

memorandum

DATE: January 29, 1993

REPLY TO
ATTN OF: Zone Biologist-Central

SUBJECT: Request for Information Response

TO: Lisa McCurdy, Asst. Refuge Manager-Missisquoi NWR

Enclosed you will find a copy of two different wildlife inventory procedures to survey heron colonies. Both are from approved wildlife inventory plans. The technique described in the Great Swamp plan utilizes standardized points to survey the colonies. This technique is adequate to estimate population size and productivity and will provide an index over time. The Iroquois technique is designed to obtain population and productivity data by using a strip-count and also a random sample. As such, it is more labor intensive to complete. The data they obtain is of sufficient quality that they submit the data to the Colonial Bird Register in Ithaca, New York.

Both techniques are adequate for the intended use of the data. The question you need to answer is what your objective is in counting the birds in the colony. If it is only to provide an index of the population, then a less intensive search may be all that is necessary. If, on the other hand, you need the data to show comparisons between habitat use, food availability, management actions or to provide data to a regional or national data base you may need a more statistically accurate methodology.

Once you decide what your objective is, you can choose or tailor a technique to your needs. I have also been in contact with OIT and Mike Irwin, PWRC to see if they have any recommended techniques. I am also waiting to speak with Diane Pence to see where the Service stands on having a standardized technique for surveying the colonies. Until I receive word back from her, I would hold off on deciding on one technique, but be thinking about objectives and possible techniques. You could also check with your States' non-game office. Many times they conduct nest colony surveys.

I have also requested information on banding supplies as you requested. George Haas should have a list of suppliers available. I will have him send them to you. There are also some other sources which I will send to you when I receive them. I also spoke with Rick Sojda, OIT regarding my vague memory of difficulties with cannon nets vs. rocket nets. The only problem he remembers is that the cannons, since they are a 2 piece instrument may be more inaccurate than rockets. He really could not be more specific since most individuals are now using rockets. I would suggest that Missisquoi upgrade to rockets as funding allows. When I receive additional information, I will pass it along.



Refuge: Great Swamp National Wildlife Refuge
Species: Great Blue Heron, (*Ardea herodias* L.)
Title: Great Blue Heron Production Inventory

Procedure No: GS-5

(1/9)

I. Purpose

The great blue heron is a colonial nesting wading bird which inhabits large shallow marshes. Heron populations have been adversely effected by loss of wetland habitats and environmental pollutants. The great blue heron is at the top of a food chain which is primarily associated with wetlands where pollution is often concentrated. For this reason, herons have been utilized as environmental indicators to the quality of wetlands habitats, Ohlendorf et.al. (1980). Concerns pertaining to water quality within the Great Swamp NWR have been expressed by numerous individuals and organizations, especially the Fish and Wildlife Service. With the advent of the great blue heron rookeries at the refuge, an ideal situation is available to assess the effect of water quality on a very sensitive wildlife species.

II. Procedure

Annual production of herons is determined by observing and counting all young within each nest during the later part of the fledgling stage. Twice between the dates specified below, a total count will be conducted at the two rookery sites. The number of adult birds, young birds, active nests and inactive nests will be recorded. This information will be compared yearly to document production trends.

Personnel Requirements

One person can adequately conduct the heron survey. Accuracy increases when the same person performs the survey or assists new employees in locating the nests.

Dates of Inventory

The inventory should take place between the middle of June and beginning of July. The great blue heron is sensitive to human disturbance, especially early in the nesting period (before mid-June). The following is the approximate nesting chronology at Great Swamp:

Mid-April	-	Nest building
April 20	-	Initiation of egg laying
April 28	-	Incubation period begins (approximately 28 days)
May 26	-	Hatching takes place (nesting period approximately 6 weeks)
July 7	-	Majority of young fledge

Time of Day

No special time of day is required for the census.

Weather Conditions

The surveys should be conducted on clear days to assure good visibility.

Survey Units

There are two heron rookeries on the refuge. The main colony is located on the north side of Pool 2, east of Primrose Brook. The second rookery (Rubenstein Marsh) is found within the refuge's Wilderness Area on Tract No. 105 (Appendix 1).

Survey Routes and Observation Points

A specific survey route will be followed annually in Pool 2. Five observation points have been established in Pool 2 (Appendix 2). Iron stakes have been placed in strategic locations for best viewing opportunities. The observation points can be located with map (Appendix 2) and compass.

The Rubenstein Marsh Rookery will not have specific observation points because the rookery is so small that it is not necessary. An observer can look from one spot and count all nests and young.

Equipment and Materials

Binoculars
Compass
Hip boots
Data sheet
Pencil

Summary Data Forms

The following information will be recorded on the summary data forms (Appendix 3, 4 and 5):

1. Young Produced - average number of young per nest.
2. Active Nest - total number of active nests in rookery.
3. Total Nest - total number of active and inactive nests in rookery.

Note: The above information will also be recorded on a colored graph located in the front of the blue heron file (see Data Filing).

Sampling Requirements

The inventory should be performed twice between the dates specified previously because of the difficulty in observing the young birds (i.e., some of the young birds crouch low in the nest, rendering them very difficult to see).

Statistical Analysis

Statistical analysis is not necessary since a complete count survey method is used. The accuracy of the survey will depend on the skill of the observer.

Data Filing

All maps, field data forms and summary data forms will be filed in the 16.000 section of the Great Swamp files which lists 16.021 specifically for great blue herons.

III. Special Considerations

Great blue heron nests are difficult to census because the trees in which the nests are located are spaced closely together. It is easy to count a nest more than once. The use of permanent observation points in Pool 2 will aid in standardizing the census method for future observers. However, the observer can make the survey even more accurate by dividing the rookery into quadrants with physical barriers such as a row of standing dead timber to separate one area from another. Personnel should also clear around the permanent iron stakes in the winter when they are easy to locate, so they will be visible for future use.

IV. Labor and CostsPersonnel

	<u>Staff Days</u>	<u>Cost</u>
GS-7	2	\$159.00

Equipment and Materials

Office supplies	\$ 15.00
Miscellaneous (compass, hip boots - 1 replacement pair, etc.)	\$ 70.00

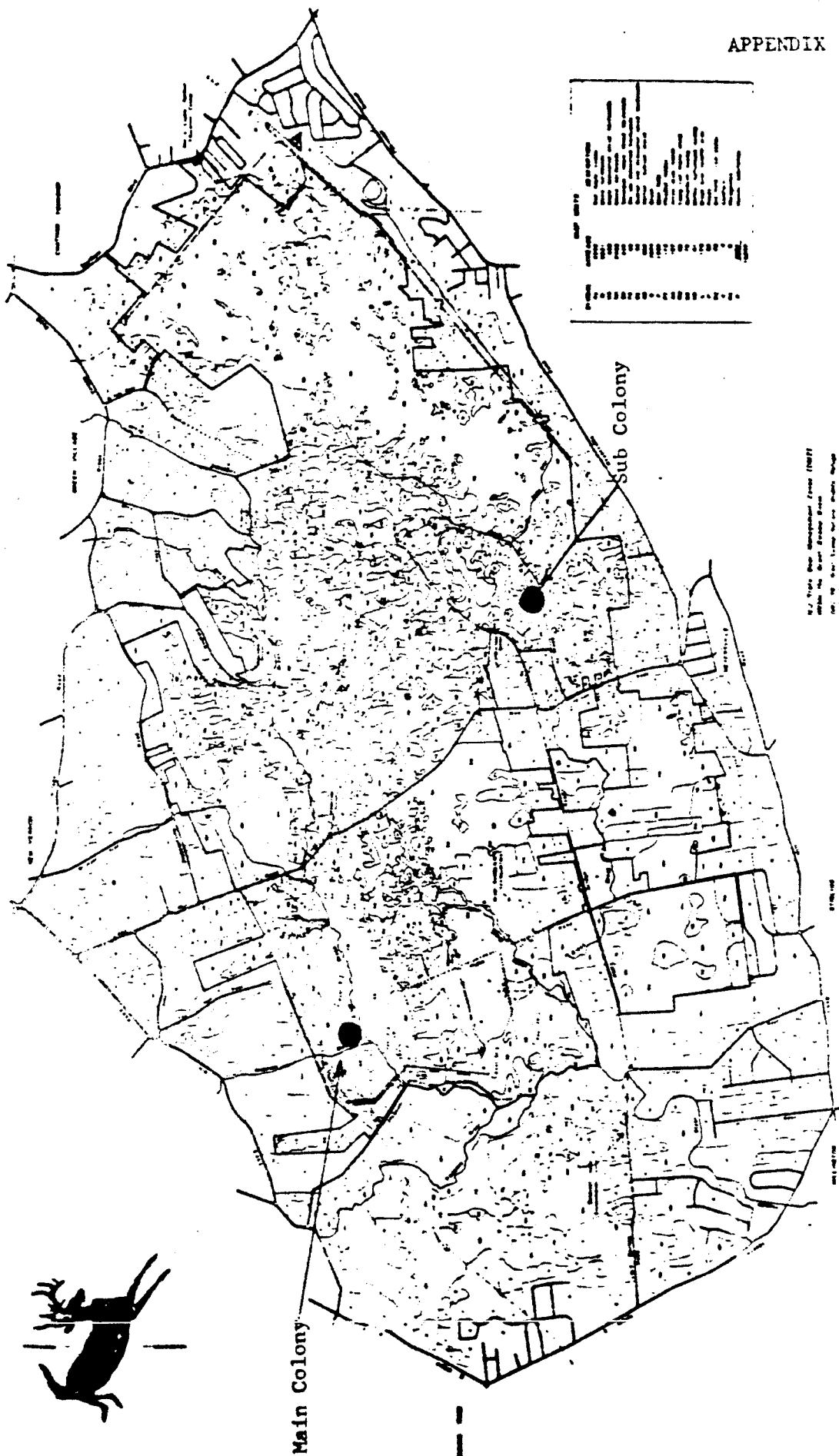
<u>Transportation</u>	<u>\$ 25.00</u>
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TOTAL	\$269.00
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References

- Ohlendorf, H. M., D. M. Swineford, and L. N. Locke. 1980. Organo Chlorine Poisoning of Herons. Proc. 1979 Conf. Colonial Waterbird Group 3:176-185.
- Short, H. L., and R. J. Cooper. 1985. Habitat Suitability Index Models: Great Blue Heron. U.S. Fish and Wildl. Serv. Biol. Rep. 82(10.99). 23 pp..

APPENDIX 1. Location of Great Blue Heron Rookeries.

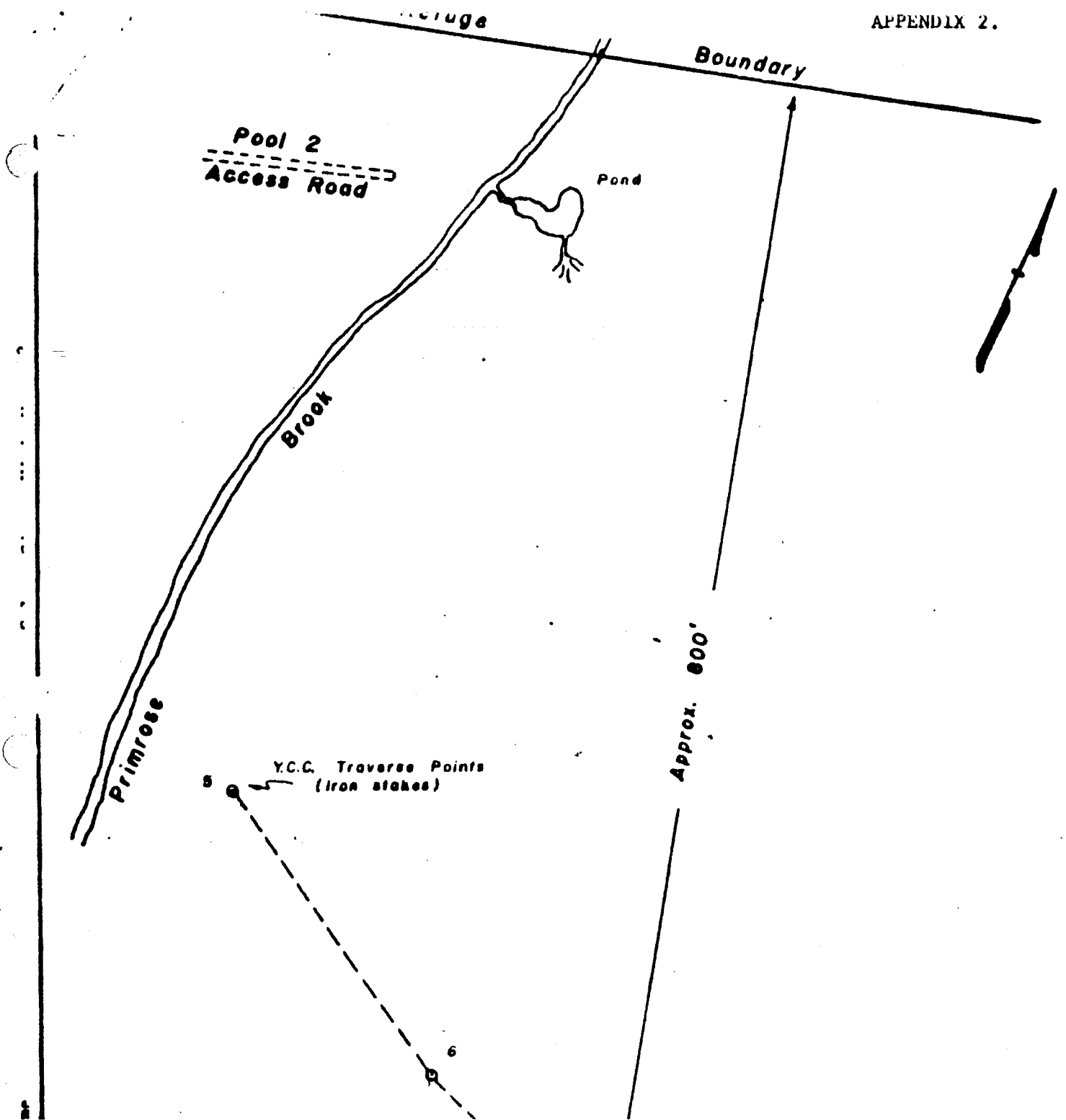


APPENDIX 1.

COVER TYPE MAP
of the
GREAT SWAMP BASIN
HUNTERDON COUNTY, NEW JERSEY
MAY 8, 1960

APPENDIX 1.

Location of Great Blue Heron Rookeries.



APPENDIX 3.

SUMMARY DATA SHEET

DATE:

LOCATION:

COMMENTS

Total # of heron nests:

of active nests:

of heron young:

of dead nestlings:

DATE:

LOCATION:

Total # of heron nests:

of active nests:

of heron young:

of dead nestlings:

DATE:

LOCATION:

Total # of heron nests:

of active nests:

of heron young:

of dead nestlings:

DATE:

LOCATION:

Total # of heron nests:

of active nests:

of heron young:

of dead nestlings:

DATE:

LOCATION:

Total # of heron nests:

of active nests:

of heron young:

of dead nestlings:

APPENDIX 4.

SUMMARY DATA SHEET
GREAT BLUE HERON SURVEY
RUBENSTEIN MARSH ROOKERY

YEAR	YOUNG PRODUCED	ACTIVE NEST	TOTAL NEST
1982			
1983			
1984			
1985			
1986			
1987			
1988			

APPENDIX 5.

SUMMARY DATA SHEET
GREAT BLUE HERON SURVEY
POOL 2 ROOKERY

919

YEAR	YOUNG PRODUCED	ACTIVE NEST	TOTAL NEST
1982			
1983			
1984			
1985			
1986			
1987			
1988			

WILDLIFE INVENTORY PROCEDURE

1/7

Refuge: Iroquois

Procedure No: Vb

Species: Great Blue Heron

Reliability Data Class:

Title: Great Blue Heron Nest Count

Nests: A

Production: B

Population: B

Purpose

The refuge has one of the largest Great Blue Heron rookeries in New York State. We have been providing data to the Colonial Bird Register in Ithaca, New York. Data on this species are also needed for our quarterly wildlife reports. Members of the general public often inquire about the rookery; thus, there is need to monitor the success of this rookery on a yearly basis.

Procedure

1. Previous Procedures.

Recent procedure has been to attempt a complete count of the nests in the period between June 15 and June 20. Five counters plus a sixth man to move canoes from the start of the count to the end of the count have been used. The total operation took about six hours, giving a total of 36 man-hours or 4.5 man-days. Water levels had to be about 612.0' so that the counters could cover the area in hip boots and still have enough water for canoe access to the rookery. In February 1982 a nest count was made to see if we were missing nests in the June count. The results indicated that we had missed 32% of the nests on the previous June count. This count took three men only three hours for a total of 9 man-hours or 1.2 man-days. This showed the superiority of a winter count. A winter count alone, however, would give no data on the number of young per nest or percent of nests that were occupied. However, a sample count each June would provide an adequate factor for this information. (See # 8, Procedure for June Check.)

2. Introduction to Planned Procedures.

Two procedures will be involved. The first will be a June check by canoe to determine the average number of young per nest and the percent of the nests being occupied. The sample count will be used for this purpose. The June check will also be used to evaluate the health of the trees in this section of the green timber impoundment (Seneca Pool). The second procedure will be a winter count of all of the nests.

3. Number of Personnel Required.

One person could do the canoe check in June, but it would probably be

advantegous to use two people. The winter check could be done with two persons, but it is advantegous to have at least three people; no more than five people should be used.

4. Dates of Inventory.

The canoe check should be done the week of June 15. Most of the young herons will be big enough by that date to be easily visible from the ground while being fed. By June 21 the water level may be too low to easily use a canoe. The winter nest count can be made anytime that the conditions are favorable after the end of the deer gun season.

5. Weather and Habitat Conditions.

It is important that the canoe check be done on a warm, fair day so that the young herons will not be exposed to unfavorable weather conditions when the parents are flushed from the nest. The water level should be at least 612.0' so that the canoe can be maneuvered throughout the area. The higher the level, the better.

The winter nest count should be done when conditions are favorable for walking. Thus the snow should be under 6 inches in depth or else frozen hard enough so that it can be walked upon without sinking into it. All water areas should be frozen hard enough to walk upon. There should be enough fresh snow so that a person can easily follow his tracks. Sunny weather would be preferable, but the count could be done on a cloudy day if a compass was used. Stormy weather should be avoided.

6. Census Aids and Equipment.

A good compass is necessary for both procedures. In the June check it would keep the canoeist from getting lost which can easily happen in that area. In the nest count a compass is used to keep a straight line on the initial strip.

7. Procedure for the Winter Nest Count.

The rookery is oblong in shape, with the elongated portion running roughly north and south. The east edge of the rookery is on the west edge of a slough, probably an old creek channel. The counters line up in a row along the east edge of the rookery (west side of the slough). It is important that the people be spaced close enough so that they can keep track of the person on each side. The person at the north end of the line will be the initial guide. He should be so placed that he can cover the north edge of the rookery. He should follow a compass course to keep as straight a line as possible without missing any nests along the north edge. The next counter will guide on him. The rest of the counters will guide on the person to their right. They will all walk westward through the rookery. Each person will count the nests to his right that are between him and the next counter. They should move slow enough so that the line can be kept approximately straight. The person at the south end of the line will be the guide on the return trip. After the counters have passed through the rookery on the initial strip, he will hold his place while the rest of the line will use him as a pivot to swing around and

form a line to head back east. On the way back, each person, except the guide, will count the nests to his left. The guide will not count, but will follow his tracks back to the start. Strips can be repeated until the entire rookery is covered. The more persons you have - no more than 5, however - the less strips will be necessary.

8. Procedure for the June Check.

The entire rookery may be reconnoitered in order to see whether it is expanding or contracting. Enough nests (at least 20) should be checked while the adults are feeding the young so that the average young per nest can be determined. If the water level is relatively low, some wading will be necessary. At least one of the persons on the June check should plan to be one of the participants of the following winter nest count.

9. Field Data Recording.

During the June check, data will be recorded on lined paper. Four lines will be used for recording the number of young herons per nest. The first line will be used for marking down the number of nests with one young, the second line for nests with two young, the third line for nests with three young and the fourth line for nests with four young. Other interesting data should also be recorded. Examples are the presence of nesting raptors within the rookery, waterfowl broods seen, fawns, etc. The observers should be alert for other species of wading birds nesting within the rookery. The percentage of empty heron nests should also be noted. Any significant changes in the health of the trees should be recorded, as death of the trees could result in abandonment of the rookery.

On the winter nest count, each counter keeps track of the number of nests he counts on each strip.

10. Summarization of Data.

Data will be summarized on the Colonial Bird Register form. Two forms will be filled out for each nesting season. The first form will contain the data from the June check with a rough estimate of the total number of nests. The second form will contain the actual count of the nests obtained on the winter count. The original forms will be sent to the Colonial Bird Banding Register. The refuge will retain copies of all forms submitted.

11. Data Filing.

Copies of all forms submitted to the Colonial Bird Register, plus all field notes made during the June check, will be kept in a manila folder entitled: Heron Rookery - Seneca Pool. This folder is currently filed in the biologist's desk under WATERBIRDS.

Reliability

If both procedures are carried out as described, we should achieve the reliability that is shown in the heading. If either of the two procedures is not done, the reliability will decrease. However, data from the winter count alone will

produce C reliability; the winter count plus June nestling sample, will produce a B reliability.

Manpower and Costs

Manpower should consist of one man-day for the June check and 1.2 man-days for the winter count for a total 2.2 man-days. Costs will depend on the grades of the men doing the work.

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GENERAL COLONY SKETCH:

[illegible]

INSTRUCTIONS FOR FIELD DATA TABULATION AND REPORTING

Please read and follow these instructions carefully. If you do not, we may have to re-copy or discard your data. The data form is set up as the source document for keypunching. It is very important, therefore, that the data is entered correctly. To facilitate making changes where necessary during editing, we ask that you fill in the information in PENCIL ONLY. We routinely encounter information in the wrong spaces. When this is done in ink, the entire form must be transcribed to correct the error. With pencil it can be corrected on the original form. OMIT SHADED BOXES. If information exceeds space given on the form, e.g., for "REMARKS", please attach additional sheets. Please include date, colony name, sub-colony if applicable, and observer on any attached sheets.

COLONY SIZE (ha): One hectare = 2.47 acres or 107,593 square feet.

COLONY NAME: Because local names often differ from "official" names, use USGS chart name if given. Include all local names in "REMARKS". If no chart name is shown, use a local name and, in SKETCH space, provide a map, if possible. Island numbers adopted by coastal zone management commissions are acceptable as colony names, provided that information on location is also provided. LAT./LONG. coordinates (to nearest minute) are especially valuable in such instances. Where several subcolonies exist in close proximity, identify each with a number in the space provided for SUBCOLONY. Separate reports should be submitted for each subcolony. Show relationships of subcolonies on SKETCH.

TIME: Use military time, e.g., 1:00 P.M. = 1300, 9:00 A.M. = 0900.

LATITUDE/LONGITUDE: Designate if possible. Please give coordinates to nearest minute. If not available, show location in colony sketch, specifying county, and we will complete.

SPECIES: Use either Common Name or Scientific Name.

TOTAL POPULATION (INDIVIDUALS)/TOTAL ACTIVE NESTS: Depending on the census technique used, record active nests (preferred) and/or total population. Estimates of total population should be reported as Individuals rather than pairs. See "CENSUS TECHNIQUE" instructions (low) for the kinds of numbers to report.

NESTING STAGE: Use the following numeric categories to indicate whether the greater number of each species in the colony is: 1. Prenesting. 2. Pairing - territory establishment. 3. Egg laying. 4. Incubation. 5. Hatching. 6. Downy young. 7. Feathered young. 8. Young flying or ready for flight. 9. Renesting. 10. Loafing on colony.

CENSUS TECHNIQUES: If, on the current visit, for each species more than one technique was used, file a separate report for each technique. Use the following numeric categories to designate the type of census: 1. Visual estimate - air (fixed wing). 2. Visual estimate - air (rotary). 3. Visual estimate - boat, car, foot (Circle one). 4. Aerial photographic count. 5. Total ground count - individuals. 6. Total ground count - nests. 7. Quadrat census (SKETCH). 8. Line strip census (SKETCH). 9. Other _____. IF "OTHER" CATEGORY IS USED, PLEASE SPECIFY IN "REMARKS" AND FILL IN BLANK SPACE ON INSTRUCTIONS (ABOVE). For techniques which sample only a portion of the colony (e.g., quadrat sampling), extrapolate sample counts to total colony numbers. Show conversion factors in "REMARKS". If the level of precision is questionable, include ranges in addition to single best estimate of numbers.

DISTURBANCE: Please check box if disturbing human activity was present at the time you visited the colony. Human technology is a general term relating to airports, highways, oil refineries, industrial parks, etc.

GENERAL HABITAT OF COLONIES: Describe the dominant feature of the habitat around the colony: e.g., a marsh, bog, island, woodland, tundra, cliff face, etc. If colony is on a spoil island, please so state. Information about particular vegetational species of interest (e.g., plants used as nest-site substrate, etc.) can be included in "REMARKS".

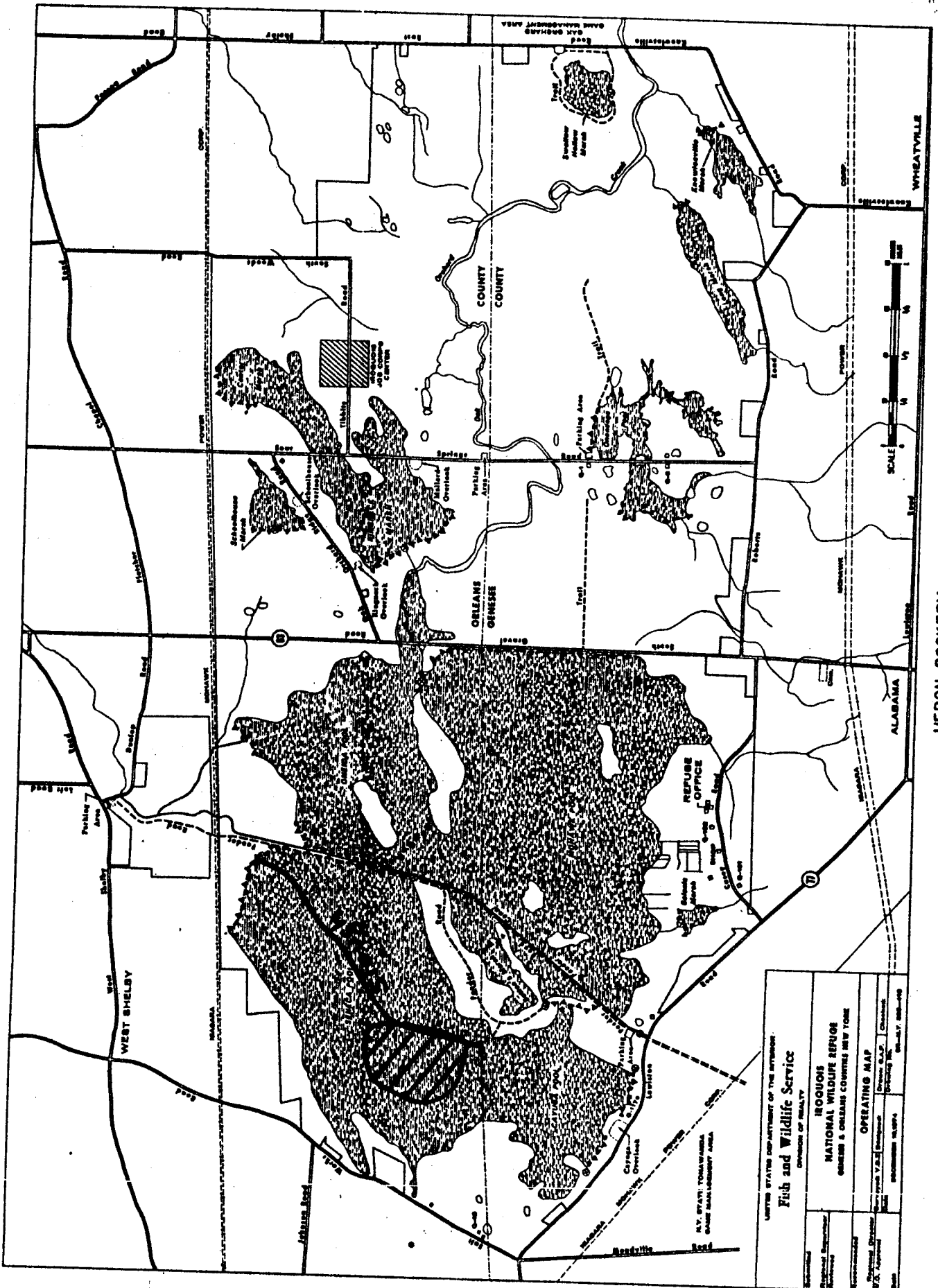
COLONY SKETCH: Show the colony location in reference to known map locations. Identify colonies in the sketch. Show sample plots (if used) and the approximate scale in relation to the whole colony. If more room is needed, attach additional sheets.



COLONIAL BIRD REGISTER

159 Sapsucker Woods Road • Ithaca, N.Y. 14850 • (607) 256-5056





UNITED STATES DEPARTMENT OF THE INTERIOR	
Fish and Wildlife Service	
DIVISION OF WILDLIFE	
IROQUOIS NATIONAL WILDLIFE REFUGE	
ORLEANS & WEST SHELBY COUNTIES NEW YORK	
OPERATING MAP	
Map No. 100-100-100	Scale 1:50,000
Map Date 10/1/74	Map Date 10/1/74
Map Author J.A. [illegible]	Map Author J.A. [illegible]
Map Editor J.A. [illegible]	Map Editor J.A. [illegible]
Map Reviewer J.A. [illegible]	Map Reviewer J.A. [illegible]
Map Approved J.A. [illegible]	Map Approved J.A. [illegible]
Map Date 10/1/74	Map Date 10/1/74