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THE BRODIE CLUB

DATE OF NEXT MEETING ; Tuesday 19 April 1988

PLACE OF NEXT MEETING ; Faunal Lab, South Borden Bldg.

SPEAKER : Dr. C. S. Churcher, Dept. of Zoology, U. of T.

SUBJECT : Faunas of the Dakhleh Oasis, Egypt.

MINUTES OF THE 839th MEETING OF THE BRODIE CLUB

Held 15TH March 1988 in the Faunal Lab, University of Toronto

Chairman Riley Recording Secretary Boissonneau

The meeting was called to order at 8.10 p.m. The Chairman called the roll. 8 members and 1 guest were present (Heather Speakman, guest of John Speakman). Bendell, Bodsworth, Churcher, Bruce and Ann Falls and Reading sent regrets. The indirect effects of the school break on attendance at this meeting is postulated.

Riley read the minutes of the 838th Meeting of the Brodie Club which were approved after Carrick's amendment -- for "Crosby", read "Speakman" -- was adopted.

ANNOUNCEMENTS

Norm Martin outlined forthcoming F. O. N. events and made available flyers pertaining thereto and copies of the current issue of Seasons, for the perusal of the members. Riley circulated an interesting article published in Gun Dog Magazine on the late Doug Clarke, entitled "The Prestige and Magic Intact".

SPEAKER OF THE EVENING

The Speaker of the Evening, Dr. Robert Jefferies, of the Department of Botany, University of Toronto, was introduced to the members by Heather Speakman.

To begin, Dr. Jefferies stated that since he had been involved in studies of the Physiology and Ecology of saline plants, Dr. Fred Cooke, of Queen's University, approached him to seek his collaboration in Dr. Cooke's Lesser Snow Goose Project. This study concerned the availability of forage of Lesser Snow Geese on their Perouse Bay nesting site, located 25 kms. east of Churchill, Manitoba. Jefferies assented to this proposal and he has now completed a decade of studies of the impact of Lesser Snow Geese upon the vegetation of the Perouse Bay nesting site.

The forage in the immediate vicinity of the nests which are located in willows near the seashore is Puccinellia phycanodes (Goose Grass), a species "lacking pollen, grains do not develop" (A. E. Porsild, 1973) which reproduces vegetatively and is frequently transported by sea ice to initiate new colonies of the species. Carex aquatilis and other Carex species, which occur further inland in areas affected by spring tides are also used as forage. Festuca rubra which is a very abundant grass species in this intertidal zone is not used by the geese.

Young Snow Geese are 80 grams at birth and increase to 1.5 kilograms in eight weeks. To achieve this almost 20-fold increase in weight, the flightless adults are forced to forage for Goose Grass near the nests in -4 to -6 degrees C. temperatures, when mainly only the rhizomes of the plant are available. This "mining" process has led to the exposure of Willow roots, which in turn has caused the demise of the shrubs. During the incubation period in the subzero Celsius temperatures, the females lose 40 % of their body weight. Within 6 to 8 hours after hatching, the young are feeding with the adults on the grazing lawn which is 3 to 5 mm. tall at this stage.

The "ritual" of the birds on the nesting site is as follows :

<u>Arrival</u>	<u>Incubation</u>	<u>Departure</u>
May 13 - 15	May 15 - June 5	August 14

It was found that in ungrazed control plots, forage production consistently dropped off by mid-July. On grazed plots, this production was maintained. In addition, it was found that the quality of forage of grazed plots was better than that of ungrazed plots. The nitrogen (N₂) content of vegetation of grazed plots was 1.5 % higher than that of ungrazed plots.

The explanation of these apparent anomalies is that the vegetation of grazed plots is enriched by the N₂ contained in bird feces. In addition, the abundant blue-green algae on the soil surface of the nesting site fix atmospheric N₂ to provide the vegetation with a second source of N₂. Dr. Jefferies also added during the question period that the saline soils of the nesting area are well supplied with all plant nutrient elements other than N₂, so that additions of this limiting element gives a considerable impetus to vegetation production. There is consistently higher N₂ production throughout the period the geese are on the nesting seasons, even in the first year of grazing.

Captive goslings have been used to test these hypotheses. It was found that the above-ground biomass production

of areas grazed intensively by the goslings was greater than that of ungrazed control plots. Also when the goslings' excrement was removed from some of their grazed plots, it was found that the above ground biomass production was less than plots where feces were left on the plots.

At the end of the birds' stay on the nesting site, it was noted that there was fecal matter on every 6 square inch of grazed areas. Long-term ungrazed control plots indicate that grazing by geese is necessary to maintain a Goose Grass grazing lawn. These plots show Stellaria humifusa and Potentilla (pulchella?) replacing Puccinellia phyanodes.

The Question Period following Dr. Jefferies' presentation brought out the following interesting points :

1. Lesser Snow Geese populations have been going up exponentially over the last decade, although graphs of populations on both summer and winter grounds indicate the population has peaked and is slowly declining at present.
2. An increase in rice and corn crops on the Gulf Coast of the Southeastern U. S. A, are a significant factor in the
3. With regard to the "mining" of Goose Grass rhizomes, the geese can mine 1 square meter of ground in an hour. This grubbing activity occurs prior to and after egg laying. There is an area in the McConnell River nesting site in 1954 was Carex sp. in the hollows and Betula glandulosa and Salix arctophila on the low mounds. At present the mounds are bare and a moss carpet has replaced the sedge cover in the hollows.
4. At McConnell River, the geese are moving out from their nesting area in a "fairy ring" in search of forage.
5. Nitrogen-fixing algae are almost exclusively confined to grazed areas, because the algae experience too much competition from plants on ungrazed areas.
6. In answer to Carrick's question, Dr. Jefferies stated that the Cape Tourmente site in Quebec is suffering the same environmental degradation as at Perouse Bay.
7. Many changes are occurring on the wintering grounds. Reservoirs, especially in Ohio and southern Michigan, are providing new wintering grounds.. Extensions of wintering grounds has caused a mixing of eastern and western populations.

8. Speakman observed that young Snow Geese are coming into the settlement at Eskimo Point to forage in an area adjacent to the town. He asked if this is a recent phenomenon. Dr. Jefferies stated that he was aware of the excellent goose forage at Eskimo Point but he did not know how long this site has been cropped.

9. With regard to the transportation of Goose Grass on an ice flow, Dr. Jefferies cited Sorenson's experience. Sorenson observed great chunks of Goose Grass on an ice flow, he obtained a sample of it, and found that he had no difficulty in growing these plants. Dr. Jefferies stated that even Goose Grass leaves washed ashore can root in the soft shoreline sediments.

10. Savage suggested that the pressure of large numbers of birds returning to the nesting ground will be a more important factor in the current decline of population than deterioration of habitat. Dr. Jefferies agreed and mentioned that in addition the changes on the wintering ground already cited. Texas farmers find that they get a greater return selling rice for goose fodder than selling it for human consumption.

11. Riley suggested that ultimately the deterioration of the environment of the nesting sites will become a factor in the population decline. Dr. Jefferies states that already during the period 1973 to the present, there has been a reduction of 1.5 eggs per clutch and a decline in the numbers of yearlings which return to the nesting grounds after their first migration. He suggested a decline in the quantity and quality of food supply is a probable factor.

12. Martin asked what percentage of potential nesting sites are now being utilized. Dr. Jefferies stated that in Manitoba it is hard to find suitable goose habitat which has not been grazed. However, the question deserves more study.

MEMBERS' NOTES AND OBSERVATIONS

Speakman read an interesting letter from Ken Reading describing his prospecting activities in Central America, his intercourse with the residents and their incredulity that any thing good could come from studying rocks, which they regard as no more than impediments to their agricultural pursuits. Reading also reported finding 3 specimens of a very rare "animal", believed to be Saduria entomon, in the eastern Arctic. Savage had a specimen brought back by one of his students last fall from the mouth of the Horton River. It has been identified as Saduria entomon by Dr. E. L. Bousfield, of the Royal Ontario Museum and the National Museums of Canada.

Meeting adjourned at 9.57 p.m.