

Editorial

Requiem for a field station: the loss of a Canadian ornithological treasure

Requiem pour une station de recherche : perte d'un trésor ornithologique canadien

*Keith A. Hobson*¹, *D. Ryan Norris*², *Gordon Goldsborough*³ and *Spencer G. Sealy*³

Key Words: *Delta Marsh Bird Observatory; Delta Marsh Field Station; Lake Manitoba, Winnipeg*

Nestled on the southern shore of Lake Manitoba about 100 km northwest of Winnipeg (Fig. 1, 2), the University of Manitoba's Delta Marsh Field Station (DMFS) had withstood many tribulations since its creation by Dr. Jennifer M. Shay OC in 1966. Many a financial and natural storm had done battle with its relatively small group of academics, staff, students, and friends who created it and supported a vision worthy of its potential over the years. And so, to some degree, when the flood waters lapped at its foundation in the spring and summer of 2011, many of us believed it would similarly endure and emerge once again as it always had. After all, it had apparently only just made it through its greatest battle ever with University of Manitoba administrators who had launched a major effort to close its doors. That initiative was justified by a corporate "bottom-line" argument but was also motivated by ignorance of both the role this station has played in the education of field biologists and ornithologists in general in Canada, its environmental and conservation significance, and of its future potential. Alas, the massive floodwaters brought to its doorstep by the man-made Assiniboine River Diversion proved to be a final justification to bulldoze it to the ground and to end a final chapter in what was an ornithological jewel of national and international significance. Instead of repairing and rebuilding this facility in tribute to its long service and to plan a safer future, it became one more casualty of fiscal restraint and deficit reduction, a victim of an uncaring and disinterested community. The Mission Statement of this field station was "to foster excellence in research and teaching, extend University resources into the community, and promote sound and sensitive environmental stewardship practices." At precisely the time when such values are needed most, we have instead witnessed a draconian and opportunistic end to a proud 44-year record.

We cannot do justice here to the many contributions made to Canadian ornithology by researchers working out of this station. Instead, and for the record, we list the ornithologically related theses and publications that were generated here (Appendix 1, 2) and reflect on other contributions including the 18-year history of the Delta Marsh Bird Observatory that was hosted at the DMFS. This list is a minimum since there are currently papers in review which we have not included here. We acknowledge also the contributions to other, non-ornithological research and teaching and reflect more broadly on the status and fate of similar facilities elsewhere in Canada and North America.

Fig. 1. The University Field Station (Delta Marsh) and the Delta Marsh Bird Observatory was located on the dune ridge forest separating Lake Manitoba from Delta Marsh. Photo credit: Gordon Goldsborough.



¹Environment Canada, Science and Technology Branch, ²University of Guelph, ³Department of Biological Sciences, University of Manitoba



Sponsored by the Society of
Canadian Ornithologists and
Bird Studies Canada

Parrainée par la Société des
ornithologistes du Canada et
Études d'oiseaux Canada



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GENERAL PERFORMANCE METRICS

In 2010, sensing the need to defend the record of the Station to the University in light of their enthusiasm to close its doors, former station director Goldsborough summarized the Station's record. The purpose of his report was to review the performance of the DMFS at fulfilling its academic mandate; that is, its support of university teaching and research. Here, we list some of the cogent points raised by Goldsborough.

Fig. 2. View of Murray's, the kitchen facility of the late University Field Station (Delta Marsh). Photo credit: Gordon Goldsborough.



During the 1970s, usage was in the range of 2000 to 4000 user-days annually. (A “user-day” is the standard metric for expression of field station usage, determined by the product of the number of users by their respective number of days of residence.) There was a general increasing trend that continued, with periodic ups and downs, to 2002 when it peaked at about 6500 user-days. There has been a decreasing trend from 2006 to 2009.

University course and school program uses have been varied through the period but were generally highest through the 1990s. Research use was highest in the late 1980s and through the 2000s, but lower in the 1990s. Uses for purposes other than teaching, research, and school programs generally increased through the entire period of record, 1986 to 2008.

Since its founding, the DMFS has provided facilities for students to undertake research towards undergraduate and graduate degrees at the University of Manitoba and other academic institutions. This support has taken the form of room and board, laboratory space, some general research equipment (e.g., boats and motors, drying ovens, power tools, bicycles), data (e.g., meteorological data from the station's real-time climate station, plant and animal specimens), library books, and Internet access. The DMFS facility was therefore integral

to the conduct of thesis research but the thesis documents were products of the academic departments from which the student originate. The vast majority of theses were in the disciplines of biology, botany, ecology, environmental science, and zoology although occasionally theses in other disciplines were completed. In the biological sciences, the major area of focus through the years has been ornithological, due in part of the active support through the years of Sealy and his students, and also from the fact that the Delta Marsh area supports some of the highest abundances in central Canada of migratory songbird taxa. In addition, the close proximity of Lake Manitoba (one of the largest lakes in the world) and Delta Marsh (the second-largest coastal wetland in North America) has meant the DMFS was truly a one-of-a-kind location for research and teaching in aquatic ecology, limnology, and wetland ecology.

The first thesis was published in 1969, three years after the DMFS was founded. Until May 2010, a total of 132 theses were published, or about 3.1 theses per year, with a range of 0 to 7 theses per year. There was a cycle in thesis output with a period of roughly ten years, with three times of highest output: the late 1970s, the late 1980s, and the late 1990s/early 2000s. There also appears to have been a general increasing trend of thesis output through the entire period, from about 2 theses per year in the 1970s to about 3 theses per year in the 2000s.

The first publication appeared in 1967, one year after the facility was founded, and data are current to May 2010. Over this 44-year period, a total of 370 publications were made, or about 8.4 publications per year, with a range of 1 to 20 publications per year.

Thesis and publication output of the Delta Marsh Field Station in the 2000s was generally as high as at any time during the entire period of operation, and except for a reduction in total user-days over the past four years—owing in part to markedly reduced activity by a researcher nearing the end of his career—total annual user days in the 1990s and 2000s has been the highest in the 44-year history of the facility. Thus, there is no basis to believe that use of the DMFS facility for teaching and research was in any long-term decline.

ORNITHOLOGICAL RESEARCH AND MONITORING

The overwhelming majority of ornithological contributions derived from DMFS can be attributed to one of our authors (Sealy) and students. This prodigious output attests to the hard work of Sealy and colleagues but also reflects the amazingly productive nature of this site. The forested dune ridge that separates Lake Manitoba from Delta Marsh provides nesting habitat for numerous species of insectivorous passerines that benefit from the massive emergence of chironomids from the adjacent marsh and lake. This superabundant food supply apparently has resulted in the highest recorded breeding

densities of Yellow Warblers (*Setophaga petechia*), and other passerines, in North America. Such high densities clearly facilitated the nest-based experimental work of Sealy and students on the evolution of host defenses against brood parasitism, an area of Sealy's work that has brought international recognition. Adjacent wetlands also host an impressive array of breeding and staging waterbirds and the Delta Marsh Waterfowl Station—a major facility for research on migratory waterfowl since the 1930s—is located but 6 km to the east. Unfortunately, the fate of that station is also now very uncertain. The DMFS was also used for many ornithological field trips as part of Sealy's undergraduate ornithology class.

The highly productive dune-ridge forest also acts as stopover habitat for thousands of migrating songbirds that in spring put down here after encountering Lake Manitoba. This natural trap facilitated early research by Sealy and students and later led to the establishment of the Delta Marsh Bird Observatory (DMBO) by Hobson in 1992. The DMBO has trained scores of aspiring young biologists since then. In fact, this was where one of the authors (Norris) was first trained to capture and handle birds. Importantly, DMBO has been one of the most productive among those making up the national Canadian Migration Monitoring Network (CMMN) averaging about 7500 captures per year for spring and fall migrants. In a recent ten-year report on population changes of Canadian birds monitored through the CMNN, the DMBO provided enough data to provide minimum sample size requirements for statistical trend analyses for an impressive 177 species (Crewe et al. 2008). Due to the closure of DMFS, the DMBO has ceased operation since 2010.

SYMBOL OF A LARGER PROBLEM

Unlike an academic department at the University of Manitoba, the DMFS had no dedicated faculty members and no academic programs so it had no control over teaching and research activities occurring at its facilities. These activities necessarily wax and wane with changing priorities of the academic departments from which the instructors, students, and researchers arise. A strict comparison of the total output of theses and publications by an academic department to that of the DMFS is difficult to make because there is no way to normalize for differences in respective levels of academic activity. The user-day statistics compiled by the DMFS have no direct counterpart in an academic department, and the FTE statistics for an academic department have no direct counterpart at the DMFS. Having said this, the lengthy lists of theses and publications arising from work at the DMFS (Appendix 1,2), and the extensive cohort of biologists who received training at Delta Marsh, demonstrate the tremendous contributions the station has made over the years. There is no doubt as to the magnitude of the effect its closure will have on Canadian ornithology and conservation. These events and statistics underline the fact that field stations are at a huge

disadvantage when it comes to justifying their existence and can easily fall prey to belt-tightening administrators focused on annual or short-term metrics. This of course is not unique to the DMFS and is a trend becoming all too familiar.

Most readers will now be familiar with threatened closures in Canada of high-profile research sites like the Experimental Lakes Area in northwest Ontario or the Polar Environment Atmospheric Research Laboratory in the High Arctic. Despite the value of the products of these facilities, namely information and data to inform federal government environmental policy relevant to a number of developments, they now struggle to exist. However, other biological field stations felt a financial crunch back in 2009 when the Major Research Facilities Grant Program run by the Natural Sciences and Engineering Research Council of Canada decided it would no longer fund individual field stations unless they could justify their importance on a national scale. This left the vast majority of field stations across Canada scrambling for short-term funding to cover this deficit, as well as the need to develop alternative long-term plans. In the short term, some field stations raised user fees but this strategy has its limits as most fees are paid by academics with limited research budgets. Other field stations quickly developed partnerships. For example, the Wildlife Research Station (WRS) in Algonquin Park, Ontario partnered with the Friends of Algonquin, a long-time non-profit organization that is a key player in delivering a variety of education services to one of Canada's most well-known parks. The partnership helped profile WRS and facilitated tax-deductible donations that could be made directly towards WRS. However, many field stations, although strategically placed in ecologically significant areas, don't have the luxury of developing such partnerships with well-established organizations.

Also in response to the decline in federal funding, the Canadian Field Research Network (CFRNet) was formed in 2010 by a group of academic and administrative field station leaders with the vision of "facilitating and promoting the understanding of Canada's natural legacy in a changing world through field research, training, and outreach" (<http://canadianfieldstations.wikispaces.com>). One of the initial motivations for forming CFRNet was to explore the possibility of developing research projects that could be carried across a network of field stations across Canada, providing leverage for acquiring operational funding that would be deemed of national significance. However, developing research initiatives that span multiple ecosystems and involve many principal investigators is no small task and will take time.

That the closure of DMFS received no national news coverage and scant attention beyond Winnipeg is perhaps not surprising. University avian research and monitoring programs never have been exactly high profile. Moreover, we seem now to be in an era where the emphasis is on quantitative ecological

modeling that can be suitably accomplished by researchers sitting in front of a computer screen rather than collecting the data themselves (Gimenez et al. 2012). Nor perhaps can we ever hope to convince university administrators and deans to begin to understand the value of these sorts of facilities in producing the next generation of field biologists and ornithologists. Field stations are absolutely critical for inspiring undergraduate students and helping them realize their potential in the ecological sciences. One thing is clear, however, and that is that the rapid demolition of DMFS after nearly half a century of service (Fig. 3), without any serious attempt to pursue alternatives is both shocking and shameful. While sleeping, we have lost both a manifestly valuable university research and teaching facility and a jewel in the crown of the Canadian Migration Monitoring Network. Canadian ornithology and conservation is all the poorer for the closing of DMFS and there may very be others to follow if we don't take immediate action.

Fig. 3. The final demolition in progress. Photo credit: Dale Wrubleski.



REQUIEM POUR UNE STATION DE RECHERCHE : PERTE D'UN TRÉSOR ORNITHOLOGIQUE CANADIEN

Nichée sur la rive sud du lac Manitoba à environ 100 km au nord-ouest de Winnipeg (figures 1 et 2), la station de recherche du marais Delta (DMFS; pour Delta Marsh Field Station) de l'Université du Manitoba a surmonté de nombreuses embûches depuis sa création en 1966 par la Dre Jennifer M. Shay O.C. Le groupe relativement modeste d'universitaires, d'employés, d'étudiants et d'amis qui a créé la DMFS et soutenu une vision digne de son potentiel au fil des ans a en effet essuyé beaucoup de tempêtes financières et naturelles. Ainsi, d'une certaine façon, quand les inondations sont venues lécher ses fondations au printemps et à l'été 2011, nombre d'entre nous ont pensé

que la station affronterait cet aléa et émergerait une fois de plus comme elle l'avait toujours fait. Après tout, la station venait apparemment tout juste de survivre à la plus grande bataille de son existence avec les administrateurs de l'Université du Manitoba, qui menaient une campagne musclée pour fermer ses portes. Cette campagne trouvait sa justification dans un argument d'entreprise fondé sur les résultats, mais était aussi motivée par l'ignorance, tant du rôle de la station dans la formation des biologistes et des ornithologues de terrain en général au Canada que de sa valeur environnementale et de protection, et de son potentiel futur. Hélas, les eaux de crue gonflées à ses pieds, amenées par le détournement d'origine anthropique de la rivière Assiniboine, ont offert la justification finale pour passer le bulldozer sur la station et clore le dernier chapitre de ce qui avait été un joyau ornithologique d'importance nationale et internationale. Plutôt que de se faire réparer et reconstruire en hommage aux nombreux services rendus et d'obtenir un avenir plus sécuritaire, cette installation est devenue un cas de plus de restriction budgétaire et de réduction de déficit, victime d'une communauté indifférente. L'énoncé de mission de la DMFS était de « favoriser l'excellence en recherche et en enseignement, prolonger les ressources de l'université dans la communauté et promouvoir des pratiques d'intendance de l'environnement sensées ». Au moment précis où les valeurs de ce type sont les plus nécessaires, nous avons plutôt été témoins de la fin draconienne et opportuniste d'une histoire à succès vieille de 44 ans.

Nous ne pouvons pas rendre ici justice aux nombreuses contributions de cette station à l'ornithologie canadienne. En revanche, et pour les annales, nous listons les thèses et les publications relatives à l'ornithologie qui sont issues de cette station (annexes 1 et 2) et qui ont été à l'origine d'autres contributions, y compris celle de 18 ans avec l'Observatoire d'oiseaux du marais Delta qui avait pignon à la DMFS. Cette liste dresse un minimum de documents puisqu'elle n'inclut pas les articles pertinents actuellement en révision. Nous reconnaissons également les autres apports en recherche et enseignement non issus du milieu ornithologique, qui reflètent davantage l'état et le sort d'installations similaires ailleurs au Canada et en Amérique du Nord.

PARAMÈTRES GÉNÉRAUX DE PERFORMANCE

En 2010, sentant le besoin de défendre le dossier de la station auprès de l'université qui démontrait un enthousiasme certain pour fermer ses portes, Goldsborough, ancien directeur de la DMFS, en fit le résumé. L'objectif de son rapport était de réviser la performance de la station quant à son mandat, c'est-à-dire le soutien à l'enseignement et à la recherche universitaire. Nous énumérons ci-dessous quelques-uns des points convaincants soulevés par Goldsborough.

Durant les années 1970, l'achalandage à la station se situait entre 2 000 et 4 000 usagers-jour annuellement. (Un « usager-

jour » est le paramètre standard pour évaluer l'utilisation d'une station de recherche, déterminée par le produit du nombre d'utilisateurs par leur nombre de jours de résidence respectif.) Il y a eu une tendance générale à la hausse, avec des hauts et des bas périodiques jusqu'en 2002, année à laquelle on a observé un maximum de 6 500 usagers-jour. Une tendance à la baisse a par la suite été observée de 2006 à 2009.

L'utilisation de la station en fonction des cours et des programmes universitaires a été variée pendant la période, mais était généralement à son maximum pendant les années 1990. Son utilisation pour la recherche a été à son apogée à la fin des années 1980 et pendant les années 2000, mais a été moindre dans les années 1990. L'utilisation de la station pour des usages autres que l'enseignement, la recherche ou les programmes scolaires a augmenté durant la totalité de la période de suivi, de 1986 à 2008.

Depuis son inauguration, la DMFS fournissait des installations et équipements aux étudiants qui entreprenaient une recherche en vue d'obtenir un diplôme tant au premier cycle qu'aux cycles supérieurs à l'Université du Manitoba et à d'autres institutions scolaires. En plus du logement et des repas, la station offrait des laboratoires, de l'équipement général de recherche (p. ex. bateaux et moteurs, fourneaux de séchage, outils électriques, bicyclettes), des données (p. ex. données météorologiques provenant de la station climatique en temps réel de la DMFS, spécimens de plantes et d'animaux), des livres de bibliothèque et l'accès Internet. Les installations de la DMFS étaient donc essentielles pour la tenue des recherches relatives aux thèses, mais les thèses demeuraient des produits des départements universitaires auxquels les étudiants étaient rattachés. La majorité des thèses étaient issues des domaines de la biologie, de la botanique, de l'écologie, des sciences environnementales et de la zoologie, mais provenaient parfois aussi d'autres domaines. Dans le domaine des sciences biologiques, la principale discipline au fil des années a été l'ornithologie, en partie en raison des activités de Sealy et de ses étudiants, et aussi du fait que le marais Delta présente des densités de passereaux parmi les plus élevées du centre du Canada. De plus, la proximité du lac Manitoba (un des plus grands au monde) et du marais Delta (le milieu humide côtier au deuxième rang d'importance en Amérique du Nord) confirmaient que la DMFS était réellement située dans un lieu unique pour la recherche et l'enseignement en écologie aquatique, limnologie et écologie des milieux humides.

La première thèse a été publiée en 1969, trois ans après l'inauguration de la DMFS. Jusqu'en mai 2010, 132 thèses ont été publiées, soit 3,1 thèses par année environ, le nombre de thèses allant de 0 à 7 par année. Un cycle de publication de thèses s'est dessiné tous les 10 ans environ, et à trois reprises il y a eu des pointes : à la fin des années 1970, à la fin des années 1980, et à la fin des années 1990-début des années 2000. Il semble également y avoir eu une tendance générale à

la hausse du nombre de thèses durant l'ensemble de la période, passant de deux thèses par an environ dans les années 1970 à trois thèses environ dans les années 2000.

Le premier article a été publié en 1967, un an après l'inauguration de la DMFS, et les dernières données récoltées remontent en mai 2010. Au cours de cette période de 44 ans, 370 articles ont été publiés, soit 8,4 articles par an environ, ce nombre allant de 1 à 20 par an.

Le nombre de thèses et d'articles issus de la DMFS dans les années 2000 a été en général aussi important qu'à n'importe quel autre moment de la période d'opération de la station et, mis à part une réduction du nombre d'utilisateurs-jour dans les quatre dernières années – en partie attribuable à la baisse d'activité d'un chercheur en fin de carrière –, le nombre d'utilisateurs-jour dans les années 1990 et 2000 a été le plus grand dans les 44 années d'existence de la station. Ainsi, il n'y a aucune raison de croire que les installations de la DMFS pour l'enseignement et la recherche subissaient un quelconque déclin d'utilisation à long terme.

RECHERCHE ET SUIVI ORNITHOLOGIQUES

La grande majorité de la contribution ornithologique issue de la DMFS peut être attribuée à un de nos auteurs – le Dr Spencer G. Sealy – et à ses étudiants. Cette activité foisonnante atteste du dur labeur de Sealy et de ses collègues, mais reflète aussi la nature incroyablement productive de ce site. La crête de plage boisée qui sépare le lac Manitoba du marais Delta fournit un habitat de nidification pour de nombreuses espèces de passereaux insectivores qui profitent de l'émergence massive de chironomidés en provenance du lac et du marais adjacents. Cette source de nourriture extrêmement abondante est apparemment à l'origine de la densité de nidification la plus élevée de Parulines jaunes (*Setophaga petechia*) et d'autres passereaux en Amérique du Nord. Ces densités élevées ont clairement facilité le travail expérimental de Sealy et de ses étudiants, qui se servaient des nids pour suivre l'évolution des moyens de défense de l'hôte contre le parasitisme des couvées, un axe de recherche pour lequel Sealy était reconnu internationalement. Les milieux humides à proximité abritent également un assemblage impressionnant d'oiseaux aquatiques nicheurs et migrants, et la station de recherche sur la sauvagine du marais Delta – une installation importante destinée à la recherche sur la sauvagine migratrice depuis 1930 – est située à 6 km environ à l'est. Malheureusement, le sort de cette station est également maintenant très incertain. La DMFS a aussi été utilisée pour de nombreuses sorties ornithologiques sur le terrain dans le cadre du cours d'ornithologie qu'a donné Sealy aux étudiants du premier cycle.

La portion boisée de la crête de plage, très productive, est également utilisée comme habitat de repos pour des milliers de passereaux migrants qui s'y arrêtent au printemps après la traversée du lac Manitoba. Ce « piège » naturel a simplifié

les débuts de recherche par Sealy et ses étudiants et a mené plus tard à l'établissement de l'Observatoire d'oiseaux du marais Delta par Hobson en 1992. L'observatoire a permis de former de nombreux jeunes aspirants biologistes depuis ce temps. En fait, c'est à cet endroit qu'un des coauteurs du présent article, Norris, a appris à capturer et à manipuler les oiseaux pour la première fois. De façon plus importante, l'observatoire du marais Delta a été l'un des observatoires les plus productifs de ceux qui font partie du Réseau canadien de surveillance des migrations, permettant la capture de 7 500 migrants environ par année au printemps et à l'automne. Dans un rapport décennal récent faisant état des changements advenus chez les populations d'oiseaux suivies par le réseau, l'observatoire a pu fournir la taille d'échantillon minimum requise pour des analyses de tendance statistiques pour le nombre impressionnant de 177 espèces (Crewe et coll. 2008). En raison de la fermeture de la DMFS, l'observatoire du marais Delta a cessé ses opérations depuis 2010.

SYMBOLE D'UN PROBLÈME PLUS GRAND

Au contraire d'un département de l'Université du Manitoba, la DMFS n'était supervisée par aucun membre de la faculté et n'était pas reliée à un programme scolaire, de sorte qu'elle n'avait pas le contrôle sur les activités d'enseignement ou de recherche qui s'y produisaient. Ces activités fluctuaient donc nécessairement beaucoup en fonction des priorités changeantes des départements desquels les instructeurs, les étudiants et les chercheurs provenaient. Une comparaison stricte du nombre total de thèses et d'articles par département universitaire par rapport à celui de la DMFS est difficile à faire, car il n'existe pas de façon de normaliser les différences du taux d'activité universitaire respectif. Les statistiques d'usagers-jour compilées par la DMFS n'ont pas d'équivalent direct dans un département universitaire, et les statistiques ETP d'un département ne trouvent pas d'équivalent à la station. Cela dit, la très longue liste de thèses et d'articles provenant de travaux réalisés à la DMFS (annexes 1 et 2) et la cohorte considérable de biologistes qui ont reçu de la formation au marais Delta démontrent l'énorme apport de la station au fil des ans. Il n'y a aucun doute sur l'ampleur de l'effet que sa fermeture aura sur l'ornithologie et la conservation au Canada. Ces événements et statistiques soulignent le fait que les stations de recherche sont grandement désavantagées lorsque vient le temps de justifier leur existence et peuvent facilement être victimes des restrictions budgétaires imposées par des administrateurs préoccupés par des paramètres annuels ou à court terme. Cette réalité n'est bien sûr pas le lot de la DMFS uniquement, mais semble plutôt être une tendance devenue trop familière.

La plupart des lecteurs sont maintenant accoutumés aux menaces de fermeture d'installations de recherche de haut niveau au Canada, comme la Région des lacs expérimentaux dans le nord-ouest de l'Ontario ou encore, le Laboratoire de recherche atmosphérique en environnement polaire dans le

Haut-Arctique. Malgré la valeur des produits issus de ces installations, soit l'information et les données servant à renseigner les politiques environnementales du gouvernement fédéral relatives à un grand nombre de projets, ils luttent maintenant pour leur survie. D'autres stations de recherche ont cependant senti venir une crise financière dès 2009 lorsque les responsables du programme de subventions destinées aux installations de recherche majeures, coordonné par le Conseil de recherches en sciences naturelles et en génie du Canada, ont décidé qu'ils ne financeraient plus de stations individuelles à moins qu'elles ne justifient leur importance sur le plan canadien. Cette décision a obligé la grande majorité des stations de recherche au Canada à chercher du financement à court terme pour pallier ce déficit et à élaborer des plans de rechange pour le long terme. Dans le court terme, certaines stations ont augmenté les frais d'utilisation pour les usagers, mais cette stratégie a ses limites puisque la plupart des frais sont payés par les universitaires, dont les budgets de recherche sont limités. D'autres stations de recherche ont rapidement développé des partenariats. Par exemple, la station de recherche sur la faune dans le parc Algonquin, en Ontario, s'est alliée avec The Friends of Algonquin Park, organisation sans but lucratif de longue date et joueur clé dans la prestation d'une variété de services éducatifs à un des parcs les plus connus au Canada. Ce partenariat a aidé à dresser le portrait de cette station de recherche et à faciliter les dons déductibles d'impôt qui ont ainsi pu lui être faits directement. Toutefois, de nombreuses stations de recherche, même si elles sont stratégiquement situées sur des lieux d'une grande importance écologique, n'ont pas le luxe de développer ce genre de partenariat avec des organisations bien établies.

Également en réponse à la diminution du financement fédéral, le Réseau canadien de recherche sur le terrain (RCRT) a été mis sur pied en 2010 par un groupe de dirigeants de stations de recherche, issus des milieux universitaire et administratif; la vision du RCRT est de « faciliter et promouvoir la compréhension de l'héritage naturel canadien dans un monde en changement à travers la recherche sur le terrain, la formation et la vulgarisation » (<http://canadianfieldstations.wikispaces.com>). Une des premières motivations dans la mise sur pied du RCRT a été d'explorer la possibilité d'élaborer des projets de recherche qui pourraient être réalisés dans un réseau de stations de recherche dans l'ensemble du Canada, fournissant l'effet de levier nécessaire pour acquérir le financement opérationnel réservé aux projets d'importance nationale. Toutefois, le développement d'initiatives de recherche qui touchent différents écosystèmes et regroupent de nombreux chercheurs principaux n'est pas une mince tâche et demandera du temps.

Que la fermeture de la DMFS n'ait reçu ni de couverture médiatique nationale ni d'attention au-delà de Winnipeg n'est peut-être pas surprenant. Après tout, les programmes de recherche universitaire et de suivi ornithologique n'ont jamais

vraiment eu la cote. De plus, nous sommes maintenant davantage dans une époque où l'accent est mis sur la modélisation écologique quantitative, qui peut facilement être accomplie par des chercheurs assis devant leur écran plutôt que par des chercheurs devant aller récolter les données eux-mêmes (Gimenez et coll. 2012). De même, comment espérer convaincre les administrateurs et doyens d'universités d'essayer de comprendre la valeur de ce genre d'installations dans la formation de la prochaine génération de biologistes de terrain et d'ornithologues professionnels? Les stations de recherche sont absolument essentielles pour inspirer les étudiants du 2^e et 3^e cycle et les aider à développer leurs aptitudes dans le domaine de l'écologie. Une chose est certaine toutefois : la démolition rapide de la DMFS après près d'un demi-siècle de service (figure 3), sans aucune recherche sérieuse de solutions de rechange, est à la fois choquante et honteuse. Pendant que nous dormions, nous avons perdu une installation de recherche et d'enseignement universitaire manifestement précieuse et un fleuron du Réseau canadien de surveillance des migrations. L'ornithologie et la conservation canadienne sont les grandes perdantes de la fermeture de la DMFS, et il se peut que d'autres stations suivent si nous n'agissons pas immédiatement.

Responses to this article can be read online at:

<http://www.ace-eco.org/issues/responses.php/553>

LITERATURE CITED

Crewe, T. L., J. D. McCracken, P. D. Taylor, D. Lepage, and A. E. Heagy. 2008. *The Canadian migration monitoring network: ten-year report on monitoring landbird population change*. CMMN-RCSM Scientific Technical Report 1, Bird Studies Canada, Port Rowan, Ontario. 69 pp.

Gimenez, O. F Abadi, J-Y. Barnagaud, L. Blanc, M. Buoro, S. Cubaynes, M. Desprez, M. Gamelon, F. Guilhamon, P. Lagrange, B. Madon, L. Marescot, E. Papadatou, J. Papaix, G. Peron and S. Servanty. 2012. How can quantitative ecology be attractive to young scientists? Balancing computer/desk work with fieldwork. *Animal Conservation*. <http://dx.doi.org/10.1111/j.1469-1795.2012.00597.x>

Appendix 1: List of ornithology-related theses arising from use of the DMFS facility (1966-2010)

Alderson, G. W. 1996. Molecular genetic analysis of the mating system and host choice of an obligate brood parasitic bird, the Brown-headed Cowbird (*Molothrus ater*). MSc thesis, Department of Biology, McMaster University. 115 pp.

Barber, C. A. 1991. Egg and clutch size in relation to brood reduction in the Yellow-Headed Blackbird. MSc thesis, Department of Zoology, University of Manitoba. 57 pp.

Bazin, R. C. 1991. Defences against brood parasitism in the Eastern Kingbird. MSc thesis, Department of Zoology, University of Manitoba. 67 pp.

Biermann, G. C. 1980. Parental care, growth rates and pre-fledging condition of Yellow Warbler nestlings in different brood sizes. MSc thesis, Department of Zoology, University of Manitoba. 84 pp.

Briskie, J. V. 1985. Growth and parental feeding of Least Flycatchers in relation to brood size, hatching order and prey availability. MSc thesis, Department of Zoology, University of Manitoba. 115 pp.

Briskie, J. V. 1990. Behavioural and anatomical correlates of sperm competition in birds. PhD thesis, Department of Biology, Queen's University. 126 pp.

Busby, D. G. 1978. Feeding ecology of a dense population of nesting Yellow Warblers. MSc thesis, Department of Zoology, University of Manitoba. 62 pp.

Campobello, D. 2008. A comparative approach to the study of avian nest defence : experience and adaptive significance. PhD thesis, Department of Zoology, University of Manitoba. 196 pp.

Capper, C.-L. 2010. Nest abandonment is not an anti-parasite defence in red-winged blackbirds (*Agelaius phoeniceus*) at Delta Marsh, Manitoba. BSc thesis, Department of Biological Sciences. 40 pp.

Cosens, S. E. 1977. Development and structure of calls in young American Coots (*Fulica americana*). MSc thesis, Department of Zoology, University of Manitoba. 132 pp.

Cosens, S. E. 1984. Sources of selection on avian songs and singing behaviour in marsh and grassland habitats. PhD thesis, Department of Zoology, University of Toronto. 133 pp.

De Ruyck, C. C. 2009. Northern Saw-Whet Owls : Migration and population trends in Manitoba. MNRM thesis, Natural Resources Institute, University of Manitoba. 112 pp.

Duerksen, R. 1996. Do nest-associated calls of female passerine birds facilitate host-nest detection by parasitic Brown-headed Cowbirds (*Molothrus ater*)? BSc Honours thesis, Department of Zoology, University of Manitoba. 52 pp.

Gagnon, C. 2007. Migratory connectivity and diet in Yellow-rumped Warblers: A stable isotope approach. University of Saskatchewan. MSc thesis, Department of Biology, University of Saskatchewan. 117 pp.

Gifford, M. M. 1993. Inter- and intraclutch egg variation in Eastern Kingbirds (*Tyrannus tyrannus*): A test of Kingbirds' ability to recognize foreign eggs. MSc thesis, Department of Zoology, University of Manitoba, 106 pp.

Gill, S. A. 1995. Information transfer, function, and evolution of Yellow Warbler alarm calls. MSc thesis, Department of Zoology, University of Manitoba, 191 pp.

- Gonzalez-Prieto, A.M. 2012. Factors influencing body condition and arrival phenology of Neotropical migrants at a northern spring stopover site. M.Sc. Thesis, Department of Biology, University of Saskatchewan. 87 pp.
- Goossen, J. P. 1978. Breeding biology and reproductive success of the Yellow Warbler on the Delta Beach Ridge, Manitoba. MSc thesis, Department of Zoology, University of Manitoba. 81 pp.
- Grant, N. D. 1998. Host choice of a generalist brood parasite, the Brown-headed Cowbird (*Molothrus ater*). Department of Biology, Laurentian University. 90 pp.
- Grieff, P. M. 1995. Cues used by brood parasites and predators to locate nests. MSc thesis. Department of Zoology, University of Manitoba. 63 pp.
- Guigueno, M. F. 2007. Role of nest sanitation in the egg rejection behavior of the Yellow Warbler (*Dendroica petechia*). BSc Honours thesis, Department of Zoology, University of Manitoba, 44 pp.
- Guigueno, M. F. 2010. Acceptance or rejection of cowbird parasitism: cues used in decision-making by Yellow Warblers (*Dendroica petechia*). MSc thesis, Department of Biological Sciences, University of Manitoba. 105 pp.
- Guinan, D. M. 1985. The diet and foraging behaviour of House Wrens (*Troglodytes aedon*) and the abundance of the invertebrate prey. MSc thesis, Department of Zoology, University of Manitoba. 84 pp.
- Hébert, P. N. 1991. The relative importance of brood reduction, predation and parental investment in the evolution of hatching asynchrony in Yellow Warblers (*Dendroica petechia*). PhD thesis, Department of Zoology, University of Manitoba. 139 pp.
- Hill, D. P. 1992. An experimental study of nest desertion by the Clay-colored Sparrow (*Spizella tallida*) in response to cowbird parasitism. MSc thesis, Department of Zoology, University of Manitoba. 51 pp.
- Hinam, H. 1998. Gape size and gape colouration of the Brown-headed Cowbird and two species of its hosts: factors determining a parasite's choice of hoist. BSc Honours thesis, Department of Zoology, University of Manitoba. 45 pp.
- Hobson, K. A. 1988. Protection of genetic parentage in the Yellow Warbler (*Dendroica petechia*). MSc thesis, Department of Zoology, University of Manitoba. 125 pp.
- Horn, A. G. 1987. Repertoires and song switching in Western Meadowlarks (*Sturnella neglecta*). PhD thesis, Department of Zoology, University of Toronto. 122 pp.
- Isabelle, A. 1988. The role of predation in the adaptive value of coloniality and polygyny in the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*). Department of Biology, University of Ottawa. 89 pp.
- Kennedy, E. 1972. The ultrastructure of the body wall of the waterfowl parasite (*Echinuria uncinata*) (Rudolphi 1819) Soloviev 1912 (Nematoda: Spiruridae). MSc thesis, Department of Zoology, University of Manitoba. 163 pp.
- La Porte, N. 2012. Revisiting the Nesting Ecology of the Western Grebe after 40 Years of Changes at Delta Marsh, Manitoba. M.Sc. Thesis, Natural Resource Institute. 121 pp.
- Leonard, M. L. 1986. Female choice and the evolution of polygyny in the Marsh Wren (*Cistothorus palustris*). PhD thesis, Department of Biology, University of Ottawa. 133 pp.

- Lichtenstein, G. 1997. Begging behaviour and host manipulation by three species of parasitic cowbirds. PhD thesis, Department of Zoology, University of Cambridge, UK. 163 pp.
- Lorenzana, J. C. 1996. Are begging calls of Brown-headed Cowbirds an adaptation for brood parasitism? The acoustic structure of begging calls of cowbirds and five nonparasitic icterine species. BSc Honours thesis, Department of Zoology, University of Manitoba. 61 pp.
- Lorenzana, J. C. 1999. Fitness costs and benefits of egg ejection in Gray Catbirds. MSc thesis, Department of Zoology, University of Manitoba. 113 pp.
- MacKenzie, D. I. 1979. Nest site selection and coexistence in Eastern and Western Kingbirds at Delta Marsh, Manitoba. MSc thesis, Department of Zoology, University of Manitoba. 116 pp.
- Mazerolle, D. 2005. Environmental, ecological, and physiological factors influencing timing of arrival and stopover ecology of migrating passerines. University of Saskatchewan. PhD thesis, Department of Biology, University of Saskatchewan. 139 pp.
- McLaren, C. M. 2000. Patterns of host nest use by Brown-Headed Cowbirds parasitizing Song Sparrows and Yellow Warblers. MSc thesis, Department of Zoology, University of Manitoba. 100 pp.
- McMaster, D. G. 1997. An experimental investigation of strategies used by Brown-headed Cowbirds to optimize parental care. PhD thesis, Department of Zoology, University of Manitoba. 139 pp.
- McNicholl, M. K. 1971. The breeding biology and ecology of Forster's Tern (*Sterna forsteri*) at Delta, Manitoba. MSc thesis, Department of Zoology, University of Manitoba. 652 pp.
- Mico, M. A. 1998. Yellow Warbler nests: Structure, building materials and cowbird parasitism. MSc thesis, Department of Zoology, University of Manitoba. 89 pp.
- Miller, A. 2006. The Manitoba Piping Plover Stewardship Project: A provincial strategy for the management of the endangered Piping Plover (*Charadrius melodus circumcinctus*). MSc thesis, Department of Environment and Geography, University of Manitoba. 105 pp.
- Miller, P. C. 1993. Molecular genetic analysis of a Brown-headed Cowbird population. MSc thesis, Department of Biology, McMaster University. 85 pp.
- Neudorf, D. L. 1991. Nest defense in four host species of the Brown-Headed Cowbird (*Molothrus ater*). MSc thesis, Department of Zoology, University of Manitoba. 92 pp.
- Neufeld, L. 1998. Egg colour variation, nest depredation, and egg size variation in Brewer's Blackbirds (*Euphagus cyanocephalus*). BSc Honours thesis, Department of Zoology, University of Manitoba. 34 pp.
- Pohajdak, G. C. [Biermann]. 1988. Feeding guilds, diets and foraging behavior of insectivorous passerines in a riparian habitat in Manitoba. PhD thesis, Department of Zoology, University of Manitoba. 220 pp.
- Purcell, S. L. 1998. The significance of waterfowl feces as a source of nutrients to algae in a prairie wetland. MSc thesis. Department of Botany, University of Manitoba. 118 pp.
- Rasmussen, J. L. 2008. Limits of grasp-ejection in Brown-headed Cowbird hosts : implications for evolutionary equilibrium and evolutionary lag. MSc thesis, Department of Biological Sciences, University of Manitoba, 106 pp.

Robinson, A. J. 2007. Responses of Song Sparrows (*Melospiza melodia*) to threats of cowbird parasitism in areas of sympatry and recent sympatry. MSc thesis, Department of Zoology, University of Manitoba, 96 pp.

Shonk, K. 2001. Movement patterns, behavior and genetic measures of space use by Brown-headed Cowbirds. MSc thesis, Department of Biology, McMaster University. 111 pp.

Stewart, R.L.M. 2003. Reported Black-billed and Yellow-billed cuckoo hosts' responses to a dummy Black-billed cuckoo and cuckoo-like eggs. MSc thesis, Department of Zoology, University of Manitoba, 133 pp.

Sutherland, D. L. 1987. Age-related reproductive success in the Yellow Warbler (*Dendroica petechia*). MSc thesis, Department of Zoology, University of Manitoba. 92 pp.

Underwood, T. J. 2004. Proximate and ultimate influences on egg recognition and rejection behaviour in response to avian brood parasitism. PhD thesis, Department of Zoology, University of Manitoba. 197 pp.

Westphal, A. M. 2012. Clutch size and laying determinacy of the Yellow Warbler (*Setophaga petechia*) at Delta Marsh, Manitoba. MSc thesis, Department of Zoology, University of Manitoba. 70 pp.

Wilner, E. M. 1988. Apportionment of parental investment in breeding American Robins. MSc thesis, Department of Zoology, University of Manitoba. 85 pp.

Woolfenden, B. E. 2000. Demography and breeding behaviour of Brown-headed Cowbirds: An examination of host use, individual mating patterns and reproductive success using microsatellite DNA markers. PhD thesis, Department of Biology, McMaster University. 225 pp.

Appendix 2. List of ornithology-related publications arising from use of the DMFS facility (1966-2010)

Alderson, G. W., H. L. Gibbs, and S. G. Sealy. 1999. Determining the reproductive behaviour of individual brown-headed cowbirds using microsatellite DNA markers. *Animal Behaviour* 58:895-905.

Alderson, G. W., H. L. Gibbs, and S. G. Sealy. 1999. Parentage and kinship studies in an obligate brood parasitic bird, the Brown-headed Cowbird (*Molothrus ater*), using microsatellite DNA markers. *Journal of Heredity* 90:182-190.

Barber, C. A., and R. M. Evans. 1995. Clutch-size manipulations in the Yellow-headed Blackbird: A test of the individual optimization hypothesis. *Condor* 97:352-360.

Barclay, R. M. R. 1988. Variation in the costs, benefits and frequency of nest reuse by Barn Swallows (*Hirundo rustica*). *Auk* 105:53-60.

Barclay, R. M. R., M. L. Leonard, and G. Friesen. 1985. Nocturnal singing by Marsh Wrens. *Condor* 87:418-422.

Bartlett, C. M., and R. C. Anderson. 1987. *Chandlerella bushi* n. sp. and *Splendidofilaria caperata* Hibler, 1964 (Nematoda:Filarioidea) from *Fulica americana* (Gruiformes:Rallidae) in Manitoba, Canada. *Canadian Journal of Zoology* 65:2799-2802.

Bartlett, C. M., and R. C. Anderson. 1987. *Pelecitus fulicaeatrae* (Nematoda:Filarioidea) of Coots (Gruiformes) and Grebes (Podicipediformes): skin-inhabiting microfilariae and development in Mallophaga. *Canadian Journal of Zoology* 65:2803-2812.

Bazin, R. C., and S.G. Sealy. 1993. Experiments on the responses of a rejector species to threats of predation and cowbird parasitism. *Ethology* 94:326-338.

Biermann, G. C., and S. G. Sealy. 1982. Parental feeding of nestling Yellow Warblers in relation to brood size and prey availability. *Auk* 99:332-341.

Biermann, G. C., and S. G. Sealy. 1985. Seasonal dynamics of body mass of insectivorous passerines breeding on the forested dune ridge, Delta Marsh, Manitoba. *Canadian Journal of Zoology* 63:1675-1682.

Briskie, J. V. 1988. Least Flycatcher lines nest with dragonfly wings. *Blue Jay* 46:155-156.

Briskie, J. V. 1993. Anatomical adaptations to sperm competition in Smith's Longspurs and other polygynandrous passerines. *Auk* 110:875-888.

Briskie, J. V. 1994. Least Flycatcher (*Empidonax minimus*). Number 99 in A. Poole, and F. Gill, editors. *The Birds of North America*. Philadelphia: The Academy of Natural Sciences; Washington, DC: The American Ornithologists Union.

Briskie, J. V. 1994. Seasonal patterns of sperm storage in the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*). *Ibis* 136:323-330.

Briskie, J. V. 1996. Lack of sperm storage by female migrants and the significance of copulations en route. *Condor* 98:414-417.

Briskie, J. V. 1996. Spatiotemporal patterns of sperm storage and last-male sperm precedence in birds. *Functional Ecology* 10:375-383.

- Briskie, J. V., and R. Montgomerie. 1992. Sperm size and sperm competition in birds. *Proceedings of the Royal Society of London, Series B* 247:89-95.
- Briskie, J. V., and R. Montgomerie. 1993. Patterns of sperm storage in relation to sperm competition in passerine birds. *Condor* 95:442-454.
- Briskie, J. V., and S. G. Sealy. 1987. Polygyny and double-brooding in the Least Flycatcher. *Wilson Bulletin* 99:492-494.
- Briskie, J. V., and S. G. Sealy. 1987. Responses of Least Flycatchers to experimental inter- and intraspecific brood parasitism. *Condor* 89:899-901.
- Briskie, J. V., and S. G. Sealy. 1988. Nest re-use and egg burial in the Least Flycatcher, *Empidonax minimus*. *Canadian Field-Naturalist* 102:729-731.
- Briskie, J. V., and S. G. Sealy. 1989. Changes in nest defense against a brood parasite over the breeding cycle. *Ethology*, 82:61-67.
- Briskie, J. V., and S. G. Sealy. 1989. Nest failure and evolution of hatching asynchrony in the Least Flycatcher. *Journal of Animal Ecology* 58:653-665.
- Briskie, J. V., and S. G. Sealy. 1989. The 1 clutch size in the Least Flycatcher. *Auk* 106:269-278.
- Briskie, J. V., and S. G. Sealy. 1990. Evolution of short incubation periods in the parasitic cowbirds, *Molothrus* spp. *Auk* 107:789-794.
- Briskie, J. V., and S. G. Sealy. 1990. Variation in size and shape of Least Flycatcher eggs. *Journal of Field Ornithology* 61(2):180-191.
- Briskie, J. V., S. G. Sealy, and K.A. Hobson. 1990. Differential parasitism of Least Flycatchers and Yellow Warblers by the Brown-headed Cowbird. *Behavioural Ecology and Sociobiology* 27:403-410.
- Briskie, J. V., S. G. Sealy, and K. A. Hobson. 1992. Behavioral defenses against avian brood parasitism in sympatric and allopatric host populations. *Evolution* 46:334-340.
- Busby, D. G., and S.G. Sealy. 1979. Feeding ecology of a population of nesting Yellow Warblers. *Canadian Journal of Zoology* 57:1670-1681.
- Campobello, D., and S. G. Sealy. 2010. Enemy recognition of Reed Warblers (*Acrocephalus scirpaceus*): threats and reproductive value act independently in nest defence modulation. *Ethology* 116:498-508.
- Campobello, D., and S. G. Sealy. 2011. Use of social over personal information enhances nest defense against avian brood parasitism. *Behavioral Ecology* 22:422-428 + supporting online material at www.behco.oxfordjournals.org/.
- Campobello, D., and S. G. Sealy. 2011. Nest defence against brood parasites is promoted by egg-removal events in a cowbird–host system. *Animal Behaviour* 82:885-891.
- Capper, C. -L., M. F. Guigueno, and S. G. Sealy. 2012. Acceptance of simulated cowbird parasitism in a northern population of Red-winged Blackbirds. *American Midland Naturalist* 167:127-135.
- Cosens, S. E. 1981. Development of vocalizations in the American Coot. *Canadian Journal of Zoology* 59:1921-1928.

- Cosens, S. E., and J. B. Falls. 1984. Comparison of sound propagation and song frequency in temperate marsh and grassland habitat. *Behavioural Ecology and Sociobiology* 15:161-170.
- Cosens, S. E., and J. B. Falls. 1984. Structure and use of song in the Yellow-headed Blackbird *Xanthocephalus xanthocephalus*. *Zeitschrift für Tierpsychologie* 66:227-241.
- Cosens, S. E., and S. G. Sealy. 1986. Age-related variation in song repertoire size and repertoire sharing of Yellow Warblers. *Canadian Journal of Zoology* 64:1926-1929.
- Dickinson, T. E., J. B. Falls, and J. Kopachena, J. 1987. Effects of female pairing status and timing of breeding on nesting productivity in Western Meadowlarks (*Sturnella neglecta*). *Canadian Journal of Zoology* 65:3093-3101.
- Ellison, K., S. G. Sealy, and H. R. McGaha. 2007. Co-occurrence of cowbird nestling bill-color morphs: adaptive or neutral mechanisms? *Auk* 124:526-536.
- Evans, R. M., and R. W. Nero. 1967. Sight record of Green Heron at Delta, Manitoba. *Blue Jay* 15:184.
- Falls, J. B., and L. G. d'Agincourt. 1982. Why do meadowlarks switch song types? *Canadian Journal of Zoology* 69:3400-3408.
- Falls, J. B., A. G. Horn, and T. E. Dickinson. 1988. How Western Meadowlarks classify their songs: Evidence from song matching. *Animal Behaviour* 36:579-585.
- Gagnon, C., and K. A. Hobson. 2009. Using isotopes to track frugivory in migratory passerines. *Canadian Journal of Zoology* 87:982-992.
- Gibbs, H. L., P. Miller, G. Alderson, and S. G. Sealy. 1997. Genetic analysis of Brown-headed Cowbirds (*Molothrus ater*) raised by different hosts: data from mtDNA and microsatellite DNA markers. *Molecular Ecology* 6:189-193.
- Gill, S. A., and S. G. Sealy. 1996. Nest defence by Yellow Warblers: Recognition of a brood parasite and an avian nest predator. *Behaviour* 133:263-282.
- Gill, S. A., and S. G. Sealy. 2003. Tests of two functions of alarm calls given by Yellow Warblers during nest defence. *Canadian Journal of Zoology* 81:1685-1690.
- Gill, S. A., and S. G. Sealy. 2004. Functional reference in an alarm signal given during nest defence: set calls of yellow warblers denote brood-parasitic Brown-headed Cowbirds. *Behavioral Ecology and Sociobiology* 56:71-80.
- Gill, S. A., P. M. Grief, L. M. Staib and S. G. Sealy. 1997. Does nest defence deter or facilitate cowbird parasitism? A test of the nesting-cue hypothesis. *Ethology* 103:56-71.
- Gill, S. A., D. L. Neudorf, and S. G. Sealy. 1997. Host responses to cowbirds near the nest: cues for recognition. *Animal Behaviour* 53:1287-1293.
- Gill, S. A., D. L. H. Neudorf, and S. G. Sealy. 2008. Do hosts discriminate between sexually dichromatic male and female Brown-headed Cowbirds? *Ethology* 114:548-556.
- Goossen, J. P. 1977. Yellow Warbler nest used by a Least Flycatcher. *Wilson Bulletin* 89:153-154.

- Goossen, J. P. 1985. Egg-burying behaviour by a Yellow Warbler in the apparent absence of cowbird parasitism. *Blue Jay* 43:188-189.
- Goossen, J. P., and S. G. Sealy. 1982. Production of young in a dense nesting population of Yellow Warblers, *Dendroica petechia*, in Manitoba. *Canadian Field-Naturalist* 96:189-199.
- Goossen, J. P., and D. G. Busby. 1979. Occurrences of the Red Phalarope in the prairie provinces and adjacent states. *Canadian Field-Naturalist* 93:446-449.
- Grant, N. D., and S. G. Sealy. 2002. Selection of Red-winged Blackbird (*Agelaius phoeniceus*) hosts by the Brown-headed Cowbird (*Molothrus ater*). *Bird Behavior* 15:21-30.
- Grieff, P. M., and S. G. Sealy. 2000. Simulated host activity does not attract parasitism by Brown-headed Cowbirds (*Molothrus ater*). *Bird Behavior* 13:69-78.
- Guigueno, M. F., and S. G. Sealy. 2009. Clutch abandonment by parasitized Yellow Warblers: Egg burial or nest desertion? *Condor* 112:399-406.
- Guigueno, M. F., and Sealy, S. G. 2009. Nest sanitation plays a role in egg burial by Yellow Warblers. *Ethology* 115:247-256.
- Guigueno, M. F., and S. G. Sealy. 2011. Aggression towards egg-removing cowbird elicits clutch abandonment in parasitized Yellow Warblers, *Dendroica petechia*. *Animal Behaviour* 81:211-218.
- Guigueno, M. F., and S. G. Sealy. Nest sanitation in passerine birds: Implications for egg rejection in hosts of brood parasites. *Journal of Ornithology* 153:35-52 + supporting online material.
- Guigueno, M. F., and S. G. Sealy. 2012. Increased investigation of manipulated clutches suggests egg recognition without rejection in a Brown-headed Cowbird (*Molothrus ater*) host, the Yellow Warbler (*Setophaga petechia*). *Auk* 129:17-25.
- Guinan, D. M., and S. G. Sealy. 1987. Diet of House Wrens (*Troglodytes aedon*) and the abundance of the invertebrate prey in the dune-ridge forest, Delta Marsh, Manitoba. *Canadian Journal of Zoology* 65:1587-1596.
- Guinan, D. M., and S. G. Sealy. 1989. Foraging substrate use by House Wrens nesting in natural cavities in a riparian habitat. *Canadian Journal of Zoology* 67:61-67.
- Hébert, P. N. 1985. Breeding failure and decline of a Common Tern colony in southern Manitoba. *Colonial Waterbirds* 8:183-185.
- Hébert, P. N. 1993. An experimental study of brood reduction and hatching asynchrony in Yellow Warblers. *Condor* 95:362-371.
- Hébert, P. N., and S. G. Sealy. 1992. Onset of incubation in Yellow Warblers: A test of the hormonal hypothesis. *Auk* 109:249-255.
- Hébert, P. N., and S. G. Sealy. 1993. Egg-size variation in Yellow Warblers: apportionment of parental investment and the brood-survival hypothesis. *Canadian Journal of Zoology* 71:1008-1011.
- Hébert, P. N., and S. G. Sealy. 1993. Hatching asynchrony and feeding rates in Yellow Warblers: A test of the sexual conflict hypothesis. *American Naturalist* 142:881-892.

- Hébert, P. N., and S. G. Sealy. 1993. Hatching asynchrony in Yellow Warblers: A test of the nest-failure hypothesis. *Ornis Scandinavica* 24:10-14.
- Hill, D. P., and S. G. Sealy. 1994. Desertion of nests parasitized by cowbirds: have Clay-coloured Sparrows evolved an anti-parasite defence? *Animal Behaviour* 48:1063-1070.
- Hinam, H. L., S. G. Sealy, and T. J. Underwood. 2004. Ruby-throated Hummingbird, *Archilochus colubris*, entanglements in burdock, *Arctium* spp., at Delta Marsh, Manitoba. *Canadian Field-Naturalist* 118:85-89.
- Hobson, K. A. 1988. First record of the Blue-winged Warbler in Manitoba. *Blue Jay* 46:86-87.
- Hobson, K. A. 1993. Status of Neotropical migrant songbirds in Manitoba - time for a second look. *Blue Jay* 51:109-112.
- Hobson, K. A., and S. G. Sealy. 1986. Foraging, scavenging, and other behaviour of swallows on the ground. *Wilson Bulletin* 99:111-116.
- Hobson, K.A., and S. G. Sealy. 1987. Cowbird egg buried by a Northern Oriole. *Journal of Field Ornithology* 58:222-224.
- Hobson, K. A., and S. G. Sealy. 1989. Female-female aggression in polygynously nesting Yellow Warblers. *Wilson Bulletin* 101:84-86.
- Hobson, K. A., and S. G. Sealy. 1989. Mate guarding in the Yellow Warbler *Dendroica petechia*. *Ornis Scandinavica* 20:241-249.
- Hobson, K. A., and S. G. Sealy. 1989. Responses of Yellow Warblers to the threat of cowbird parasitism. *Animal Behaviour* 38:510-519.
- Hobson, K. A., and S. G. Sealy. 1990. Breeding season aggression of female Yellow Warblers to models of male and female conspecific intruders. *Animal Behaviour* 39:809-811.
- Hobson, K. A., and S. G. Sealy. 1990. Female song in the Yellow Warbler. *Condor* 92:259-261.
- Hobson, K. A., M. L. Bouchart, and S. G. Sealy. 1988. Responses of naive Yellow Warblers to a novel nest predator. *Animal Behaviour* 36:1823-1830.
- Hobson, K. A., H. L. Gibbs, H. den Haan, S. van Wilgenberg, and R. J. G. Dawson. 2000. Sexing hatching-year Yellow Warblers using plumage characteristics. *North American Bird Bander* 25:8-12.
- Hobson, K. A., and S. G. Sealy. 1987. Cowbird egg buried by a Northern Oriole. *Journal of Field Ornithology* 58:222-224.
- Horn, A. G., and P. Christie. 1985. First Sage Thrasher sighting in Manitoba. *Blue Jay* 43:177-178.
- Horn, A. G., and J. B. Falls. 1986. Western Meadowlarks switch song types when matched by playback. *Animal Behaviour* 34:927-929.
- Horn, A. G., and J. B. Falls. 1988. Responses of Western Meadowlarks (*Sturnella neglecta*) to song repetition and contrast. *Animal Behaviour* 36:291-293.

- Horn, A. G., and J. B. Falls. 1988. Structure of Western Meadowlark (*Sturnella neglecta*) song repertoires. *Canadian Journal of Zoology* 66:284-288.
- Kasumovic, M. M., H. L. Gibbs, B. E. Woolfenden, S.G. Sealy, and H. Nakamura, H. 2002. Primary sex-ratio variation in two brood parasitic birds: Brown-headed Cowbird (*Molothrus ater*) and Common Cuckoo (*Cuculus canorus*). *Auk* 119:561-566.
- Klippenstine, D. R., and S. G. Sealy. 2010. Assessing generalized egg mimicry: A quantitative comparison of eggs of Brown-headed Cowbirds and grassland passerines. *Wilson Journal of Ornithology* 122:346-353.
- Klippenstine, D. R., and S. G. Sealy. 2008. Differential ejection of cowbird eggs and non-mimetic eggs by grassland passerines. *Wilson Journal of Ornithology* 120:667-673 + FRONTISPIECE.
- Leonard, M. L., and J. Picman. 1986. Why are nesting Marsh Wrens and Yellow-headed Blackbirds spatially segregated? *Auk* 103:135-140.
- Leonard, M. L., and J. Picman. 1987. Female settlement in Marsh Wrens: Is it affected by other females? *Behavioral Ecology and Sociobiology* 21:135-140.
- Leonard, M. L., and J. Picman. 1987. Nesting mortality and habitat selection by Marsh Wrens. *Auk* 104:491-495.
- Leonard, M. L., and J. Picman. 1987. The adaptive significance of multiple nest building by male Marsh Wrens. *Animal Behaviour* 35:271-277.
- Leonard, M. L., and J. Picman. 1988. Mate choice by Marsh Wrens: The influence of male and territory quality. *Animal Behaviour* 36:517-528.
- Lichtenstein, G., and S. G. Sealy. 1998. Nestling competition, rather than supernormal stimulus, explains the success of parasitic Brown-headed Cowbird chicks in Yellow Warbler nests. *Proceedings of the Royal Society of London, Series B* 265(1392): 249-254.
- Lorenzana, J. C., and S. G. Sealy. 1999. A meta-analysis of the impact of parasitism by the Brown-headed Cowbirds on its hosts. *Studies in Avian Biology* 18:241-253.
- Lorenzana, J. C., and S. G. Sealy. 2001. Fitness costs and benefits of cowbird egg ejection by Gray Catbirds. *Behavioral Ecology* 12(3):325-329.
- Lorenzana, J. C., and S. G. Sealy. 2002. Did blue eggs of Black-billed (*Coccyzus erythrophthalmus*) and Yellow-billed (*C. americanus*) Cuckoos evolve to counter host discrimination? *Auk* 119:851-854.
- MacKenzie, D. I., and C. E. McKenzie. 1980. Morphological variation in *Plagiorchis noblei* Park 1936 (Trematoda:Plagiorchiidae) from *Tyrannus tyrannus* and *T. verticalis* (Aves:Tyrannidae). *Journal of Parasitology* 66:145-149.
- MacKenzie, D. I., and S. G. Sealy. 1981. Nest site selection in Eastern and Western Kingbirds: A multivariate approach. *Condor* 83:310-321.
- MacKenzie, D. I., C. E. McKenzie, and L.W. Brownlie. 1979. Comparison of the helminth fauna of Eastern and Western Kingbirds at Delta, Manitoba. *Canadian Journal of Zoology* 57:1143-1149.

- MacKenzie, D. I., S. G. Sealy, and G. D. Sutherland. 1982. Nest-site characteristics of the avian community in the dune-ridge forest, Delta Marsh, Manitoba: a multivariate analysis. *Canadian Journal of Zoology* 60:2212-2223.
- Mazarolle, D. F., S. G. Sealy, and K. A. Hobson. 2011. Interannual flexibility in breeding phenology of a Neotropical migrant songbird in response to weather conditions at breeding and wintering areas. *Écoscience* 18:18-25.
- Mazarolle, D. F., and K. A. Hobson. 2005. Estimating origins of short-distance migrant songbirds in North America: Contrasting inferences from hydrogen isotope measurements of feathers, claws, and blood. *Condor* 107:280-288.
- Mazarolle, D. F., and K. A. Hobson. 2006. Patterns of differential migration in White-throated Sparrows evaluated with isotopic measurements of feathers. *Canadian Journal of Zoology* 85:413-420.
- Mazarolle, D. F., K. Dufour, K. A. Hobson, and H. den Haan. 2005. Effects of large-scale climatic fluctuations on survival and productivity of a Neotropical migrant songbird. *Journal of Avian Biology* 36:155-163.
- Mazarolle, D. F., K. A. Hobson, and L. I. Wassenaar. 2005. Combining stable isotope and band-encounter analyses to delineate migratory patterns and catchment areas of White-throated Sparrows at a migration monitoring station. *Oecologia* 144:541-549.
- McGregor, P. K., and J. B. Falls. 1984. The response of Western Meadowlarks (*Sturnella neglecta*) to the playback of undegraded and degraded songs. *Canadian Journal of Zoology* 62:2125-2128.
- McKenzie, C. E., and D. I. MacKenzie. 1981. Comparison of the ectoparasitic fauna of Eastern and Western Kingbirds at Delta Marsh, Manitoba. *Canadian Journal of Zoology* 59:717-721.
- McLaren, C. M., and S. G. Sealy. 2000. Are nest predation and brood parasitism correlated in Yellow Warblers? A test of the cowbird predation hypothesis. *Auk* 117:1056-1060.
- McLaren, C. M., and S. G. Sealy. 2003. Factors influencing susceptibility of host nests to brood parasitism. *Ethology Ecology and Evolution* 15:343-353.
- McLaren, C. M., B. E. Woolfenden, H. L. Gibbs, and S. G. Sealy 2003. Genetic and temporal patterns of multiple parasitism by Brown-headed Cowbirds (*Molothrus ater*) on Song Sparrows (*Melospiza melodia*). *Canadian Journal of Zoology* 81:281-286.
- McLaren, C. M., T. J. Underwood, and S. G. Sealy. 2006. Conflicting temporal changes in the frequency and intensity of cowbird parasitism on four common hosts over 130 years. *Condor* 108:238-242.
- McMaster, D. G., and S. G. Sealy. 1997. Host-egg removal by Brown-headed Cowbirds: A test of the host incubation limit hypothesis. *Auk* 114:212-220.
- McMaster, D. G., and S. G. Sealy. 1998. Red-Winged Blackbirds (*Agelaius phoeniceus*) accept prematurely hatching Brown-headed Cowbirds (*Molothrus ater*). *Bird Behavior* 12:67-70.
- McMaster, D. G., and S. G. Sealy. 1998. Short incubation periods of Brown-headed Cowbirds: How do cowbird eggs hatch before Yellow Warbler eggs? *Condor* 100:102-111.
- McMaster, D. G., and S. G. Sealy. 1999. Do Brown-Headed Cowbird hatchlings alter adult Yellow Warbler behavior during the hatching period? *Journal of Field Ornithology* 70:365-373.

- McMaster, D. G., D. L. Neudorf, S. G. Sealy, and T. E. Pitcher. 2004. A comparative analysis of laying times in passerine birds. *Journal of Field Ornithology* 75:113-122.
- McMaster, D. G., S. G. Sealy, S. Gill, and D. Neudorf. 1999. Timing of egg laying in Yellow Warblers. *Auk* 116:236-240.
- McNicholl, M. K. 1968. Vocalization in the White Pelican. *Blue Jay* 22:124-125.
- McNicholl, M. K. 1969. Further note on Knot records for Manitoba. *Blue Jay* 27:83.
- McNicholl, M. K. 1969. The Knot as a migrant in southern Manitoba. *Blue Jay* 27:28-35.
- McNicholl, M. K. 1972. An observation of apparent death-feigning by a toad. *Blue Jay* 30:54-55.
- McNicholl, M. K. 1972. The use of hovering as a search method by the Northern Shrike. *Blue Jay* 30:96-97.
- McNicholl, M. K. 1973. Habituation of aggressive responses to avian predators by terns. *Auk* 90:902-904.
- McNicholl, M. K. 1973. Volume of Forster's Tern eggs. *Auk* 90:915-917.
- McNicholl, M. K. 1975. Interactions between Forster's Terns and American Coots. *Wilson Bulletin* 87:109-110.
- McNicholl, M. K. 1979. Destruction to nesting birds on a marsh bay by a single storm. *Prairie Naturalist* 11:60-62.
- McNicholl, M. K. 1979. Passerines feeding from floating vegetation. *Blue Jay* 37:223.
- McNicholl, M. K. 1979. Territories of Forster's Terns. *Proceedings of the Colonial Waterbird Group* 3:196-203.
- McNicholl, M. K. 1981. Interactions between Forster's Terns and Yellow-headed Blackbirds. *Colonial Waterbirds* 4:150-154.
- McNicholl, M. K. 1982. Factors affecting reproductive success of Forster's Terns at Delta Marsh, Manitoba. *Colonial Waterbirds* 5:32-38.
- McNicholl, M. K. 1983. Hatching in Forster's Terns. *Condor* 85:50-52.
- McNicholl, M. K., and J. P. Goossen. 1980. Warblers feeding from ice. *Wilson Bulletin* 92:121.
- McNicholl, M. K., R. D. England, and R. F. Koes. 1972. Black-necked Stilts observed in Manitoba. *Canadian Field-Naturalist* 86:380-382.
- Murphy-Klassen, H. M., T. J. Underwood, S. G. Sealy, and A. A. Czyrnyj. 2005. Long-term trends in spring arrival dates of migrant birds at Delta Marsh, Manitoba, in relation to climate change. *Auk* 122:1130-1148.
- Nelson, C. H. 1993. *The Downy Waterfowl of North America*. Delta Station Press, Deerfield, Illinois. 302 pp.

- Neudorf, D. L., and S. G. Sealy. 1992. Responses of four passerine species to threats of predation and cowbird parasitism: enemy recognition or generalized response? *Behaviour* 123:84-105.
- Neudorf, D. L., and S. G. Sealy. 1994. Sunrise nest attentiveness in cowbird hosts. *Condor* 96:162-169.
- Neudorf, D. L. H., K. E. Sears, and S. G. Sealy. 2011. Responses of Yellow-headed Blackbirds and Yellow Warblers to wrens. *Wilson Journal of Ornithology* 123:823-827.
- Peer, B. D., and S. G. Sealy. 2000. Conspecific brood parasitism and egg rejection in Great-tailed Grackles. *Journal of Avian Biology* 31:271-277.
- Peer, B. D., and S. G. Sealy. 2004. Correlates of egg rejection in hosts of the Brown-headed Cowbird. *Condor* 106:580-599.
- Peer, B. D., and S. G. Sealy. 2004. Fate of grackle (*Quiscalus* spp.) defenses in the absence of brood parasitism: implications for long-term host-parasite coevolution. *Auk* 121:1172-1186.
- Peer, B. D., H. J. Homan, and S. G. Sealy. 2001. Infrequent cowbird parasitism on Common Grackles revisited: new records from the northern Great Plains. *Wilson Bulletin* 113:90-93.
- Picman, J. 1989. Mechanism of increased puncture resistance of eggs of Brown-headed Cowbirds. *Auk* 106:577-583.
- Picman, J., and A. Isabelle. 1995. Sources of nesting mortality and correlates of nesting success in Yellow-headed Blackbirds. *Auk* 112:183-191.
- Picman, J., and A. K. Picman. 1980. Destruction of nests by the Short-billed Marsh Wren. *Condor* 82:176-179.
- Picman, J., S. Pribil, and A. Isabelle. 2002. Antipredation value of colonial nesting in Yellow-headed Blackbirds. *Auk* 119:461-472.
- Rasmussen, J. L., and S. G. Sealy. 2006. Hosts feeding only Brown-headed Cowbird fledglings: Where are the host young? *Journal of Field Ornithology* 77:269-279.
- Rasmussen, J. L., S. G. Sealy, and T. J. Underwood. 2009. Method of ejection of Brown-headed Cowbird eggs and associated costs for American Robins and Gray Catbirds. *Condor* 111:570-574.
- Reid, M. L., and S. G. Sealy. 1986. Behavior of a polygynous yearling Yellow Warbler. *Wilson Bulletin* 98:315-317.
- Sealy, S. G. 1978. Clutch size and nest placement of the Pied-billed Grebe in Manitoba. *Wilson Bulletin* 90:301-302.
- Sealy, S. G. 1978. Possible influence of food on egg-laying and clutch size in the Black-billed Cuckoo. *Condor* 80:103-104.
- Sealy, S. G. 1979. Extralimital nesting of Bay-breasted Warblers: Response to forest tent caterpillars? *Auk* 96:600-603.
- Sealy, S. G. 1979. Prebasic molt of the Northern Oriole. *Canadian Journal of Zoology* 57:1473-1478.

- Sealy, S. G. 1980. Breeding biology of Orchard Orioles in a new population in Manitoba. *Canadian Field-Naturalist* 94:154-158.
- Sealy, S. G. 1980. Reproductive responses of Northern Orioles to a changing food supply. *Canadian Journal of Zoology* 58:221-227.
- Sealy, S. G. 1982. Rough-winged Swallows scavenging adult midges. *Wilson Bulletin* 94:368-369.
- Sealy, S. G. 1984. Extra-pair copulation in the Yellow Warbler *Dendroica petechia*. *Animal Behaviour* 32:295-296.
- Sealy, S. G. 1985. Analysis of a sample of Tennessee Warblers window-killed during spring migration in Manitoba. *North American Bird Bander* 10:121-124.
- Sealy, S. G. 1985. Erect posture of the young Black-billed Cuckoo: Adaptation for early mobility in a nomadic species. *Auk* 102:889-892.
- Sealy, S. G. 1985. Where do Northern ("Baltimore") Orioles spend the winter? *North American Bird Bander* 10:12-17.
- Sealy, S. G. 1985. Winter recovery, in Guatemala, of a Warbling Vireo banded in southern Manitoba, and an examination of other recoveries from the wintering range. *North American Bird Bander* 10:37-38.
- Sealy, S. G. 1986. Fall migration of Northern Orioles: An analysis of tower-killed individuals. *North American Bird Bander* 11:43-45.
- Sealy, S. G. 1986. Ruby-throated Hummingbird associating with a foraging Hairy Woodpecker. *Blue Jay* 44:241-242.
- Sealy, S. G. 1988. Aggressiveness in migrating Cape May Warblers: Defense of an aquatic food source. *Condor* 90:271-274.
- Sealy, S. G. 1989. Defense of nectar resources by migrating Cape May Warblers. *Journal of Field Ornithology* 60:89-93.
- Sealy, S. G. 1989. Incidental "egg dumping" by the House Wren in a Yellow Warbler nest. *Wilson Bulletin* 101:491-493.
- Sealy, S. G. 1992. Removal of Yellow Warbler eggs in association with cowbird parasitism. *Condor* 94:40-54.
- Sealy, S. G. 1994. Observed acts of egg destruction, egg removal and predation on nests of passerine birds at Delta Marsh, Manitoba. *Canadian Field-Naturalist* 108:41-51.
- Sealy, S. G. 1995. Burial of cowbird eggs by parasitized Yellow Warblers: An empirical and experimental study. *Animal Behavior* 49:877-889.
- Sealy, S. G. 1996. Evolution of host defenses against brood parasitism: Implications of puncture-ejection by a small passerine. *Auk* 113:346-355.
- Sealy, S. G. 2003. Laying times and a case of conspecific nest parasitism in the Black-billed Cuckoo. *Journal of Field Ornithology* 74:257-260.

- Sealy, S. G. 2004. Noteworthy Manitoba bird specimens in the Stewart-Hay Memorial Museum and University of Manitoba Zoology Museum. *Blue Jay* 62:182-196.
- Sealy, S. G. 2004. Paint flakes on the exterior and in the wall of a Ruby-throated Hummingbird nest. *Blue Jay* 62:74-76.
- Sealy, S. G., and R. Bazin. 1995. Low frequency of observed cowbird parasitism on Eastern Kingbirds: Host rejection, effective nest defense, or parasite avoidance? *Behavioral Ecology* 6:140-145.
- Sealy, S. G., and G. C. Biermann. 1983. Timing of breeding and migrations in a population of Least Flycatchers in Manitoba. *Journal of Field Ornithology* 54:113-122.
- Sealy, S. G., and H. E. den Haan. 1985. Return of a Red-eyed Vireo: A transient or breeder? *North American Bird Bander* 10:41-42.
- Sealy, S. G., and K. A. Hobson. 1987. On the "concealing pose" of the Northern Saw-whet Owl. *Blue Jay* 45:33-37.
- Sealy, S. G., and J. C. Lorenzana. 1998. Yellow Warblers (*Dendroica petechia*) do not recognize their own eggs. *Bird Behavior* 12:57-66.
- Sealy, S. G., and D. G. McMaster. 2004. Two additional observations of egg laying by parasitic Brown-headed Cowbirds. *Blue Jay* 62:24-27.
- Sealy, S. G., and D. L. Neudorf. 1995. Male Northern Orioles eject cowbird eggs: Implications for the evolution of rejection behaviour. *Condor* 97:369-375.
- Sealy, S. G., and T. J. Underwood. 2004. Accepters and rejecters of cowbird parasitism in the new world orioles (*Icterus* spp.). *Ornitologia Neotropical* 15:331-347.
- Sealy, S. G., G. C. Biermann, and H. E. den Haan. 1987. Spring migrations of Alder and Yellow-bellied Flycatchers in southern Manitoba. *North American Bird Bander* 12:54-57.
- Sealy, S. G., J. V. Briskie, and G. C. Biermann. 1986. Deaths of female passerine birds on their nests while incubating. *Journal of Field Ornithology* 57:315-317.
- Sealy, S. G., J. F. Chace, and A. J. Banks. 2000. Two subspecies of Warbling Vireo differ in their responses to cowbird eggs. *Western Birds* 31:190-194.
- Sealy, S. G., K. A. Hobson, and J. V. Briskie. 1989. Responses of Yellow Warblers to experimental intraspecific brood parasitism. *Journal of Field Ornithology* 60:224-229.
- Sealy, S. G., D. G. McMaster, and B. D. Peer. 2002. Tactics of obligate brood parasites to secure suitable incubators. Pages 254-269 in D. C. Deeming, editor. *Avian Incubation: Behaviour, Environment and Evolution*. Oxford University Press, Oxford.
- Sealy, S. G., D. G. McMaster, S. A. Gill, and D. L. Neudorf. 2000. Yellow Warbler nest attentiveness before sunrise: anti-parasite strategy or onset of incubation? Pages 169-177 in J. N. M. Smith, T. Cook, S. I. Rothstein, S. K. Robinson, and S. G. Sealy, editors. *Ecology and Management of Cowbirds and Their Hosts: Studies in the Conservation of North American Passerine Birds*. University of Texas Press, Austin. 388 pp.

- Sealy, S. G., D. L. Neudorf, and D. P. Hill. 1995. Rapid laying by Brown-headed Cowbirds *Molothrus ater* and other parasitic birds. *Ibis* 137:76-84.
- Sealy, S. G., D. L. Neudorf, K. A. Hobson, and S. A. Gill. 1998. Nest defense by potential hosts of the Brown-headed Cowbird. Methodological Approaches, benefits of defense and coevolution, chapter 10. Pages 194-211 in S. I. Rothstein and S. K. Robinson, editors. *Parasitic Birds and their Hosts, Studies in Coevolution*. Oxford University Press, Oxford. .
- Smith, J. N. M., and S. G. Sealy. 2000. Introduction to Part III, Host-cowbird behavioral interactions. Pages 159-160 in J. N. M. Smith, T. Cook, S. I. Rothstein, S. K. Robinson, and S. G. Sealy, editors. *Ecology and Management of Cowbirds and Their Hosts: Studies in the Conservation of North American Passerine Birds*. University of Texas Press, Austin.
- Smith, J. N. M., T. Cook, S. I. Rothstein, S. K. Robinson, and S. G. Sealy. 2000. Introduction to Part II, Cowbird spacing behavior, host selection, and negative consequences of parasitism for commonly used hosts. Pages 83-86 in J. N. M. Smith, T. Cook, S. I. Rothstein, S. K. Robinson, and S. G. Sealy, editors. *Ecology and Management of Cowbirds and Their Hosts: Studies in the Conservation of North American Passerine Birds*. University of Texas Press, Austin. 388 pp.
- Stewart, K. W., I. M. Suthers, and K. Leavesley. 1985. New fish distribution records in Manitoba and the role of a man-made inter-connection between two drainages as an avenue of dispersal. *Canadian Field-Naturalist* 99:317-326.
- Underwood, T. J., and S. G. Sealy. 2002. Adaptive significance of egg coloration. Pages 280-298 in D. C. Deeming (ed.) *Avian Incubation: Behaviour, Environment, and Evolution*. Oxford University Press, Oxford.
- Underwood, T. J., and S. G. Sealy. 2002. Breeding status and notes on the diet of the Northern Saw-whet Owl at Delta Marsh, Manitoba. *Blue Jay* 60:130-135.
- Underwood, T. J., and S. G. Sealy. 2006. Grasp-ejection in two small ejectors of cowbird eggs: A test of bill-size constraints and the evolutionary equilibrium hypothesis. *Animal Behaviour* 71:409-416.
- Underwood, T. J., and S. G. Sealy. 2006. Influence of shape on egg discrimination in American Robins and Gray Catbirds. *Ethology* 111:164-173.
- Underwood, T. J., and S. G. Sealy. 2006. Parameters of Brown-headed Cowbird *Molothrus ater* egg discrimination in Warbling Vireos *Vireo gilvus*. *Journal of Avian Biology* 37:1-10.
- Underwood, T. J., and S. G. Sealy, S. G. 2008. UV reflectance of eggs of Brown-headed Cowbirds (*Molothrus ater*) and acceptor and rejecter hosts. *Journal of Ornithology* 149:313-321.
- Underwood, T. J., S. G. Sealy, and C. M. McLaren. 2004. Experiments on egg discrimination in two North American corvids: Further evidence for retention of egg ejection. *Canadian Journal of Zoology* 82:1399-1407.
- Underwood, T. J., S. G. Sealy, and C. M. McLaren. 2004. Infrequent brood parasitism on Eastern Wood-Pewees despite acceptance of experimental Brown-headed Cowbird eggs. *Journal of Field Ornithology* 75:165-171.
- Weatherhead, P. J., S. G. Sealy, and R. M. R. Barclay. 1985. Risks of clustering in thermally stressed swallows. *Condor* 87:443-444.

- Wishart, R. A., and S. G. Sealy. 1980. Late summer time budget and feeding behaviour of Marbled Godwits (*Limosa fedoa*) in southern Manitoba. *Canadian Journal of Zoology* 58:1277-1282.
- Wong, P. L., and R. C. Anderson. 1987. New and described species of *Skrjabinoclava* Sobolev, 1943 (Nematoda:Acuarioidea) of the proventriculus of Nearctic waders (Aves:Charadriiformes) with a review of the genus and a key to species. *Canadian Journal of Zoology* 65:2760-2779.
- Wong, P. L., A. O. Bush, and R. C. Anderson. 1987. Redescription of *Sdrjabinocerca prima* Shikhobalova, 1930 (Nematoda:Acuarioidea) from the American Avocet (*Recurvirostra americana* Gmelin). *Canadian Journal of Zoology* 65:1569-1573.
- Woolfenden, B. E., H. L. Gibbs, and S. G. Sealy. 2001. Demography of Brown-headed Cowbirds at Delta Marsh, Manitoba. *Auk* 118:156-166.
- Woolfenden, B. E., H. L. Gibbs, and S. G. Sealy. 2002. High opportunity for sexual selection in both sexes of an obligate brood parasitic bird, the Brown-headed Cowbird (*Molothrus ater*). *Behavioral Ecology and Sociobiology* 52:417-425.
- Woolfenden, B. E., H. L. Gibbs, C. M. McLaren, and S. G. Sealy. 1998. Community-level patterns of parasitism: Use of three common hosts by a brood parasitic bird, the Brown-headed Cowbird. *Ecoscience* 11:238-248.
- Woolfenden, B. E., H. L. Gibbs, S. G. Sealy, and D. G. McMaster. 2003. Host use and fecundity of individual female Brown-headed Cowbirds. *Animal Behaviour* 66:95-106.