BOMBAY HOOK NATIONAL WILDLIFE REFUGE

Annual Water Management Program - 1986

Introduction

This program describes the results of 1985's water management and outlines the 1986 regime. Water management objectives and techniques were discussed in detail in our revised water management plan submitted for Regional Office approval April 19, 1983. Although this plan, to our knowledge, has not been officially approved to date we are operating under the overall water management schemes discussed in the plan.

Fish screens were kept in place at all pool water control structures during the year in an attempt to prevent the intrusion of mature carp into the pools. Portions of pool fringes infested with Phragmites which had not been sprayed previously were treated with the herbicide Rodeo during early September.

The only significant fish kill during the year was a result of our intentional draw-down of the Shearness Impoundment when thousands of carp were killed. No evidence of botulism or other avian diseases were noted in any of the pools with the exception of a lead poisoning outbreak during December which claimed approximately 200 snow geese and approximately 6-10 Canadas.

Weather

Total precipitation for 1985 (through November) has been above normal. Normal annual precipitation for this locale is 42.30" and through November 44.86" had been received. Seventy-two percent (32.3") fell during the period May through September. Water management problems centered on getting rid of excess water rather than not having enough. Following the summer drawdown of Shearness Pool Hurricane Gloria swept off the coast and dumped 5.3" of rain in the impoundment and immediately filled it above objective levels. Temperature extremes during both winter and summer were in the normal range. The maximum temperature recorded was 95° F. on August 14th and the minimum temperature was -5° F. on January 21. All impoundments remained frozen during the period January 10 - February 8, 1985.

Managed Impoundments - 1,100 acres

Raymond Pool - 95 acres

Constructed in 1939.

Actual water levels approximated objective levels through May. However, attempts to de-water the pool during the summer proved infeasible due to the amount of precipitation received. Fall water levels also exceeded that which were planned. The low elevation of the Raymond Pool outlet structure coupled with a less than perfect functioning flap gate made it very difficult to remove excess water from this pool particularly when managing for

the lower water levels. Despite not being able to achieve our de-watering objective Raymond Pool still produced good stands of emergent vegetation, principally soft-stem bulrush, three-square, spikerush, and millet around the pool fringes.

In 1986 our principle objective will again call for a late summer draw-down and hopefully a de-watering of the entire pool to create a more favorable environment for emergent vegetation. Levels will be gradually raised during August to flood a portion of the emergent vegetation and create suitable habitats for shorebirds and early waterfowl migrants. Levels will be gradually raised throughout the fall to make more of the area suitable for feeding ducks and geese.

Shearness Pool - 560 acres

Constructed in 1956.

Actual water levels approximated objective levels through April. A dry late April and early May enabled us to begin de-watering during May. Despite high levels of precipitation during the summer we were able to completely de-water almost the entire pool. Frequent heavy rains during July and August made it difficult to keep the bottom exposed. However, frequent manipulation of stoplogs and flap gates paid off with excellent stands of emergents covering an estimated 95% of the pool surface. Wild millet, Cyperus, wild rice, and scattered patches of cattail attracted ducks to the impoundment in numbers not seen in over 10 years after it was flooded by the heavy rains of Hurricane Gloria in September. De-watering of the pool served a two-fold purpose in that it not only resulted in an abundance of available waterfowl food but also eliminated thousands of carp from the pool. By de-watering during July and August the fish decomposed and were gone by the time the pool was reflooded, thus reducing the chances of a botulism outbreak associated with the maggot infested carp.

Plans for 1986 are similar to those for 1985. A complete de-watering of the pool during the summer months will again be attempted. Fall water levels will be maintained at slightly lower levels than were called for in the 1985 program since our observations this year indicated that the lower levels resulted in greater duck utilization within the pools.

Bear Swamp - 240 acres

Constructed in 1961.

Ice conditions facilitated the burning of 30 acres of cattail within the pool during late January. With the exception of the months of January and May near objective water levels were maintained throughout the year. Heavy stands of cattail were broken up somewhat by extensive muskrat feeding and served to make the area more attractive to waterfowl. Spikerush and millet were well established throughout the pool and produced good feed for the ducks. Snow geese utilized the pool in greater numbers than had been seen

previously, as they fed extensively on the cattail rhizomes and also the spikerush, particularly in the areas which were prescribed burned.

Plans for 1986 again call for prescribed burning of the cattail stands if the conditions permit. Relatively constant water levels will be maintained through June. A gradual lowering of the water levels during July and August should encourage growth of millet and spikerush. The pool will be re-flooded in September and constant levels will be maintained through the remainder of the year.

Finis Pool - 205 acres

Constructed in 1944.

Near objective water levels were maintained except during periods following heavy rains. Smartweed production was again good while cattail invasion of the pool continued. Wood ducks again accounted for the major duck use within the pool during spring, summer, and early fall, while mallards, blacks, and gadwall predominated during late fall and winter. An increase in coot use of this pool was also noted. Beaver trapping by the Refuge staff removed seven animals from the east end of the pool by the water control structures. This greatly alleviated the problem of debris removal from the two structures which had developed into a daily chore.

Relatively constant levels are planned for 1986. A slight lowering of the water level during the late spring and summer months should encourage smartweed production.

Prepared by: _____
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Reviewed by: _____ 1/28/86

Approved by: _____ 1/31/86

ANNUAL WATER MANAGEMENT PROGRAM - Year 19 86

Refuge Bombay Hook Water Unit Name or Number Bear Swamp Pool

Maximum w.s. elevation permissible 4.50

Flowline elevation of lowest drain structure -1.17 MSL

Average elevation of pool bottom (not borrow pit bottom). 1.25 - 2.90

Date	I. A. Water Surface Elevations and Salinity for Past Year: Planned 1985 Water Surface Elevations	I. A. Water Surface Elevations and Salinity for Past Year: Actual 1985 Salinity (% of Sea Water)	II. A. Planned Elevation and Salinity for Program Year: Water Surface Elevation	II. A. Planned Elevation and Salinity for Program Year: *Salinity Objective
Jan. 1	De-water	1.44	1.50	
15	De-water	Frozen	1.35	
Feb. 1	1.30	Frozen	1.30	
15	1.40	1.20	1.20	
Mar 1	1.50	1.10	1.20	
15	1.50	1.18	1.30	
Apr 1	1.50	1.24	1.40	
15	1.50	1.16	1.50	
May 1	1.50	0.78	1.50	
15	1.50	0.88	1.50	
June 1	1.50	1.00	1.50	
15	1.50	1.00	1.50	
July 1	1.20	0.60	1.50	
15	1.00	0.90	1.30	
Aug. 1	1.00	0.80	1.00	
15	0.90	1.00	1.00	
Sept. 1	1.20	1.00	0.90	
15	1.30	0.85	1.20	
Oct 1	1.50	1.60	1.40	
15	1.50	1.58	1.50	
Nov 1	1.50	1.45	1.50	
15	1.50	1.50	1.50	
Dec. 1	1.75	1.60	1.50	
15	1.75	1.88	1.50	
31	1.75		1.50	

*To be used for pools approved for brackish water management.

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ANNUAL WATER MANAGEMENT PROGRAM - Year 19 86

Refuge Bombay Hook Water Unit Name or Number Shearness Pool

Maximum w.s. elevation permissible 4.00

Flowline elevation of lowest drain structure -3.00 MSL

Average elevation of pool bottom (not borrow pit bottom). 0.75 to 2.90

	I. A. Water Surface Elevations and Salinity for Past Year		II. A. Planned Elevation and Salinity for Program Year	
Date	Planned 1985 Water Surface Elevations	Actual 1985 Salinity (% of Sea Water)	Water Surface Elevation	*Salinity Objective
Jan. 1	2.50	2.60	2.00	
15	2.50	Frozen	2.00	
Feb. 1	2.50	Frozen	2.00	
15	2.50	2.86	2.00	
Mar 1	2.60	2.60	2.00	
15	2.70	2.60	2.00	
Apr. 1	2.80	2.70	2.00	
15	2.80	2.68	2.00	
May 1	2.80	1.80	2.00	
15	2.80	1.96	2.00	
June 1	2.80	2.20	2.00	
15	1.80	1.44	1.80	
July 1	De-water	De-watered	De-water	
15	De-water	De-watered	De-water	
Aug. 1	De-water	De-watered	De-water	
15	De-water	1.22	1.00	
Sept. 1	1.50	1.34	1.15	
15	1.80	1.24	1.25	
Oct 1	2.20	3.10	2.30	
15	2.30	2.54	1.35	
Nov. 1	2.50	2.00	1.40	
15	2.50	2.00	1.45	
Dec. 1	2.50	2.24	1.50	
15	2.50	2.44	1.65	
31	2.50		1.80	

*To be used for pools approved for brackish water management.

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ANNUAL WATER MANAGEMENT PROGRAM - Year 19 86

Refuge Bombay Hook Water Unit Name or Number Raymond Pool

Maximum w.s. elevation permissible 4.00 MSL

Flowline elevation of lowest drain structure -3.00 MSL

Average elevation of pool bottom (not borrow pit bottom). 1.00 to 1.50

Date	I. A. Water Surface Elevations and Salinity for Past Year		II. A. Planned Elevation and Salinity for Program Year	
	Planned 1985 Water Surface Elevations	Actual 1985 Salinity (% of Sea Water)	Water Surface Elevation	*Salinity Objective
Jan. 1	1.80	1.66	1.80	
15	1.80	Frozen	1.80	
Feb. 1	1.80	Frozen	1.80	
15	1.80	2.18	1.80	
Mar. 1	1.80	1.75	1.80	
15	1.80	1.75	1.80	
Apr. 1	1.80	1.72	1.70	
15	1.80	1.80	1.60	
May 1	1.80	1.50	1.60	
15	1.80	1.62	1.45	
June 1	1.50	1.50	1.35	
15	1.00	1.54	1.25	
July 1	De-water	1.40	De-water	
15	De-water	1.60	De-water	
Aug. 1	De-water	1.50	De-water	
15	0.75	1.50	0.75	
Sept. 1	0.90	1.64	1.00	
15	1.25	1.56	1.25	
Oct. 1	1.25	2.30	1.25	
15	1.25	2.30	1.35	
Nov. 1	1.40	2.20	1.40	
15	1.50	2.45	1.45	
Dec. 1	1.60	1.60	1.50	
15	1.70	2.15	1.50	
31	1.70			

*To be used for pools approved for brackish water management.

ANNUAL WATER MANAGEMENT PROGRAM - Year 19 86

Refuge Bombay Hook Water Unit Name or Number Finis Pool

Maximum w.s. elevation permissible 6.20 MSL

Flowline elevation of lowest drain structure 1.20 MSL

Average elevation of pool bottom (not borrow pit bottom).

Date	I. A. Water Surface Elevations and Salinity for Past Year: Planned 1985 Water Surface Elevations	Actual 1985 Salinity (% of Sea Water)	II. A. Planned Elevation and Salinity for Program Year: Water Surface Elevation	*Salinity Objective
Jan. 1	4.70	4.56	4.70	
15	4.70	Frozen	4.70	
Feb. 1	4.70	Frozen	4.70	
15	4.70	4.68	4.70	
Mar. 1	4.70	4.68	4.70	
15	4.70	4.66	4.70	
Apr. 1	4.70	4.90	4.70	
15	4.70	4.70	4.70	
May 1	4.45	4.58	4.70	
15	4.15	4.70	4.70	
June 1	4.15	4.90	4.45	
15	4.15	4.15	4.30	
July 1	4.15	3.90	4.15	
15	4.15	5.12	4.15	
Aug. 1	4.15	5.50	4.15	
15	4.15	5.50	4.15	
Sept. 1	4.30	4.40	4.30	
15	4.40	4.38	4.40	
Oct. 1	4.50	5.30	4.50	
15	4.60	4.58	4.68	
Nov. 1	4.60	4.65	4.60	
15	4.60	4.68	4.60	
Dec. 1	4.60	4.60	4.60	
15	4.60	4.68	4.60	
31	4.60		4.60	

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