

# THE BRODIE CLUB



ROYAL ONTARIO  
MUSEUM OF ZOOLOGY

## THE 1,046th MEETING OF THE BRODIE CLUB

The 1,046th meeting of the Brodie Club was held at 7:30 pm on Tuesday, March 15, 2011 in Room 432 of the Ramsay Wright Laboratories of the University of Toronto.

Chair: Don Sutherland  
Secretary: Ricky Dunn

The meeting was attended by 34: 28 members and 6 guests.

### **Roll Call:**

**Present:** Abraham, E. Addison, Aird, Bertin, Bodsworth, Boswell, Crins, Currie, Curry, Dunn, Eadie, A. Falls, B. Falls, Gray, D. Hussell, J. Hussell, Iron, A. Juhola, H. Juhola, Larsen, Lumsden, Machin, McAndrews, Slessor, Speakman, Sutherland, Tasker, Tomlinson.

**Regrets:** R. Addison, J. Bendall, Y. Bendall, Bryant, Pittaway, J. Rising, T. Rising, Seymour.

**Guests:** Peter Hussell (guest of Erica Dunn), Dave Beadle (Hugh Currie), Sharon Hick (Jock McAndrews), Marty Obbart (Ken Abraham), Eric Davies (Ellen Larsen). Allegra Fryxell attended the meeting as a guest of the speaker.

**Minutes:** Minutes of the February meeting were adopted as circulated (Moved by Curry, seconded by Currie, passed).

### **Announcements and New Business:**

- Ed Addison announced that David Tomlinson recently received a Lieutenant Governor's Ontario Heritage Award for Lifetime Achievement for his contributions in preserving, protecting and promoting Aurora's natural heritage for 25 or more years. David has documented wildlife in natural areas such as McKenzie Marsh and Sheppard's Bush, providing an invaluable record of bird populations in Aurora. In 2003, he inspired the creation of Aurora's Environmental Advisory Committee and was one of its first members. David also developed the Aurora Community Arboretum's Master Plan to preserve and protect the natural environment along the East Holland River. David personally promotes Aurora's ecosystem by leading walking tours as well as other various environmental initiatives such as local tree plantings.



<http://townofauroraontario.blogspot.com/2011/03/some-housekeeping.html>)

- Ed brought brochures on the work of Uta Strelive, an award winning wood carver who carves birds. Uta was a technician at the Ontario Research Foundation and then at the University of Guelph working with Roy Anderson for years.  
[http://www.natureartists.com/uta\\_strelive.asp](http://www.natureartists.com/uta_strelive.asp)
- A letter from Ken Reading to Addisons suggested it would be nice to have more information on fellow Brodie members, so we could know each other better. It was proposed (by Bertin, seconded by Larsen, and passed) that members without mini-bios already on file be invited to submit one (after being given a model). Dunn will attempt to gather bios that have been published in past minutes of the club, so we'll know which members should be approached.
- D. Hussell noted the death of Bill Wasserfall, a founder of the Ontario Bird Banding Association, Point Pelee Banding Station and Long Point Bird Observatory, as well as helping at Hawk Cliff Raptor Banding Station. Bill was the first supplier of mist nets in Ontario, and although inactive in recent years, was a friend and inspiration to many of the older generation of Canadian ornithologists.
- Abraham brought several copies of the Parks Canada Ecological Integrity Statement for perusal.

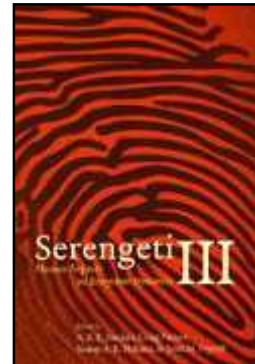
## SPEAKER



Dr. John Fryxell, Department of Integrative Biology at the University of Guelph, spoke on

### Spatial Predatory-Prey Dynamics in the Serengeti.

Dr. Fryxell has spent some 15 years working in the Serengeti, with collaborators, and is author of a book on their research



## **The Ecosystem**

“The Serengeti” refers to an entire grassland ecosystem. Much of it is within Tanzania’s Serengeti National Park and adjacent reserves, with a small portion in Kenya. The park is Tanzania’s biggest tourist attraction and covers 25,000 km<sup>2</sup>. The Serengeti Plains are underlain by impervious soils that discourage tree roots, but are enriched by volcanic ash which support the fertile grasslands. In the north and west these grasslands meld into savannah woodlands, which actually make up the bulk of the park.

Temporal and spatial variations in rainfall are key factors in the functioning of this ecosystem. Rainfall in the wet season (November to May) varies annually, from 500 to 1400 mm, depending in part on ENSO events. Early in the season the centre of rainfall is in the southeast, then it sweeps to the northwest. On average, there is more rain in the north and northwest, while the southeast plains are as dry as the Okanagan in BC or the U.S. Southwest. These patterns combine to make a gradient in overall productivity, with the richest areas in

the southeast during the wet season, but with better grazing in the northwest once the grassy plains dry out.

## Wildebeest

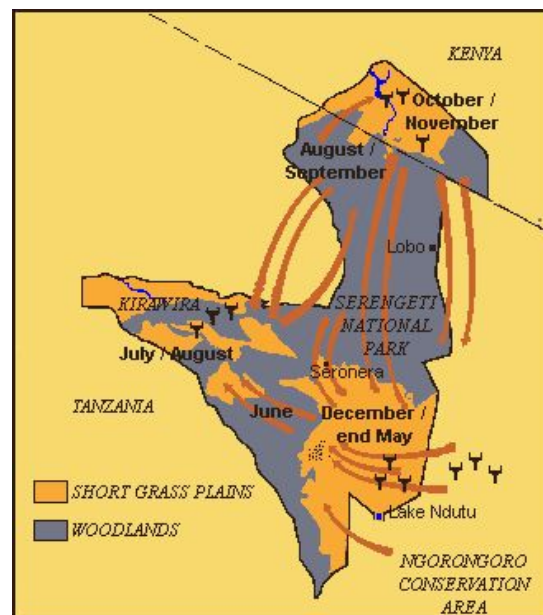


Ruminants are very good at detecting the conditions of their forage, and some of the 18 species that co-exist in the Serengeti have annual migrations that follow the rainfall. Migration supports larger population sizes, and the most numerous of the migrants is the wildebeest. (Zebra, and to a lesser extent, Thomson's gazelle, are also migratory.) Around 1880 the cattle disease, Rinderpest, reached sub-Saharan Africa, devastating native ruminant populations. A pan-African inoculation program in the 1960s led to a huge increase in the Serengeti wildebeest population

which rose from 200,000 to 1.5 million before levelling off. Coincident with the population increase, there was a decrease in the amount of food available per wildebeest (as well as a decline in the number of lions turning to man-eating). Studies of wildebeest mortality have shown that the main cause of the population levelling off was death to starvation (78% of all mortality), with drowning, predation, poaching, etc. having relatively little effect. These facts underline the importance of forage conditions to wildebeest, and its role in their spectacular migration.

Wildebeest follow the seasonal rains from the southeast to the northwest, then to the northeast towards Kenya, and back to the southeast when the next rainy season begins. Satellite tracking has documented many individual routes. While the initial moves to the northwest follow the direction of some major rivers, there does not seem to be any tendency to follow rivers per se; and indeed, lions prefer to hunt close to rivers because there are more gullies and shrubs where they can hide.

The decline in wildebeest 100 years ago led to an increase in tree density on the savannahs, but now the herds prevent most young trees from becoming established. Grasslands are expanding, and controlled burns are also used now to maintain grassland extent and quality.



Fryxell and colleagues developed a model that predicts wildebeest movement, based on three key elements: (1) spatial and seasonal variation in rainfall, (2) wildebeest responses to local forage conditions such that they tend to prefer places with grass of intermediate height that offers highest energetic gains, and (3) a constant underlying gradient of plant quality with

lowest nutritional quality in the northwest and highest nutritional quality in the southeast. The model was used to predict what might happen to the wildebeest population as the result of a proposed highway across the northern Serengeti that would bar the herd moving into Kenya during the latter part of the wet season. Although the road would cut off only 5-10% of the park, the model predicts that wildebeest population would be reduced by 25-50%.

### **Predator-Prey Interactions**

Wildebeest are preyed upon by lions, and their social behaviour appears to be strongly affected by that fact. Computer simulations showed that a lion moving across the landscape is far less likely to encounter wildebeest if the latter are clumped into groups of about 5-25 than if they are spread out singly. Lions need to be within 200m to detect prey.

Lions also travel in groups – which in reality reduces their ability to detect prey. Studies have shown that prides of about six females are more successful at their hunts than are smaller groups. In part this is because females need to stay together to defend their territory from other prides. However, daily food intake generally goes down with increasing size of pride (except for groups feeding on buffalo, which require more lions to kill), and this relationship probably sets the upper limits on pride size.



As with the wildebeest, lion prides are affected by the gradient of rainfall across the Serengeti. Unlike the latter, however, the reproductive rate of lions is higher in the northwest than in the dryer southeast, despite the fact that wildebeest calve in the southeast. Wildebeest productivity is most affected by quality of grass, while the lion reproductive success may be most affected by amount of alternate prey in the season when wildebeest are not present.

### **QUESTIONS:**

*Are lions confined to their territories?*

Some animals do follow the herds, but these are mainly lone males. If a pride moves, it loses its territory.

*Prior to 1890 (when wildebeest were decimated), were there more trees than now?*

Hard to know, but possibly not, as there would have been a higher density of herbivores to keep them under control.

*During the rapid wildebeest population growth in 1960s and 70s, what happened to lion populations?*

Possibly not much. Lions do thrive in high rainfall years when there are lots of young wildebeest, but about half their prey base is non-migratory, so they can keep going without that seasonal bonanza.

*Most of the wildebeest migration is within park boundaries – is that because the park was set up to encompass the migration, or because the animals have learned to stay within protected*

*area?* Possibly a bit of both, especially in the west where human population density just outside the park is high and growing.

*In calculating lion reproductive success, was an adjustment made for take-overs?*

Yes- it's hard for a male to keep a pride for more than a couple of years. Adjustment was also made for lion population density.

*Has the Kenyan government objected to the proposed highway through the park?*

Yes, as tourism to their part of the Serengeti would be affected – but they would also benefit from the development that would come with the road. The Tanzanian President has not been persuaded by the wildebeest population model or Kenya's objections, but Germany has offered to pay for routing the road around the park. The matter is still up in the air.

*When and where do most wildebeest deaths from malnutrition occur?*

Mostly in the six to eight weeks of the dry season, and especially in Kenya, where the population is concentrated by the end of the wet season.

*What happens to the sedentary ruminants when the wildebeest leave?*

Predation rates go up. However, when the wildebeest are present they compete for food, and as they are ten times more abundant than the sedentary species, that negative effect may be as serious as increased predation during the rest of the year. Most of the non-migratory species have specialized niches and food sources that get them through the dry season.

Ken Abraham thanked the speaker, who kindly offered to answer any additional questions via email (jfryxell@uoguelph.ca)

## **NOTES & OBSERVATIONS**

- Oliver Bertin noted an article in *Ontario Sailor Magazine* (March 2011) on the death of Charlie, a Trumpeter Swan that was a fixture in Bluffer's Park (Scarborough) for 18 years, and very popular with local residents despite his feisty character. He was euthanized by Toronto Wildlife Centre in November after catching himself in two treble fishing hooks. Charlie "was almost single-handedly responsible for repopulating the area" with Trumpeters, having raised 35 cygnets (5 in 2010) with his long-standing mate Jet (named after her tag, "747"). Some of his offspring were leucistic, a rare colour variation with orange feet.
- Oliver reported seeing a cormorant in Toronto Harbour that was as gray as a Great Blue Heron.
- Jean Iron showed a Ministry of Natural Resources calendar that has an outdoor theme each year and is illustrated by, and provided to, school children in the Hudson Bay Lowland. It also contains photos and explanatory text. This year's theme was "healthy birds and healthy habitats," and was very well done.
- David Tomlinson saw an American Crow carrying twigs for nest building on 3 March, a very early date.

- Jock McAndrews reported a brown variant of the gray squirrel at his feeder, and asked how rare this might be. Many members reported seeing them occasionally, among the usual gray and black morphs. J. Hussell reported a local population of “blonde” gray squirrels in Kingston, Ontario.



A Kingston squirrel

### **NEXT MEETING**

The next meeting will be held Tuesday, April 19 at 7:30 pm in Room 432 of the Ramsay Wright Zoological Laboratories. Locke Rowe (University of Toronto) will speak on the breeding behavior of water striders.

The meeting was adjourned at 9:02 p.m.