

HUMAN IMPACTS TO SENSITIVE NATURAL RESOURCES ON THE ATLANTIC BARRIER ISLANDS ON THE EASTERN SHORE OF VIRGINIA

2005 REPORT



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Virginia Coastal Zone
MANAGEMENT PROGRAM



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Cover photo: Surf fishermen on Wreck Island Natural Area Preserve, Photo by R. Ayers, 2005

Photo enhancements: Where noted some digital photos shown as figures were enhanced using Adobe Photoshop 6.0 to highlight a portion of the photo. Contrast and brightness level were adjusted to make images of the photos more recognizable. In some pictures, all or some of the color was removed to highlight areas and to reduce overall image/pixel size. Except where cited, all photos were by R. Ayers, Virginia Eastern SHOREKEEPER®, 2004-2005

Introduction

Land managers responsible for the protection of the Atlantic barrier islands on the Eastern Shore of Virginia remain concerned about the effects of human activity on the sensitive natural resources of the islands. Although most of the discussion has been focused around colonial and solitary beach nesting birds, impacts to other fauna and flora are also of concern. To address these concerns, the Virginia Eastern SHOREKEEPER® received funding from the Virginia Coastal Zone Management Program (VCZM Program) to conduct a second year of on-the-water monitoring to investigate, assess and document harmful human activity along the Atlantic seaside of the Virginia Eastern Shore. Second year assessment will evaluate first year observations and recommendations if implemented. Specific grant objectives were;

GRANT OBJECTIVE: Document human impacts to sensitive marine resources.

Part 1 - On-site monitoring of sensitive natural resources

The Virginia Eastern SHOREKEEPER will conduct year round on-the-water monitoring to provide protection for oyster reef sanctuaries, planted and restored eelgrass beds, nesting shorebirds and colonial bird colonies. The Shorekeeper will maintain a close working relationship with the Virginia Marine Resources Commission and all the other Seaside Heritage Program partners. Trained Volunteer Creek Watches will provide periodic monitoring of their assigned area. When observations indicate an imminent impact to the coastal resources, the Creek Watches will report the activity to the appropriate federal, state or local agency. Potential impacts reported by the Creek Watchers, individual citizens or the SHOREKEEPER would be investigated and documented by the SHOREKEEPER. Activities resulting in infractions of existing laws will be referred to the appropriate agency, with follow-up monitoring by the SHOREKEEPER. A report documenting specific human impacts, including scale of impacts and suggested strategies to offset any documented impacts will be provided.

Part 2 - Expand outreach and public education

The Virginia Eastern SHOREKEEPER plans to expand its outreach to include active notification and public education at local public boat launching points, through distribution and posting of fact sheets and other informational material. The primary distribution of these materials will be by the SHOREKEEPER and his volunteers. Other methods will include distribution at the newly installed Seaside Heritage kiosks, at local informational points, local festivals and public events. The SHOREKEEPER will be responsible for the maintenance of these materials at the remote locations. In addition, the Creek Watchers volunteer training program will continue recruitment of volunteers to broaden its monitoring of human impacts to sensitive marine resources.

AUTHORS GENERAL COMMENTS: The barrier islands flanking the seaside of the Eastern Shore of Virginia comprise one of the best protected and least impacted barrier island chains on the entire Atlantic coast. Protection is largely due to conservation minded private and public ownership and the relatively limited access to the islands. This is an amazingly pristine natural system.

HUMAN HISTORY: Historically, the Virginia barrier islands have had modest spikes of human settlement. Since the first arrivals of European settlers, the islands have been primarily used for animal grazing, waterfowl hunting and to support the once abundant seafood industry on the Eastern Shore. Most notable was the town of Broadwater, located on the southern end of Hog Island. Settled shortly after the Revolutionary War, the population of the town grew to around 250. In the early 1900's, severe storms and coastal erosion began to force the residents to move inland. Hunting lodges, U.S. Lifesaving Stations and lighthouses were also scattered throughout the islands. Small caretaker houses, used to maintain seasonal lodges and oversee livestock herds, and watch houses, primarily used by waterman to watch over their oyster and scallop grounds, were abundant. A series of storms in the 1930's, as well as changes in the coastal fisheries combined with improved powerboats, caused most remaining island inhabitants to leave the islands permanently. The only remaining inhabited structures were U.S. Coast Guard Stations, watch houses and a few hunting lodges. In the early 1960's, developers produced plans to develop several of the islands. The plans included elaborate bridges, airports and marinas. Before these projects could be implemented, however, The Nature Conservancy (TNC), and state and

federal agencies were able to purchase and protect most of the barrier islands. The exception was Cedar Island, which was platted for several hundred residential lots. Although in the late 1980's the island supported nearly forty seasonal cottages, the project never fully succeeded due to erosion and natural island migration processes.



Figure 1. Virginia barrier Island ownership. (Graphic provided by Virginia Coastal Zone Management Program, 2005)

OWNERSHIP: Within the survey area of Gargathy Inlet south to the mouth of the Chesapeake Bay, the islands are primarily in protective ownership (figure 1). The Nature Conservancy owns all of Parramore Island, Revel Island, Little Cobb Island, Ship Shoal Island, Myrtle Island and Smith Island. The Nature Conservancy also owns the southern two thirds of Metompkin Island, and most of Hog Island and Cobb's Island. The US Fish & Wildlife Service (USF&WS) owns the north third of Metompkin Island and manages it through the Chincoteague National Wildlife Refuge (NWR). Fisherman Island National Wildlife Refuge is owned by USF&WS, but has a significant road right-of-way for a four-lane highway connection from the Eastern Shore to the Chesapeake Bay Bridge Tunnel. Wreck Island Natural Area Preserve (NAP) is owned by the Virginia Department of Conservation on Recreation, Division of National Heritage (DCR/DNH). Large private in-holdings still remain on Cedar Island(s). Some parcels on the island have been purchased by or donated to the USF&WS and TNC. Other smaller in-holdings remain on Hog Island and Cobb's Island. In addition, several interior marsh islands are in protective ownership and the Virginia Marine Resources Commission (VMRC) owns most of the tidal salt marsh.

METHODS

The scale of the patrol area was the major consideration in developing survey methods. With approximately 50 miles of Atlantic coastal beaches along the barrier islands, over 500 miles of tidal shoreline along the mainland and thousands of acres of island upland and tidal marsh, plus the variability of weather and tides, no systematic sampling method was considered feasible. Random samplings, augmented by targeted patrols during known seasonal activities, were selected. Anecdotal information derived from Seaside Heritage partners and local contacts reinforced these methods. In addition, as a condition of the grant, all monitoring activities

were conducted from the water or public land. No privately owned land was accessed and persons on privately owned land were not approached. This limited most of the public education but did not adversely affect any field observations.

A survey area from Gargathy Inlet at the north end of Metompkin Island south to the Chesapeake Bay was selected. The area from Gargathy Inlet north is primarily managed and patrolled by USF&WS personnel from the Chincoteague Island NWR. Because Assateague, Wallops and Assawoman Islands are all accessible by vehicle and patrolled by the USF&WS, boat surveys were deemed unnecessary. Fisherman Island NWR was included in the survey area.

The primary method of observation was frequent and random on-the-water patrols. The Virginia Eastern Shorekeeper operates a 22-foot *BayRider*® skiff with an outboard motor. This flat bottom boat can operate comfortably in 18 inches of water and in the near-shore waters of the Atlantic Ocean. In addition, the Shorekeeper took advantage of other Seaside Heritage partners, local waterman and private boaters to access broad areas along the seaside. For remote access, kayaks were transported in the Shorekeeper boat and launched to access even more remote island areas. Between October 2004 and September 2005, over 460 hours of on-the-water observations were logged by the Shorekeeper and volunteers (Figure 2).

Patrols were primarily scheduled around weather, tide and season. Weather was the predominant variable influencing the observation of recreational use of the barrier islands. However, patrols were conducted during adverse weather and at night to fully survey the human impacts. Winter observations were limited due to safety concerns. Tide was a limiting variable for safe boat operation and access to some remote locations. Restored eelgrass beds and Virginia Oyster Heritage Program (VOHP) oyster reefs were primarily patrolled during low tide to allow for physical observation of growth and turbidity monitoring. Seasonal variability allowed for targeted surveys. Although random, more patrols were conducted on Friday and Saturday than during the remainder of the week, to better observe impacts from recreational use. Once shorebird nesting activity was observed in the spring, targeted patrols were increased near nesting areas.

Historic data and current input from island land managers was used to rank the general sensitivity of individual Atlantic barrier islands (Table 1). All observed human activity was noted. Activities were categorized into two groups; authorized and unauthorized. Authorized activities included any activity allowed by law and in compliance with policies or restrictions imposed by the landowners. Unauthorized activities included any activities not allowed by law or inconsistent with landowner policies and restrictions. Laws pertaining to on-the-water activities and related to coastal fisheries and hunting are well documented and concerns were directly addressed to the Virginia Marine Resources Commission or the Department of Game and Inland Fisheries, when appropriate. Laws pertaining to nesting birds and individual landowner policies and restrictions were more ambiguous. All privately owned property was considered closed to the public, except for property owned by TNC, which allows conditional activities on most of their property. Two examples of unclear activities follow. (1) Driving a vehicle on the beach on Cedar Island North would be considered an authorized activity. However, it would be considered an unauthorized activity to drive on the same beach near a Piping Plover nest. (2) Surf fishing would be an authorized activity in the early spring and an unauthorized activity during the posted summer bird nesting season. Virtually all activities conducted by landowners and land managers were considered authorized. Most activities revolve around research and are authorized by research permits and agreements.



Figure 2. The Virginia Eastern Shorekeeper and boat on patrol. Photo by D. Field, DCR/DNH.

Table 1. 2005 general sensitivity of flora and fauna to human impacts on Atlantic barrier islands of the Eastern Shore.
 HIGH - Frequent human activity would likely have a negative impact. Avian population is large or avian activity, such as nesting or breeding, is considered significant relative to other locations.
 MED - Frequent human activity may be disruptive and that sustained activity would have a negative impact. Avian population or activity is considered important.
 LOW - Could be disturbed or affected by excessive human activities. Avian population is low or not considered at risk.

*1 Cedar Island is currently divided by a significant ocean inlet and is shown as two separate islands.

*2 The south end of Parramore Island has merged with Revel Island

ISLAND	Birds					Other		Habitat		
	Solitary	Colonial	Wading	Marsh	Waterfowl	Mammal	Reptile	Dune	Upland	Fresh W
Metompkin Island	HIGH	MED	LOW	MED	MED	HIGH	MED	MED	-	-
Cedar Island, North (*1)	HIGH	HIGH	LOW	MED	MED	HIGH	MED	HIGH	HIGH	-
Cedar Island, South (*1)	MED	LOW	MED	MED	MED	LOW	MED	HIGH	HIGH	-
Dawson Shoal	MED	HIGH	LOW	-	LOW	LOW	MED	LOW	-	-
Parramore Is NAP (*2)	LOW	LOW	LOW	MED	MED	HIGH	MED	MED	MED	MED
Revel Island (*2)	LOW	LOW	LOW	MED	LOW	MED	MED	LOW	LOW	-
Hog Island	MED	MED	MED	MED	MED	LOW	MED	MED	MED	MED
Cobb's Island	MED	MED	HIGH	MED	MED	LOW	MED	LOW	LOW	MED
Little Cobb's Island	LOW	HIGH	LOW	LOW	LOW	LOW	MED	LOW	-	-
Wreck Island NAP	MED	HIGH	HIGH	MED	MED	LOW	MED	LOW	LOW	-
Ship Shoal Island	MED	LOW	LOW	MED	MED	MED	MED	LOW	-	-
Myrtle Island	LOW	LOW	LOW	MED	MED	MED	MED	LOW	-	-
Smith Island	MED	LOW	LOW	MED	MED	HIGH	MED	MED	MED	MED
Fisherman Island NWR	HIGH	MED	MED	MED	MED	HIGH	MED	HIGH	HIGH	-

Both authorized and unauthorized activities were broken down into the individual human impact and the collateral impact related activities. Table 2 summarizes the observed impacts of human visitation on the Atlantic barrier islands and will be reviewed in the Discussion section.

Human Impacts were grouped into the following categories:

1. BEACH - Any recreational activity on the beach (*i.e.* beach walking, shell collecting, artifact hunting, bird watching, picnicking and using the island as a rest room).
2. FISH - Fishing activities, primarily surf fishing. Includes inlet fishing and accessing fishing areas.
3. HUNT- Hunting activities, including waterfowl, Rail hunting, building and accessing blinds or hunting areas and flushing waterfowl from closed areas to open areas. Raccoon and fox collection are included under research.
4. RESEARCH - Scientific activities or general studies conducted by the landowners or with a valid research permit or agreement.
5. NIGHT - Any activity conducted between sunset and sunrise. Generally, overnight activities.
6. OWNER - Any activity authorized by the owner that is not covered in another category. This includes mowing, prescribed fire, herbicide application, construction and repair of structures.

The collateral impacts from human impact were grouped into the following:

1. BOAT - Use of a boat, other than a canoe or kayak, to gain access to the impacted area (Figure 4).
2. KAYAK - Use of a canoe or kayak to access the impacted area.
3. VEHICLE - Use of any type of vehicle to access the impacted area. Includes trucks, ATV's and pull carts.



4. TRAILS - Describes new and historic trails and roads maintained to provide access. Does not include animal trails.
5. COTTAGE - Any permanent structure used for temporary occupancy or storage. Includes the Cape Charles Lighthouse on Smith Island. Does not include abandoned structures.
6. CAMP – Any activity relating to camping or setting up an area beyond a simple picnic. Includes setting up tents, cooking equipment, tables, volleyball nets, temporary generators and building campfires.
7. DOGS - Any domestic pet that is released on a barrier island, except for dogs that are authorized for use while hunting (Figure 3).

Figure 3: Unleashed dog flushing a Willet off the beach on Cedar Island.

Table 2. 2005 observed impacts of human visitation and collateral activity on the Atlantic barrier islands. Does not include the effects of traffic from the Chesapeake Bay Bridge Tunnel right-of-way through Fisherman Island NWR.

		Human impact						Collateral use impact						
		Beach	Fish	Hunt	Research	Night	Owner	Boat	Kayak	Vehicle	Trails	Cabin	Cottage	Dogs
Metompkin Island	Authorized	HIGH	-	-	HIGH	-	MED	MED	HIGH	MED	-	-	-	-
	Unauthorized	HIGH	HIGH	LOW	-	-	-	HIGH	HIGH	-	-	-	MED	HIGH
Cedar Island, North	Authorized	HIGH	-	-	HIGH	HIGH	HIGH	HIGH	MED	HIGH	HIGH	HIGH	-	HIGH
	Unauthorized	HIGH	HIGH	MED	-	MED	-	HIGH	HIGH	-	-	-	HIGH	HIGH
Cedar Island, South	Authorized	HIGH	LOW	MED	LOW	HIGH	HIGH	HIGH	LOW	HIGH	HIGH	HIGH	LOW	HIGH
	Unauthorized	HIGH	MED	LOW	-	MED	-	HIGH	MED	-	-	-	MED	HIGH
Dawson Shoal	Authorized	HIGH	LOW	-	LOW	-	-	LOW	-	-	-	-	-	-
	Unauthorized	HIGH	MED	-	-	MED	-	HIGH	MED	-	-	-	HIGH	HIGH
Parramore Is NAP	Authorized	MED	LOW	-	HIGH	MED	MED	HIGH	-	HIGH	HIGH	HIGH	-	-
	Unauthorized	HIGH	MED	LOW	-	MED	-	HIGH	MED	-	-	-	HIGH	MED
Revel Island	Authorized	LOW	-	-	MED	-	-	LOW	-	LOW	-	-	-	-
	Unauthorized	MED	LOW	LOW	-	-	-	MED	LOW	-	-	-	-	MED
Hog Island	Authorized	MED	-	MED	HIGH	MED	MED	HIGH	-	MED	HIGH	HIGH	MED	MED
	Unauthorized	MED	HIGH	MED	-	MED	-	HIGH	LOW	-	-	-	MED	MED
Cobb's Island	Authorized	LOW	-	LOW	LOW	-	LOW	LOW	-	-	-	LOW	-	MED
	Unauthorized	HIGH	MED	LOW	-	-	-	MED	LOW	-	-	-	MED	MED
Little Cobb's Island	Authorized	LOW	-	-	LOW	-	-	LOW	-	-	-	-	-	-
	Unauthorized	HIGH	HIGH	-	-	MED	-	HIGH	MED	-	-	-	MED	HIGH
Wreck Island NAP	Authorized	MED	-	-	MED	-	MED	MED	-	-	-	-	-	-
	Unauthorized	HIGH	HIGH	-	-	-	-	HIGH	LOW	-	-	-	-	HIGH
Ship Shoal Island	Authorized	LOW	-	-	LOW	-	-	LOW	-	-	-	-	-	-
	Unauthorized	MED	MED	-	-	-	-	MED	-	-	-	-	-	MED
Myrtle Island	Authorized	LOW	MED	-	LOW	-	-	LOW	-	-	-	-	-	-
	Unauthorized	LOW	-	-	-	-	-	-	-	-	-	-	-	MED
Smith Island	Authorized	MED	-	-	HIGH	LOW	HIGH	HIGH	-	HIGH	HIGH	HIGH	-	-
	Unauthorized	HIGH	HIGH	?	-	-	-	HIGH	HIGH	-	-	-	MED	HIGH
Fisherman Is NAP	Authorized	HIGH	-	-	HIGH	LOW	HIGH	-	-	HIGH	HIGH	-	-	-



Figure 4. Typical recreational visitors to the Virginia barrier islands (Little Cobb's Island, 2004)

RESULTS

By any comparative standard, human impacts to sensitive natural resources on the Virginia Barrier Islands is very low. However, with the global significance of the barrier island chain, particularly in relation to nesting and migratory birds and the favorable habitat that supports these birds, any human disturbance demands a raised level of concern. Land managers, in particular, must exercise due diligence in keeping this unique and dynamic habitat a naturally functioning system.

Results from 2005 support survey findings in 2004, with only two notable exceptions; increases in landowner supported research and a slight increase in recreational surf fishing. Generally, there was widely distributed light recreational usage throughout the survey area. Observed impacts of human visitation and collateral activity are summarized by general impacts (Table 2). In 380 hours of patrolling by the Shorekeeper, human activity was observed on a barrier island or near a sensitive restoration area on most dates. Good seasonable weather and light winds made many weekends favorable for recreational activities. This was contrasted by relatively lower numbers of fish, particularly Atlantic Croaker, caught in seaside waters. The combination of these two factors seems to have kept the total number of recreational boaters that accessed the islands about the same as 2004.

Cumulative summary: For the second year, casual entry by recreational beachcombers into colonial and solitary bird nesting sites was the most often observed disturbance. Between April and September 2004, over 31 intrusions were observed near nesting bird sites on Metompkin Island, Cedar Island North, Dawson Shoal, Little Cobb Island, Wreck Island NAP and Fisherman Island NWR. Most observations consisted of two persons walking along the beach. Unleashed, mostly large dogs were observed on Metompkin, Cedar North and South, Parramore, Hog, Little Cobb and Smith Island. Personal vehicles or ATV's were regularly noted on Cedar Island North and South and Fisherman Island NWR. Seasonal ATV use was observed on Metompkin, Cedar Island North and Cedar Island South and Smith Island in conjunction with spring mammal research. Two separate unauthorized vehicle uses were reported on Cedar Island North, where one truck and one ATV were observed driving on the upper beach and in over-wash areas near where solitary nesting birds were reported to be. Large groups of 6 or more were observed picnicking on Metompkin Island, Cedar Island North, Dawson Shoal, Hog Island, Cobb's Island, Little Cobb Island and Smith Island. Cedar Island North and Dawson Shoal appeared to be the preferred areas for local citizens to picnic. Primary use of Little Cobb Island was by people from North Carolina (indicated by the boat registration numbers) during the Croaker fishing season.

Surf fishermen: The consensus among land managers was that surf fishermen provided minimal disturbance to sensitive natural resources. For the most part, fishing activities were limited to the surf zone of the beach. Most fishermen to the islands are seasoned anglers who seem to demonstrate care and respect towards the sensitive natural resources. Although surf fishing is not new to the barrier islands, there has been a notable increase in the size of the groups fishing and the equipment used. In the mid-1990's, a typical surf fishing party was two to three persons, with two fishing rods each and a five-gallon bucket used to carry all supplies. This year an increase in non-motorized carts and individual fishermen fishing 5 rods at one time was noted. Surf fishing parties of ten or more fishermen were noted on Wreck Island NAP 6 times and on Smith Island twice. In most cases, their boat was within the sight of the fishermen. On Cedar Island (north), Hog Island, Smith Island, Ship Shoal Island and

Wreck Island NAP, surf fishermen were observed fishing from the beach during the autumn. The accompanying boats were anchored behind tidal sandbars on the seaside of the island.

Researchers: Researchers accounted for approximately 40 percent of the humans observed on the islands. Though difficult to quantify, researchers accounted for the most hours on the islands with routine daylong activities and numerous nighttime activities on Metompkin Island, Cedar Island North, Parramore Island, Hog Island and Smith Island. In preliminary discussions with land managers, there was concern about the cumulative impact of researchers on nesting birds. All agreed that the ongoing and new research is needed, both to further science and aid in land management decisions. Some land managers voiced concern over the particular scale or scope of individual studies. Of note were concerns over single species studies conducted in, or near, multiple-species colonies.

DISCUSSION

Conclusions in the 2004 human impact study may have overstated the overall human impacts to sensitive natural resources. Following a second year of observations, except for some research and studies conducted with land managers approval, current human disturbances are short in duration and may not have long-term impacts. While any human impact is worth monitoring, the barrier islands are a disturbance driven system with frequent disruption by storm and tide. The flora and fauna that use these islands are adapted to these disturbances. Human activities near or over restored eelgrass restoration beds do not appear to be having a negative effect on restoration efforts. Human activities near or over VOHP oyster restoration beds are inconclusive. Although harmful activity was not observed during the survey period, private leaseholders and VMRC reports indicate that illegal harvests have greatly damaged VOHP restoration efforts in some areas.

Overall human usage, within the Seaside Heritage area surveyed, may not be increasing. Based on historical and anecdotal information (Badger and Kellam, 1989; Barnes and Truitt, 1997; Personal observation) human usage on the barrier islands appears to have decreased between the peak of activity in the early 1900's and 1994. Since 1994, there has been a steady decline of hunting lodges, watch houses, U.S. Coast Guard Stations and seasonal cottage construction (personal observation). Currently, all the Coast Guard Stations are closed. Only a few hunting lodges, used primarily by small groups of hunters, are present on Cedar, Hog and Cobb's Islands, and only a few watch houses are located behind the islands. In addition, these watch houses are used only sporadically and primarily by watermen awaiting a rising tide. The numbers of cottages, on both Cedar Islands, has been reduced dramatically and are continually threatened by adverse weather. Today, the island continues to be breached by storms and an inlet divides the island in two. Only eight cottages remain, four of which are abandoned (Figure 5).



Fig 5: Cedar Island cottages. Left frame taken on 8 May 2004 and shows three cabins on the ocean side of Cedar Island. Right frame, taken 28 October 2004, shows the same area with two of the three cabins washed away. Photos by R. Ayers 2004.

By stark contrast, a majority of the Atlantic coast has seen dramatic increases in human impacts in the past one hundred years (U.S. Commission on Ocean Policy, 2000). Areas north and south of the Virginia barrier islands have been subject to residential and commercial development, impacted by shoreline hardening, modification and replenishment and now support year-round human populations. The general assumption, by land managers along the Virginia barrier islands, is that the wholesale loss of coastal habitat to the north and south along the East Coast places even more importance on the conservation value of the remaining natural communities on these islands. Although that point is not in question, it does pertain to the relevance of human impacts on the Virginia barrier islands. By scale, human usage on all of the islands within the survey area is substantially less than, for example Fenwick Island, Ocean City, Maryland, with its millions of annual visitors (Maryland Coastal Bays Program, 2004). The relatively low amount of human visitation on the Eastern Shore Atlantic barrier islands offsets the high number of important natural resources.

ISLAND ACCESS POINTS: Getting from the mainland to the islands appears to be a strong variable in where the islands are impacted. As expected, the relationship to the mainland public boat ramps to the closest landing point on the islands clearly affects the number of recreational visitors. Virtually all island access was onto sandy beaches either near an inlet or at an over-wash area. It was thought that the increased use of kayaks would begin to provide access to areas not normally accessed by larger boats. The kayakers that were observed on the islands were accessing the islands in the same locations as the boats. The more remote island landings were by island researchers, surf fishermen and hunters who used local knowledge to access small creeks and guts. The preferred island landing points are sandy beach on the inlet or backside of the island. Current and tide did not seem to affect the decision to land, though it often affected how long visitors remained there. Under ideal weather and tide conditions, local boaters would beach their boat and anchor the stern into deeper water. Out of town boats would anchor out in deeper water and wade or swim in or simply beach the boat for short periods of time. Kayakers, canoes and small aluminum boats would always be pulled up on the beach away from wave activity.



Figure 6, Bird colony posting sign on Wreck Island NAP.

Figure 7 shows mainland debarkation points and island access points within the Seaside Heritage Program survey area. Public ramps in Wachapreague, Folly Creek, Gargathy Creek and Oyster were the launching points for most boaters accessing the islands. Ramps in Quinby, Willis Wharf and Red Bank were frequently used, but had a lower number of boats that accessed the islands. The ramp at Kiptopeke State Park is also shown because a large number of boats use the ramp to access Fisherman Island NWR and the southern end of Smith Island.

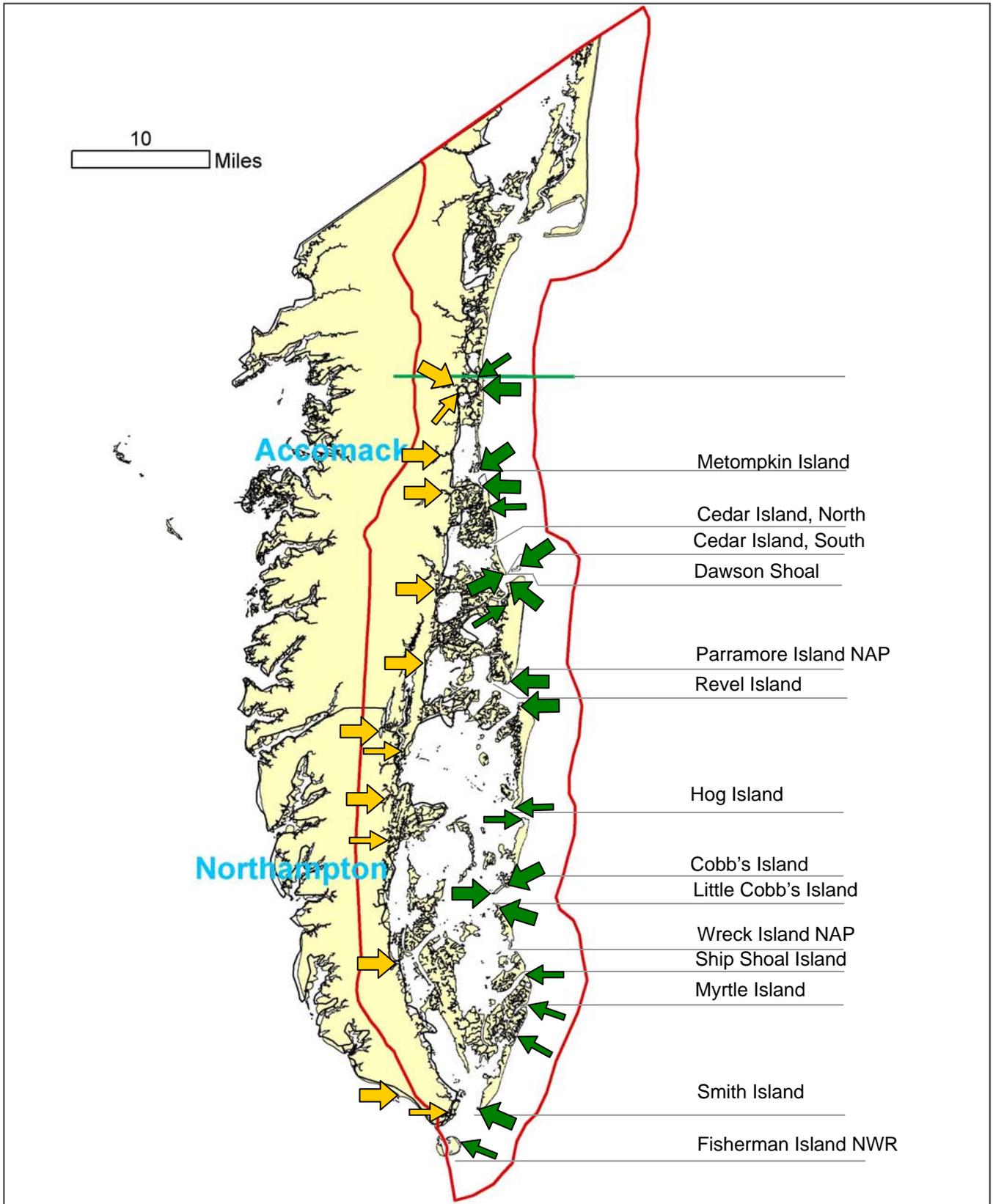


Figure 7. Seaside Heritage Program area mainland debarkation points and island access points. Red outline indicates program area.

-  = Public boat ramps.
-  = Private boat ramps that are regularly used.
-  = Primary island access points.
-  = Secondary access points. Surveys were not conducted north of Gargatha Inlet, indicated by green line.

2004 RECOMMENDATIONS FOLLOW-UP:

Recommendation 1 summary: *Land managers, large property owners and resource managers should meet to discuss the issue of human impacts on the barrier islands, and;*

Recommendation 2 summary: *Use policies need to be clarified and made available to the public.*

Results: Meetings held from February – June 2005 brought together land managers and resources managers to discuss island access issues and methods of public education. As a result of those meetings, consensus was reached on the content of a single brochure to address nesting bird sensitivities and land ownership. An *ad hoc* design team with personnel from the Virginia CZM Program, Virginia Department of Game and Inland Fisheries, U. S. Fish and Wildlife Service, Virginia Department of Conservation and Recreation and The Nature Conservancy developed a brochure titled “*LIFE ON THE BEACH ISN’T ALWAYS EASY.*” (Figure 8) Exterior text, graphics, photos and layout were based on a similar brochure developed by the Hauser Group for the Georgia Department of Natural Resources Non-game Wildlife & Natural Heritage Section, Text and graphics were adapted by several VCZMP, Seaside Heritage partners and reviewed by all primary barrier island land managers. Final design was developed by the Virginia Office of Graphic Communications, Department of General Services. The brochure was funded in part by the Virginia CZM Program through a grant from NOAA under the Coastal Zone Management Act and in part by the Virginia Department of Game and Inland Fisheries through a grant from the USFWS, Federal Aid to Wildlife Restoration Project. Brochures were printed and distributed to land managers for local distribution. The Shorekeeper distributed brochures to public contact points and local eco-tour business owners. The land managers and the Shorekeeper also use the brochure when conducting outreach to educate the public on barrier island protection and public use policy. The brochure has been well received.



Figure 8: “LIFE ON THE BEACH ISN’T ALWAYS EASY” brochures. Background is opened brochure showing ownership.

Recommendation 3 summary: *Colonial nesting bird areas need to be more clearly defined and posted.*

Recommendation 4 summary: *Islands that are closed to the public should be posted as such.*

Recommendation 5 summary: *Temporary barriers need to be considered.*



Figure 9: USF&WS sign on Assawoman Island

Results: 2005 was a clear improvement in posting nesting bird areas over the past few years. USF&WS at Chincoteague, which manages a number of the northern barrier islands, began clearly posting Assawomen (Figure 9) and northern Metompkin Islands heavily for the past few years. Over the years they have refined their posting to increase clarity and conciseness. In 2005, The Nature Conservancy hired additional personnel, supported by summer interns, who posted lands owned by The Nature Conservancy. Posting in 2005 was well placed and covered a majority of the areas where nesting occurred. The Virginia Department of Conservation and Recreation, Division of Natural Heritage (DCR/DNH) has had a full time regional steward on the Eastern Shore for the past five years. Posting on DCR/DNH land has been effective. The Virginia Department of Game and Inland Fisheries (VDGIF) have a Nongame biologist supported by summer interns, who monitor Piping Plover and other solitary nesting birds on TNC and USF&WS lands. Their increased presence on the islands has located and posted many solitary nest sites, primarily on Metompkin and Cedar Islands, which have traditionally gone un-posted. Their increased presence may have deterred or prevented human impacts from recreational users on solitary nesting sites. At Wire Passage landing on Metompkin Island, a simple rope was tied between posting signs and arranged to channel visitors from the boat landing to the beach. This method was a simple and effective way to divert visitors around critical areas. USF&WS, Eastern Shore/Fisherman Island NWR was assigned a full-time law enforcement officer in 2005. Although most of the summer the officer was away at training, the availability of an officer

and the additional presence will assist in monitoring and deterring unwanted human impacts. With the exception of the USF&WS properties, islands that are closed to the public are not marked.



The SAV protection areas in Chincoteague Bay are well marked with permanent wooden pilings and large clearly visible signs. Oyster reefs and restoration areas are poorly marked. Signage is often damaged by storm and tide and not replaced for extended periods. Also, most of the signage contains the word's "No Trespassing" (figure 10), which may in some cases, be confusing and/or not permitted by regulation. In Virginia, shellfish leases, not adjoining riparian lands, only cover 12 inches from the bottom. In effect, the water that covers these leases is still open for public use. Even in designated Oyster Management Areas it is not illegal to be in the area provided you are not in possession of shellfish or shellfish harvesting equipment, Land managers that post lands with "No trespassing" signs should ensure that their signage is in conformance with VMRC regulations. Some areas are marked with metal posts and may not be in compliance with Virginia code. Two sections of Virginia Code that may be relevant follow.

Figure 10: Collage of signage marking oyster grounds on the seaside. Photo assembled from three different signs from three different seaside locations

MARKING LEASED OYSTER PLANTING GROUNDS:

4 VAC 20-290-20: General. Leased oyster planting ground shall be marked by the lessee if the oyster planting ground is being worked. No harvesting or planting of leased oyster planting ground shall occur unless the lessee first has properly designated and marked the lease in accordance with the provisions of this chapter.

4 VAC 20-290-30(B)1: Method and manner of marking, Description of markers: Stakes shall be no longer than two inches in diameter at the mean low water line and shall extend at least four feet above the mean high water line. The stake shall be of such materials not so rigid as to harm a boat if accidentally struck. Bamboo, white oak, cedar, or gum saplings are commonly used, but not required. If polyvinyl chloride (PVC) pipe is used, and driven into the bottom, the diameter of the PVC pipe shall be two inches or less. Metal pipe markers are prohibited.

2005 RECOMMENDATIONS:

1. Barrier Island landowners, land managers and a representative sampling of researchers need to meet to evaluate the human impacts of certain types of research. TNC and state and federal agencies have in place good research permitting processes that are used to evaluate proposed research or studies on their lands. A greater effort is needed to share the type, scope and scale of approved and denied research applications with TNC and state and federal landowners. This will aide land managers in evaluating the cumulative effects of all ongoing research within the barrier island chain. Ideally, consensus should be reached on acceptable and unacceptable research practices.
2. Recent changes in the Eastern Shore Tourism Commission and changes in Accomack and Northampton County's leadership have placed in increased emphasis on nature-based or eco-tourism. While this is not a new idea, it seems to have received a new level of attention. At a joint Northampton/Accomack County Board of Supervisors meeting in September 2005, Northampton County Supervisor Andrew Barbour presented a draft proposal that outlined the value of the seaside and barrier islands as a marketable resource to draw visitors to the Eastern Shore. Private and public land managers need to seriously consider the values and impacts of this proposal. Because most barrier island land is in protective ownership, any broad planned use of the barrier islands would need "permission" from The Nature Conservancy, USF&WS or DCR/DNH.
3. Signage on kiosks installed along with the Seaside Water Trail floating docks should be carefully worded and vetted though the various land managers to balance their barrier island protection concerns with encouraging responsible public access to the Seaside. While no specific language is suggested, these kiosks will be one of the few public information points to educate visitors

4. The Eastern Shore Avian Partnership needs to meet and update their Conservation Action Plan. The most recent revision was in 1996. The plan has served as a good strategic plan for the avian work conducted over the past ten years. The partnership should revisit the plan, document its successes and adjust it accordingly. The plan could also provide a valuable framework that could ultimately be adopted in a comprehensive Seaside Management Plan.
5. Oyster restoration areas need to be clearly marked with compliant signage. Private and state leaseholders need to mark areas to aid with monitoring and enforcement. TNC has already increased signage and has begun to map reefs using GPS to provide the Shorekeeper and law enforcement personnel exact reef locations.
6. Increased monitoring and enforcement is needed in southern oyster restoration areas. Thefts in 2005 greatly reduce the oyster stocks in these critical areas. The remote location of these sites makes monitoring difficult. The Shorekeeper will increase patrols in these areas.

REFERENCES

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