

# *A Brief History of Bombay Hook National Wildlife Refuge*



## *Early Settlement*

Known to the Native Americans as Canaresse, meaning "at the thickets," and later referred to as Ruyge-Bosje, meaning "shaggy bushes" or thicket, Bombay Hook received its final name from the corruption of the Dutch "Bompies" or "Bompies Hoek" meaning "little-tree point." In 1679 Mechacksett, chief of Kahansink sold Bombay Hook wetlands to Peter Bayard, an early Dutch settler. The price for the area was 1 gun, 4 handfuls of powder, 3 waistcoats, 1 anchor of liquor and 1 kettle.

Bombay Hook National Wildlife Refuge was established March 16, 1937 as a resting and feeding area for migratory and wintering waterfowl. The Refuge was purchased from local land owners with federal duck stamp funds. Today the Refuge totals 15,978 acres.

## *Civilian Conservation Corps*

On April 1, 1938, the Civilian Conservation Corps (CCC) based at Leipsic started work on the refuge. The CCC constructed dikes, buildings, water control structures and impoundments. The CCC built Raymond Pool, removed timber from Shearness and Finis swamps, transplanted 300 ash trees, built a 99 foot look-out tower and a boat house, ran ditches for mosquito control, and conducted various wildlife surveys. The camp ended March 18, 1942. Nationally, the CCC built facilities at many of the refuges and parks across the country.



**Civilian Conservation Corps**

## *Allee House*

The Allee House at Bombay Hook National Wildlife Refuge stands today, as it did in the eighteenth century, overlooking the fields and marshes of Kent County. It is one of the most handsome and best preserved examples of an early brick farmhouse in Delaware.

The Allee House was built about 1753 by Abraham Allee, the son of John Allee, a Huguenot refugee from Artois, France.

Abraham Allee served as a member of the Assembly in 1726, was appointed a Justice of the Peace in 1738, and was Chief Ranger for the county in 1749.

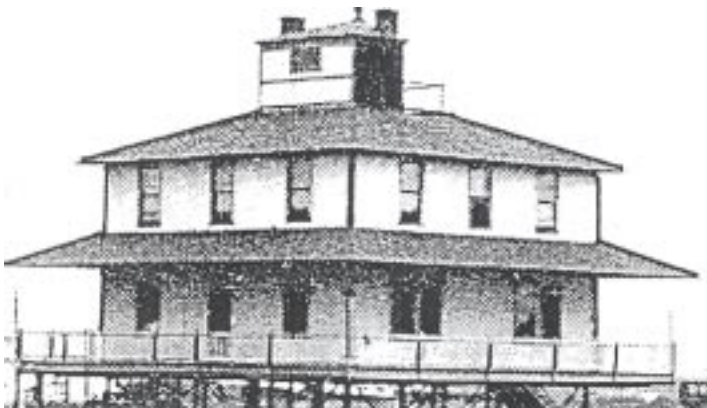


**Allee House**

The Allee House features fine brickwork laid in Flemish bond with a few glazed header bricks. The interior of the house is distinguished by the handsome wood paneling of the parlor. The cornice in this room has a dentil course that is particularly well formed, and the splendid panels of the chimney breast are joined on either side by two striking recessed, arched china closets. These closets have paneled doors and graduated butterfly shelves against a barrel back with a fluted center post.

### *Port Mahon Lighthouse*

Port Mahon, located at the southern boundary of the Refuge was named after the capital of the Spanish Island of Minorca. Built about 1890, Port Mahon included a blacksmith shop and a general store and was once the center of port activity in the Little Creek area.



**Port Mahon Lighthouse**

The lighthouse was built in 1903 and the lighthouse keeper tended the kerosene lamps faithfully. General supplies were brought in yearly when carts were able to carry them over the marsh-lined dirt road from Little Creek. All of the light station, with the exception of the support pilings, was destroyed by fire in 1984.

### *Bombay Hook Lighthouse*

The Bombay Hook Lighthouse was constructed by the U.S. Government in 1829. In 1830, former Delaware Governor Jacob Stout, laid out the road between Bombay Hook Lighthouse and Smyrna. In 1831, President Andrew Jackson and his Secretary of Treasury, Louis McLane appointed Duncan Stewart as the Bombay Hook Lighthouse Keeper. In 1850, Duncan's daughter, Margaret Stewart, was appointed to her father's position.



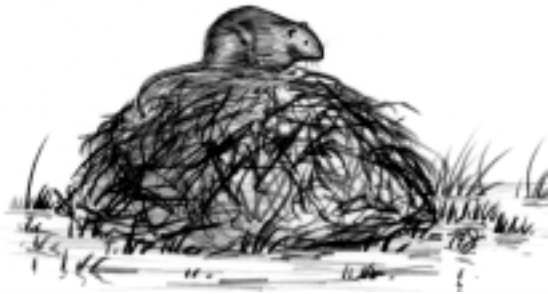
**Bombay Hook Lighthouse**

In September of 1912, the lighthouse was "discontinued" and an unmanned light was installed at Smyrna Range Light. In the early 1970's vandals burned the abandoned structure.

### *Occupations*

Many of the families in the region were farmers who enjoyed the rich soil of the area. From the earliest times, the settlers cut sizable amounts of salt hay from Bombay Hook. Salt hay was marketed as livestock fodder in Delaware and New Jersey. This practice continued into the 20th Century.

Settlers also trapped muskrat and hunted waterfowl. Fish, crabs, and oysters were plentiful. Many of the local residents today still farm, trap muskrats, fish, and hunt waterfowl.



### Natural History

While the refuge is home and stopping place for a wide variety of birds, mammals, and reptiles, the most popularly recognized species utilizing the refuge are eagles, deer, and vast flocks of migrating waterfowl and shorebirds.

### Eagles

Eagles have been a documented nesting species throughout the history of the refuge. During the 61 year period from 1937-1998 there have been 19 successful nests with 28 eaglets fledged. There were 11 years when eagles did not attempt to nest. Nesting data from four years is incomplete and hatching data is also missing from three years. During all other years eagles attempted to nest, but were unsuccessful at either hatching eggs or rearing their young. (See chart this page -

#### Bombay Hook - Number of Eaglets Fledged

In the years of 1949, 50, and 54, two nests were present on the refuge. In 1982 an eaglet was placed in the nest but was rejected by the nesting pair. In 1986 an undiagnosed type of toxin adversely affected the nesting pair. One eagle disappeared, and one was successfully rehabilitated.

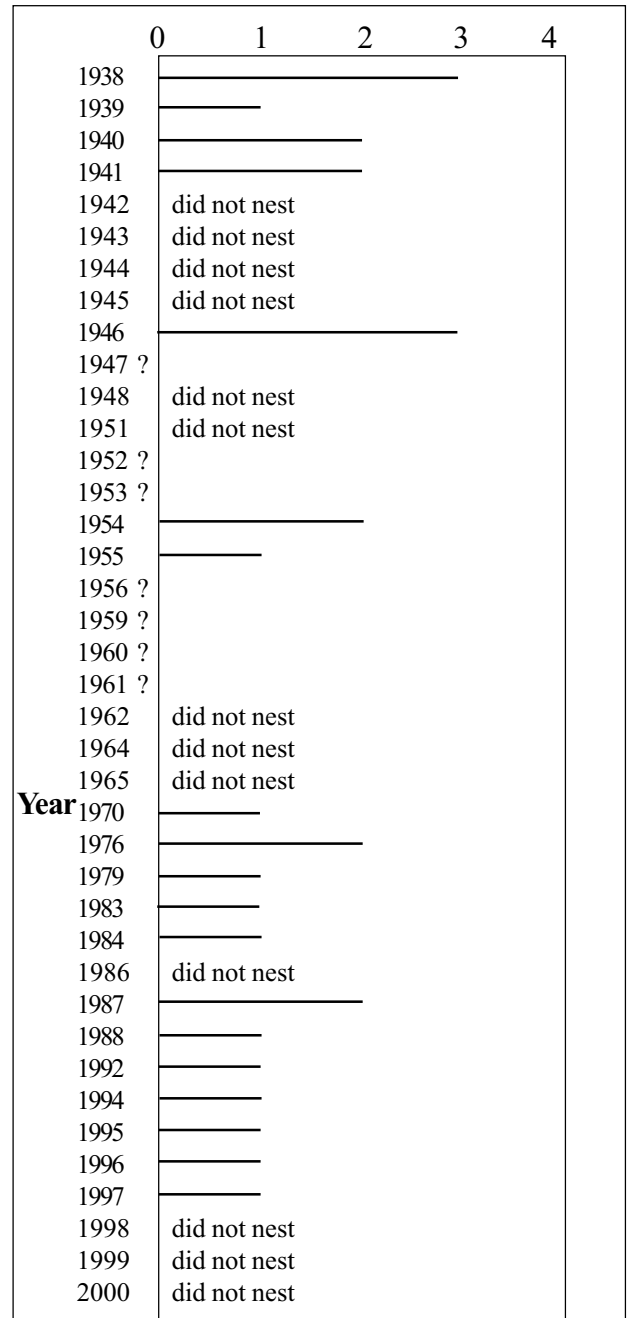


A second pair established territory on the refuge at approximately the same time but did not attempt to nest. In 1987 this pair successfully hatched and fledged two young, the first production of two eaglets at Bombay Hook since 1976.

There was a noticeable absence of eagles on the refuge during 1942-1945. This can be explained by the pres-

ence of military activity on the refuge during that period. Beginning in the 1950's pesticides, e.g. DDT, had begun to be used in the general vicinity of the refuge and on the refuge. A noticeable decrease in hatching success was seen, beginning in the mid 1950's and continuing through the 1970's. Egg shell fragments collected from unsuccessful nests in the 1970's confirmed that there was a thinning of the shell and that DDT residues were present.

#### Bombay Hook - Number of Eaglets Fledged



? - Data missing or incomplete.

Note: For years not listed, nesting eagles were unsuccessful.

## Deer



The first record of deer on the Refuge was in 1941 when the herd consisted of four individuals. The deer population built up to 45 animals by 1947. By 1948, the first complaints of deer damage came from farmers adjacent to refuge lands.

The first refuge shotgun deer hunt was held during the 1953 statewide deer hunting season. Of the 120 animals on the refuge, 56 were taken. During the first archery season in 1955, 8 deer were harvested.

By 1970 the deer herd had expanded to 150 animals, and in 1972 the first primitive weapon deer season was held. Gradual increases in the deer herd throughout the 1980's resulted in a healthy herd estimated at about 225-250 animals, and by 2000, over 500 deer.

## Canada and Snow Geese

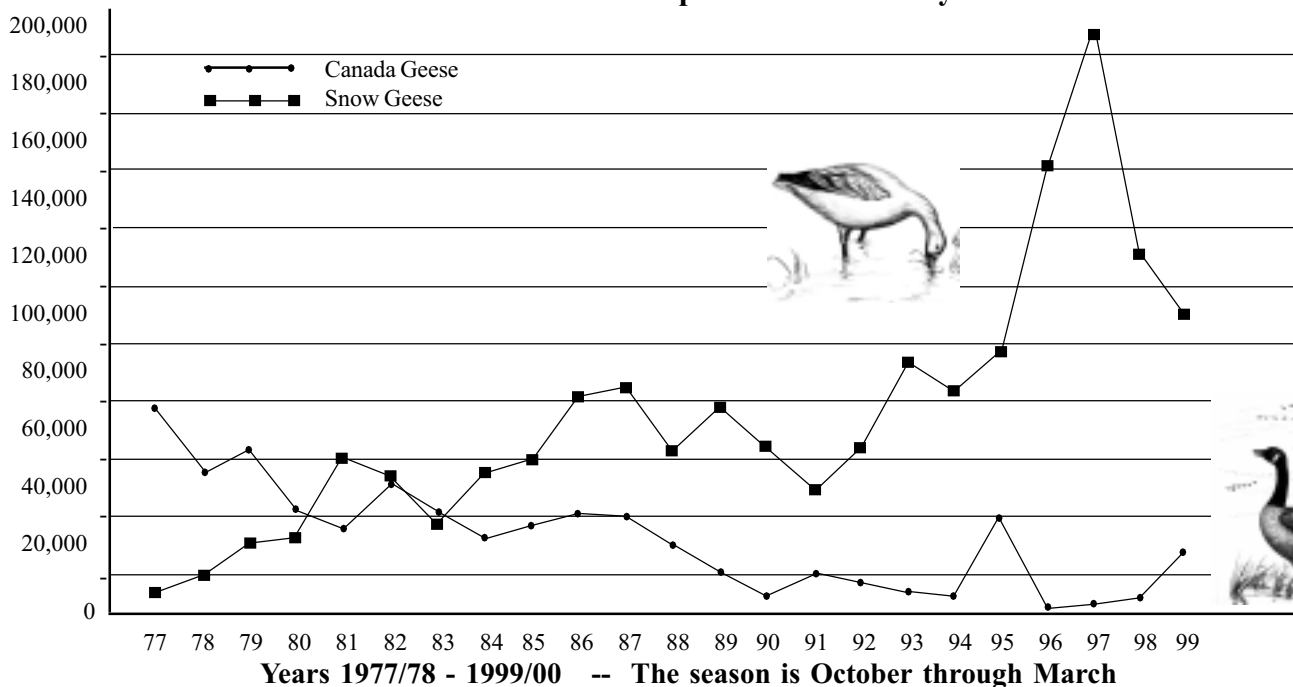
During the early 1940's waterfowl usage of the refuge was very low due to the necessity of using three sections of the refuge for aerial bombardment testing during the war effort. By 1957 refuge cropland management programs and changes in agricultural patterns of the Delmarva Peninsula resulted in an increase to 15,000 Canada geese and 5,000

snow geese. Throughout the 1960's, snow goose peaks averaged around 3,000 to 4,000. In 1977 Canada geese peaked at 69,000 while snow goose populations remained stable.

During the 1980's and the 1990's the increase in snow goose usage of Bombay Hook was phenomenal. Snow goose peak numbers have spiraled upward from 5,500 in the 1978/79 season to 20,500 in the 1979/80, 46,235 in 1984/85 and to 198,000 in the 1997/98 season. The large rises in snow goose populations at Bombay Hook has resulted in certain management problems. The snow goose does not graze like the Canada goose but rather pulls the saltmarsh grasses out by the roots; resulting in a large area of marsh becoming a tidal mudflat instead of the buffering estuarine salt marsh it once was.

Beginning in 1983, a limited snow goose hunting program was initiated by refuge personnel in an attempt to disperse the concentrations of snow geese from the salt marsh. This management technique proved successful, significantly reducing the amount of grazing damage the birds inflicted on the fragile salt marsh habitat, and continues to be used during the fall and winter months. The incredible snow goose numbers attracted the attention of National Geographic's "Explorer" and in October 1986, film crews broadcast live from the refuge amidst a tremendous storm of landing snow geese. The 1990's have seen even a sharper increase in the numbers of snow geese that migrate through or winter in the Delmarva area. In 1997, the high count of snow geese at Bombay Hook was 198,000.

**Canada and Snow Goose Populations at Bombay Hook**



## Ducks

The duck population of Bombay Hook in 1939 was recorded at 10,000, mostly Black ducks. A series of impoundments, totalling 1,100 acres, were constructed between 1939 and 1961 to provide a diversity of habitat for waterfowl. Rice was cultivated on the refuge during the 1950's to also encourage waterfowl usage. Records of 1952 document an overall increase in Black duck usage to about 70 birds per square mile of refuge. In 1953 Black duck/Mallard hybridization was noted as increasing.

During the late 1970's and early 1980's peak duck populations on the refuge declined, reflecting the lowered continental populations due to loss of wetlands. In the season of 1977/78, ducks peaked at about 38,000, while in 1980/81 they peaked at 24,800. From 1981 to 1984 duck populations decreased to a low of about 13,800. Duck numbers on the refuge rebounded beginning in 1985 due to initiation of intensive management of the impoundments and resulting abundance of food plants. The 1996/97 season saw a peak population about 76,521 ducks.

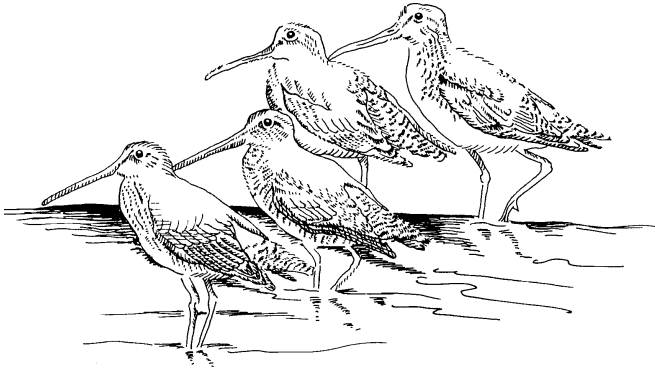


### BOMBAY HOOK DUCK POPULATIONS 1977-2000

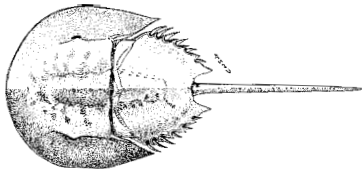
SEASON OCTOBER - MARCH	PEAK NUMBER OF DUCKS	MONTH
1977-1978	37,970	January
1978-1979	26,254	January
1979-1980	16,315	February
1980-1981	24,799	December
1981-1982	15,797	February
1982-1983	12,700	November
1983-1984	13,749	November
1984-1985	25,160	December
1985-1986	23,713	October
1986-1987	16,752	November
1987-1988	16,347	November
1988-1989	29,500	November
1989-1990	22,550	October
1990-1991	26,157	November
1991-1992	20,500	December
1992-1993	25,700	November
1993-1994	26,912	December
1994-1995	76,676	December
1995-1996	36,876	November
1996-1997	76,521	December
1997-1998	25,468	December
1998-1999	25,935	November
1999-2000	24,530	November

# Shorebirds and Horseshoe Crabs

Its location on the Delaware Bay gives Bombay Hook the ideal opportunity to provide major resting and feeding grounds for hundreds of thousands of migrating shorebirds. The annual shorebird flight from wintering grounds in South America to their nesting grounds above the Arctic Circle, coincide precisely with the egg-laying activities of horseshoe crabs along the bay shores.



Each year in May, the crabs lay their small, green eggs at the shallow water's edge. Migrating shorebirds, particularly Ruddy turnstones, Red knots, Dowitchers, Dunlins, and semi-palmated Sandpipers take advantage of this source of protein, concentrating along the shore of Delaware Bay in numbers not seen anywhere else on the East Coast.



## Conclusion

The history of the Bombay Hook area provides us with an appreciation of how people, land resources, and wildlife have co-existed and collectively shaped the current surroundings. Although the recorded events span a period of over 300 years, it only represents a snapshot in the earth's history. Conservation of our natural resources will help preserve the area as we know it today, provide habitat for wildlife in the future, and provide natural resources for future generations.



## U.S. Fish and Wildlife Service

Bombay Hook is one of over 500 refuges in the National Wildlife Refuge System administered by the U.S. Fish and Wildlife Service. The National Wildlife Refuge System is a network of lands and waters managed specifically for the protection of wildlife and wildlife habitat and represents the most comprehensive wildlife management program in the world. Units of the system stretch across the United States from Alaska to the Florida Keys and include small islands in the Caribbean and South Pacific. The character of the refuges is as diverse as the nation itself.

The Service also manages National Fish Hatcheries, and provides Federal leadership in habitat protection, fish and wildlife research, technical assistance and the conservation and protection of migratory birds, certain marine mammals and threatened and endangered species.

For further information, contact:

Refuge Manager  
Bombay Hook National Wildlife Refuge  
2591 Whitehall Neck Road  
Smyrna, DE 19977

Office: (302) 653-9345

Visitor Center: (302) 653-6872

Hearing impaired may call the Delaware Relay Center at 1-800-232-5460 TDD/ 1-800-232-5470 voice.

Graphics by Bob Jones, Karen Boylan, and USFWS.

Allee House by Eileen Doran.

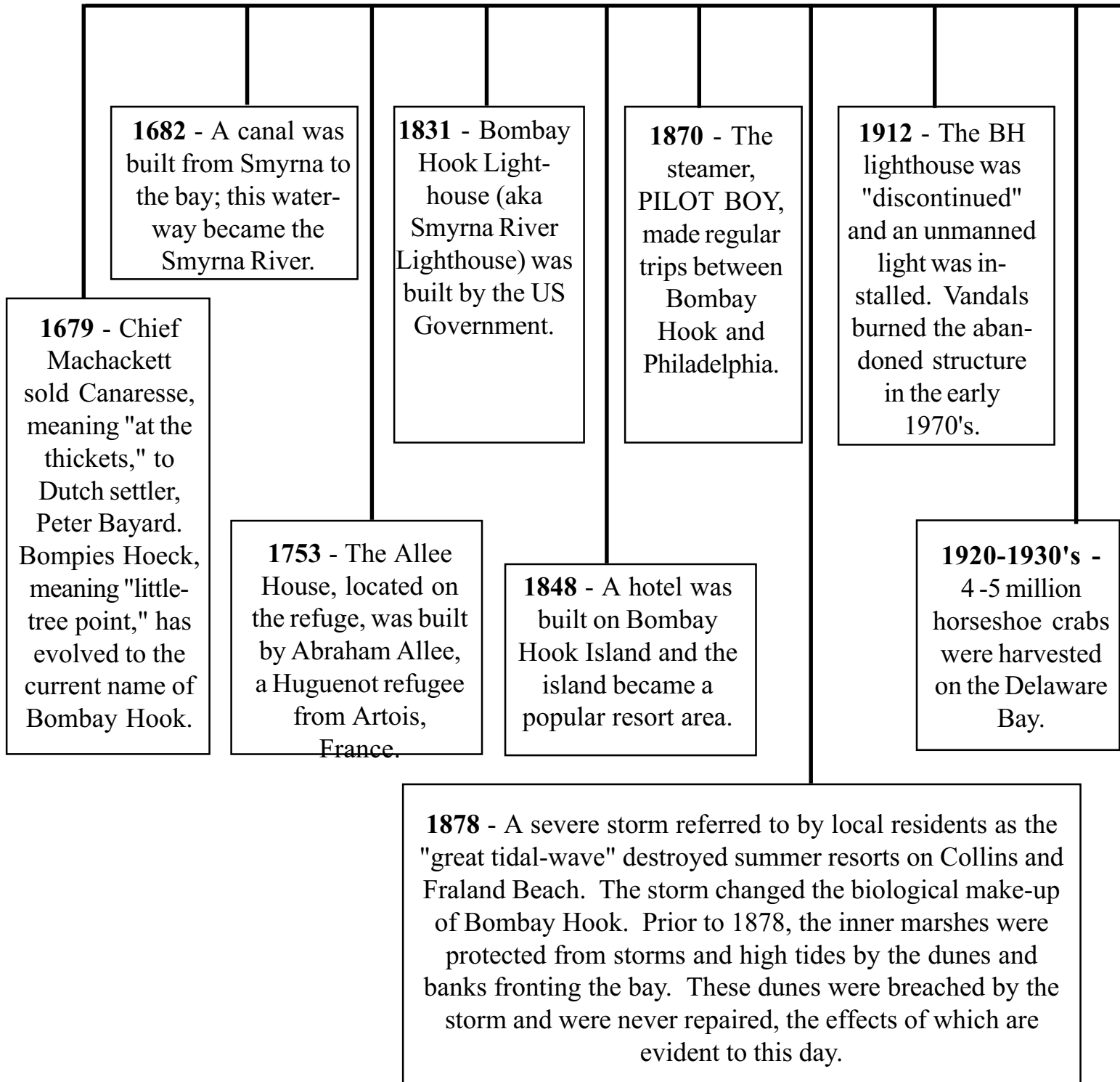
Bombay Hook Lighthouse by Hometown Collectibles.

Port Mahon Lighthouse and CCC Refuge's photo archives.



DEPARTMENT OF INTERIOR  
U.S. FISH AND WILDLIFE SERVICE

# BOMBAY HOOK TIMELINE



# BOMBAY HOOK TIMELINE

**1934** - Migratory Bird Conservation Act passed. Later Bombay Hook was purchased with this funding.

**1938** - The Civilian Conservation Corps constructed dikes, buildings, water control structures and impoundments. They built Raymond Pool, removed timber, transplanted ash trees, ran ditches for mosquito control, and built a 99' tower. The camp ended in 1942.

**1980** - Atlantic Beaked Whale beached at Bombay Hook.

**1986** - Bombay Hook represented the US in "World Safari" a satellite program by National Geographic, BBC, and Turner Broadcasting. BH was selected because of its high concentration of snow geese.

**1990** - Federal, State, and private organizations joined together to determine the status of the horseshoe crabs. Volunteers continue to survey the Delaware Bay during peak spawning season in May and June.

**1993** - Bombay Hook NWR acquired Steamboat Landing, increasing the acreage to 15,978.

**1937** - Bombay Hook National Wildlife Refuge was established as a resting and feeding area for migratory and wintering waterfowl. The property contained 12,000 acres and was purchased with Duck Stamp funds.

**1941-1945** - The refuge was used by the U.S. Army Air Force: A tower was used to locate a radio direction finder, part of the refuge was used as a ground gunnery range, and research on aerial rockets was conducted on the refuge.

**1999** - Volunteers won the Governor's Outstanding Volunteers Award. Volunteers have donated over 34,100 hours of hard work since 1983. The "Friends of BH" has donated over \$55,590.00 to environmental education and interpretive brochures since 1990.

**2000** - 10 Years of Horseshoe Crab Surveys result in tighter restrictions on the harvesting of Horseshoe Crabs.