF YNG FLEDGED | REASON FOR LOSS OF EGGS OR CHICKS                        | # YNG BANDED | # BANDED YNG FLEDGED | NOTES                                       |
|---------|------------|---------|----------|-----------|--------------------------------|------------------|--|--------------|----------------------|---|
| 1       | 27-May     | 001     | 37.60878 | -75.66570 | pair                           | 0                |  | 0            | 0                    | Did not find nesting attempt                |
| 2       | 27-May     | 002     | 37.60544 | -75.65195 | eggs                           | 0                | eggs of second attempt washed out                        | 0            | 0                    | Found second nesting attempt                |
| 3       | 27-May     | 003     | 37.60334 | -75.64610 | young                          | 3                |  | 1            | 1                    |   |
| 4       | 27-May     | 004     | 37.60187 | -75.64549 | young                          | 3                |  | 0            | 0                    | Found attempt with large yng                |
| 5       | 27-May     | 005     | 37.59479 | -75.64560 | eggs                           | 0                | first attempt unknown; eggs of second attempt washed out | 0            | 0                    | Two attempts found                          |
| 6       | 27-May     | 011     | 37.59405 | -75.64571 | young                          | 1                |  | 1            | 1                    |   |
| 7       | 18-Jun     | 011     | 37.59405 | -75.64571 | eggs                           | 1                |  | 1            | 1                    |   |
| 8       | 27-May     | 012     | 37.59343 | -75.64560 | pair                           | 0                |  | 0            | 0                    | Did not find nesting attempt; assumed young |
| 9       | 10-Jun     | 024     | 37.61011 | -75.64513 | young                          | 1                |  | 1            | 1                    |   |
| 10      | 10-Jun     | 025     | 37.61177 | -75.64527 | pair                           | 0                |  | 0            | 0                    | Did not find nesting attempt                |
| 11      | 10-Jun     | 026     | 37.61414 | -75.64592 | young                          | 3                |  | 3            | 3                    |   |
| 12      | 27-May     | 027     | 37.59250 | -75.64536 | eggs                           | 0                | wash out   | 0            | 0                    | Two attempts found                          |
| 13      | 10-Jun     | 028     | 37.61490 | -75.64587 | young                          | 1                |  | 1            | 1                    |   |
| 14      | 10-Jun     | 029     | 37.61601 | -75.64676 | pair                           | 0                |  | 0            | 0                    |   |
| 15      | 10-Jun     | 029     | 37.61601 | -75.64676 | pair                           | 0                |  | 0            | 0                    |   |
| 16      | 10-Jun     | 030W    | 37.61966 | -75.64614 | young                          | 3                |  | 0            | 0                    |   |
| 17      | 10-Jun     | 030E    | 37.61966 | -75.64614 | young                          | 2                |  | 1            | 1                    |   |
| 18      | 10-Jun     | 032     | 37.58834 | -75.62891 | pair                           | 1                |  | 0            | 0                    | Club House Point; amidst gull colony        |
| 19      | 10-Jun     | 032     | 37.58834 | -75.62891 | pair                           | 0                |  | 0            | 0                    | Club House Point; amidst gull colony        |
| 20      | 10-Jun     | 032     | 37.58834 | -75.62891 | pair                           | 0                |  | 0            | 0                    | Club House Point; amidst gull colony        |
| 21      | 10-Jun     | 033     | 37.58548 | -75.62703 | pair                           | 0                |  | 0            | 0                    | Club House Point; amidst gull colony        |
| 22      | 10-Jun     | 033     | 37.58548 | -75.62703 | pair                           | 0                |  | 0            | 0                    | Club House Point; amidst gull colony        |
| 23      | 10-Jun     | 033     | 37.58548 | -75.62703 | pair                           | 0                |  | 0            | 0                    | Club House Point; amidst gull colony        |
| 24      | 10-Jun     | 034     | 37.58223 | -75.62787 | eggs                           | 0                | wash out   | 0            | 0                    | Club House Point; amidst gull colony        |
| 25      | 10-Jun     | 035     | 37.58025 | -75.62738 | young                          | 2                |  | 0            | 0                    |   |
| 26      | 27-May     | 036     | 37.59008 | -75.64389 | eggs                           | 0                | 1 egg depredated   | 0            | 0                    |   |
| 27      | 10-Jun     | 037     | 37.57929 | -75.62699 | pair                           | 0                |  | 0            | 0                    | Did not find nesting attempt                |
| 28      | 10-Jun     | 038     | 37.57791 | -75.62748 | pair                           | 0                |  | 0            | 0                    | Did not find nesting attempt                |
| 29      | 10-Jun     | 039     | 37.59909 | -75.62568 | pair                           | 0                |  | 0            | 0                    | Did not find nesting attempt                |
| 30      | 10-Jun     | 040     | 37.60057 | -75.62934 | young                          | 2                |  | 2            | 2                    |   |
| 31      | 10-Jun     | 041     | 37.59488 | -75.62881 | pair                           | unknown          |  | 0            | 0                    |   |
| 32      | 10-Jun     | 042     | 37.59459 | -75.63085 | young                          | 1                |  | 0            | 0                    |   |
| 33      | 10-Jun     | 043W    | 37.59457 | -75.63192 | young                          | 3                |  | 0            | 0                    |   |
| 34      | 10-Jun     | 043E    | 37.59457 | -75.63192 | young                          | 1                |  | 0            | 0                    |   |
| 35      | 10-Jun     | 044     | 37.59506 | -75.63545 | young                          | 1                |  | 1            | 1                    |   |
| 36      | 10-Jun     | 045     | 37.60134 | -75.63812 | pair                           | 0                | wash out   | 0            | 0                    | Did not find nesting attempt                |
| 37      | 3-Jul      | 046     | 37.58996 | -75.64364 | pair                           | 0                |  | 0            | 0                    | Found second attempt                        |

## APPENDIX 3 (cont.)

| PAIR ID | DATE FOUND | PAIR ID | LATITUDE | LONGITUDE | FOUND WITH PAIR / EGGS / YOUNG | # OF YNG | # YNG FLEDGED | REASON FOR LOSS OF EGGS OR CHICKS | # YNG BANDED | # BANDED YNG FLEDGED | NOTES                        |
|---------|------------|---------|----------|-----------|--------------------------------|----------|---------------|-----------------------------------|--------------|----------------------|------------------------------|
| 38      | 10-Jun     | 047     | 37.58837 | -75.64135 | young                          | 3        | 3             |                                   | 2            | 2                    |                              |
| 39      | 27-May     | 050     | 37.58941 | -75.64199 | pair                           |          | 0             |                                   | 0            | 0                    | Did not find nesting attempt |
| 40      | 27-May     | 060     | 37.58816 | -75.63123 | eggs                           |          | 0             |                                   | 0            | 0                    | Two attempts found           |
| 41      | 27-May     | 062     | 37.58843 | -75.63095 | young                          | 2        | 2             |                                   | 0            | 0                    |                              |
| 42      | 27-May     | 068     | 37.58159 | -75.62748 | young                          | 1        | 0             |                                   | 0            | 0                    |                              |
| 43      | 27-May     | 069     | 37.57868 | -75.62691 | young                          | 2        | 1             |                                   | 1            | 1                    |                              |
| 44      | 15-Jun     | 072     | 37.59777 | -75.68123 | eggs                           |          | 0             | depredated                        | 0            | 0                    |                              |
| 45      | 15-Jun     | 073     | 37.59773 | -75.68114 | eggs                           | 1        | 1             |                                   | 0            | 0                    |                              |
| 46      | 23-Jun     | 075     | 37.60406 | -75.64694 | young                          | 3        | 3             |                                   | 0            | 0                    |                              |
| 47      | 27-May     | 084     | 37.57333 | -75.62604 | young                          | 2        | 2             |                                   | 2            | 2                    |                              |

## Appendix 4. Summary of banded American Oystercatchers on Metompkin Island in 2004.

| DATE      | SITE      | NEST ID | LATITUDE | LONGITUDE | AGE | USFWS BAND # | UPPER LEFT | LOWER LEFT | UPPER RIGHT | LOWER RIGHT | FLEDGED? |
|-----------|-----------|---------|----------|-----------|-----|--------------|------------|------------|-------------|-------------|----------|
| 17-Jun-04 | Metompkin | M4504   | 37.77618 | -75.53492 | L   | 87598812     | BL (11)    | -          | BL (11)     | USFWS       | YES      |
| 18-Jun-04 | Metompkin | M1204   | 37.74120 | -75.5596  | L   | 87598813     | BL (12)    | -          | BL (12)     | USFWS       | YES      |
| 18-Jun-04 | Metompkin | M1504   | 37.74481 | -75.55319 | L   | 87598814     | BL (13)    | -          | BL (13)     | USFWS       | YES      |
| 18-Jun-04 | Metompkin | M1604   | 37.74890 | -75.55045 | L   | 87598815     | BL (14)    | -          | BL (14)     | USFWS       | YES      |
| 18-Jun-04 | Metompkin | M1704   | 37.74967 | -75.55014 | L   | 87598816     | BL (15)    | -          | BL (15)     | USFWS       | YES      |
| 21-Jun-04 | Metompkin | M6004   | 37.71906 | -75.57304 | L   | 87598817     | BL (16)    | -          | BL (16)     | USFWS       | YES      |
| 21-Jun-04 | Metompkin | M3104   | 37.71978 | -75.57095 | L   | 87598818     | BL (17)    | -          | BL (17)     | USFWS       | YES      |
| 22-Jun-04 | Metompkin | M2804   | 37.72712 | -75.56826 | L   | 87598819     | BL (18)    | -          | BL (18)     | USFWS       | YES      |
| 22-Jun-04 | Metompkin | M3004   | 37.72138 | -75.57232 | L   | 87598820     | BL (19)    | -          | BL (19)     | USFWS       | YES      |
| 22-Jun-04 | Metompkin | UNK     | 37.72011 | -75.57226 | L   | 87598821     | BL (20)    | -          | BL (20)     | USFWS       | YES      |
| 22-Jun-04 | Metompkin | M5704   | 37.72451 | -75.5706  | L   | 87598822     | BL (21)    | -          | BL (21)     | USFWS       | YES      |
| 22-Jun-04 | Metompkin | M5704   | 37.72451 | -75.5706  | L   | 87598823     | BL (22)    | -          | BL (22)     | USFWS       | YES      |
| 22-Jun-04 | Metompkin | M2604   | 37.72894 | -75.56725 | L   | 87598824     | BL (23)    | -          | BL (23)     | USFWS       | YES      |
| 29-Jun-04 | Metompkin | M6304   | 37.76733 | -75.53942 | L   | 87598835     | BL (34)    | -          | BL (34)     | USFWS       | YES      |
| 29-Jun-04 | Metompkin | 13      | 37.76117 | -75.54439 | L   | 87598836     | BL (35)    | -          | BL (35)     | USFWS       | YES      |
| 29-Jun-04 | Metompkin | M7704   | 37.75967 | -75.54412 | L   | 87598837     | BL (36)    | -          | BL (36)     | USFWS       | YES      |
| 5-Jul-04  | Metompkin | M6304   | 37.76733 | -75.53942 | L   | 87598839     | BL (38)    | -          | BL (38)     | USFWS       | YES      |
| 5-Jul-04  | Metompkin | M6304   | 37.76733 | -75.53942 | L   | 87598840     | BL (39)    | -          | BL (39)     | USFWS       | YES      |
| 6-Jul-04  | Metompkin | M6304   | 37.77513 | -75.53485 | L   | 87598841     | BL (40)    | -          | BL (40)     | USFWS       | YES      |
| 6-Jul-04  | Metompkin | M6404   | 37.77382 | -75.53573 | L   | 87598842     | BL (41)    | -          | BL (41)     | USFWS       | YES      |
| 8-Jul-04  | Metompkin | M6904   | 37.70649 | -75.57657 | L   | 87598843     | BL (42)    | -          | BL (42)     | USFWS       | YES      |
| 8-Jul-04  | Metompkin | M6904   | 37.70649 | -75.57657 | L   | 87598844     | BL (43)    | -          | BL (43)     | USFWS       | YES      |
| 15-Jul-04 | Metompkin | M7904   | 37.73766 | -75.56253 | L   | 87598848     | BL (47)    | -          | BL (47)     | USFWS       | YES      |
| 15-Jul-04 | Metompkin | M7904   | 37.73766 | -75.56253 | L   | 87598847     | BL (46)    | -          | BL (46)     | USFWS       | YES      |
| 28-Jul-04 | Metompkin | M9304C  | 37.74296 | -75.55618 | L   | 87598850     | BL (49)    | -          | BL (49)     | USFWS       | YES      |
| 28-Jul-04 | Metompkin | M9304C  | 37.74296 | -75.55618 | L   | 87598851     | BL (50)    | -          | BL (50)     | USFWS       | YES      |
| 28-Jul-04 | Metompkin | M9104C  | 37.76508 | -75.54075 | L   | 87598852     | BL (51)    | -          | BL (51)     | USFWS       | 2 OF 3   |
| 28-Jul-04 | Metompkin | M9104C  | 37.76508 | -75.54075 | L   | 87598853     | BL (52)    | -          | BL (52)     | USFWS       | 2 OF 3   |
| 28-Jul-04 | Metompkin | M9104C  | 37.76508 | -75.54075 | L   | 87598854     | BL (53)    | -          | BL (53)     | USFWS       | 2 OF 3   |
| 10-Aug-04 | Metompkin | M9204C  | 37.76871 | -75.5377  | L   | 87598855     | BL (54)    | -          | BL (54)     | USFWS       | YES      |
| 10-Aug-04 | Metompkin | M9204C  | 37.76871 | -75.5377  | L   | 87598856     | BL (55)    | -          | BL (55)     | USFWS       | YES      |
| 17-Aug-04 | Metompkin | .       | 37.76003 | -75.54414 | HY  | 87598857     | BL (56)    | -          | BL (56)     | USFWS       | YES      |
| 17-Aug-04 | Metompkin | .       | 37.76003 | -75.54414 | HY  | 87598858     | BL (57)    | -          | BL (57)     | USFWS       | YES      |
| 17-Aug-04 | Metompkin | .       | 37.76057 | -75.54326 | HY  | 87598859     | BL (58)    | -          | BL (58)     | USFWS       | YES      |
| 17-Aug-04 | Metompkin | .       | 37.76057 | -75.54326 | HY  | 87598860     | BL (59)    | -          | BL (59)     | USFWS       | YES      |
| 17-Aug-04 | Metompkin | .       | 37.76057 | -75.54326 | HY  | 87598901     | BL (60)    | -          | BL (60)     | USFWS       | YES      |
| 17-Aug-04 | Metompkin | .       | 37.76253 | -75.54184 | HY  | 87598902     | BL (61)    | -          | BL (61)     | USFWS       | YES      |
| 17-Aug-04 | Metompkin | .       | 37.76954 | -75.53803 | HY  | 87598903     | BL (62)    | -          | BL (62)     | USFWS       | YES      |
| 17-Aug-04 | Metompkin | .       | 37.76954 | -75.53803 | HY  | 87598904     | BL (63)    | -          | BL (63)     | USFWS       | YES      |

BL = black color band with white engraved 2-digit codes. Parentheses indicate 2-digit code.

USFWS = incology U.S. Fish and Wildlife Service band.

**Appendix 5. Summary of banded American Oystercatchers at Wachapreague, Virginia in 2004.**

| DATE      | SITE         | NEST ID | LATITUDE | LONGITUDE | AGE | USFWS BAND # | UPPER LEFT | LOWER LEFT | UPPER RIGHT | LOWER RIGHT | FLEDGED? |
|-----------|--------------|---------|----------|-----------|-----|--------------|------------|------------|-------------|-------------|----------|
| 15-Jun-04 | Wachapreague | 26      | 37.61414 | -75.64592 | L   | 87598803     | BL (03)    | -          | BL (03)     | USFWS       | YES      |
| 15-Jun-04 | Wachapreague | 26      | 37.61414 | -75.64592 | L   | 87598804     | BL (04)    | -          | BL (04)     | USFWS       | YES      |
| 15-Jun-04 | Wachapreague | 26      | 37.61414 | -75.64592 | L   | 87598805     | BL (05)    | -          | BL (05)     | USFWS       | YES      |
| 15-Jun-04 | Wachapreague | 30E     | 37.61966 | -75.64614 | L   | 87598807     | BL (06)    | -          | BL (06)     | USFWS       | YES      |
| 16-Jun-04 | Wachapreague | 24      | 37.61011 | -75.64513 | L   | 87598808     | BL (07)    | -          | BL (07)     | USFWS       | YES      |
| 16-Jun-04 | Wachapreague | 11      | 37.59405 | -75.64571 | L   | 87598809     | BL (08)    | -          | BL (08)     | USFWS       | YES      |
| 16-Jun-04 | Wachapreague | 47      | 37.58837 | -75.64136 | L   | 87598810     | BL (09)    | -          | BL (09)     | USFWS       | YES      |
| 16-Jun-04 | Wachapreague | 47      | 37.58837 | -75.64136 | L   | 87598811     | BL (10)    | -          | BL (10)     | USFWS       | YES      |
| 23-Jun-04 | Wachapreague | 28      | 37.61490 | -75.64587 | L   | 87598825     | BL (24)    | -          | BL (24)     | USFWS       | YES      |
| 23-Jun-04 | Wachapreague | 3       | 37.60334 | -75.64610 | L   | 87598826     | BL (25)    | -          | BL (25)     | USFWS       | YES      |
| 23-Jun-04 | Wachapreague | 84      | 37.57333 | -75.62604 | L   | 87598827     | BL (26)    | -          | BL (26)     | USFWS       | YES      |
| 23-Jun-04 | Wachapreague | 84      | 37.57333 | -75.62604 | L   | 87598828     | BL (27)    | -          | BL (27)     | USFWS       | YES      |
| 23-Jun-04 | Wachapreague | 40      | 37.60057 | -75.62934 | L   | 87598829     | BL (28)    | -          | BL (28)     | USFWS       | YES      |
| 23-Jun-04 | Wachapreague | 40      | 37.60057 | -75.62934 | L   | 87598830     | BL (29)    | -          | BL (29)     | USFWS       | YES      |
| 3-Jul-04  | Wachapreague | 44      | 37.59506 | -75.63545 | L   | 87598838     | BL (37)    | -          | BL (37)     | USFWS       | YES      |
| 8-Jul-04  | Wachapreague | 69      | 37.57868 | -75.62691 | L   | 87598845     | BL (44)    | -          | BL (44)     | USFWS       | YES      |
| 12-Jul-04 | Wachapreague | 73      | 37.59773 | -75.68114 | AD  | 87598846     | BL (45)    | -          | BL (45)     | USFWS       | -        |
| 21-Jul-04 | Wachapreague | 11      | 37.59405 | -75.64571 | AD  | 87598849     | BL (48)    | -          | BL (48)     | USFWS       | -        |
| 20-Aug-04 | Wachapreague | 11      | 37.59405 | -75.64571 | L   | 87598905     | BL (64)    | -          | BL (64)     | USFWS       | YES      |

BL = black color band with white engraved 2-digit codes. Parentheses indicate 2-digit code.

USFWS = incoloy U.S. Fish and Wildlife Service band.

### Appendix 6. Summary of banded American Oystercatchers on Fisherman Island in 2004.

| DATE   | SITE      | NEST ID | LATITUDE | LONGITUDE | AGE | USFWS BAND # | UPPER LEFT | LOWER LEFT | UPPER RIGHT | LOWER RIGHT | FLEDGED? |
|--------|-----------|---------|----------|-----------|-----|--------------|------------|------------|-------------|-------------|----------|
| 15-Jun | Fisherman | F08     | 37.08775 | -75.94453 | L   | 87598801     | BL (01)    | -          | BL (01)     | USFWS       | NO       |
| 15-Jun | Fisherman | F20     | 37.10372 | -75.94753 | L   | 87598802     | BL (02)    | -          | BL (02)     | USFWS       | YES      |
| 24-Jun | Fisherman | F28     | 37.08681 | -75.94567 | L   | 87598831     | BL (30)    | -          | BL (30)     | USFWS       | NO       |
| 24-Jun | Fisherman | F28     | 37.08681 | -75.94567 | L   | 87598832     | BL (31)    | -          | BL (31)     | USFWS       | NO       |
| 24-Jun | Fisherman | F33     | 37.09214 | -75.94192 | L   | 87598833     | BL (32)    | -          | BL (32)     | USFWS       | YES      |
| 24-Jun | Fisherman | F38     | 37.08536 | -75.94842 | L   | 87598834     | BL (33)    | -          | BL (33)     | USFWS       | NO       |

BL = black color band with white engraved 2-digit codes. Parentheses indicate 2-digit code.  
 USFWS = incoloy U.S. Fish and Wildlife Service band.