

NUTRITIONAL ECOLOGY WORKING GROUP

SUMMER 2020 NEWSLETTER

VOLUME 2, ISSUE 3



Hello NEWG members,

Hello members and friends of the Nutritional Ecology Working Group,

Summer is quickly coming to an end, which means we are nearing the annual TWS conference and our annual meeting. Before we get to meeting details, we'd also like to announce a webinar series that we will be hosting this winter. More information on that series will be available soon and we will be issuing a call for abstracts to follow.

At the TWS conference, the Nutritional Ecology Working Group will be hosting a recruitment meeting that is open to all conference attendees. Spread the word to anyone you know who may be interested in joining the NEWG, but isn't already a member. If you are already a member, we encourage you to attend our meeting on October 7, from 12-1:30 pm MT, which will be hosted via Zoom. We encourage all NEWG members to attend this meeting and to come to share ideas about the needs you have as a student or professional in the field of nutritional ecology and what the Working Group can do to help address these needs. The meeting will begin with a 10-15 min overview of ongoing activities of the NEWG and then will split into three breakout groups (wildlife managers, wildlife academics, and students and early-career professionals) to discuss how NEWG can help meet the needs of its members and its mission. We also hope to recruit new members and diversify our membership beyond the many of us who work on ungulates and we are counting on our membership to help us achieve that goal.

Although we had originally planned to host a symposium at the TWS conference, we made the difficult decision, based on feedback from our presenters and board members (including recent experiences with virtual conferences) to withdraw the symposium from this year's TWS conference. We plan to resubmit the symposium proposal for the next in-person TWS conference. Progress is still being made on a skills workshop, which we are hoping will be offered in late 2021. If you have an idea for a symposium or workshop at a future conference, including a joint-symposium with another working group, and are not sure how or when to get started, please reach out to us for assistance or bring these ideas to our October meeting. Lastly, we are hoping to form and fill some committees within NEWG, and will be providing more information and looking for volunteers for these committees at our next meeting.

As a reminder, we are still looking for feedback on our mission statement and are always soliciting citations for newly published research and links to webinars in the field of nutritional ecology to include in our newsletter.

Looking forward to seeing all of you via Zoom on October 7th at 12 pm MT!

Kristin Denryter

Chair, Nutritional Ecology Working Group

EXECUTIVE BOARD

Chair

Kristin Denryter

Secretary

Rachel Smiley

Treasurer

Katie Anderson

Newsletter editor

Taylor LaSharr

Website, Outreach, Communications

Dan Thompson

Board Members at Large

Rachel Cook

Tom Stephenson

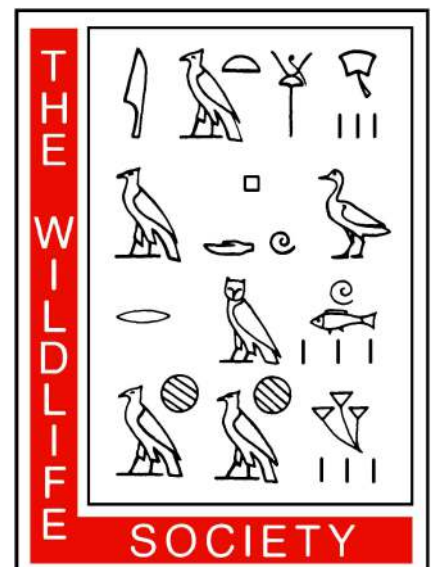


TABLE OF CONTENTS

Message from the Board.....	1
Announcements & Upcoming Events.....	2
Webinar Series	3
Professional Networking	3
Projects in Progress	4
Recent & Relevant Literature	4-6
Lab Analyses.....	6



ANNOUNCEMENTS & UPCOMING EVENTS

Annual Meeting | Please join us on October 7, 2020, 12-1:30 pm MT for our annual meeting. A zoom link will be provided for the meeting to the working group as the meeting gets closer.

TWS Symposium | We have decided to postpone the NEWG-sponsored symposium *Linking Wildlife Nutrition with Population Productivity* until the 2021 meeting occurs in person.

Skills Workshop | The Nutritional Ecology Working Group is working on developing a skills workshop. See the Projects in Progress section for more information!

Wildlife Techniques Manual | The latest volume of the Wildlife Techniques Manual features a highly anticipated new chapter on Techniques for Wildlife Nutritional Ecology authored by NEWG members Dr. Lisa Shipley, Dr. Rachel Cook, and Dr. David Hewitt. This 44 page chapter includes sections on measuring food abundance and quality, diet composition and selection, food intake, nutritional requirements, and nutritional condition as well as sections on calculating nutritional carrying capacity and linking nutrition to populations. The 2- volume manual now available for order!

WEBINAR SERIES

The Wildlife Society's Nutritional Ecology Working Group invites you to participate in a Webinar series over the winter of 2020-2021 (November-April). Webinars will take place the first Wednesday of every month. Webinars will be 1 hour long, and we encourage you to present your current research in nutritional ecology and engage the audience. Format is open, this can be a principal investigator giving an overview of their research, to several graduate students presenting ongoing research for a university lab. The Nutritional Ecology Working Group will send out a formal announcement and call for presenters in late September.

PROFESSIONAL NETWORKING—ANNUAL CONFERENCE

One highlight of the [TWS Annual Conference](#) for many students is the Professional Networking Event. This year's networking event is on **Monday September 28 from 6:00 to 8:00 pm EDT**. We'll have two networking lounges for each working group and for several common career paths. Please consider volunteering to represent your working group or one of the career paths. Our goal is to have one working group representative in each networking lounge. You can [SIGN UP HERE](#) (or via the link below). Please direct any questions to lara_pacifici@ncsu.edu.



PROJECTS IN PROGRESS

Skills Workshop | The Nutritional Ecology Working Group is planning to host its first skills workshop in August 2021 (assuming in-person gatherings are safe by this date). This 2-3 day workshop will be conducted in Pullman, WA through a course offering from University of Idaho and will be focused on sampling food abundance and quality for herbivores. The workshop will provide a mix of lectures, hands-on sampling/processing/analyzing, and problem solving exercises. College credit and/or continuing education credits may be available and we will be offering scholarship positions for minorities. More details on the agenda will be provided at our annual meeting in October and we anticipate finalizing the cost, agenda, dates, and workshop duration before winter. If you have any inquiries or questions, please contact [Dr. Rachel Cook](#).

Online Resources | The Nutritional Ecology Working Group is currently working on organizing resources related to lab analyses, foundation papers, and additional resources on nutritional ecology. We are excited to be able to put these resources in a central location for the working group to access. We are currently collating papers that represent some of the foundational work in nutritional ecology. If there is a paper that you think is seminal to the field of nutritional ecology, please add that information to [this document](#). We hope to have these resources available by early 2021.

RECENT & RELEVANT LITERATURE

- Bänsch, S., Tschardtke, T., Ratnieks, F. L., Härtel, S., & Westphal, C. (2020). Foraging of honey bees in agricultural landscapes with changing patterns of flower resources. *Agriculture, Ecosystems & Environment*, 291, 106792.
- Bezdiček, J., Nesvadbová, A., Makarevich, A., & Kubovičová, E. (2020). Relationship between the animal body condition and reproduction: the biotechnological aspects. *Archives Animal Breeding*, 63, 203–209.
- Bonebrake, T. C., Rezende, E. L., & Bozinovic, F. (2020). Climate change and thermoregulatory consequences of activity time in mammals. *American Naturalist*, 196.
- Boyero, L., López-Rojo, N., Bosch, J., Alonso, A., Correa-Araneda, F., & Pérez, J. (2020). Microplastics impair amphibian survival, body condition and function. *Chemosphere*, 244, 125500.
- Brodeur, J. C., Damonte, M. J., Candiotti, J. V., Poliserpi, M. B., D'Andrea, M. F., & Bahl, M. F. (2020). Frog body condition: Basic assumptions, comparison of methods and characterization of natural variability with field data from *Leptodactylus latrans*. *Ecological Indicators*, 112, 106098.
- Cavallo, C., Chiaradia, A., Deagle, B. E., Hays, G. C., Jarman, S., McInnes, J. C., ... Reina, R. D. (2020). Quantifying prey availability using the foraging plasticity of a marine predator, the little penguin. *Functional Ecology*, 34, 1626–1639.
- Clive, L. F. R., Gardner, M. G., Clayton, J., Baring, R., Hutchinson, M. N., Fenner, A., & Bull, C. M. (2020). Population augmentation had no effect on the abundance or body condition of conspecifics and co-occurring lizard species in a native grassland community. *Austral Ecology*, 45, 478–487.
- Comas, M. (2020). Body condition, sex and elevation in relation to mite parasitism in a high mountain gecko. *Journal of Zoology*, 310(4), 298–305.
- de Barros, M. S. F., & dos Santos Calado, T. C. (2020). Plastic ingestion lead to reduced body condition and modified diet patterns in the rocky shore crab *Pachygrapsus transversus* (Gibbes, 1850)(Brachyura: Grapsidae). *Marine Pollution Bulletin*, 156, 111249.
- Denryter, K., Cook, R. C., Cook, J. G., Parker, K. L., & Gillingham, M. P. (2020). State-dependent foraging by caribou with different nutritional requirements. *Journal of Mammalogy*, 101(2), 544–557.
- Ferguson, S. H., Yurkowski, D. J., Young, B. G., Fisk, A. T., Muir, D. C. G., Zhu, X., & Thiemann, G. W. (2020). Comparing temporal patterns in body condition of ringed seals living within their core geographic range with those living at the edge. *Ecography*, 1–15.
- Foo, D., Hindell, M., McMahon, C., Goldsworthy, S., & Bailleul, F. (2020). Environmental drivers of oceanic foraging site fidelity in central place foragers. *Marine Biology*, 167(6).
- Frankish, C. K., Manica, A., & Phillips, R. A. (2020). Effects of age on foraging behavior in two closely related albatross species. *Movement Ecology*, 8, 1–17.
-

- Freeman, N. E., Norris, D. R., Sutton, A. O., & Newman, A. E. M. (2020). Raising young with limited resources: supplementation improves body condition and advances fledging of Canada Jays. *Ecology*, *101*, 1–10.
- Garbuzov, M., Balfour, N. J., Shackleton, K., Al Toufaily, H., Scandian, L., & Ratnieks, F. L. W. (2020). Multiple methods of assessing nectar foraging conditions indicate peak foraging difficulty in late season. *Insect Conservation and Diversity*.
- Garrett, N., & Daw, N. D. (2020). Biased belief updating and suboptimal choice in foraging decisions. *Nature Communications*, *11*(1), 1–12. <https://doi.org/10.1038/s41467-020-16964-5>
- Greene, L. K., Clarke, T. A., Southworth, C. A., Bornbusch, S. L., & Ehmke, E. E. (2020). Daily lettuce supplements promote foraging behavior and modify the gut microbiota in captive frugivores. *Zoo Biology*.
- Grimaudo, A. T., Hope, S. F., DuRant, S. E., Kennamer, R. A., Hallagan, J. J., & Hopkins, W. A. (2020). Ambient temperature and female body condition are related to night incubation behavior in wood ducks *Aix sponsa*. *Journal of Avian Biology*, *51*, 1–11.
- Guerrero-Cárdenas, I., Álvarez-Cárdenas, S., Gallina, S., Corcuera, P., Romero-Figueroa, G., Lozano-Cavazos, E. A., ... & Guerrero-Tovar, I. Y. (2020). Estimation of temporary changes in the body condition of the bighorn sheep (*Ovis Canadensis weemsi*) from photointerpretation, in the Sierra El Mechudo, BCS, Mexico. *Acta zoológica mexicana*, *36*.
- Hale, S. L., Koprowski, J. L., & Archer, S. R. (2020). Black-tailed prairie dog (*Cynomys ludovicianus*) reintroduction can limit woody plant proliferation in grasslands. *Frontiers in Ecology and Evolution*, *8*. <https://doi.org/10.3389/fevo.2020.00233>
- Hemingway, C. T., Ryan, M. J., & Page, R. A. (2020). State-dependent learning influences foraging behaviour in an acoustic predator. *Animal Behaviour*, *163*, 33–38.
- Hennessy, G., Harris, C., Eaton, C., Wright, P., Jackson, E., Goulson, D., & Ratnieks, F. F. (2020). Gone with the wind: effects of wind on honey bee visit rate and foraging behaviour. *Animal Behaviour*, *161*, 23-31.
- Hobart, B. K., Kramer, H. A., Jones, G. M., Dotters, B. P., Whitmore, S. A., Keane, J. J., & Peery, M. Z. (2020). Stable isotopes reveal unexpected relationships between fire history and the diet of Spotted Owls. *Ibis*.
- Hong-bi, P., Dong-min, H., Di, Z., & Wan-long, Z. (2020). Effects of food restriction on body mass, energy metabolism and thermogenesis in a tree shrew (*Tupaia belangeri*). *Animal Biology*, *70*(2), 175-187.
- Hückstädt, L. A., Piñones, A., Palacios, D. M., McDonald, B. I., Dinniman, M. S., Hofmann, E. E., ... & Costa, D. P. (2020). Projected shifts in the foraging habitat of crabeater seals along the Antarctic Peninsula. *Nature Climate Change*, *10*(5), 472-477.
- Hull, I. T., L. A. Shipley, S. L. Berry, C. Loggers, and T. R. Johnson. 2020. Effects of fuel reduction timber harvests on forage resources for deer in northeastern Washington. *Forest Ecology and Management* 458:1-13. <<https://doi.org/10.1016/j.foreco.2019.117757>>.
- Labourgade, P., Ballesta, L., Huvencers, C., Papastamatiou, Y., & Mourier, J. (2020). Heterospecific foraging associations between reef-associated sharks: first evidence of kleptoparasitism in sharks. *Ecology*.
- Leathwick, D. M., Miller, C. M., Waghorn, T. S., Hea, S. Y., & Candy, P. M. (2020). Production responses in adult ewes to long-acting anthelmintic treatment pre-mating: relationship with body condition score. *New Zealand Journal of Agricultural Research*, 1-14.
- Lynch, E. C., Johnson, C. A., Lynch, R. F., Rothman, J. M., Di Fiore, A., & Palombit, R. A. (2020). Mothers and fathers improve immature baboon foraging success. *Behaviour*, *1*(aop), 1-28.
- Maslo, B., Burkhalter, J. C., Bushek, D., Yuhas, T., Schumm, B., Burger, J., & Lockwood, J. L. (2020). Assessing conservation conflict: does intertidal oyster aquaculture inhibit foraging behavior of migratory shorebirds? *Ecosphere*, *11*.
- McGraw, K. J., Chou, K., Bridge, A., McGraw, H. C., McGraw, P. R., & Simpson, R. K. (2020). Body condition and poxvirus infection predict circulating glucose levels in a colorful songbird that inhabits urban and rural environments. *Journal of Experimental Zoology Part A: Ecological and Integrative Physiology*.
- Nolte, C. R., Nel, R., & Pfaff, M. C. (2020). Determining body condition of nesting loggerhead sea turtles (*Caretta caretta*) in the South-west Indian Ocean. *Journal of the Marine Biological Association of the United Kingdom*, *100*(2), 291-299.
- O'Connell, M., Jordan, Z., McGilvray, E., Cohen, H., Liere, H., Lin, B. B., ... Jha, S. (2020). Reap what you sow: local plant composition mediates bumblebee foraging patterns within urban garden landscapes. *Urban Ecosystems*.
- Pigeault, R., Cozzarolo, C. S., Glaziot, O., & Christe, P. (2020). Effect of age, haemosporidian infection and body condition on pair composition and reproductive success in Great Tits *Parus major*. *Ibis*, *162*, 613–626.
- Prat, Y., & Yovel, Y. (2020). Decision making in foraging bats. *Current Opinion in Neurobiology*, *60*, 169-175.
- Quillfeldt, P., Weimerskirch, H., Delord, K., & Cherel, Y. (2020). Niche switching and leapfrog foraging: Movement ecology of sympatric petrels during the early breeding season. *Movement Ecology*, *8*, 1–14.
- Requier, F., Jowanowitsch, K. K., Kallnik, K., & Steffan-Dewenter, I. (2020). Limitation of complementary resources affects colony growth, foraging behavior, and reproduction in bumble bees. *Ecology*, *101*, 1–11.

- Ribeiro, P. V. A., Baesse, C. Q., de Magalhães Tolentino, V. C., de Oliveira, M. M., da Cunha, M. J. R., Melo, C., & Cury, M. C. (2020). Associations among biomass, body condition, and blood parasitism in avian species from the Brazilian Cerrado. *Ciência e Natura*, 42, 50.
- Sabal, M. C., Hazen, E. L., Bograd, S. J., MacFarlane, R. B., Schroeder, I. D., Hayes, S. A., ... Wells, B. K. (2020). California current seascape influences juvenile salmon foraging ecology at multiple scales. *Marine Ecology Progress Series*, 634, 159–173.
- Schmitt, M. H., Ward, D., & Shrader, A. M. (2020). Salivary tannin-binding proteins: A foraging advantage for goats?. *Livestock Science*, 234, 103974.
- Semakula, J., Corner-Thomas, R. A., Morris, S. T., Blair, H. T., & Kenyon, P. R. (2020). Predicting ewe body condition score using lifetime live-weight and liveweight change and previous body condition score record. *Animals*, 10.
- Sion, G., Watson, M. J., & Bouskila, A. (n.d.). Measuring body condition of lizards: a comparison between non-invasive dual-energy X-ray absorptiometry, chemical fat extraction, and calculated indices, 1–14.
- Stephenson, T. R., German, D. W., Cassirer, E. F., Walsh, D. P., Blum, M. E., Cox, M., ... Monteith, K. L. (2020). Linking population performance to nutritional condition in an alpine ungulate. *Journal of Mammalogy*.
- Tarroux, A., Cherel, Y., Fauchald, P., Kato, A., Love, O. P., Ropert-Coudert, Y., ... Descamps, S. (2020). Foraging tactics in dynamic sea-ice habitats affect individual state in a long-ranging seabird. *Functional Ecology*, (December 2019), 1839–1856. <https://doi.org/10.1111/1365-2435.13632>
- Twardochleb, L. A., Treakle, T. C., & Zarnetske, P. L. (2020). Foraging strategy mediates ectotherm predator–prey responses to climate warming. *Ecology*.
- Ulappa, A. C., L. A. Shipley, R. C. Cook, J. G. Cook, and M. E. Swanson. 2020. Silvicultural herbicides and forest succession influence understory vegetation and nutritional ecology of black-tailed deer in managed forests. *Forest Ecology and Management* <https://doi.org/10.1016/j.foreco.2020.118216>
- Valdebenito, J. O., Martínez-de la Puente, J., Castro, M., Pérez-Hurtado, A., Tejera, G., Székely, T., ... Figuerola, J. (2020). Association of insularity and body condition to cloacal bacteria prevalence in a small shorebird. *PLoS One*, 15, e0237369.
- Van Donk, S., Shamoun-Baranes, J., Bouten, W., Van Der Meer, J., & Camphuysen, K. C. J. (2020). Individual differences in foraging site fidelity are not related to time-activity budgets in herring gulls. *Ibis*, 162, 429–445.
- Ventura, F., Granadeiro, J. P., Padget, O., & Catry, P. (2020). Gadget petrels use knowledge of the windscape, not memorized foraging patches, to optimize foraging trips on ocean-wide scales. *Proceedings of the Royal Society B: Biological Sciences*.
- Yeakel, J. D., Bhat, U., & Newsome, S. D. (2020). Caching in or falling back at the Sevilleta: the effects of body size and seasonal uncertainty on desert rodent foraging.
- Yijie Wang, Rui Zhou, Qiaoling Yu, Tianshu Feng, Huan Li, Gut microbiome adaptation to extreme cold winter in wild plateau pika (*Ochotona curzoniae*) on the Qinghai-Tibet Plateau, *FEMS Microbiology Letters*, Volume 367, Issue 16, August 2020, fnaa134

LAB ANALYSES FOR NUTRITION WORK

Have you ever struggled to determine where to send your forage samples for analyses of nutritional quality and wished there was a place you could check to see what your options are? You're not alone. Few labs in the USA complete all nutritional assays for ruminants and these assays though similar in name can vary from lab to lab. We're working to compile a comprehensive list of laboratories in the USA and Canada that offer *in vitro* digestibility assays, bomb calorimetry and sequential fiber analysis, tannin precipitation, etc. and provide a key to help you determine which assays you need and which labs can perform those assays. Have some good tips on where you've sent forage samples? Email us at tws.nutritional.ecology@gmail.com and we'll add them to our list.



Above: Sampling forage quality at Starkey Experimental Forest and Range. Photo: Jennifer Merems.