DUCK VIRUS ENTERITIS

CONTINGENCY PLAN

PRIME HOOK NATIONAL WILDLIFE REFUGE

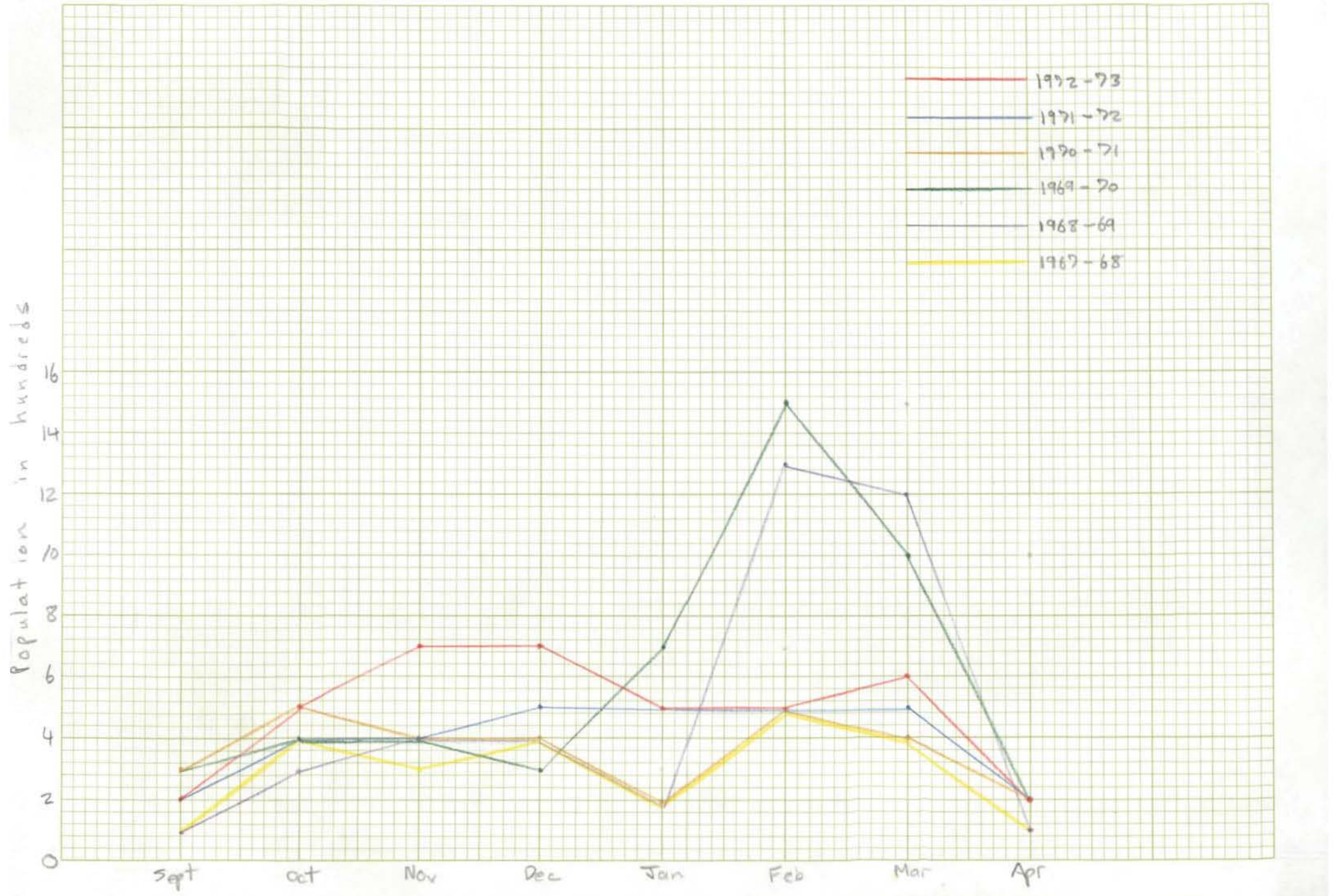
1. Waterfowl Population Data

a. Species and numbers.

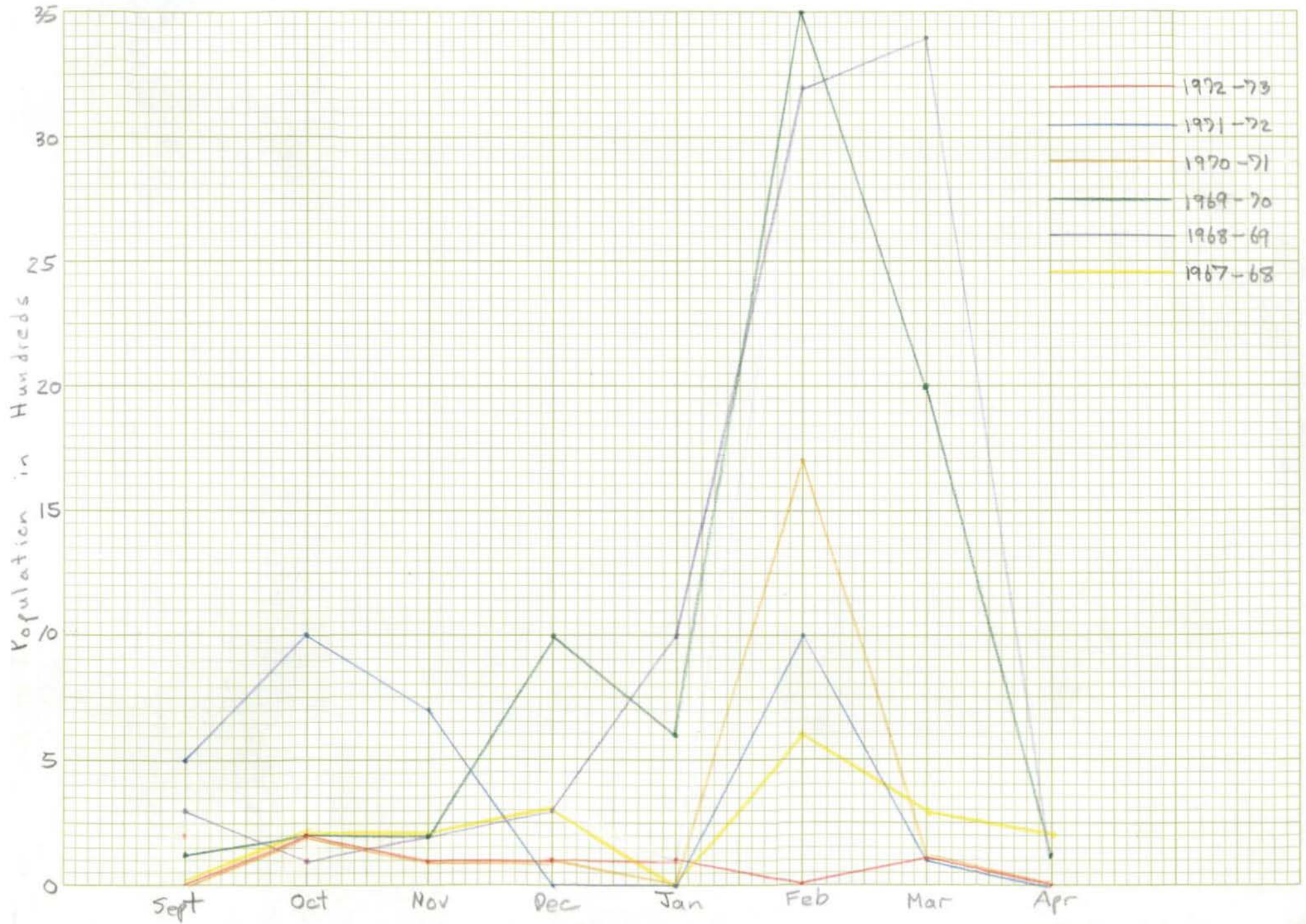
The waterfowl history by major species for the period 1967 (autumn) to 1973 (spring) is shown in the following graphs. Also provided are graphs showing (1) the average population of all ducks and (2) the average population of all waterfowl, for the period 1970 (autumn) to 1973 (spring).

Peak Populations Canada Goose Prime Hook Refuge

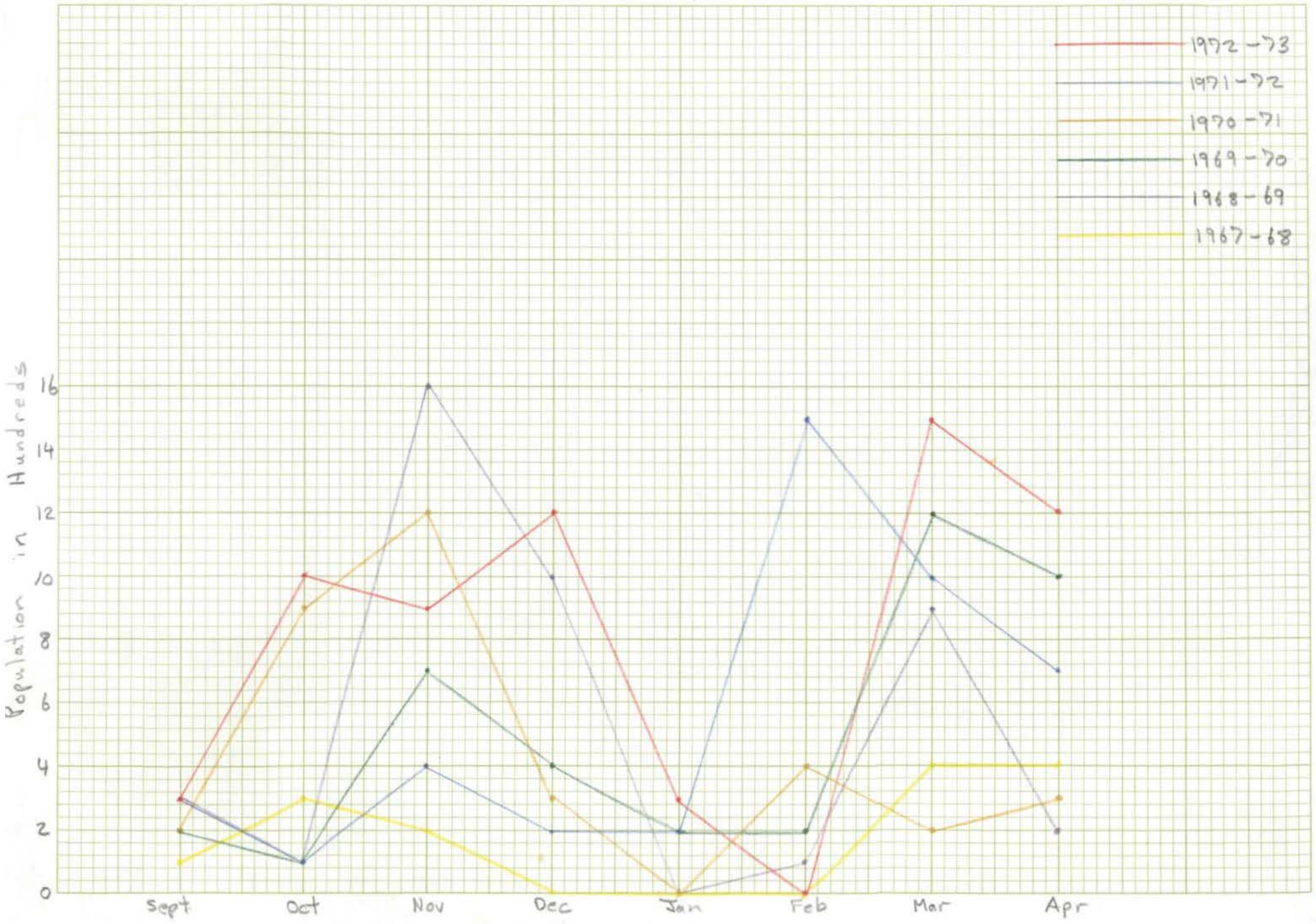
Peak Populations Black Duck Prime Hook Refuge



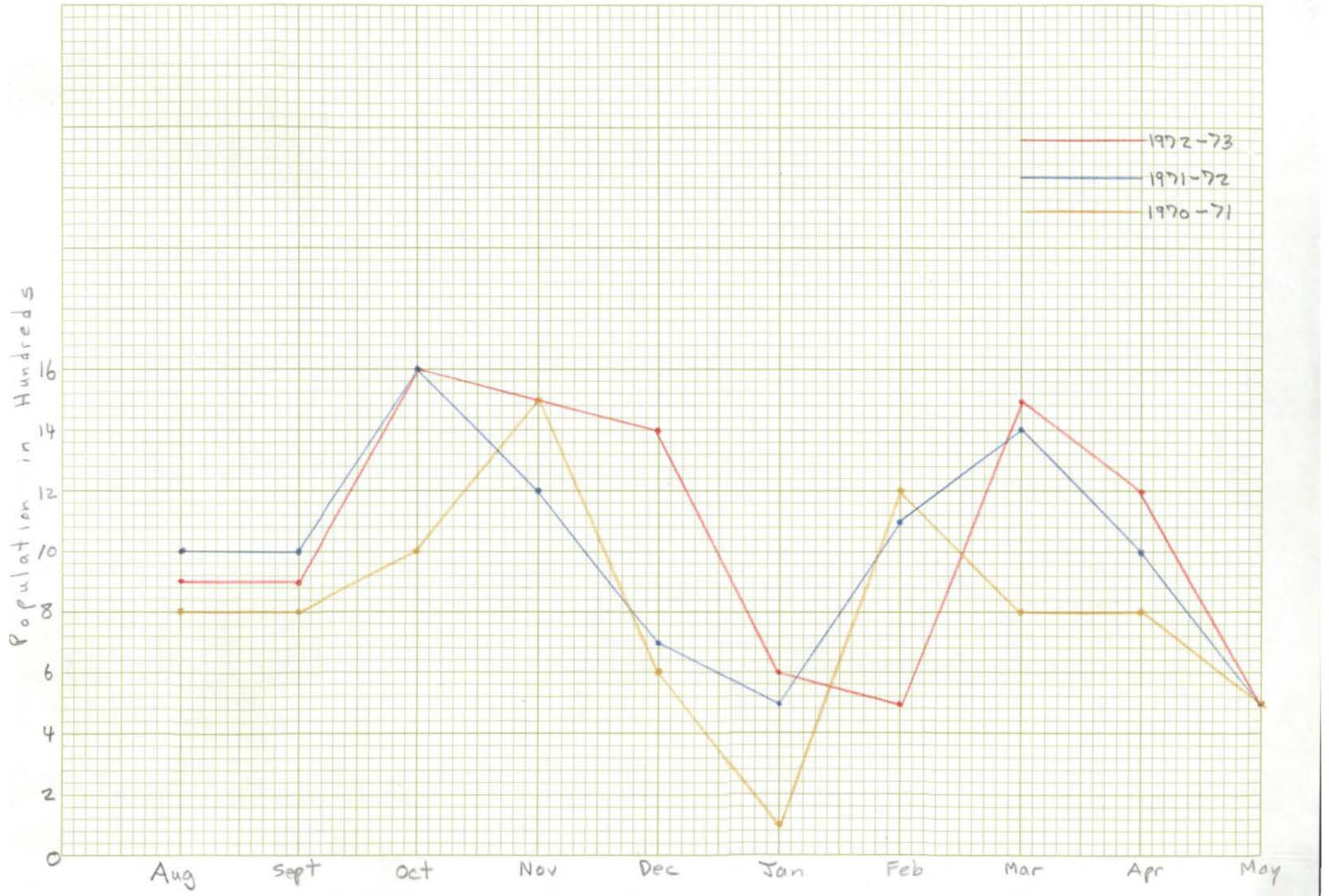
Peak Populations Pintail Prime Hook Refuge



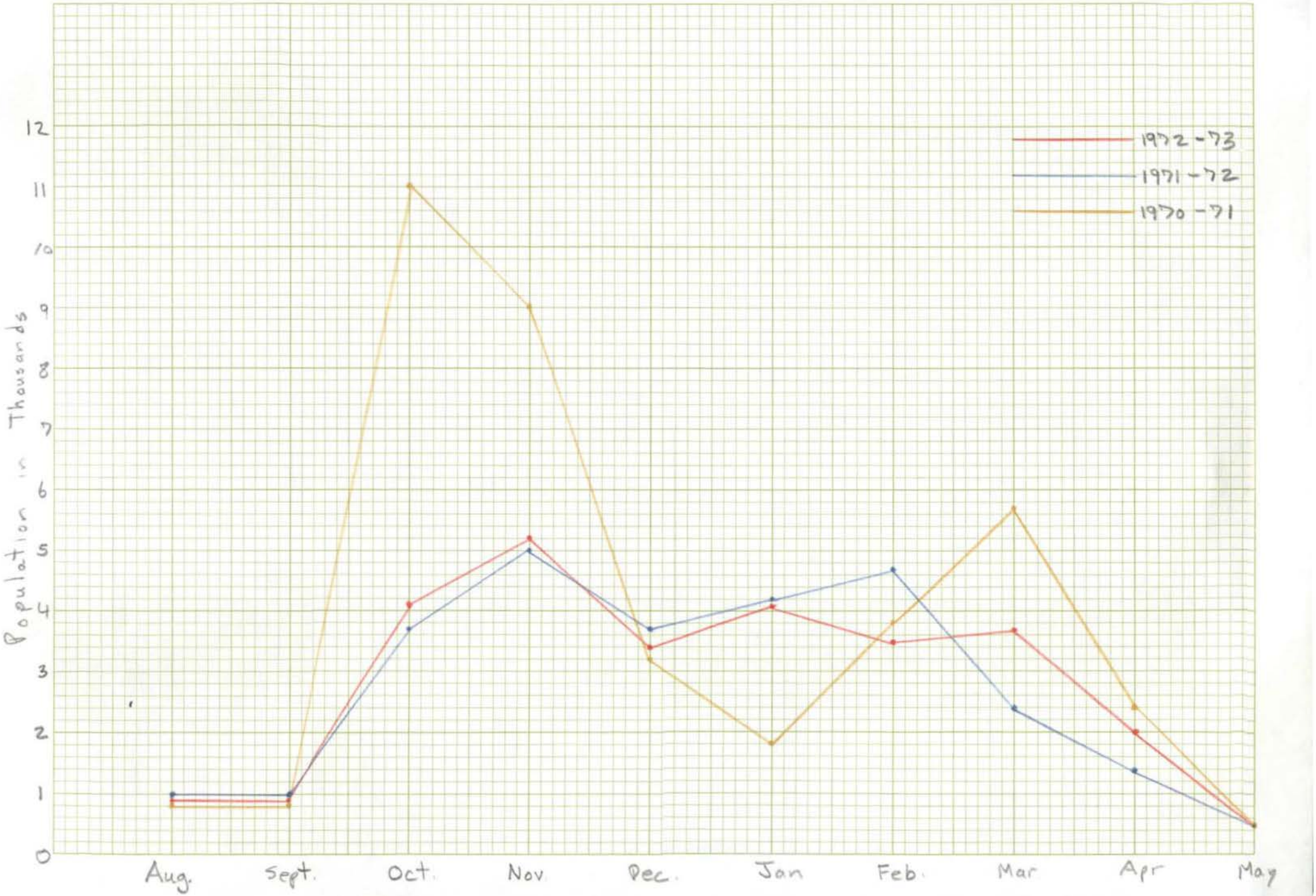
Peak Populations Green-winged Teal Prime Hook Refuge



Average Populations All Duck Species Prime Hook Refuge



Average Populations All Waterfowl Prime Hook Refuge



b. Migration Chronology

Canada Goose: The first autumn migrants, no more than a few hundred geese, arrive the last week of September. The population increases rapidly in October, reaching a peak the last week of October or the first week in November. With the opening of the waterfowl hunting season in the first week of November, 50 to 60% of the geese depart, a population decrease that is conspicuous in years when the fall peaks are greater than 10,000 birds. Populations continue to decrease at a slow rate through November and by early December only one to three thousand geese remain. The late December population may be higher or lower than earlier in the month by 1,000 to 1,500 geese. In general, the population remains stable or decreases slightly into January, rises gradually through February to a spring peak, usually less than 5,000 geese, the first or second week of March. Only 1,000 to 1,500 geese remain during April and all but one to two hundred are gone by the first week in May.

Black Duck:

The late summer population is 200 to 300 ducks. The peak fall population is only 400 to 700 birds and may occur anytime from late October to early December. The population is low during the winter, starts to increase in mid or late February, and reaches the spring peak in late February or early March. Numbers then decrease quite rapidly and by the first week of April only 100 to 150 black ducks remain.

Pintail

The first of the autumn migrants arrive in late August or early September and the population increases to 100 to 500 birds during September. The autumn peak is reached anytime from mid-September to mid-December. The peak of the spring migration occurs between early February and early March. By late March most of the migrants have moved on northward.

Green-winged Teal

The first autumn migrants arrive during August, with up to 150 present at the end of that month. The peak of fall migration may occur anytime from late October to mid-December, usually in early to mid-November. Winter populations are low, usually less than 300 birds. The peak population of spring migrants may be anytime from late February to late March, usually in late March. The population may remain high, up to 1,000 birds, until mid-April.

c. Migration Routes and Distribution Records

Areas that Refuge flocks frequent during migration will be plotted from band returns and included as an appendix to this plan.

Refuge Waterfowl Concentrations

Canada goose

The major concentrations occur in the following fresh or brackish marsh ponds (see Map 1).

Unit 2

Bennett Pond

Unnamed whale-shaped pond west of Slaughter Canal in north-west quarter.

Unit 3

Spatterdock Pond and Broken Marshes

Shell Beach Pond

Goose Pond

Unnamed pond on Black farm in south-central sector

Unit 4

Virge's Pond in north-central sector.

The peak population on each of the above water areas may be 1,000 to 3,000 geese. These large concentrations occur only in the autumn before the opening of the hunting season except on Unit 4 where a large flock of geese may remain into the winter.

Ducks:

Duck populations are generally low at all seasons and no concentration of thousands of birds occurs in any of the many ponds on the Refuge. The largest flocks, 500 to 1,200 ducks, are comprised mainly of green-winged teal and use the following areas:

Unit 3

Unnamed pond on Black farm in south-central sector. Cattail marsh in northeast corner (spring only).

Unit 4

Virge's Pond in north central sector.

The largest concentration of black ducks and mallards, 500 and 250 respectively, is usually found in the marshes northeast of Refuge headquarters (Shell Beach Pond and environs) during late February and early March. In some years two to three thousand pintails may congregate in wet corn stubble fields, especially in the northwest quarter of Unit 2, during their migration in February and March.

2. Dispersal of Waterfowl

a. Consequences of dispersal

Waterfowl dispersed from any single pond, group of ponds or marsh area when the hunting season is closed would most likely fly to other water areas on the Refuge. Similar dispersal during the hunting season would probably cause some birds, especially Canada geese and black ducks, to resort to Delaware Bay for resting except in rough weather.

Simultaneous dispersal of waterfowl from all the major resting areas on the Refuge would probably cause an immediate exodus to Delaware Bay and adjacent off-refuge marshes and ponds. Eventually some of these birds, especially during the hunting season, would relocate to other areas eg. the sanctuary area at the Gordon Pond Wildlife Area [redacted] between Lewes and Rehoboth Beach, and many would probably leave this area of the State.

b. Mechanics of dispersal

Exploders should be effective in dispersing waterfowl from most of the Refuge water areas as none of these waterfowl resting areas are extremely large. At many of these ponds, particularly in Unit 3, the exploders would have to be placed on rafts or platforms as there is no stable ground on the pond perimeters.

Placement and servicing of the exploders in most locations in Unit 3 would have to be done by small outboard boat or airboat.

During periods of low water, periods when the likelihood of disease incidence is increased, boats could not reach many parts of Unit 3 and a helicopter would be the most feasible alternative.

The expeditious placement and servicing of exploders in much of Units 1 and 2 would require an all terrain vehicle or helicopter. Some areas of both these units could be reached by boat via the Slaughter Creek and Canal. Exploders could be deployed from trucks at most of the likely sites in Unit 4.

Dispersal of waterfowl from water areas by light airplane might be successful at some of the smaller ponds and less successful at the larger ponds. It would be least successful during periods of very cold temperatures when the birds are reluctant to fly. A helicopter would probably be more successful at flushing waterfowl from any of the water areas.

c. Materiel

The following materials are on hand or are available on short notice:

1. Automatic exploders, for operation on LP gas

Number	Location
2	Bombay Hook Refuge
1	Division of Law Enforcement, Dover, Delaware
7	Division of Wildlife Services, Annapolis, Maryland

2. Shellcrackers - 40 boxes of 25 on hand at Division of Wildlife Services, Annapolis, Md.:

Can be ordered, with delivery within seven to ten days, from: Marshall Hyde, Inc.
Port Huron, Michigan 48060
Telephone: 313-982-2140

3. Helium balloons - 400 (inflatable to three foot diameter) on hand at Division of Wildlife Services, Annapolis, Md.

Locations of Airports and Air Strips

1. Joseph Hudson
Lewes-Milton Road, Lewes, Del. Tel. 645-8675
Five miles southeast of Refuge headquarters.
Grass strip.

2. Milford Air Park
Milford, Del. Tel. 422-4916
Twelve miles northwest of Refuge headquarters.
Grass strip.

3. Rehoboth Airport
Route 14, Rehoboth, Del. Tel. 227-2626
Ten miles southeast of Refuge headquarters.

4. Sussex County Airport
Georgetown, Delaware Tel. 856-7059
Twelve miles southwest of Refuge headquarters.
Paved runway.

d. Water manipulation.

The Refuge has no capability to manipulate or control water levels. There are no impoundments nor are there functional water control structures on any of the creeks, canals or other drainage channels. A man-made rubble pile in the Ptersfield Ditch maintains a higher than normal water level in the marsh of Unit 3.

Most of the marshes of Units 1, 2, 4 and the southeastern quarter of Unit 3 are slight to moderately brackish with the normal tides affecting only a small portion of their area. Except in Unit 4, these tides must pass through the narrow bridge openings of road beds which limits the amount of saline water entering the marsh. Tide water from Delaware Bay enters Units 1 and 2 via Slaughter Creek and Canal, Unit 4 via tributaries of the Broadkill River, and the southeastern quarter of Unit 3 from the Broadkill River through the Petersfield Ditch.

Unit 3, except for the southeastern quarter, is fresh marsh with many interconnected ponds. The major source of water for much of this area is Prime Hook Creek which enters the western side of the Unit from Waples Pond. During periods of drought the water levels in the ~~new~~ non-tidal creeks and ponds in all Units may drop drastically and many of the ponds may go completely dry.

A regulation of the Delaware Department of Natural Resources and Environmental Control, Division of Fish and Wildlife, Title 7, Section 766(a) states that "No person shall open any mouth or drain which would permit the draining of Prime Hook Creek into the Delaware Bay between the first day of October in each year and the tenth day of March in the succeeding year."

3. Concentration of Waterfowl.

Flocks of waterfowl might be concentrated and held by providing an ample supply of food, principally ear or shelled corn. It would be most readily accepted and easily distributed if spread in selected agricultural fields nearest to the ponds used as resting areas by the birds. Based on an average daily consumption of .5 pounds of food per bird, 500 pounds of shelled corn, an estimated ten bushels, would be needed daily for each 1,000 birds in the population.

Feed grains are available from the following dealers:

1. Townsend's Inc.
   Route 24, Millsboro, Del. Tel. 934-9221

2. Betts and Son, Inc.
   Route 16, Milton, Del. Tel. 684-8511

3. Davis C. Draper
   Lincoln, Del. Tel. 422-4953

4. Frank Clendaniel, Inc.
   Lincoln, Del. Tel. 422-4611

A hazard in the artifical feeding of waterfowl is the danger of attracting and holding waterfowl from off-Refuge areas, birds that were not using the Refuge initially. In addition, waterfowl from a section of the Refuge where they might not be exposed to infection, for example, the salt marsh, might be in greater danger if attracted to feeding sites and adjacent ~~impoundments~~ ponds.

4. Extermination.

Conceivably, the disease problem could be so severe as to necessitate the sacrifice of the entire waterfowl flock. This decision is reserved for the Bureau Director or his delegate (DVE Chief). Once the decision is made, the most expedient methods will be employed.

DVE HAZARD APPRAISAL FORM

Summary Value

Name of Area: Prime Hook National Wildlife Refuge

State: Delaware County: Sussex Congressional District: 1

1. Peak Waterfowl Populations and Marsh and Water Acres

	Sep-Oct-Nov	Dec-Jan	Feb-Mar-Apr
(a) Ducks	2000	500	500
Geese	5000	2000	2000
Swans			
TOTALS	7000	2500	2500
(b) Critical Water Acres	500	25	25
(c) Birds Per Acre	14	100	100

Managers Do Not Write in boxes - To be completed by Regional Office

2. Major Species Canada Goose, Black Duck, Green-winged Teal

3. Type of habitat where most birds concentrate (check one)

(a) River, stream, tidal marsh or estuary ____; (b) Permanent open water x ; (c) deep marsh (over 2 ft.) ____; shallow marsh (less than 2 ft.) ____: (e) Stagnant ____

4. Water

(a) Amount of water flow in concentration area (check one);

High ____; Moderate ____; Low ____; None x ;

(b) Source of Water Supply Stream flow from upland, precipitation

(c) Water Control Capability None

5. Stress factor potential: Low ____; Med x ; High ____

6. Estimated proportion of discrete population(s) in the concentration:

Species and explanation None

0-10% ____; 11-25% ____; 26-50% ____; 51-100% ____

7. Major Food Source: Refuge ; Off Refuge x

Acquatic ; Upland x

8. Proximity of Private Aviary Flocks Nine flocks of 3 to 100 birds within five mile radius.

9. Management capabilities for population control

(a) Preventing concentrations Expand hunting, pyrotechnics, hazing, eliminate farming program, don't maintain goose pastures.

(b) Holding concentrations Increase acreage of hot crops, begin feeding program.

(c) Dispersing concentrations Expand hunting, pyrotechnics, hazing.

10. Probable Consequences of population dispersal

(a) Biological Waterfowl would seek resting areas on other marshes or offshore in the Bay. The extensive acreage of off-Refuge cropfields and pastures would continue to be the major feeding site.

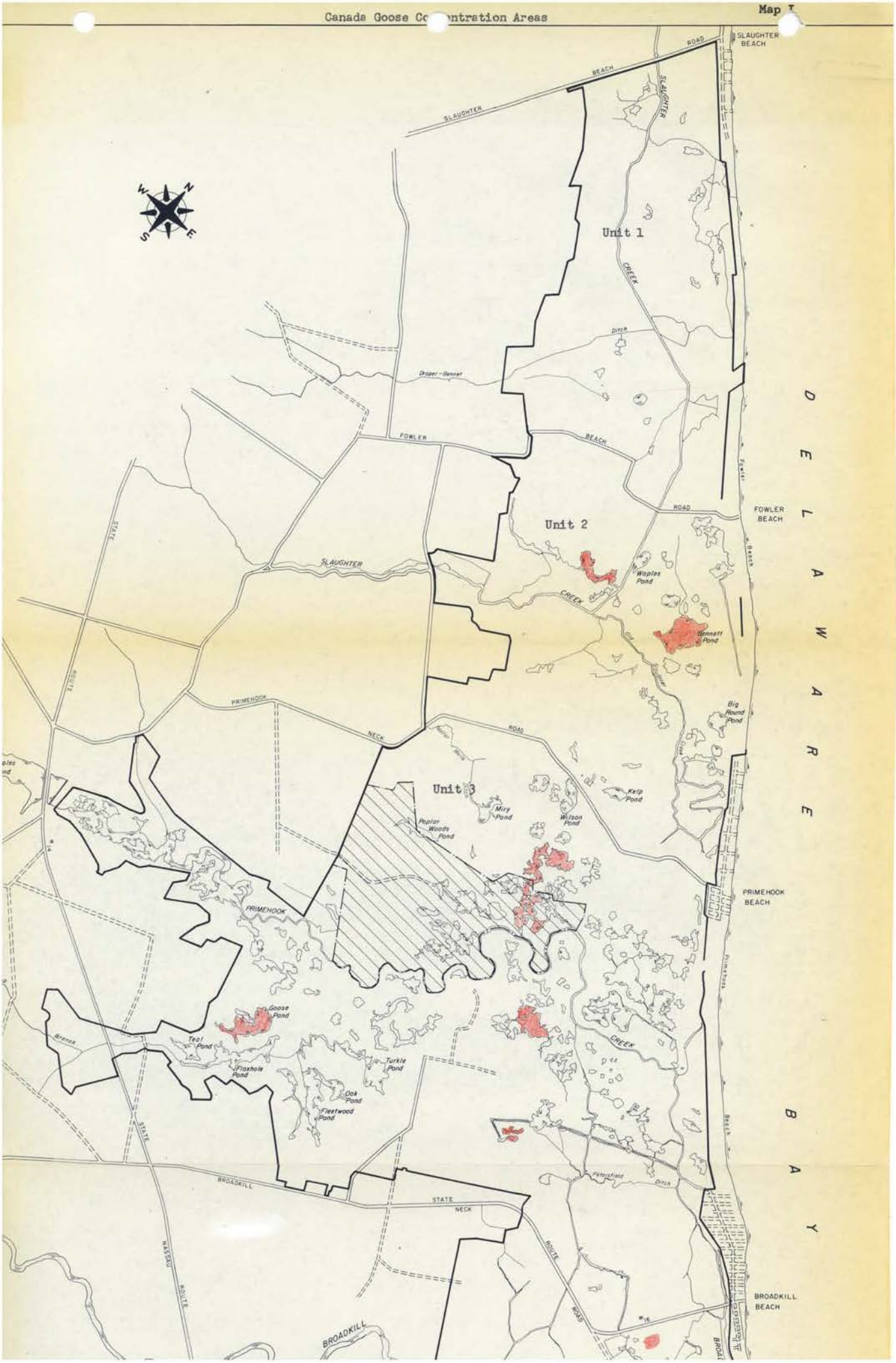
(b) Political Measures other than expansion of hunting would perhaps be objectionable to the Delaware Division of Fish & Wildlife because of its effect on waterfowl hunting in the general area.

(c) Social Expansion of hunting would be opposed by some groups. Dispersing concentrations by other than hunting would be objectionable to hunters and land owners.

11. Remarks: Expansion of hunting likely to generate the least adverse reaction.

Canada Goose Concentration Areas

Map 1



REVISIONS	DATE	BY

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
BRANCH OF ENGINEERING

REGIONAL ENGR. REVIEWED	**PRIME HOOK NATIONAL WILDLIFE REFUGE**
	SUSSEX COUNTY DELAWARE
RECOMMENDED REGIONAL DIRECTOR	**OPERATING MAP**
R.O. APPROVAL DATE	SURVEYED: DESIGNED: DRAWN: E.C. CHECKED:
	DATE: JANUARY 18, 1966 DRWG. NO.: SR-DEL-630-407