

# *A Biologist's Photographic Record of Smith Island and Vicinity*

**Specially Prepared for Blackwater National Wildlife Refuge**

**by**

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**February 2013**

*“When you are on the trail of an elusive bird like the American black duck, it leads you to remote and interesting places.....”*

## INTRODUCTION

For a period of about 12 years, starting in about 1994, I regularly visited Smith Island either to assist Mike Harrison in pursuit of work of mutual interest with black ducks, or to conduct my own field research as field biologist with the Patuxent Wildlife Research Center. During this period of time, and I conducted formal research studies on Martin Refuge with black ducks (Haramis et al. 2002) and red foxes (with colleague Dennis Jorde) and with diamondback terrapins (Haramis et al. 2011) with biologist Paula Henry. Throughout these studies, I took special care to document with photographs Tangier Sound wildlife, habitats, and to some extent the watermen culture.

Whereas much of our research has been documented in formal publication, my desire to convey the intangible aspects of this experience led to this report format. I thought it would be beneficial to refuge staff to include details of the experience, including digital photos for use elsewhere, that otherwise might be lost in time. Herein I include photos and brief text as somewhat of a travel log of this

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experience. I have selected images because of their biological interest and to a lesser extent cultural content. I have included annotation in figure titles to provide continuity and context to the photos. I conclude with a list of pertinent citations.

## BACKGROUND

Our work on Smith Island was as culturally rich as it was biologically rich. We realized quickly how local culture was intrinsically linked in time to both black ducks (and waterfowl in general) and another subject of our studies, the diamondback terrapin. We found that many Smith Islanders were avid waterfowlers and pursued fall and winter duck and goose hunting. However, as we became aware of the free-spirited nature of Smith Islanders we hadn't anticipated illegal activity in the form of the bait trapping of ducks. As biologists, we viewed duck trapping as just another (although anomalous) source of mortality affecting demographics. We did not pursue prosecution of those responsible for this act, but tried to understand the cultural significance of its presence. We learned that Smith Islanders have a long history of entitlement to Bay resources, dating back to the founding of the community in the late 1600s, over 100 years before the United States was established as a country (Dize 1990). The community survived on its hard work, innovative self-sufficiency, and independence, qualities arising from its isolation. In many ways these qualities remain as much a part of the watermen culture today as they did generations ago, although life today is certainly much easier. Duck trapping is just one of a number of activities that is a carryover from the past. Few individuals take part in this activity and we believe it will eventually die out as new generations lose contact with the old ways. The title of Tom Horton's popular book perhaps sums it up most eloquently as Smith Island remains in many ways "*An Island Out of Time*" (Horton 1996).

Smith Islanders have also had a long relationship with the diamondback terrapin, first as a ready source of food, and later as a profitable commercial fishery. As skilled watermen, Smith Islanders were no doubt active participants in the wanton harvest of terrapins for the restaurant trade for a period of decades near the turn of the century. At that time, inch for inch, or pound for pound, terrapins were the most valuable resource ever harvested from the Chesapeake Bay, a fact that nearly led to their extirpation. It is my belief that the offshore islands of Tangier Sound are the richest habitat and potentially most important nursery area for diamondback terrapins in the Bay..... and perhaps throughout the range of the northern subspecies.

I have long been involved with black ducks and at this point a diversion for a mini review of species status is in order. When I arrived at the Patuxent Wildlife Research Center in 1976, I learned how the black duck was historically the premiere wintering dabbling duck in Chesapeake Bay....and to the dismay of managers was in sharp decline... so much so that a special symposium was held in the late 1960s in nearby Chestertown, Maryland, to address specifically this concern (Barske 1968). Status of the black duck population and its management have been topics of heated debate and extensive study ever since. Ultimately, adoption of conservative hunting regulations has served to stabilize and even increase numbers of black ducks. However, black ducks have not recovered to the numbers witnessed a half century ago and remain a species of special management concern by the Fish and Wildlife Service. Atlantic Flyway black duck management has by necessity focused on the bulk of the population that breeds in Canada and winters in the eastern U.S., primarily eastern coastal habitats. Smaller populations of breeding birds also occur in coastal New Jersey, the Chesapeake Bay, and in the coastal Carolinas, but these have been deemed too small to be of management emphasis and, as a result, have been addressed indirectly through habitat joint ventures.

Chesapeake Bay once played a much larger role for both wintering and breeding black ducks than it does today. With the advent of winter aerial surveys (ca. 1950s) biologist Bob Stewart documented the great numbers of black ducks that once wintered on Chesapeake Bay and coastal New Jersey (Stewart 1958), and at about the same time, Vernon Stotts (former MD-DNR biologist) documented the large size of the breeding population in the Kent and Eastern Neck Island region of the upper Bay (Stotts 1957; Stotts and Davis 1960). Today numbers of wintering and locally breeding Bay black ducks have dwindled to but a small fraction of those observed in the 1950s , i.e., the Stewart/Stotts era (Krementz 1991). Unfortunately, no simple solution has been forthcoming to restore the local black duck population and causes of the decline embrace a complex of anthropogenic and natural factors negatively affecting black duck productivity. Key factors noted for the decline have been the widespread loss of submerged aquatic vegetation, the primary food base for breeding adults and growing juvenile black ducks, and the increase in human population growth along Bay shorelines that has translated to increased disturbance and loss of nesting habitat. Also noted has been the negative interaction of black ducks with the release of hundreds of thousands of game farm mallards in the region, an event that took place over several decades in the mid 20<sup>th</sup> century and continues to some extent today. Because black ducks have evolved relatively recently from our native prairie mallard, black ducks and mallards readily hybridize. The result of such hybridization gives preference to dominant

mallard traits. This process of introgression is thought to have compromised specific behavioral and morphological characters of black ducks. Thus the introduction of the mallard as a breeding bird in eastern black duck habitats has resulted in an erosion of the black duck genotype. The process is complicated by the release of game farm mallard stock that differs in morphology and behavior from the pure mallard as a result of intense captive breeding. Massive releases of game farm mallard stock in the east thus accelerated hybridization with the black duck. I note that the enhanced sexual vigor of game stock mallards, especially of males, may have served as a catalyst in this process. Today pure black duck stock is only present where black ducks remain isolated from mallards. A decade or so ago, black ducks maintained such isolation only in the maritime provinces of Canada, but this may not be the case today.

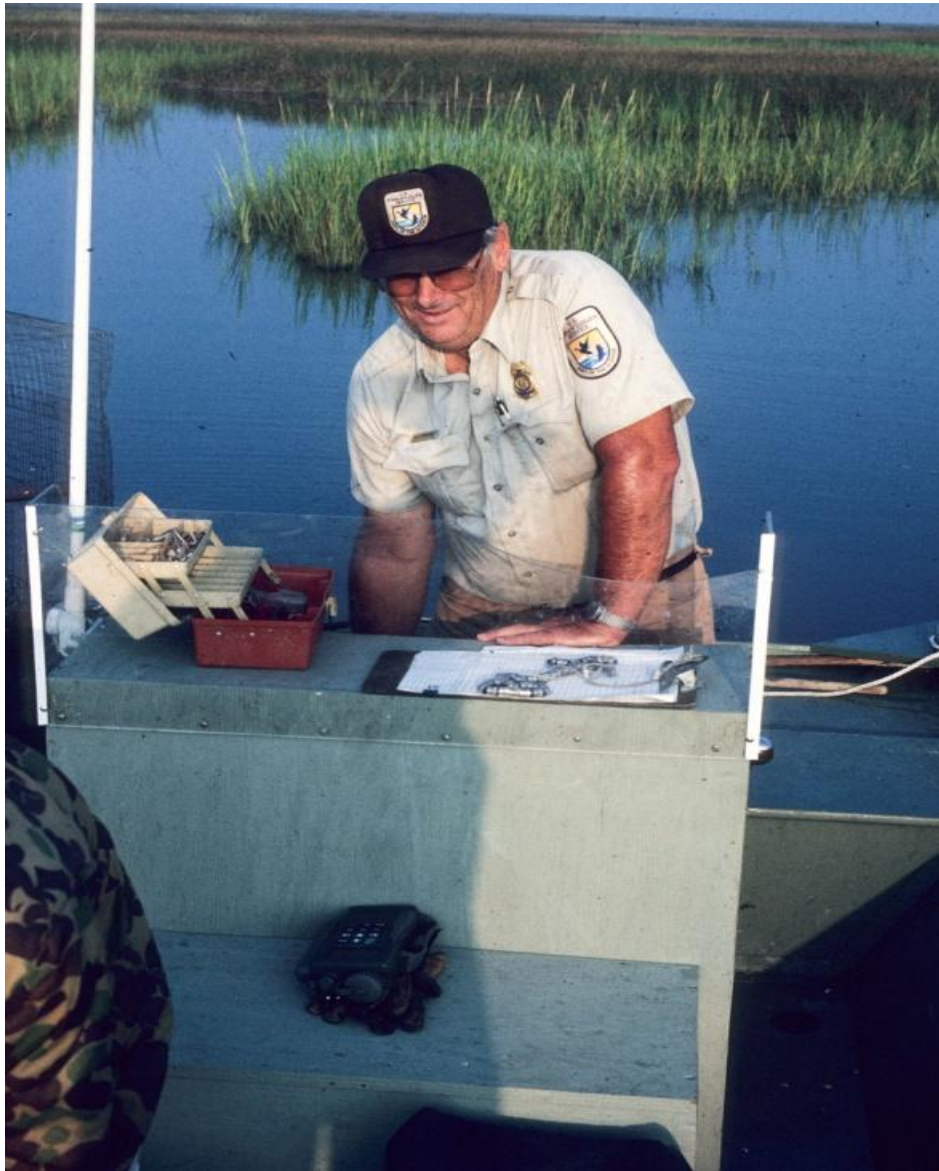
Pursuing my interest in Chesapeake Bay black ducks, I realized that numbers of breeding birds had greatly diminished in the upper Bay, so I searched for a viable population of black ducks that might still exist in the remote salt marsh region of the lower eastern shore. This search led me to two places that were known for maintaining good numbers of preseason bandings of black ducks: Deal Island and Smith Island. I eventually met Mike Harrison, native Smith Islander and caretaker of Martin Refuge, and Bill McInturf, the state biologist in charge of the Deal Island impoundment. Both Mike and Bill were banding more black ducks preseason than anyone in the Chesapeake Bay and they were doing it at an unlikely time, in the middle of summer. I was curious to learn of Mike's trapping methods on Smith Island and to assess the number of black ducks there for conducting a field study.

As it turned out, I found the Smith Island salt marsh compelling and biologically rich. Indeed, the region was archetypical of the mesohaline province of the Chesapeake Bay. Equally enriching was exposure to the watermen culture and history of Smith Island. Mike Harrison was stellar in tutoring on both. I found support (and justification) for the work from the Navy, an agency that was charged with the management of Bloodworth Island Bombardment Range and wished to include such management under the auspices of the Atlantic Flyway Habitat Joint Venture. Minimal funding was secured for a telemetry study with the primary objective of producing guidelines to improve management of insular breeding black ducks in the Tangier Sound region.

Here then is a selection of photos from the work I conducted on Smith Island and vicinity ca. 1994-2006, principally with my colleague Dennis Jorde.



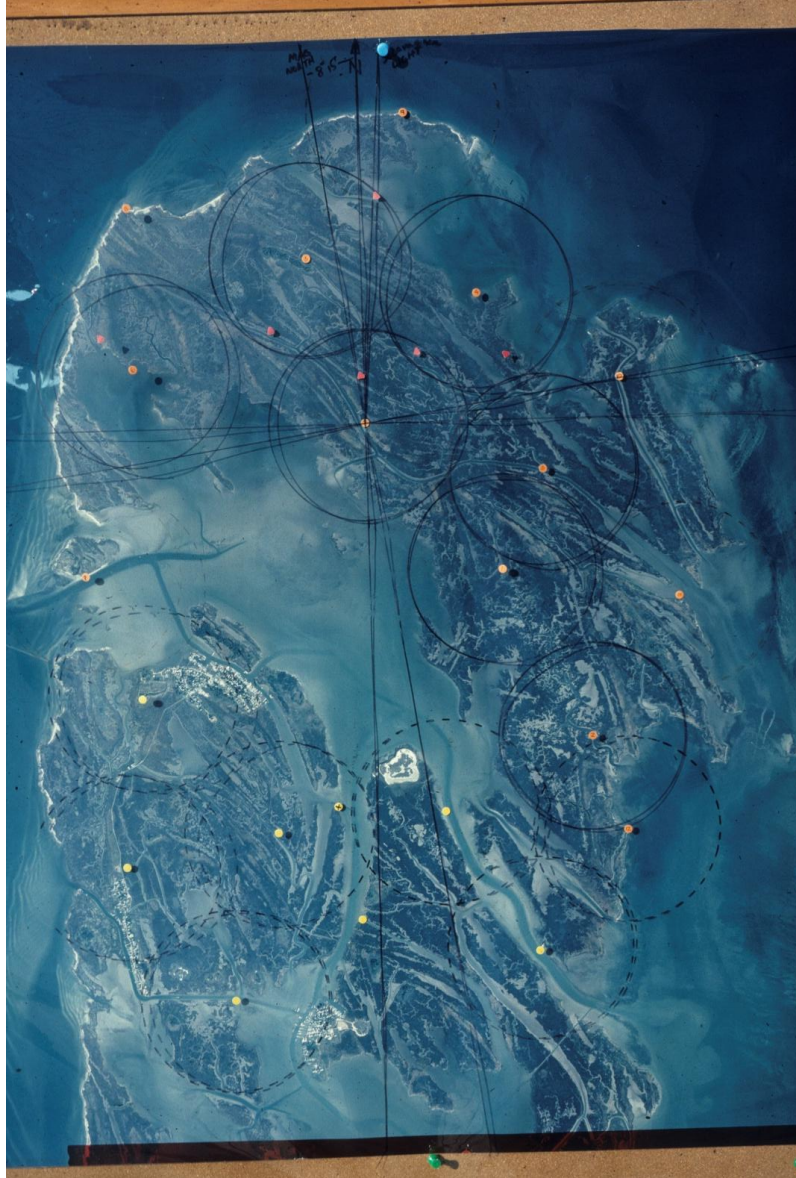
*Fig. 1. We could not have completed work on the Tangier Sound islands without having a base camp facility at Middleton House, Ewell, Smith Island. This site provided not only comfortable living and office space but also provided a workshop and storage space for field gear. Importantly, the Refuge had docking facilities and an adjacent public boat ramp that allowed us to remove boats on a weekly basis from salty bay water and thus prevent biological fouling. We brought additional boat trailers out from Crisfield and used the station pickup truck to remove and launch our skiffs as needed.*



*Fig. 2. Mike Harrison's collaborative support and knowledge of all things Smith Island was vital to our mission. His interest and participation in our black duck project was special. We depended on Mike's knowledge of the environment, local culture, his exceptional boating skills and practical problem-solving talent.*



***Figs. 3 & 4.** An important facility for our radio tracking of black ducks and red foxes was the fire tower located on Joe's Ridge on Martin. This tower allowed placement of antennas and scanning of a large portion of the refuge, especially on high tides when the birds were distributed within the marsh, versus the island perimeter at low tide. We also used the site for storage of traps, such as the decoy traps seen stacked in the center of the photo at left. The boat shed also served as an important indoor storage site for such items as duck traps and bait. We discovered that this site harbored a healthy population of Norway rats that quickly located the bait grain we stored there. The large rookery of wading birds that occupied the pines in the background no doubt provided eggs and chicks to the rat diet as well.*



**Fig. 5.** Navigation about the Martin Refuge and other islands required knowledge of the myriad of uncharted tidal creeks, passage of such at various tide level, and awareness of various hazards. Mike Harrison's intimate knowledge of every tidal creek was invaluable to us, as was the aerial spot photos provided by the Navy (above) that we used initially as a road map. To locate radio-tagged black ducks, we routinely visited a series of fixed antenna towers (marked above) that we placed strategically in the marsh to cover virtually the entire island. The approximate range of reception from each tower is shown by the inscribed circles. Tree hammocks and spoil sites, such as the one appearing white at center of the photo (Easter Point) served as priority high ground locations for red foxes, and presumably nesting black ducks.





**Fig. 6.** *Biologist Dennis Jorde uses a scanning receiver at one of our fixed antenna sites to systematically search for radio-tagged black ducks and red foxes. Rank black needlerush, as depicted in this photo, dominates the Smith Island salt marsh.*



*Fig. 7. In tidal salt marsh, black duck nests were structured similar to diving duck nests, i.e., were large mound-like structures with an entrance ramp. Eggs were often buried in nest material as the birds built up the nest to avoid flooding from high tides. Virtually all nests of this type in low marsh were lost to storm tides or predators. We found no nests in high marsh (i.e., *S. patens*) where flooding may have been moderated. We interpreted the absence of such nests as a testament to predatory pressure from foxes, gulls, and crows. We note that we could not duplicate the black duck nest in *patens* marsh as pictured with the first refuge caretaker Stanley Marshall in the Martin Wilderness Report (Anon. 1971).*



*Figs. 8 & 9. Black duck nests found in tidal needlerush were constructed of finely broken fragments of needlerush vegetation. Few of these nests contained whole eggs which indicated fox intervention. Other nests contained only small egg fragments (below), which indicated loss to fish crows or gulls.*



*Fig. 10. Occasionally a black duck would fall prey to a local raptor, usually the peregrine falcon, of which two pairs nested on man-made hacking towers on Martin. Raptors typically picked the carcass clean of flesh leaving only the bones to bleach in the sun. We observed peregrines to make easy prey of migrating shorebirds and especially wading bird chicks as they first ventured from the nest as weak flyers. A vagrant horned owl might appear from time to time during summer and harbor in a tree hammock. We never observed owls nesting on the island, perhaps because of its remoteness from the mainland, or more likely the paucity of prey during winter. Similarly, bald eagles appeared from time to time but were not known to nest.*



*Fig. 11. Red foxes were the principal mammalian predator of birds and bird eggs on Bloodsworth, South Marsh, and Smith Islands. This red fox, trapped with a padded foot-hold trap at Fog Point, was collared with VHF radio and released. Mink were noted by watermen to be formerly present in the Spring Island area (just south of Bloodsworth), but we never saw a mink (or raccoon) in our years on the islands. We did find the carcass of a nutria on Smith Island and later, tracks of a nutria on the beach at South Marsh. I saw only a single snake, a southern water snake, on the wharf at Smith Island. Whereas water snakes were common in the brackish tidal marshes of the Blackwater River, we never saw a snake in the salt marsh at Smith Island. Muskrats were also present on Smith Island in very low density as the salt marsh vegetation did not support large populations.*

*[Note: Red foxes suppress the productivity of numerous prey species, especially ground-nesting birds and terrapins. Their presence also inhibits establishment of colonial nesting ground species such as common and royal terns. **The most significant conservation action that could be addressed on the islands, therefore, would be to extirpate foxes.** Observations by watermen, although sketchy, suggest that foxes were not known on the islands until the big freezeup of the Bay during the series of unusually cold winters of 1976-77, 77-78, and 78-79.]*



*Fig. 12. Because red foxes routinely patrol beaches to scavenge prey, inspection of sandy beaches for fox tracks is an easy way to verify their presence on Tangier Sound islands.*



*Fig. 13. Numerous prey of red foxes can be located near den sites. Here biologist Dan Stotts holds the remains of a recently killed clapper rail, the most abundant salt marsh rail on Smith Island, at a den near Fog Point. Fox dens were restricted to high ground, either on well developed windward beach heads (dunes) or man-made spoil mounds such as at Swan Island or Easter Point. A discerning eye can locate many other small spoil mounds that provide refuge to foxes and rodents adjacent to navigable channels that are periodically dredged.*



**Fig. 14.** Brian Eyler prepares a padded foot-hold trap at an active fox den on Swan Island. Note the 'old-field' vegetation that has developed on the higher ground.





***Figs. 15 &16.** Furbearer biologist Robert Colona (MD-DNR) helped us set fox traps on Smith Island. It was difficult to catch foxes with Robert’s conventional land-based methods as island foxes “acted” differently. We actually caught (unhurt) a nest-searching female black duck in one of these traps. A VHF transmitter was surgically implanted in the duck and we tracked her for the season.*



***Figs. 17&18.*** Red foxes targeted terrapin nests during the early summer terrapin nesting season (May – July). Each night foxes searched the beaches for eggs deposited during daylight hours. Most terrapin nests were concentrated high on well developed sandy, i.e. windward bayside beaches, like at Fog Point.



***Figs. 19 &20.*** Diamondback terrapins are a highly dimorphic species with adult females (shown) being about 3 times larger (by mean weight) than adult males. Female terrapins may lay up to three clutches of leathery eggs each season. Loss of eggs to predators is widespread as evidenced by the common presence of egg shells under perches used by gulls and fish crows (above). Egg shells of clapper rail and black duck were also common at such perches. This indicated the effectiveness of these visual avian predators in the open salt marsh environment.



**Fig. 21.** *Terrapin tracks were common on beaches during the early summer terrapin nesting season. They come ashore to deposit eggs during daylight hours.*



**Fig. 22.** *This hole, located high on a beach, was likely the work of a Norway rat. The abundance of Norway rats on Smith Island was not surprising given a history of over 300 years of human habitation.*



*Figs. 23 &24. Otter sign, including tracks and splashings were common on the islands. The presence of fish scales and blue crab shell in splashings attested to the importance of these items in the otter's diet. Study of otter movements on the islands, including seasonal movements to land-based marshes, has never been attempted.*



***Figs. 25 &26.** Two anomalous findings were the carcasses of a leatherback turtle and northern gannet, both of which succumbed to accidental deaths: the turtle was entangled in crab pot lines and the gannet tackled too big a rockfish and likely drowned. Leatherbacks were rare in the Smith Island area, whereas loggerheads were the most common marine turtle sighted in summer. Several loggerheads died each season from unknown causes and washed up on beaches. In recent years, the number of northern gannets visiting Tangier Sound during spring migration has been on the increase.*



*Fig. 27. We used decoy traps to attempt to capture pre-nesting female black ducks for radio tagging (note live female black duck under perch in center of trap). We rotated pen-reared female black ducks weekly from our colony at the Patuxent Wildlife Research Center for use in these traps. The decoy traps were largely unsuccessful which indicated that black ducks did not aggressively defend territories. This response suggested that many black duck pairs may have been loafing in the area rather than actively nesting. We subsequently depended on conventional bait trapping to provide a sample of black ducks for radio tagging.*





*Figs. 28 &29. We used Mike Harrison's preseason bait trapping methods to successfully capture black ducks in early spring (Harrison et al. 2000). Mike was the first to discover how black ducks could be trapped in July in the salt marsh without cold stress to attract them to bait. The success of baiting ducks during the spring and summer season was a testament to the lack of comparable high-energy*

*foods for black ducks in the salt marsh environment. There is no natural food source that can compare to the energy content and digestibility of corn.*

*[Note: Unknown to us at the time, **Smith Island had a long and illustrious reputation in illegal duck trapping.** In the distant past this activity may have been considered a “cultural pastime,” but by the 1990s, only a few Smith Islanders continued with this activity.... And incidentally it may have been motivated more by a grudge match with local law enforcement authority, i.e., Mike Harrison, than with the need to put ducks in the freezer. No doubt Mike’s trapping success profited from techniques learned from local poachers.]*



**Fig. 30.** Veterinarian Glenn Olsen readies a female black duck for release after surgically implanting a radio transmitter in the bird’s abdomen. Glenn developed these surgical techniques during an earlier study with canvasbacks on Chesapeake Bay (Olsen et al. 1992; Haramis et al. 1993). A total of 56 black ducks were radio tagged in this manner during our study on Smith Island, 1995-96.



*Fig. 31. Biologist Dennis Jorde completes a post-surgical inspection of a male black duck. Middleton House served as a convenient veterinary hospital for this work where general anesthesia and an aseptic surgical theater were required by animal welfare regulations.*



*Figs. 32 &33. Surf scoters (above) and long-tailed ducks (formally called oldsquaws) are common winter residents of Tangier Sound. We collected a number of these ducks under special permit in support of cooperative wildlife studies at the Patuxent Wildlife Research Center.*



*Fig. 34. When I first began working on Smith Island in the early 1990s, there were only a handful of brown pelicans nesting at a single rookery in the Cheeseman Island area (southern tip of Smith Island). Like gulls, pelicans found subsidy in the large quantity of waste bait tossed from crab pots daily by watermen. As a result, their population expanded to hundreds of pairs in just a few years.*



*Fig. 35. This little blue heron (juvenile) is just one of nine species of wading birds that occupy mixed rookeries in tree hammocks around the islands. The presence of tree hammocks and the rich food sources around Martin Refuge make this one of the most productive sites for wading birds in the Chesapeake Bay region. Because Bloodsworth and South Marsh Islands (and many others) are treeless, establishing small tree plantations as rookery sites on these islands could be highly beneficial to increasing populations of wading birds in the Tangier Sound area.*



***Figs. 36 &37.** With the help of Smith Island resident and former terrapin harvester Dwight Marshall (top photo), we documented the technique of winter scrape fishing (dredging of terrapins using a modified crab scrape shown in Fig.36; see also Fig. 43), and characteristics of terrapins in estuarine bay hibernacula at six sites around the islands (Haramis et al. 2011). Greatest numbers of terrapins were captured at the north end of Smith Island where in concert with summer captures a population of about 7,000 animals was estimated using mark-recapture methods.*



**Fig. 38.** *Some terrapins live several decades and achieve large size. The female on the left (weight 1,922 g; plastron length 202 mm) was previously marked and known to be 20 years of age. The female on the right (3,022 g; 238 mm) was the largest captured during our studies and is believed to approximate the maximum size for the species within the Bay and likely throughout the species' range.*





*Figs. 39 &40. Our winter studies were supplemented by extensive summer work at Smith Island led by biologist Paula Henry. Fyke nets (above) were used to trap terrapins at select perimeter sites whereas wire bait traps (not shown) were used in the interior of the island.*



*Figs. 41 & 42. During our winter and summer terrapin studies, all captures were marked by drilling a small hole in the tenth right perimeter scute and attaching a numbered monel tag. We found that these tags wore out quickly due to abrasion and salt water corrosion; however, the hole served as a lasting visible mark indicating that the terrapin had been previously captured. In addition, we permanently marked all terrapins, some 3000+, with unique identifying PIT tags that were inserted subcutaneously at the right rear leg with a special syringe. These tags can be easily read by passing an electronic PIT tag scanner over the animal.*



*Fig. 43. Scrape boats were developed by Smith Island watermen to dredge the shallow edges of the marsh for molting blue crabs. They did this by dragging a scrape (shown here and in Fig. 44) through meadows of submerged aquatic vegetation, mostly of widgeon grass and eelgrass. Author William Warner documented this well in his classic book **Beautiful Swimmers** (Warner 1977). This common blue crab scrape is what watermen modified for winter harvest of diamondback terrapins (see Figs. 36 & 37).*



*Fig. 44. Scrapes used for traditional crab harvesting were pulled by hand for many years, but this labor intensive method was replaced by the hydraulic winch. Although the scrape removed a great deal of vegetation from the Bay bottom, watermen believed that this type of thinning actually stimulated vegetative growth and thus was beneficial to plant vigor. Submerged aquatic vegetation varied in extent from year to year but there was no apparent evidence any decline was tied to watermen scraping activity.*



*Fig. 45. This squall line passing over the Methodist Church in Ewell reminds me of the danger of thunderstorms to small watercraft in the large open environment of the offshore islands. Sometimes generating winds of 60 mph or more, we found these storms could race across the open bay and imperil even very large vessels. Throughout the summer months, boaters should keep their eye along the skyline for advanced warning of approaching thunderstorms.*

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