The Rocky Point Bird Observatory Hummingbird Project

The Hummingbird Project has been truly lucky to have partnered with Goldstream Hatchery, which embodies the concept that nature is interconnected. We are a volunteer-run, citizen science research project that focuses on hummingbirds in BC and Alberta. At Goldstream Hatchery, our teams monitor two of the five hummingbird species found commonly in Canada: Rufous (Selasphorus rufus) and Anna's (Calypte anna) Hummingbirds. We study their life history, health, breeding, and habitat use.

Unfortunately, many hummingbird species are in serious decline and the Rufous Hummingbird is a tipping point species, i.e., species that ‘have lost two-thirds of their populations in the past 50 years, and are on track to lose another 50% in the next 50 years’ (North American Bird Conservation Initiative, 2022.) This makes our work to understand these birds all the more urgent. Thus, in recent years, our research efforts have expanded to include questions around 'what habitat resources are used' and 'how habitat influences distribution and access to resources'. We use this information to advocate for hummingbirds and their conservation.

Volunteers maintain numerous feeders to keep hungry hummingbirds happy at the hatchery - Jannaca Chick

At the hatchery, we love answering questions and sharing our findings with the volunteers. We see important clues to hummingbird activities, from pollen deposited as they do their job as warm-blooded pollinators, to bits of spider’s web for nest construction.

Flowers have left yellow pollen on this female's head and bill - Jannaca Chick

Sometimes there are special life moments, like an egg that is ready to be laid, or little bits of broken shell from a newly hatched chick, stuck to a female's breast. We also appreciate when the hatchery volunteers dive in and help us with that needed 'extra scribe' or trapper!

Fragments of eggshell from a newly hatched chick - Jen Neve

Hummingbirds are dedicated nectar drinkers, consuming 2-4 times their body weight a day. With that level of intake, they must constantly offload waste. In fact, urine and faeces are so generously donated by the birds during handling, that it is often a case of collect it or wear it. These waste samples are information gold and have led to some significant ‘firsts’, including new understandings about hummingbird diet and how agricultural pesticides contaminate hummingbirds and the wider the environment.

Generous waste production - Jannaca Chick

From their waste, we have learned that hummingbirds eat a vast array of small flying insect prey, many of which have aquatic life stages. Nestling’s bodies grow quickly on the fat and protein these insects provide. For hummingbirds to breed successfully and for the Rufous population to start to recover, we need wetlands, from small ponds to vast marshes, which can provide the quality insect resources for hummingbirds to thrive. These same resources are key to a robust aquatic food web that is so important for the success of salmon, and so many conservation activities for improving salmon habitat intersect with those for hummingbirds. for the success of salmon, and so

Much of the decline in Rufous Hummingbirds coincided with the use of a new group of agricultural pesticides, the neonicotinoids. The abundantly donated waste samples of hummingbirds have let us look at how current agricultural practices are exposing hummingbirds to neonicotinoid pesticides and other chemical treatments. In a collaboration with Environment Canada, we found that hummingbirds are experiencing significant exposure to pesticides. For this work, Goldstream Hatchery has represented a ‘clean’, uncontaminated situation. This short video explains our earliest pesticide exposure work, which has now expanded to identify contamination of soil, water and plants far from the sites of initial application. These findings are shared with the Pesticide Management Regulatory Agency, the wider research community and the general public.

Watch a short video here with Jen Neve collecting samples: https://www.youtube.com/watch?v=E5jZ9fCsbLw

To learn more about our latest research efforts, please check our publications page or visit rpbo.org.

Recent Publications

Bishop CA, English SG, Maisonneuve F, Moran AJ, Higo HA, Common J, Hick KG, and Elliott JE. (2022) Temporal and spatial patterns of systemic insecticides in avian and insect pollinators and lowers in western Canada (2018, 2019). Environ Adv 8:100211. https://doi.org/10.1016/j.envadv.2022.100211.

Drake A, Bishop CA, Moran AJ and Wilson S (2022) Geographic and Temporal Variation in Annual Survival of a Declining Neotropical Migrant Hummingbird (Selasphorus rufus) Under Varying Fire, Snowpack, and Climatic Conditions. Front Ecol Evol 10:825026. doi: 10.3389/fevo.2022.825026.

Bishop CA, Woundneh M, Maisonneuve F, Common J, Elliott JE, and Moran AJ. (2020) Determination of neonicotinoids and butenolide residues in avian and insect pollinators and their ambient environment in Western Canada (2017, 2018). Sci Tot Environ, 737, 139386. https://doi.org/10.1016/j.scitotenv.2020.139386

Moran AJ, Prosser SWJ, Moran JA. (2019) DNA metabarcoding allows non-invasive identification of arthropod prey provisioned to nestling Rufous hummingbirds (Selasphorus rufus). PeerJ 7:e6596 https://doi.org/10.7717/peerj.6596

Bishop CA., Moran AJ., Toshack MC, Elle E, Maisonneuve F, and Elliott JE. (2018) Hummingbirds and Bumble Bees Exposed to Neonicotinoid and Organophosphate Insecticides in the Fraser Valley, British Columbia, Canada. Environ Toxicol Chem. 37 (8):2143-2152.

Moran, A. and Fraser, D.F. (2015) Rufous Hummingbird in Davidson, P.J.A., R.J. Cannings, A.R. Couturier, D. Lepage, and C.M. Di Corrado (eds.). The Atlas of the Breeding Birds of British Columbia, 2008-2012. Bird Studies Canada. Delta, B.C

Moran, A. and Fraser, D.F. (2015) Black-chinned Hummingbird in Davidson, P.J.A., R.J. Cannings, A.R. Couturier, D. Lepage, and C.M. Di Corrado (eds.). The Atlas of the Breeding Birds of British Columbia, 2008-2012. Bird Studies Canada. Delta, B.C.

Moran, A. and Fraser, D.F. (2015) Calliope Hummingbird in Davidson, P.J.A., R.J. Cannings, A.R. Couturier, D. Lepage, and C.M. Di Corrado (eds.). The Atlas of the Breeding Birds of British Columbia, 2008-2012. Bird Studies Canada. Delta, B.C.

Moran, A. and Fraser, D.F. (2015) Anna's Hummingbird in Davidson, P.J.A., R.J. Cannings, A.R. Couturier, D. Lepage, and C.M. Di Corrado (eds.). The Atlas of the Breeding Birds of British Columbia, 2008-2012. Bird Studies Canada. Delta, B.C.