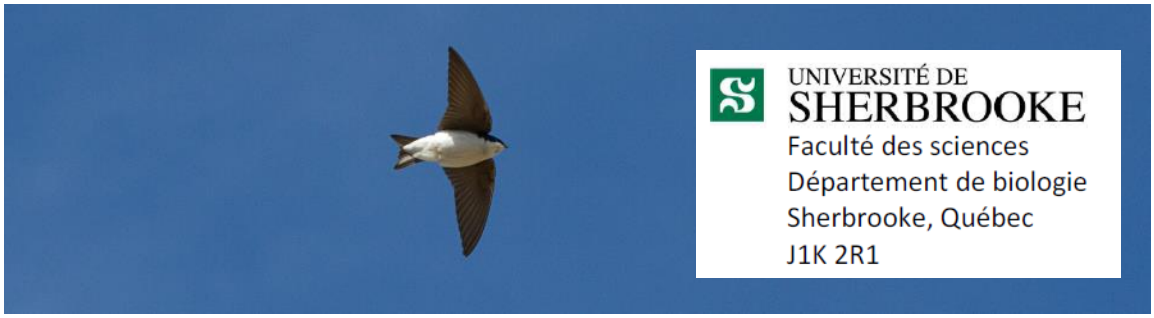

UNIVERSITÉ DE SHERBROOKE
Faculté des sciences
Département de biologie
Sherbrooke, Québec
J1K 2R1

Dear participants,

The tree swallow project is now on its twelfth season! We would like to take the opportunity to thank you for your perpetual welcome and support. By allowing us to access your lands, you represent a fundamental basis of our project. Thanks to you support, six students are now pursuing their graduate studies.

Ongoing projects

Emilie Lefol is a new PhD candidate since May 2015. Broadly, she is interested by factors influencing extra-pair relations in the tree swallow. Indeed, tree swallows can have multiple sexual partners. More precisely, she investigates the links between genetics, morphological characteristics (plumage coloration, body size and mass), and the choice of partners. You might have the chance to meet her on the field during the upcoming seasons!

Nghia Tran started his master's in 2015. He studies the parental effort, namely the effort that adults provide to rear chicks. In order to have a global idea of the parental effort, Nghia is interested by the investment in eggs, incubation behavior and young provisioning. He also seeks to understand the various factors influencing incubation behavior.

Audrey Turcotte started her master's in September 2014 and assesses the effect of a blood parasite infection, the avian malaria, on individual reproductive capacity. Her objective is also to determine the parasite distribution in the study system and the environmental characteristics affecting the probability of infection. Preliminary results are showing a 20% average of the adults infected by avian malaria. During summer 2015, blood samples taken from nestlings a few days before fledging revealed that 18% of the nestlings were infected on average. As previous knowledge assumed transmission to occur only on wintering grounds, this result confirms that the disease is also transferred during the reproductive period.

During her master's, Geneviève Coudé studied the impact of landscape composition on female mating strategies. It is largely known that a female can copulate with multiple males to fertilize their eggs. In fact, in 90% of cases, the male attending a nest provides care to young that are not his own! In the light of her analyses, the number of fathers and extra-pair young per nest decrease when the landscape is not favorable to movements, but increases when the density of potential partners is high. Females also tend to seek partners far away when the surrounding males are infected by parasites that chew holes in their feathers.

Clarence Schmitt started her PhD in 2012 and investigates the tree swallow's immune responses. All living organisms have an immune system that protects them against pathogens like bacteria and viruses. The capacity to overcome micro-organisms can vary according to numerous factors, e.g. the environment in which the bird lives and his genetics. Clarence recently observed that swallows nesting in farms closer to Montreal had a better immunity than the ones nesting closer to Sherbrooke. Factors like agricultural intensification could be involved. She now works on estimating how genetic variation affects the capacity to fight against pathogens, an important aspect for survival, evolution, and species conservation.

Audrey Bourret is finishing her PhD on the genetic bases of different morphological traits (e.g. body mass) and reproductive traits (e.g. laying date). For her research, she investigates the effect of the environment (landscape, environmental conditions) on genetic variation and the possible evolutionary outcomes of these traits in response to natural selection pressures. Her work aims at improving our understanding of species adaptation mechanisms to environmental changes.

2015 statistics

Year 2015 was a good one for tree swallows in our study system. The nest box occupancy rate was 65%, which is higher than last years' occupancy (58%). Nest box occupancy rate by house sparrows continued to stagnate below 20%. The reproductive performance slightly decreased compared to last year: 65% of all laid eggs have hatched, and 73% of nestlings have fledged, respectively 11 and 10 % less than last year. 2014 and 2015 occupancy rate and nestling survival

still remain relatively good. This could be due to clement meteorological conditions. For more details, we added in the appendix a summary table of nest box occupancy and some reproduction statistics for tree swallows on each farm as well as the evolution of the total number of nestlings produced since 2004 in figure 1. We also included a figure 2 which shows a tendency for female tree swallows to lay their eggs earlier, an indirect effect of climate change.

Also, we make available to you the climate data we collected on your lands from mid-April to mid-July (temperature taken every hour and precipitations every two days). If you wish to retrieve these data or for any question or comments, please contact Professor Marc Bélisle (contact details below). Also, do not hesitate to contact him for any modification or nest box damage in order to facilitate the repair that takes place each spring.

To conclude, we would like to express our gratitude for your precious collaboration in this project which brings interesting and valuable discoveries every years!

Best regards,

Marc Bélisle
Professeur agrégé
Laboratoire d'écologie spatiale et écologie du paysage
Tel: 819-821-8000 #61313
Email : Marc.M.Belisle@USherbrooke.ca

Dany Garant
Professeur titulaire
Laboratoire d'écologie moléculaire et évolutive

Fanie Pelletier
Professeure agrégée
Laboratoire de démographie évolutive et conservation

Table 1. Productivity of the 41 farms for seasons 2014 and 2015, in number of nests per species. The number of fledglings is written in brackets for the tree swallow.

Farm	2014			2015		
	Tree swallow Nests (fledglings)	Eastern bluebird Nests	House Sparrow Nests	Tree swallow Nests (fledglings)	Eastern bluebird Nests	House Sparrow Nests
1	10 (43)	0	0	18 (13)	0	0
2	0 (0)	0	17	0 (0)	1	15
3	7 (18)	3	0	11 (29)	2	0
4	9 (53)	0	0	10 (52)	0	0
5	8 (11)	0	0	6 (9)	0	0
6	3 (10)	0	8	1 (6)	0	8
7	9 (38)	0	9	7 (0)	0	4
8	2 (3)	0	13	3 (2)	0	9
9	6 (23)	1	0	10 (26)	1	0
10	3 (9)	0	10	3 (0)	0	13
11	2 (11)	0	0	4 (5)	0	0
12	5 (10)	2	0	6 (21)	1	0
13	3 (11)	1	0	4 (8)	1	0
14	11 (28)	1	0	14 (10)	0	0
15	13 (50)	0	0	12 (42)	0	0
16	9 (29)	1	0	14 (26)	0	0
17	6 (17)	0	0	6 (23)	0	0
18	7 (30)	0	0	9 (24)	0	0
19	4 (15)	0	2	6 (0)	0	4
20	5 (12)	0	0	10 (19)	0	0
21	3 (5)	0	0	3 (13)	0	0
22	11 (32)	1	0	7 (22)	0	4
23	11 (47)	0	0	12 (45)	0	0
24	7 (23)	0	0	8 (26)	0	0
25	4 (4)	0	3	6 (2)	0	4
26	10 (39)	0	0	10 (37)	0	0
27	3 (5)	0	9	5 (16)	0	6
28	9 (20)	0	0	7 (17)	0	1
29	5 (19)	0	4	6 (0)	0	7
30	4 (13)	1	9	6 (18)	0	5
31	9 (35)	0	2	10 (35)	0	3
32	6 (21)	0	0	9 (24)	0	0
33	4 (11)	0	3	6 (15)	0	2
34	2 (2)	0	2	1 (3)	0	0
35	10 (23)	1	0	9 (27)	1	0
36	7 (19)	0	0	8 (20)	0	0
37	9 (34)	0	0	10 (38)	0	0
38	10 (34)	0	0	12 (40)	0	0
39	4 (8)	0	7	2 (11)	0	9
40	2 (7)	0	0	6 (15)	2	0
41	9 (23)	0	5	10 (13)	0	2

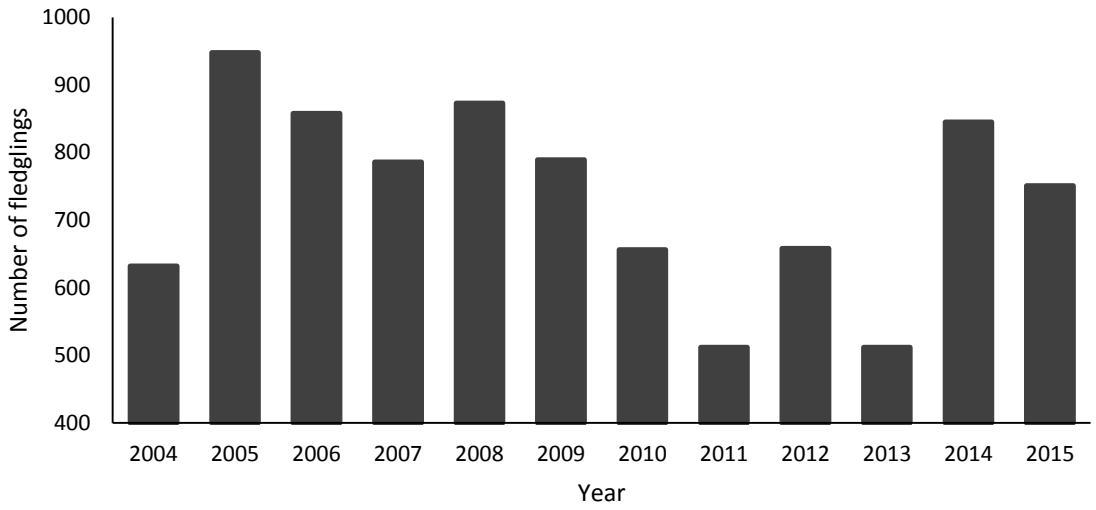

Figure 1. Total number of fledglings produced in the study system as a function of time. The system includes 400 nest boxes.

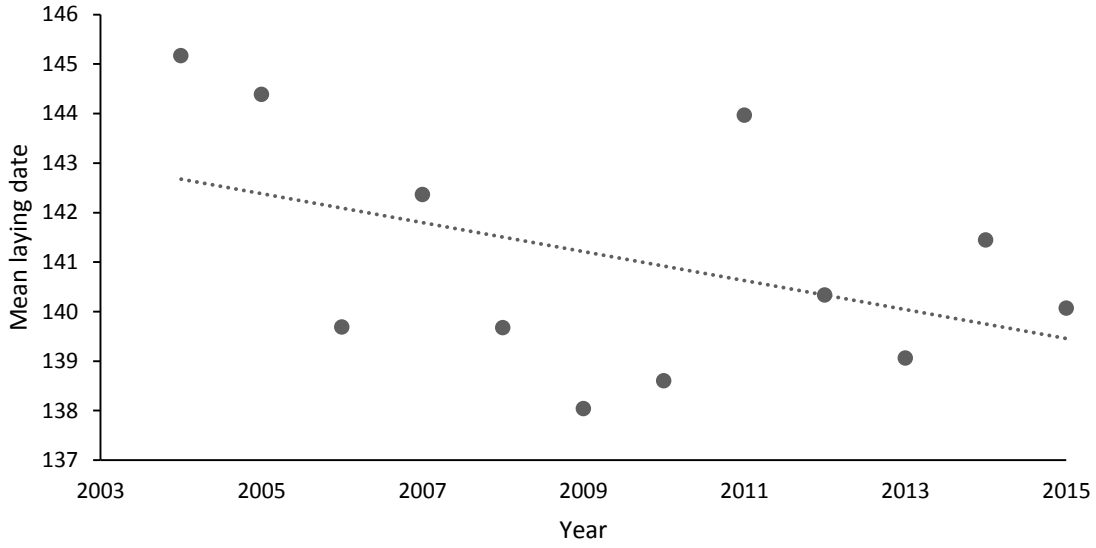

Figure 2. Tree swallow mean laying date as a function of time. The earliest date in Julian day (137) equals to May 17, and the latest date (146) equals to May 26, for non-leap years.