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Male Yellow-headed Blackbirds / carouge à tête jaune mâle at Oak Hammock Marsh, Manitoba. Photo by/par Barbara Bleho.

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Editors' Message

Rob Warnock and Barbara Bleho

Welcome to the second issue of *Picoides* of 2017! We hope everyone had a great start to spring and summer!

In this issue, we have the President's message, 2017 SCO-SOC election announcement, 2017 SCO-SOC Student Research Awards announcement, two student awardee reports, four thesis abstracts in Canadian Ornithology, a book review and a notice for 2018 IOC in Vancouver. Please check them all out.

In the President's message, Ken Otter discusses the improving membership numbers, and the ongoing President's membership drive challenge (Ken will look great in his new 'official uniform' if we meet the membership goal of 300 new and renewed memberships by this summer (70 more to go at time of writing)). Ken also briefly discusses, the student research award recipients, the recent SCO-SOC election, our upcoming joint meeting with American Ornithology in August in East Lansing, MI and concludes his message by plugging for submissions to *Picoides*. Thanks, Ken!

We congratulate the 2017 Student Research Award recipients. They are Amélie Roberto-Charron, University of Manitoba, Taverner Award; Devin de Zwaan, University of British Columbia, Taverner Award; Shannon Whelan, McGill University, Baillie Award; and Leanne Grieves, University of Western Ontario, Fred Cooke Award. Check out their project summaries in this issue. We look forward to learning more about their fascinating research from their future reports in *Picoides*.

We also congratulate all candidates who stood for SCO-SOC election this year and we welcome Dorothy Hill, Andy Horn and Beth MacDougall-Shackleton to the SCO-SOC council. Congratulations to Greg Mitchell on his re-election as Recording Secretary.

This issue concludes with Ken Otter's detailed review of the book, *Cat Wars*. Check it out.

The next *Picoides* submission deadline is October 15, 2017. Without submissions, there is no *Picoides*. Please keep the submissions coming. We prefer larger issues than smaller ones. Also, we welcome feedback from our readership as it is your publication. Have a safe and wonderful summer!

FRANÇAIS— *Message des éditeurs—Rob Warnock et Barbara Bleho*

Bienvenue dans le deuxième numéro de *Picoides* de 2017! Nous espérons que tout le monde a eu un bon début de printemps et l'été!

Dans ce numéro, nous avons le message du président, l'annonce électorale SCO-SOC 2017, l'annonce des prix de recherche d'étudiants SCO-SOC 2017, deux rapports de boursiers étudiant, quatre résumés de thèse en ornithologie canadienne, une revue de livre et un avis pour IOC 2018 à Vancouver. Veuillez les vérifier tous.

Dans le message du président, Ken Otter discute de l'amélioration des effectifs et du défi du président en cours afin d'augmenter le nombre d'adhésion (Ken va être joli dans son nouvel « uniforme officiel » si nous atteignons l'objectif de 300 nouvelles adhésions ou renouvelées d'ici cet été (il en manque 70 au moment de la rédaction de ce document)). Ken discute également brièvement des récipiendaires des prix de recherche d'étudiants, des récentes élections SCO-SOC, de notre prochaine réunion conjointe avec l'American Society en août prochain à East Lansing (MI) et conclut son message en sollicitant des soumissions pour *Picoides*. Merci, Ken!

Nous félicitons les récipiendaires du Prix de recherche étudiante 2017, que ce soit Amélie Roberto-Charron (Université du Manitoba) pour le prix Taverner; Devin de Zwaan (Université de la Colombie-Britannique) pour le prix Taverner; Shannon Whelan (Université McGill), pour le prix Baillie; et Leanne Grieves (Université de Western Ontario) pour le prix Fred Cooke. Consultez leurs résumés de projets dans ce numéro. Nous sommes impatients d'en apprendre davantage sur leurs fascinantes recherches lors de la publication de futurs rapports dans *Picoides*.

Nous félicitons également tous les candidats qui ont participé aux élections SCO-SOC cette année et nous accueillons Dorothy Hill, Andy Horn et Beth MacDougall-Shackleton au conseil SCO-SOC. Félicitations à Greg Mitchell pour sa réélection en tant que secrétaire.

Ce numéro se conclut par l'examen détaillé de Ken Otter du livre, Cat Wars. C'est à voir !

La prochaine date limite de soumission des Picoides est le 15 octobre 2017. Sans vos soumissions, il n'y a pas de Picoides. Veuillez poursuivre vos soumissions. Nous préférons les numéros plus fournis que les plus petits. En outre, nous accueillons les commentaires de nos lecteurs, car c'est votre publication. En vous souhaitant un très bel été !



Follow SCO on Twitter! Follow us @SCO_SOC for news, exciting research, updates from members, and more!

Suivez SOC sur Twitter! Suivez-nous @SCO_SOC pour les nouvelles, la recherche passionnant, mises à jour des membres, et plus encore!



Northern Saw-whet Owl fledglings northeast of Prince Albert, Saskatchewan. Photo by Ed Rodger.

President's Message

Ken Otter

Over the past few months, the council has been very busy with overseeing elections, awards committees and planning for this summer's joint meeting with the AOS. The conservation committee undertook a review of the Recovery Plan for the Bicknell's Thrush, and I would like to thank Joe Nocera for pulling together a group of people to take on this important task for the society.

The meeting this summer is looking to be a good one, and I encourage you all to join us in Michigan. There have been over 400 abstracts submitted and the local committees, travel awards committees and scientific program committees have all been very active to make this a memorable event. However, for those who want to see me wearing a Parrot costume, we are still going to have to push for more members – we are currently sitting in the mid 230's (definitely up from this time last year) but the challenge was for 300, so please keep spreading the word.

In this issue, we also are announcing those newly elected to council – Andy Horn, Beth MacDougall-Shackleton and Dorothy Hill. They will begin their terms this fall, and I would like to offer them my congratulations, and am looking forward to working with them. I would also like to thank those who let their names stand, and encourage all members to get involved in council. We will be looking for new people to let their names stand for next year!

Also in this issue is the announcement of this year's student awards winners – Congratulations to all of you. We also have reports from several of last year's winners, and I look forward to also seeing some of these people present at this summer's meeting. For all students, whether you win awards or not, we would love to hear about your research, so please submit abstracts or summaries of your work for publication in *Picoides*. You can spice these up with images of yourself and/or your study species, and it is a great way to make sure your peers know about your work

Finally, I would like to thank both Rob Warnock and Barbara Bleho for their work putting these excellent issues of *Picoides* together. In preparing this message (and starting back when I was the society's webmaster), I went back through our back history of *Picoides* over the years. It has been fascinating to see the evolution of our society's voice over the years. Having been a society Newsletter editor in the past, I can attest to the huge amount of time and effort that gets put into preparing something of this nature. Rob has been overseeing *Picoides* since the first issue of 2006! By my accounting, that makes me the 7th President he has worked with during his tenure, and it certainly gives him the distinction of being the longest-standing officer currently in the society's council. Barbara has been co-editor since 2013, also spanning a few presidents herself. The society owes both of you a debt of gratitude! One way we can all do this is to submit material for future issues. Put your names forward to have your work highlighted, submit reviews of books or commentaries that may be of interest to the society. *Picoides* is your voice – help us maintain the excellent publication it is.

FRANÇAIS— *Message du président— Ken Otter*

Au cours des derniers mois, le conseil a été très occupé à superviser les élections, les comités de prix et bourses et la planification de la réunion conjointe de cet été avec l'AOS. Le comité de conservation a entrepris un examen du Plan de rétablissement de la Grive de Bicknell et j'aimerais remercier Joe Nocera d'avoir mené un groupe pour assumer cette importante tâche pour la société.

La réunion de cet été devrait à être intéressante et je vous encourage tous à nous rejoindre dans le Michigan. Plus de 400 résumés ont été soumis et le comité local, le comité des bourses de voyage et celui de la programmation scientifique ont tous été très actifs afin de nous offrir une conférence mémorable. Cependant, pour ceux qui veulent me voir porter un costume de perroquet, nous devons encore faire augmenter le nombre de membres - nous sommes actuellement arrêtés à environ 235 (définitivement plus que l'année dernière à pareille date) mais le défi est pour 300, alors continuez à diffuser le mot.

Dans ce numéro, nous annonçons également les nouveaux élus au conseil - Andy Horn, Beth MacDougall-Shackleton et Dorothy Hill. Ils commenceront leur terme cet automne, j'aimerais les féliciter et je suis impatient de travailler avec eux. Je tiens également à remercier

ceux qui quittent leur poste et j'encourage tous les membres à s'impliquer dans le conseil. Nous serons à la recherche de nouvelles personnes pour des positions au conseil l'année prochaine !

Également dans ce numéro figure l'annonce des lauréats des prix étudiants de cette année - Félicitations à vous tous. Nous avons également des rapports de plusieurs des gagnants de l'année dernière et je suis impatient de rencontrer certaines de ces personnes lors de la réunion de cet été. Pour tous les étudiants, que vous gagniez ou non des prix, nous aimerions en connaître davantage sur vos recherches, alors soumettez des résumés de votre travail pour publication dans *Picoides*. Vous pouvez les agrémenter avec des images de vous-même ou de vos espèces d'étude et c'est une excellente façon de vous assurer que plusieurs de vos pairs connaissent votre travail

Enfin, j'aimerais remercier à la fois Rob Warnock et Barbara Bleho pour leur travail à assembler tous ces excellents numéros de *Picoides*. En préparant ce message (et du temps où j'étais le webmaster de la société), je suis retourné dans le passé de *Picoides*. Il est fascinant de voir l'évolution de la voix de notre société au cours des années. Ayant été éditeur de bulletin de la société dans le passé, je peux attester de l'énorme quantité de temps et d'efforts nécessaire à la préparation d'un document de cette nature. Rob travaille à *Picoides* depuis le premier numéro de 2006 ! Selon mes calculs, cela me fait le 7^e président avec lequel il a travaillé pendant son mandat et cela lui confère certainement l'honneur d'être le plus ancien actuellement au conseil de la société. Barbara a été co-éditeur depuis 2013, couvrant également quelques présidents. La société vous doit tous deux une fière chandelle ! L'une des façons de les remercier est de soumettre du matériel pour les futurs numéros. N'hésitez pas à soumettre des articles présentant vos travaux, soumettez des commentaires sur des livres ou des commentaires susceptibles d'intéresser la société. *Picoides* est votre voix - aidez-nous à maintenir l'excellente publication qu'il est.

Welcome New and Re-elected Members of SCO-SOC Council

We welcome the three new Councillors who have been elected: Dorothy Hill, Andy Horn, and Beth MacDougall-Shackleton. Thank you to all five candidates for allowing your name to stand in this election, and for your willingness to give your time and expertise to the SCO-SOC. We also welcome Greg Mitchell who has been elected for a second term as Recording Secretary.

Bienvenue aux nouveaux et les membres réélus du Conseil SCO-SOC

Nous accueillons les trois nouveaux conseillers élus: Dorothy Hill, Andy Horn, et Beth MacDougall-Shackleton. Merci à tous les cinq candidats pour permettre à votre nom de se tenir dans cette élection, et pour votre volonté de donner votre temps et votre expertise au SCO-SOC. Nous accueillons également Greg Mitchell qui a été élu pour un deuxième mandat en tant que secrétaire d'enregistrement.

2017 Student Awards Recipients

On behalf of the Society of Canadian Ornithologists/Société des ornithologues du Canada and Bird Studies Canada, the SCO-SOC Student Awards Committee wishes to congratulate the four 2017 SCO-SOC Student Award winners. We received many outstanding applications from across Canada, making it a challenge for this year's committee members (Ken Abraham, Ministry of Natural Resources and Forestry; Marc Avey, Public Health Agency of Canada and University of Ottawa; Andy Horn, Dalhousie University; Ken Otter, University of Northern BC; Greg Robertson, Environment Canada; Colleen Barber, Saint Mary's University) to select this year's recipients. We would like to thank all those who applied and encourage those not selected this year to try again in 2018.

Au nom de la Society of Canadian Ornithologists / Société des ornithologues du Canada et Bird Studies Canada, le Comité des prix des étudiants SCO-SOC tient à féliciter les quatre lauréats du prix étudiant SCO-SOC 2017. Nous avons reçu de nombreuses demandes exceptionnelles de partout au Canada, ce qui en fait un défi pour les membres du comité de cette année (Ken Abraham, Ministère des Richesses Naturelles et des Forêts, Marc Avey, Agence de la santé publique du Canada et Université d'Ottawa; Andy Horn, Université Dalhousie, Ken Otter, Université du Nord de la Colombie-Britannique, Greg Robertson, Environment Canada, Colleen Barber, Université Saint Mary's) pour sélectionner les bénéficiaires de cette année. Nous tenons à remercier tous ceux qui ont postulé et nous encourageons ceux qui ne sont pas sélectionnés cette année à tenter à nouveau en 2018.

2017 Baillie Award

Shannon Whelan, Ph.D., McGill University

Linking laying date plasticity to foraging behaviour in sub-Arctic seabird



Shannon Whelan. Photo by/par
Hannes Schraft.

Climate change is shifting the timing of ecological events in taxa across the globe. These shifts are happening at different rates within food webs and can create “mismatches” between predators and their prey. Within populations, some individuals are better able to adjust to environmental change. For example, individuals can vary in their ability to advance timing of reproduction in response to warming temperatures. However, the mechanisms driving these individual differences remain unclear. I hypothesize that individual differences in foraging efficiency drive variation in reproductive timing in a warming climate. To test this hypothesis, I will examine the relationship between foraging efficiency and laying date plasticity in an Arctic-breeding seabird, the black-legged kittiwake (*Rissa tridactyla*), utilizing a long-term breeding dataset, historical climate data, and modern bio-logging technology. This study will provide insight on the role of foraging behaviour in phenological plasticity and predict the degree to which black-legged kittiwakes will be able to cope with future climate change.

*Les changements climatiques modifient le calendrier des événements écologiques des taxons à travers le monde. Ces décalages se produisent à différents niveaux dans les réseaux alimentaires et peuvent créer des «disparités» entre les prédateurs et leurs proies. Dans les populations, certains individus sont meilleurs à s'adapter au changement environnemental. Par exemple, les individus peuvent varier dans leur capacité à devancer le calendrier de reproduction en réponse aux températures du réchauffement. Cependant, les mécanismes qui influencent ces différences individuelles demeurent méconnus. Je pose l'hypothèse que les différences individuelles dans l'efficacité d'alimentation entraînent une variation dans le moment de la reproduction sous un climat qui se réchauffe. Pour tester cette hypothèse, j'examinerai la relation entre l'efficacité d'alimentation et la plasticité de la date de ponte d'un oiseau de mer, la Mouette tridactyle (*Rissa tridactyla*), utilisant un ensemble de données à long terme sur la reproduction, les données climatiques historiques et une technologie moderne en biologie (bio-logging). Cette étude fournira un aperçu du rôle du comportement d'alimentation dans la plasticité phénologique et de prévoir jusqu'à quel degré les Mouettes tridactyle seront en mesure de faire face aux changements climatiques futurs.*

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2017 Taverner Award

Amélie Roberto-Charron, M.Sc., University of Manitoba

Shedding light on the migratory connectivity of a threatened neotropical migrant, the Canada Warbler (*Cardellina canadensi*)

The Canada Warbler is a threatened Neotropical migrant that has declined by 2.3 percent per year (1966 to 2012). The cause of the decline is hypothesized to be linked to wintering grounds activities as Canada Warbler overwintering habitat is one of the most globally threatened. Interestingly, the decline is inconsistent across the breeding range with populations in the east experiencing more pronounced declines than in the west. This may be the result of strong migratory connectivity, where populations that breed together also overwinter together. We propose to identify the migration routes and migratory connectivity of this species through the use of light-level archival tracking devices, known as geolocators, to better understand the cause of the decline, to focus conservation efforts and to ultimately stop the decline.



Amélie Roberto-Charron. Photo by/par Kevin Methuen.

La Paruline du Canada est un migrant néotropical menacé dont la population a diminué de 2,3 pourcents par an (1966 à 2012). La cause du déclin est supposée être liée aux activités sur les aires d'hivernage alors que l'habitat hivernal de la Paruline du Canada est l'un des plus menacés à l'échelle mondiale. Il est intéressant de noter que le déclin est inconsistant à travers son aire de reproduction alors que les populations de l'est présentent des déclin plus prononcés que celles dans l'ouest. Ceci peut être le

résultat d'une connectivité migratoire forte, où les populations qui se reproduisent hivernent ensemble. Nous proposons d'identifier les itinéraires de migration et la connectivité migratoire de cette espèce grâce à l'utilisation de dispositifs de suivi d'archivage au niveau de la lumière, connus en tant que géolocaliseurs, pour mieux comprendre la cause du déclin, pour concentrer les efforts de conservation et pour finalement arrêter le déclin.

Devin de Zwaan, Ph.D., University of British Columbia

Nestling development under pressure: high elevation, stochastic weather, and predation risk

Nestling development is a critical life-stage for songbirds, as growth patterns influence recruitment and adult fitness. Yet, nestling growth and development is constrained by weather and predation risk. Research on nestling development tends to be biased towards certain systems (i.e., nest boxes) and lacks a comprehensive understanding by focusing on influential proximate factors in isolation,



Devin de Zwaan. Photo by/par Devin de Zwaan.

without considering interaction effects. Using an alpine population of Horned Lark (*Eremophila alpestris*) with high developmental variance, I will examine the influence of nest-specific perceived predation risk and weather on nestling: (1) growth rate and resource allocation, and (2) corticosterone ('stress' hormone) response. Since altricial songbird nestlings are dependent on parental care, I will also investigate these responses directly, and as mediated by condition-dependent parental behaviour. This research addresses development consequences for a ground-nesting songbird in response to stochastic weather and predation risk, both of which are expected to increase under climate change projections.

Le développement des jeunes au nid est un stade de vie critique pour les oiseaux chanteurs, car les patrons de croissance influencent le recrutement et la condition physique des adultes. Pourtant, la croissance et le développement des jeunes sont

contraints par le temps et le risque de prédation. La recherche sur le développement de nidification tend à être biaisée à l'égard de certains systèmes (e.g. les nichoirs) et manque de compréhension globale en mettant l'accent sur des facteurs proximaux qui influencent

l'isolement, sans tenir compte des effets d'interaction. En utilisant une population alpine d'Alouette hausse-col (Eremophila alpestris) avec une forte variance de développement, j'examinerai l'influence du risque de prédation perçue spécifique au nid et du temps sur le nid: (1) le taux de croissance et l'allocation des ressources, et (2) la réponse de corticostérone (l'hormone de stress). Étant donné que les jeunes oiseaux chanteurs altriciaux dépendent des soins parentaux, j'étudierai également directement ces réponses et l'effet indirect par un comportement parental dépendant de la condition. Cette recherche porte sur les conséquences pour le développement d'un oiseau chanteur qui niche au sol en réponse aux événements stochastiques de la météo et au risque de prédation, lesquels devraient augmenter en fonction des projections de changement climatique.

2017 Fred Cooke Award

Leanne Grieves, Ph.D., University of Western Ontario

Do preen gland bacterial communities mediate chemical communication and MHC-related mate choice in song sparrows?

Major histocompatibility complex (MHC) genes are a cornerstone of the vertebrate immune system. Many animals prefer mates dissimilar to themselves at MHC because the resulting MHC-diverse offspring are protected against a wider array of diseases. Some vertebrates assess the MHC of potential mates using smell but in birds, while some species apparently prefer MHC-dissimilar mates, the mechanism for assessing MHC remains unknown. New research indicates that birds' preen oil conveys information about MHC,



Leanne Grieves. Photo by/par Luc Peters.

potentially mediated by preen-gland bacteria, which suggests that olfaction may be important for avian mate choice. I will use a Y-maze to test whether song sparrows prefer preen oil from MHC-dissimilar over MHC-similar birds of the opposite sex. I will also assess population differences in MHC, preen oil, and preen gland bacteria of song sparrows at two sites in Ontario. This research could provide some of the first evidence for odour-based mate choice in birds.

Les principaux gènes du complexe d'histocompatibilité (MHC) sont une partie importante du système immunitaire des vertébrés. Beaucoup d'animaux préfèrent les compagnons avec un MHC dissemblables à eux-mêmes parce que les descendants issus de MHC dissemblables sont protégés contre une plus large gamme de maladies. Certains vertébrés évaluent le MHC des partenaires potentiels en utilisant l'odeur alors que certaines espèces préfèrent apparemment les compagnons dissemblables avec le MHC, mais chez les oiseaux, le mécanisme d'évaluation du MHC reste inconnu. De nouvelles recherches indiquent que l'huile de la glande uropygienne des oiseaux transmet de l'information sur le MHC, potentiellement influencé par les bactéries de la glande uropygienne, ce qui suggère que l'olfaction peut être importante pour le choix du

partenaire aviaire. J'utiliserai un labyrinthe Y pour examiner si les bruants chanteur préfèrent l'huile uropygienne du sexe opposé qui est dissemblable au MHC par rapport aux oiseaux semblables au MHC. Je vais également évaluer les différences dans le MHC, l'huile uropygienne, et les bactéries de la glande uropygienne des bruants chanteur dans deux populations en Ontario. Cette recherche pourrait fournir une partie de la première preuve pour le choix de couple à base d'odeur chez les oiseaux.

Student contributions wanted for *Picoides*!

SCO-SOC encourages students to submit material for *Picoides*. In particular, we would like each issue to feature abstracts of at least one or two recently published theses. They must be from students at a Canadian university, but need not necessarily focus on Canadian birds. Abstracts should be 250-400 words long, preferably accompanied by one or two relevant photos.

We also welcome articles describing aspects of student research in greater detail; these should focus on a subject relevant to Canadian ornithology, require references, and may be up to 1000 words long, again preferably accompanied by one or two photos. See page 18 for submission details.

Student Awardee Reports

2016 Fred Cooke Award Report

Receiver response to vocal and visual signal divergence in a Neotropical songbird

Alana Demko, Ph.D. candidate, University of Windsor (demko@uwindsor.ca)

Divergence in animal signals between populations can contribute to pre-mating reproductive isolation¹. In birds, divergence in mating signals – such as bright plumage and elaborate song – often mirrors genetic differentiation^{2,3}. However, learned traits (e.g., song in oscine passerines) may diverge independently of heritable traits (e.g., calls^{4–6}). When comparing hybridizing populations, it is critical to sample multiple traits across the known hybrid zone to determine if phenotypic change is gradual or discrete^{6,7} or if there is asymmetrical introgression among trait types^{5,8}. Receiver response strength to signal divergence may vary among populations owing to selective pressures such as female choice^{9,10}, male-male aggression¹¹, and learned discrimination¹². Receiver responses to signal divergence among populations are rarely investigated, however^{2,13}.

My research investigates signal divergence among populations in the Rufous-capped Warbler (*Basileuterus rufifrons*), a tropical resident songbird with range-wide variation in plumage and vocalizations¹⁴. The eight subspecies fall into two groups: (1) white-bellied with repetitive songs, in Mexico and NW Guatemala; and (2) yellow-bellied with variable songs, in SE Mexico and Central and South America¹⁴ (Figs. 1–2). White-bellied *B.r. rufifrons* and yellow-bellied *B. r. delatirii* reportedly hybridize extensively in Chiapas, Mexico and Guatemala¹⁴. Furthermore, the subspecies *B.r. salvini*, found in the lowland Atlantic area of southern Mexico and northern Central America¹⁴, has a mixed yellow and white belly (Fig. 3), but similar vocalizations to the white-bellied *rufifrons*¹⁵ (Fig. 2). A comprehensive study of phenotypic and genetic divergence in this species is currently underway, although responses to this divergence have yet to be investigated. **My research objective is to test whether signal divergence in Rufous-capped Warbler populations results in receiver response variation, and potentially reproductive isolation.**

From April–July 2016, my Mexican collaborators and I captured and recorded songs from Rufous-capped Warblers at 11 sites in Oaxaca, Chiapas, and Veracruz, Mexico. In total, we collected vocal recordings, feather samples, morphological measurements, digital photographs, and blood samples for genetic analysis from over 100 individuals of three subspecies (*rufifrons*, *salvini*, and *delatirii*).



Figure 3. Male of subspecies *salvini* captured at Los Tuxtlas Biological Station, Veracruz in April 2016. *Salvini* has similar facial markings as *rufifrons* but more extensive yellow on the belly. Photo by/par A. Demko.

Importantly, one site contained high densities of the morphologically and vocally distinct subspecies *rufifrons* and *delatirii* in sympatry. Field observations and preliminary

vocal analyses at this site suggest that the two subspecies hold exclusive territories, but some individuals show intermediate plumage traits. From April–June 2017, I will test the importance of vocal signals for within-subspecies discrimination in Rufous-capped Warblers by playing songs to territorial warblers in both allopatric and sympatric *rufifrons* and *delatirii* populations. Ongoing vocal and genetic analyses including further samples from sympatric zones in 2017 will clarify whether morphological and acoustic divergence reflects genetic divergence among populations, and whether receiver response to vocal signals is related to phenotypic and genetic divergence.



Figure 1. Examples of the two main plumage-based groups of Rufous-capped Warblers. The *rufifrons* group (left) has a greyish-white belly and extensive white below the eye, while the *delatirii* group (right) has a yellow belly and extensive rufous on the cheeks. Photographs from www.pbase.com.

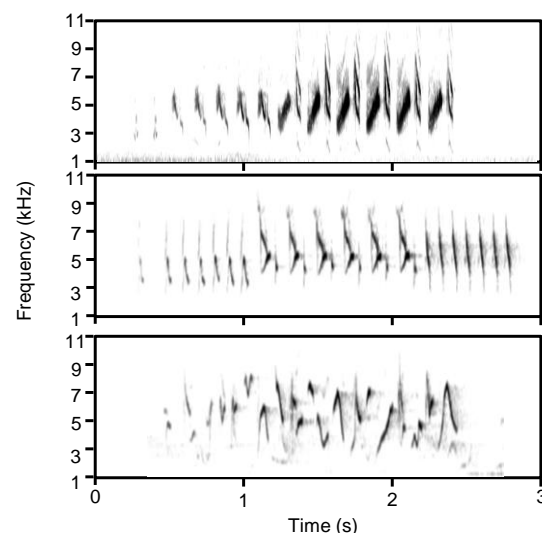


Figure 2. Spectrograms of male Rufous-capped Warbler songs recorded by A. Demko: *rufifrons* in Oaxaca, Mexico (top); *salvini* in Veracruz, Mexico (middle), and *delatirii* in Guanacaste, Costa Rica (bottom). Both *rufifrons* and *salvini* have repetitive songs with few syllable types, while *delatirii* has variable songs with many syllable types.

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2016 Baillie Award Report

Why do the colour patterns of bird species differ when they live together?

Haley Kenyon, PhD Candidate, Queen's University

Signal evolution in birds: a struggle between opposing forces

The striking variation in bird colouration has long been a subject of fascination for birdwatchers, naturalists, and artists. At the same time, this diversity makes birds an excellent group from which we can learn about signal evolution in general. Despite being such a focus of interest, however, the evolution of colouration in birds appears complex and is still not well understood. By examining how the signals of closely related species change when they live together, we can begin to understand patterns of colour evolution and the role they play in shaping avian biodiversity.

Due to the action of opposing forces, it is difficult to predict how species of birds that co-occur in overlapping ranges (i.e., in sympatry) should differ. On one hand, we expect species that live together to have similar signals as they adapt to their shared habitats. For example, for best transmission, birds that live in forests may sing lower songs and have brighter colours than birds that live in open habitats (Boncoraglio and Saino 2007, Marchetti 1993). On the other hand, we expect species that live together to have different signals so they can best differentiate between individuals of their own and different species (i.e., for species recognition). Evidence for such divergence among interacting species is widespread (e.g., Sætre et al. 1997, Moriarty Lemmon 2009, Anderson and Grether 2010) and examples of relatively young bird species that live together and are strikingly different in their colour patterns, like Yellow and Blackpoll Warblers, are quite common. These opposing lines of evidence have led to controversy as to whether species should be more similar or more different overall when they live together.

Species that live together tend to be more different in their colour patterns

Recent comparative work suggests that differences may, in fact, be favoured over similarities: closely related species of birds worldwide which overlap in their ranges differ more in their overall colour patterns than those that live apart (Martin et al. 2015). A key question, however, remains - what interactions among overlapping species have driven this pattern?

Conventionally, such differences are thought to result from selection against hybridization; if closely related species that live together share similar signals, then females may have difficulties distinguishing males of their own species from those of different species and experience costs if hybridization is unfavourable (Dobzhansky 1937). This process, known as reinforcement, has been described in plants, *Drosophila*, and other groups (Coyne and Orr 2004), but the idea that reinforcement is widespread remains contentious (e.g., Hudson and Price 2014). If reinforcement commonly leads to colour pattern divergence in birds, then why do so many closely related species with dramatically different color patterns still hybridize in the wild (e.g., Birds-of-Paradise: Martin 2015; Mallards and American Black Ducks: Broadsky and Weatherhead 1984)?

Another idea: are aggressive interactions more important?

An increasingly popular alternative focuses on the role that species recognition plays in aggressive interactions; if closely related species that live together share similar signals, then intraspecific aggression may be misdirected towards members of different species (Grether et al. 2009), creating fitness costs and favouring signal divergence (e.g., Grant and Grant 2010). While some case studies provide evidence that selection against this misdirected aggression may play a role in shaping signal diversity, there are few clear tests of this hypothesis (Grether et al. 2009) and it has never been addressed in parallel with its more common alternative. Through my PhD research I aim to test among these alternative hypotheses to determine why closely related species of birds that live together tend to be so different in their colour patterns.

Preliminary Results:

During the breeding season of 2016 I conducted experiments at the Queen's University Biological Station to test the hypothesis that selection against misdirected aggression drives colour pattern divergence among closely related species that live together. To test how aggressively males respond to the colour patterns of close relatives, I simulated intrusions into Black-capped Chickadee (*Poecile atricapillus*) territories using 3D printed models painted to match the colour patterns of several different



Black-capped Chickadee at the Queen's University Biological Station (photo by/par Haley Kenyon).

Chickadee species. Thanks to the James L. Baillie Student Award for Field Research I was able to conduct these experiments in the field and to visit several museum collections in preparation for these experiments to measure the colour patterns of three males per species and use these data to create models with accurate colour patterns.

Preliminary results suggest that males respond with equal aggression to intruders of different species regardless of their colour patterns, indicating that the colour pattern differences observed among closely related species that live together may not be the result of selection against misdirected aggression. I am currently conducting additional aggression experiments, both on Black-capped Chickadees and other species of birds. In addition, I am conducting experiments to test the hypothesis that selection against hybridization may have driven this pattern. This work provides an exciting opportunity to better understand the incredible diversity in avian colour patterns that we see in nature.

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Recent Canadian Ornithology Theses

Recent graduate theses from the Atlantic Laboratory for Avian Research at the University of New Brunswick (<http://www.unb.ca/research/alar/>)

Kevin Kelly. 2015. Atlantic Puffin health and its effect on reproductive success and honest signalling in bills and feet. M.Sc. Atlantic Laboratory for Avian Research, University of New Brunswick, Fredericton, NB.



Kevin Kelly. Photo by Tony Diamond.

In seabirds, monitoring the health of individuals and how it affects reproductive success allows researchers to make predictions about the population as a whole. In my study I focused on body condition and heterophil: lymphocyte ratio (H:L), as a measure of stress response, in Atlantic Puffins (*Fratercula arctica*). When testing what aspects of health are predictive of reproductive success I found that females with lower heterophil:lymphocyte ratios have better egg hatching success, while I found no aspect of male health to be predictive of egg hatching success. Additionally I tested whether the colour of puffin bills or feet was related to their body condition or H:L ratio but found no correlation between colouration and these health metrics in either sex, though my sample sizes were small and no definitive conclusions could be made. Finally, I tested whether my handling of breeding puffins was detrimental to their breeding success in case that invalidated my study on health and reproductive success. I found no significant difference in egg hatching or chick fledging rates between birds that were handled during incubation and those that were not during this study.

(Please see also: Kelly, K.G, Diamond, A.W., Holberton, R.L. and Bowser, A.K. 2015. Researcher handling of incubating puffins *Fratercula arctica* has no effect. *Marine Ornithology* 43: 77-82.

Kevin Mahabir. 2017. Influence of habitat on the occurrence of the endemic Barbuda Warbler (*Setophaga subita*) and resident Yellow Warbler (*S. petechia*). M.Sc.F. Atlantic Laboratory for Avian Research, University of New Brunswick, Fredericton, NB.

The Barbuda Warbler (*Setophaga subita*), endemic to Barbuda, Lesser Antilles, and resident Yellow Warbler (*S. petechia*) are known to co-exist in at least some areas on Barbuda; but since little else is known of these species' ecology on the island, much more groundwork is needed. This study explored (i) spatial and temporal distribution; (ii) seasonal patterns of breeding and moult; and (iii) patterns of habitat use, of both warbler species on Barbuda. Gathering these data required extensive island surveys of both species conducted over four month-long field trips. Mist-netting and colour-banding target warbler species revealed information on demography, breeding and dispersal. The distribution of each species was found to be non-random, and negatively associated with the presence of the other. Point-count data analysis reveals that both the Barbuda and Yellow Warbler use similar physical resources, but their mutual avoidance based on interspecific interactions may define their ecological separation. Both species were found to breed almost at the same time, in months of May and June, a pattern consistent with most North American Passerines.



Barbuda Warbler. Photo by Brigitte Noel.

Sarah A. Hudson (née Trefry). 2015. Effect of wing tags and testing hypotheses of sexual size dimorphism in frigatebirds. Ph.D. 2015. Atlantic Laboratory for Avian Research, University of New Brunswick, Fredericton, NB.

Sexual size dimorphism (SSD) is one of the most apparent and puzzling differences between males and females across many different taxa. This dissertation explores the evolution and maintenance of female-biased SSD (females larger than males) in Magnificent Frigatebirds (*Fregata magnificens*) breeding on Barbuda, in the eastern Caribbean. I tested two hypotheses to explain SSD. The first, the resource division hypothesis, implicates natural selection in the evolution of SSD through selection for reduced intersexual competition via trophic niche divergence. Using prey, stable isotope, and foraging location data, I



Sarah Trefrey with tagged frigatebird. Photo by Geoff Holroyd.

tested specific predictions relating to larger female size. My results did not support the resource division hypothesis in frigatebirds, given the similarities in breeding season prey, stable isotope values, and foraging locations between males and females. A second hypothesis attempting to explain smaller male size is the aerial agility hypothesis, which proposes that smaller males have an advantage during mating displays or other aerial acrobatics. Wing traits affecting flight performance and predicted to be under selection were measured from breeding birds, and fledging success was used as a measure of fitness. Projection pursuit regression and cubic splines were used to explore the strength and shape of selection acting on wing traits, respectively. Male wing traits influencing maneuverability were under stronger selection than in females and correlated with nest volume, providing support for the aerial agility hypothesis maintaining small male size. This likely reflects the male's role

in collecting nest material. Large female size may be a result of extended parental care relative to males, and requires further study. Because of low fledging success early in the study, I also conducted an experimental study and meta-analysis on the effects of wing tags, a common avian field marker. Wing tags had a significant negative effect on nest success in Magnificent Frigatebirds, and on survival and hatch and nest success in other birds. Based on these findings, I strongly recommend against the use of wing tags in future studies.

(See also: Trefry S.A. and Diamond A.W. 2017. Exploring hypotheses for sexual dimorphism in frigatebirds. *Evolutionary Ecology Research* 18:225-252; and Trefry, S.A., Diamond, A.W. and Jesson, L.K. 2013. Wing marker woes: a case study and meta-analysis of the impacts of wing and patagial tags. *Journal of Ornithology* 154:1-11. DOI 10.1007/s10336-012-0862-y; and Trefry, S.A., Diamond, A.W., Spencer, N.C. and Mallory, M.L. 2013. Contaminants in magnificent frigatebird eggs from Barbuda, West Indies. *Marine Pollution Bulletin* 75:317-321.)

Kate Shlepr. 2017. The geography of diet: diversity in diet and foraging behavior in Herring Gulls (*Larus argentatus*) across Atlantic Canada. M.Sc. Atlantic Laboratory for Avian Research, University of New Brunswick, Fredericton, NB.

Changes in food availability are thought to be the primary driver of Herring Gull (*Larus argentatus*) species decline, but empirical evidence linking gull diet to population dynamics is lacking. First, I test the ability of new GPS tracking technology to provide representative data on Herring Gull movement, analyzing the effect of tag deployment on adult behavior and reproductive output. I found that effects were short-term. Secondly, I analyze data from GPS tags deployed on Herring Gulls at two colonies in the Bay of Fundy, Canada, and combine results with those from a more established diet methodology, stable isotope analysis. I found that variation in individual foraging strategy is high, but colony-level differences in diet and foraging location do emerge. This study provides the foundation for understanding how differences in individual foraging strategy may lead to variation in individual reproductive success and the ability to adapt to a changing environment.



Kate Shlepr measuring wing of a Herring Gull. Photo by Kate Shlepr.

Announcements

SAVE-THE-DATES— AUGUST 19-26 2018



www.iocongress2018.com

VANCOUVER COMES ALIVE WITH BIRDS IN AUGUST 2018

The International Ornithologists' Union accepted Vancouver's bid to stage the **27th International Ornithological Congress** (IOCongress2018) for 10-26 August 2018. Considered the most prestigious and largest meetings of avian scientists, these Congresses have occurred almost every four years since the first in Vienna, Austria, 1884. Canada hosted only once previously, Ottawa 1986, and Vancouver will be the first time the Congress has been on the Pacific coast of the Americas. Both SCO-SOC and Bird Studies Canada are Co-Hosts.

Planning is set to make IOCongress2018 not only an unqualified success but also a new norm for scientific meetings by engaging the public and business. In particular, partnering with Vancouver Bird Week has fostered the first **Vancouver International Bird Festival** – A World Celebration of All Things Birds – nature, art, music, performance, film, photography and adventure. Two thousand scientists from 100 countries plus thousands more public will be educated, informed and entertained through exhibitions, lectures, a bird fair, trade shows, tours and workshops on BIRDS – the Gateway to Nature.

Further Information: Bob Elner, Convener, rwelner@sfu.ca

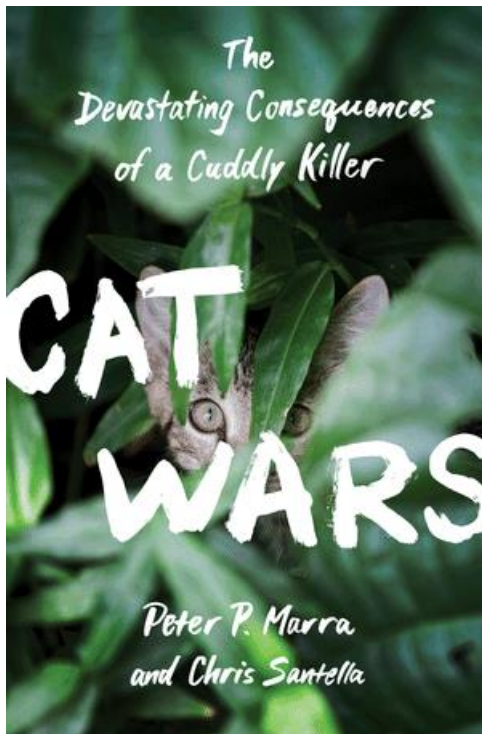
Building an Educational and Environmental Awareness Legacy through Birds

Book Review

Cat Wars: The Devastating Consequences of a Cuddly Killer

By Peter P Marra and Chris Santella

Published in 2016 by Princeton University Press, Princeton, NJ. 216 pages.



My own love of cats started long before my fascination with birds. From as early as I can remember, my family has always had cats, and I have long recognized the potential these animals have as predators on native wildlife. Of the seven cats I have shared a household with over my life, only two were definite “hunters,” but one of these was fairly extreme in that capacity; a Siamese my family had when I was a child who regularly brought home birds, snakes and rodents. He even caught crows. He alone probably made up for those other five.

It is this impact of cats as introduced predators on native wildlife that is the primary focus of Peter Marra and Chris Santella’s new book, *Cat Wars*. The book opens with a recounting of the fate of a ground wren endemic to a small New Zealand island (Stephen Island) on which was built a light house. The Stephen’s Island Wren is known only from several taxidermy specimens made by one of the lighthouse keepers in the late 1890s, all of which were supplied to him by his cat, who is deemed responsible for decimating the species.

Cat Wars provides a very balanced accounting of the controversy over the impact that free-roaming and feral cats have on native fauna. Beginning with studies by Stanley Temple in the American Midwest (Chapter 2), extrapolation of the number of birds killed by free-roaming cats identifies our beloved companions as one of the prime contributors of human-induced risks to avifauna worldwide. The chapter details a number of examples

of threatened or endangered species for which predation by domestic pets has played a significant factor in their demise. Indeed, recent estimates place the 8.5 million owned cats (plus adding approximately half that number of unowned feral cats) as killing between 100-350 million birds in Canada per year [1]. Feral cat colonies appear the worst culprits, but the sheer increase in the number of owned, free-roaming cats is definitely providing a strong contribution. Together their effect constitutes a significant proportion (2-7%) of the bird populations in Canada. Similar estimates suggest that bird losses in the US are up to 10x those of Canada [2].

Such numbers, as well as simply witnessing cat predations in gardens and at feeders, has been a source of ire amongst the growing population of bird watchers in North America. However, there has been a similar increase in the number of devotees on the other side of the equation, both cat-fanciers and those that devote their time to the welfare of feral cat colonies. As Marra and Santella outline in a chapter entitled “The rise of bird lovers and cat lovers: the perfect storm,” this has led to a number of high-profile showdowns between the perspectives of either group.

The book outlines part of the conundrum of the issue of cat predation – after all, cats began their association with humans specifically as an agent of pest control for granivorous rodents and even birds. Throughout much of modern history, cats have been used to manage rodent outbreaks on farms and in cities. Even recent initiatives are not only utilizing, but even transplanting feral cat colonies specifically for “eco-friendly rat control” in highly urbanized areas [3, 4]. Kitty-cam studies [5] and prey-return studies [6] show that rodents do constitute significant prey items, but birds are often equivalent or secondary prey in most of these studies. In some cases, birds constituted the majority of returned prey [7], or individual cats specialized on particular prey types like birds [6]. While some argue that cats reduce rodent populations, and thus the potential diseases they transmit, Marra and Santella, in the evocatively titled chapter “the Zombie Maker” also point out that many feral cat colonies are themselves vectors of diseases that can be transmitted to humans,

including rabies and plague. One such zoonosis that receives a lot of attention is *Toxoplasma*, which has an unusual effect in infected rodents of making them less fearful of cats, and thus easier prey (and thus spreading the protozoan back to cats!). Recent work cited in the chapter links *Toxoplasma* with such altered brain chemistry in humans as bipolar disorder and depression, thus indicating that *Toxoplasmosis* is less than innocuous in humans.

A major focus of the second half of the book is in discussing whether restricting free-ranging in domestic cats may not only create relief on bird populations, but also may be in the best interest of cats themselves. Marra and Santella paint a bleak picture of the fate of feral cats – subject to disease, predation themselves, starvation and traffic fatalities. They counter with ample evidence that indoor cats or those with more restricted outdoor ranging tend to have higher survivorship and be in greater health. Certainly, our newest cat (pictured here) is only allowed into our backyard when she is on a long tether, but this has more to do with the fact we live on a busy road that has claimed five of our neighbours' free-roaming cats, coupled with the high number of foxes, coyotes, and bears in the area that result in many "Missing Cat" posters in our northern neighbourhood! 'Nuisance' issues related to free-roaming cats has recently been used by several large municipalities in Canada to institute licensing bylaws that restrict animals to only within the owner's property – Winnipeg and Saskatoon have such bylaws, and it looks like my own city of Prince George, BC is beginning to discuss this as well. While licensing is often driven more by people not wanting the neighbourhood cat yowling on their fence in the middle of the night, or leaving presents in their gardens, registration is often a means of ensuring owners of domestic cats are keeping on top of spay/neutering and vaccinations, which both reduce overpopulation issues and disease transmission. This would bring domestic cats in line with domestic dogs, for which bylaws on free-roaming in cities have been implemented for similar 'nuisance' reasons (soiling property, bites, etc.) for nearly a century, and have been responsible for decreasing instances of dog-transmitted rabies. Marra and Santella postulate that maybe the time to consider similar measures for cats has come. Even the humane societies suggest this approach, coupled with affordable access to spay/neuter clinics, may be part of a larger strategy to curb a major explosion in cat populations in Canada [8]. One side-effect of such policies would be to help control agencies better distinguish free-roaming owned cats from feral cats for targeted colony management, but an obvious side consequence would be a possible reduction in bird takes.



The Otter family's cat. Photo by Ken Otter

Certainly, Marra and Santella make a compelling case in this book that cat predation has a serious impact on wildlife, particularly where natural ground predators are lacking. At the very least, the evidence they present should invoke discussions as proposed by Calver et al. [9] that there is sufficient evidence of impacts on wildlife to recommend restricting free-ranging cat predation while work to document the impact of cats on wildlife population levels can be obtained. This latter study goes so far as to suggest that mandatory registration include restricting outdoor access to cats that are either tethered or wearing prey-alerting collars. One such alerting device, high-vis ruffled collars (think "Scrunchies for cats" – e.g. birdbesafe.com) that appear brighter and more obvious to birds and reptiles with tetrachromatic vision than to rodents with bichromatic vision, appear in recent studies to be effective at reducing bird returns by individually-tracked cats [10, 11].

Regardless of one's opinions on this topic, Marra and Santella's book is a fascinating accounting of this issue, and well worth a read.

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