

A synthetic review of terrestrial biological research from the Alberta oil sands region: ten years of published literature

Supplemental Information: Appendix 3

Table A3: Bibliography of peer-reviewed literature reviewed, organised by conceptual model columns (Pressures, Stressors, Pathways, Responses) and boxes (individual conceptual model elements) as numbered in **Figure 2**.

Table of Contents

Pressure	2	Contaminant exposure	21
Contaminants.....	2	Food availability / sources	23
Disturbance.....	4	Habitat change.....	23
Infrastructure	7	Human access	24
Non-oil sands	8	Invasive species.....	24
 		Land deformation	24
Stressor	10	Light penetration	24
Contaminants - Mercury	10	Microclimate.....	25
Contaminants - Other	11	Natural disturbance regime	25
Contaminants - PACs.....	11	Predator-prey dynamics	26
Contaminants - Trace elements	12	Soil chemistry.....	25
Disturbance - Areal / Polygonal	13	 	
Disturbance - Extraction	14	Response	27
Disturbance - Linear.....	14	Community - Cover / Structure.....	27
Disturbance - Unspecified / Non-oil sands	16	Community - Diversity / Richness	27
Infrastructure - Noise.....	18	Distribution - Abundance.....	28
Infrastructure - Physical	18	Distribution - Behaviour.....	29
Non-oil sands - Climate change	19	Distribution - Dispersal / Migration	30
Non-oil sands - Weather / Climate	19	Distribution - Occupancy	30
Non-oil sands - Wildfire	20	Health - Condition.....	31
 		Health - Function	32
Pathway	20	Health - Reproduction	32
Barriers & connectivity	20	Health - Stress.....	33
Bioaccumulation	21		

Pressure

Contaminants

- 5 Bartels SF, Gendreau-Berthiaume B, Macdonald SE. 2019. The impact of atmospheric acid deposition on tree growth and forest understory vegetation in the Athabasca Oil Sands Region. *Sci Total Environ.* 696:133877. doi:10.1016/J.SCITOTENV.2019.133877.
- 6 Berger RG, Aslund MW, Sanders G, Charlebois M, Knopper LD, Bresee KE. 2016. A multiple lines of evidence approach for the ecological risk assessment of an accidental bitumen release from a steam assisted gravity drainage (SAGD) well in the Athabasca oil sands region. *Sci Total Environ.* 542:495–504. doi:10.1016/j.scitotenv.2015.10.050.
- 7 Boutin C, Carpenter DJ. 2017. Assessment of wetland/upland vegetation communities and evaluation of soil-plant contamination by polycyclic aromatic hydrocarbons and trace metals in regions near oil sands mining in Alberta. *Sci Total Environ.* 576:829-839. doi:10.1016/j.scitotenv.2016.10.062.
- 10 Cho S, Dinwoodie G, Fu Y, Abboud S, Turchenek L. 2019. An assessment of long-term soil acidification trends in Alberta, Canada. *Ecol Indic.* 98(August 2018):712–722. doi:10.1016/j.ecolind.2018.11.020.
- 11 Cruz-Martinez L, Fernie KJ, Soos C, Harner T, Getachew F, Smits JEG. 2015. Detoxification, endocrine, and immune responses of tree swallow nestlings naturally exposed to air contaminants from the Alberta oil sands. *Sci Total Environ.* 502:8-15. doi:10.1016/j.scitotenv.2014.09.008.
- 18 Dolgova S, Popp BN, Courtoeil K, Espie RHM, Maclean B, McMaster M, Straka JR, Tetreault GR, Wilkie S, Hebert CE. 2018. Spatial trends in a biomagnifying contaminant: Application of amino acid compound-specific stable nitrogen isotope analysis to the interpretation of bird mercury levels. *Environ Toxicol Chem.* 37(5):1466-1475. doi:10.1002/etc.4113.
- 21 Eccles KM, Thomas PJ, Chan HM. 2020. Relationships between mercury concentrations in fur and stomach contents of river otter (*Lontra canadensis*) and mink (*Neovison vison*) in Northern Alberta Canada and their applications as proxies for environmental factors determining mercury bioavailability. *Environ Res.* 181:108961. doi:10.1016/j.envres.2019.108961.
- 22 Fernie KJ, Marteinson SC, Chen D, Eng A, Harner T, Smits JEG, Soos C. 2018. Elevated exposure, uptake and accumulation of polycyclic aromatic hydrocarbons by nestling tree swallows (*Tachycineta bicolor*) through multiple exposure routes in active mining-related areas of the Athabasca oil sands region. *Sci Total Environ.* 624:250-261. doi:10.1016/j.scitotenv.2017.12.123.
- 23 Fernie KJ, Marteinson SC, Chen D, Palace V, Peters L, Soos C, Smits JEG. 2019. Changes in thyroid function of nestling tree swallows (*Tachycineta bicolor*) in relation to polycyclic aromatic compounds and other environmental stressors in the Athabasca Oil Sands Region. *Environ Res.* 169(November 2018):464–475. doi:10.1016/j.envres.2018.11.031.
- 24 Fernie KJ, Marteinson SC, Soos C, Chen D, Cruz-Martinez L, Smits JEG. 2018. Reproductive and developmental changes in tree swallows (*Tachycineta bicolor*) are influenced by multiple stressors, including polycyclic aromatic compounds, in the Athabasca Oil Sands. *Environ Pollut.* 238:931-941. doi:10.1016/j.envpol.2018.03.074.

- 29 Godwin CM, Smits JEG, Barclay RMR. 2016. Metals and metalloids in nestling tree swallows and their dietary items near oilsands mine operations in Northern Alberta. *Sci Total Environ.* 562:714-723. doi:10.1016/j.scitotenv.2016.04.069.
- 30 Golzadeh N, Barst BD, Basu N, Baker JM, Auger JC, McKinney MA. 2020. Evaluating the concentrations of total mercury, methylmercury, selenium, and selenium:mercury molar ratios in traditional foods of the Bigstone Cree in Alberta, Canada. *Chemosphere.* 250:126285. doi:10.1016/j.chemosphere.2020.126285.
- 31 Graney JR, Landis MS, Puckett KJ, Studabaker WB, Edgerton ES, Legge AH, Percy KE. 2017. Differential accumulation of PAHs, elements, and Pb isotopes by five lichen species from the Athabasca Oil Sands Region in Alberta, Canada. *Chemosphere.* 184:700-710. doi:10.1016/j.chemosphere.2017.06.036.
- 32 Hebert CE, Campbell D, Kindopp R, MacMillan S, Martin P, Neugebauer E, Patterson L, Shatford J. 2013. Mercury trends in colonial waterbird eggs downstream of the oil sands region of Alberta, Canada. *Environ Sci Technol.* 47(20):11785-11792. doi:10.1021/es402542w.
- 33 Hebert CE, Weseloh DVC, Macmillan S, Campbell D, Nordstrom W. 2011. Metals and polycyclic aromatic hydrocarbons in colonial waterbird eggs from Lake Athabasca and the Peace-Athabasca Delta, Canada. *Environ Toxicol Chem.* 30(5):1178-1183. doi:10.1002/etc.489.
- 43 Laxton DL, Watmough SA, Aherne J, Straker J. 2010. An assessment of nitrogen saturation in *Pinus banksiana* plots in the Athabasca Oil Sands Region, Alberta. 1.:171-180. doi:10.4081/jlimnol.2010.s1.171.
- 44 Lundin JI, Riffell JA, Wasser SK. 2015. Polycyclic aromatic hydrocarbons in caribou, moose, and wolf scat samples from three areas of the Alberta oil sands. *Environ Pollut.* 206:527-534. doi:10.1016/j.envpol.2015.07.035.
- 45 MacKenzie MD, Dietrich ST. 2020. Atmospheric sulfur and nitrogen deposition in the Athabasca oil sands region is correlated with foliar nutrient levels and soil chemical properties. *Sci Total Environ.* 711:134737. doi:10.1016/j.scitotenv.2019.134737.
- 61 Savard MM, Bégin C, Marion J. 2014. Modelling carbon isotopes in spruce trees reproduces air quality changes due to oil sands operations. *Ecological Indicators.* 45:1-8. doi:10.1016/j.ecolind.2014.03.005.
- 71 Thomas PJ, Eccles KM, Mundy LJ. 2017. Spatial modelling of non-target exposure to anticoagulant rodenticides can inform mitigation options in two boreal predators inhabiting areas with intensive oil and gas development. *Biol Conserv.* 212:111–119. doi:10.1016/j.biocon.2017.06.005.
- 72 Thomas PJ, Newell EE, Eccles K, Holloway AC, Idowu I, Xia Z, Hassan E, Tomy G, Quenneville C. 2021. Co-exposures to trace elements and polycyclic aromatic compounds (PACs) impacts North American river otter (*Lontra canadensis*) baculum. *Chemosphere.* 265:128920. doi:10.1016/j.chemosphere.2020.128920.
- 78 Watmough SA, Bird A, McDonough A, Grimm E. 2019. Forest Fertilization Associated with Oil Sands Emissions. *Ecosystems.* 22(1):1–14. doi:10.1007/s10021-018-0249-x.

Disturbance

- 1 Abib TH, Chasmer L, Hopkinson C, Mahoney C, Rodriguez LCE. 2019. Seismic line impacts on proximal boreal forest and wetland environments in Alberta. *Sci Total Environ.* 658:1601–1613. doi:10.1016/j.scitotenv.2018.12.244.
- 2 Arienti MC, Cumming SG, Krawchuk MA, Boutin S. 2009. Road network density correlated with increased lightning fire incidence in the Canadian western boreal forest. *Int J Wildl Fire.* 18(8):970. doi:10.1071/wf08011.
- 3 Ball J, Sólymos P, Schmiegelow F, Hache S, Schieck J, Bayne E. 2016. Regional habitat needs of a nationally listed species, Canada Warbler (*Cardellina canadensis*), in Alberta, Canada. *Avian Conservation and Ecology.* 11(2):10. doi:10.5751/ACE-00916-110210.
- 8 Cadieux P, Boulanger Y, Cyr D, Taylor AR, Price DT, Sólymos P, Stralberg D, Chen H, Brecka A, Tremblay JA. 2020. Projected effects of climate change on boreal bird community accentuated by anthropogenic disturbances in western boreal forest, Canada. *Divers Distrib.*:1–15. doi:10.1111/ddi.13057.
- 9 Cameron EK, Bayne EM. 2009. Road age and its importance in earthworm invasion of northern boreal forests. *J Appl Ecol.* 46(1):28–36. doi:10.1111/j.1365-2664.2008.01535.x.
- 12 Dawe CA, Filicetti AT, Nielsen SE. 2017. Effects of linear disturbances and fire severity on velvet leaf blueberry abundance, vigor, and berry production in recently burned jack pine forests. *Forests.* 8(10):398. doi:10.3390/f8100398.
- 13 Dawe KL, Bayne EM, Boutin S. 2014. Influence of climate and human land use on the distribution of white-tailed deer (*Odocoileus virginianus*) in the western boreal forest. *Can J Zool.* 92(4):353–363. doi:10.1139/cjz-2013-0262.
- 14 Dawe KL, Boutin S. 2016. Climate change is the primary driver of white-tailed deer (*Odocoileus virginianus*) range expansion at the northern extent of its range; land use is secondary. *Ecol Evol.* 6(18):6435–6451. doi:10.1002/ece3.2316.
- 15 Dickie M, McNay SR, Sutherland GD, Cody M, Avgar T. 2020. Corridors or risk? Movement along, and use of, linear features varies predictably among large mammal predator and prey species. *J Anim Ecol.* 89(2):623–634. doi:10.1111/1365-2656.13130.
- 16 Dickie M, Serrouya R, DeMars C, Cranston J, Boutin S. 2017. Evaluating functional recovery of habitat for threatened woodland caribou. *Ecosphere.* 8(9):e01936. doi:10.1002/ecs2.1936.
- 17 Dickie M, Serrouya R, McNay RS, Boutin S. 2017. Faster and farther: wolf movement on linear features and implications for hunting behaviour. du Toit J, editor. *J Appl Ecol.* 54(1):253–263. doi:10.1111/1365-2664.12732.
- 19 Domahidi Z, Shonfield J, Nielsen SE, Spence JR, Bayne EM. 2019. Spatial distribution of the boreal owl and northern saw-whet owl in the Boreal region of Alberta, Canada. *Avian Conserv Ecol.* 14(2). doi:10.5751/ACE-01445-140214.
- 25 Fisher JT, Burton AC, Nolan L, Roy L. 2020. Influences of landscape change and winter severity on invasive ungulate persistence in the Nearctic boreal forest. *Sci Rep.* 10(1):1–11. doi:10.1038/s41598-020-65385-3.

- 26 Fisher JT, Burton AC. 2018. Wildlife winners and losers in an oil sands landscape. *Frontiers in Ecology and the Environment*. 16(6):323-328. doi:10.1002/fee.1807.
- 27 Foster KR, Godwin CM, Pyle P, Saracco JF. 2017. Reclamation and habitat-disturbance effects on landbird abundance and productivity indices in the oil sands region of northeastern Alberta, Canada. *Restoration Ecology*. 25(4):532-538. doi:10.1111/rec.12478.
- 35 Hedley RW, McLeod LJT, Yip DA, Farr D, Knaga P, Drake KL, Bayne E. 2020. Modeling the occurrence of the yellow rail (*Coturnicops noveboracensis*) in the context of ongoing resource development in the oil sands region of Alberta. *Avian Conserv Ecol*. 15(1):1–14. doi:10.5751/ACE-01538-150110.
- 36 Kansas J, Charlebois M, Skatter H. 2015. Vegetation recovery on low impact seismic lines in Alberta's oil sands and visual obstruction of wolves and woodland caribou. *Can Wildl Biol Manag*. 4(2):137–149.
- 37 Latham ADM, Latham MC, Boyce MS, Boutin S. 2011. Movement responses by wolves to industrial linear features and their effect on woodland caribou in northeastern Alberta. *Ecol Appl*. 21(8):2854-2865. doi:10.1890/11-0666.1.
- 38 Latham ADM, Latham MC, Boyce MS, Boutin S. 2013. Spatial relationships of sympatric wolves (*Canis lupus*) and coyotes (*C. latrans*) with woodland caribou (*Rangifer tarandus caribou*) during the calving season in a human-modified boreal landscape. *Wildl Res*. 40(3):250-260. doi:10.1071/WR12184.
- 39 Latham ADM, Latham MC, Boyce MS. 2011. Habitat selection and spatial relationships of black bears (*Ursus americanus*) with woodland caribou (*Rangifer tarandus caribou*) in northeastern Alberta. *Can J Zool*. 89(4):267-277. doi:10.1139/z10-115.
- 42 Latifovic R, Pouliot D. 2014. Monitoring cumulative long-term vegetation changes over the Athabasca Oil Sands region. *IEEE J Sel Top Appl Earth Obs Remote Sens*. 7(8):3380-3392. doi:10.1109/JSTARS.2014.2321058.
- 46 Mahon CL, Holloway G, Sólymos P, Cumming SG, Bayne EM, Schmiegelow FKA, Song SJ. 2016. Community structure and niche characteristics of upland and lowland western boreal birds at multiple spatial scales. *Forest Ecology and Management*. 361:99-116. doi:10.1016/j.foreco.2015.11.007.
- 47 Mahon CL, Holloway GL, Bayne EM, Toms JD. 2019 May 23. Additive and interactive cumulative effects on boreal landbirds: winners and losers in a multi-stressor landscape. *Ecol Appl*. e01895. doi:10.1002/eap.1895.
- 48 Mao L, Dennett J, Bater CW, Tompalski P, Coops NC, Farr D, Kohler M, White B, Stadt JJ, Nielsen SE. 2018. Using airborne laser scanning to predict plant species richness and assess conservation threats in the oil sands region of Alberta's boreal forest. *For Ecol Manage*. 409:29-37. doi:10.1016/j.foreco.2017.11.017.
- 49 Mayor SJ, Boutin S, He F, Cahill JF. 2015. Limited impacts of extensive human land use on dominance, specialization, and biotic homogenization in boreal plant communities. *BMC Ecology*. 15(1):5. doi:10.1186/s12898-015-0037-9.
- 50 Mayor SJ, Cahill JF, He F, Sólymos P, Boutin S. 2012. Regional boreal biodiversity peaks at intermediate human disturbance. *Nat Commun*. 3:1142. doi:10.1038/ncomms2145.

- 51 Morissette JL, Bayne EM, Kardynal KJ, Hobson KA. 2019. Regional variation in responses of wetland-associated bird communities to conversion of boreal forest to agriculture. *Avian Conserv Ecol.* 14(1). doi:10.5751/ACE-01355-140112.
- 53 Neilson EW, Boutin S. 2017. Human disturbance alters the predation rate of moose in the Athabasca oil sands. *Ecosphere.* 8(8):e01913. doi:10.1002/ecs2.1913.
- 56 Riva F, Acorn JH, Nielsen SE. 2018. Narrow anthropogenic corridors direct the movement of a generalist boreal butterfly. *Biol Lett.* 14(2):20170770. doi:10.1098/rsbl.2017.0770.
- 57 Riva F, Acorn JH, Nielsen SE. 2018a. Distribution of Cranberry Blue Butterflies (*Agriades optilete*) and Their Responses to Forest Disturbance from In Situ Oil Sands and Wildfires. *Diversity.* 10(4). doi:10.3390/d10040112.
- 58 Riva F, Acorn JH, Nielsen SE. 2018b. Localized disturbances from oil sands developments increase butterfly diversity and abundance in Alberta's boreal forests. *Biological Conservation.* 217:173–180. doi:10.1016/j.biocon.2017.10.022.
- 59 Riva F, Pinzon J, Acorn JH, Nielsen SE. 2020. Composite Effects of Cutlines and Wildfire Result in Fire Refuges for Plants and Butterflies in Boreal Treed Peatlands. *Ecosystems.* 23(3):485–497. doi:10.1007/s10021-019-00417-2.
- 60 Roberts D, Ciuti S, Barber QE, Willier C, Nielsen SE. 2018. Accelerated seed dispersal along linear disturbances in the Canadian oil sands region. *Scientific Reports.* 8(1):4828. doi:10.1038/s41598-018-22678-y.
- 64 Singer H V., Slattery SM, Armstrong L, Witherly S. 2020. Assessing breeding duck population trends relative to anthropogenic disturbances across the Boreal plains of Canada, 1960–2007. *Avian Conserv Ecol.* 15(1):1. doi:10.5751/ACE-01493-150101.
- 65 Singhroy V, Li J, Samsonov S, Shen L, Pearse J. 2014. InSAR monitoring of surface deformation induced by steam injection in the Athabasca oil sands, Canada. In: 2014 IEEE Geoscience and Remote Sensing Symposium. IEEE. p. 4796-4799.
- 66 Stern ER, Riva F, Nielsen SE. 2018. Effects of Narrow Linear Disturbances on Light and Wind Patterns in Fragmented Boreal Forests in Northeastern Alberta. *Forests.* 9(8):486. doi:10.3390/f9080486.
- 67 Stevenson CJ, Filicetti AT, Nielsen SE. 2019. High precision altimeter demonstrates simplification and depression of microtopography on seismic lines in treed peatlands. *Forests.* 10(4):295. doi:10.3390/f10040295.
- 68 Stewart FEC, Nowak JJ, Micheletti T, McIntire EJB, Schmiegelow FKA, Cumming SG. 2020. Boreal Caribou Can Coexist with Natural but Not Industrial Disturbances. *J Wildl Manage.* 84(8):1435–1444. doi:10.1002/jwmg.21937.
- 69 Tattersall ER, Burgar JM, Fisher JT, Burton AC. 2020. Boreal predator co-occurrences reveal shared use of seismic lines in a working landscape. *Ecol Evol.* 10(3):1678–1691. doi:10.1002/ece3.6028.
- 70 Tattersall ER, Burgar JM, Fisher JT, Burton AC. 2020. Mammal seismic line use varies with restoration: Applying habitat restoration to species at risk conservation in a working landscape. *Biol Conserv.* 241:108295. doi:10.1016/j.biocon.2019.108295.
- 73 Toews M, Juanes F, Burton AC. 2017. Mammal responses to human footprint vary with spatial extent but not with spatial grain. *Ecosphere.* 8(3). doi:10.1002/ecs2.1735.

- 74 Toews M, Juanes F, Burton AC. 2018. Mammal responses to the human footprint vary across species and stressors. *Journal of Environmental Management*. 217:690-699. doi:10.1016/j.jenvman.2018.04.009.
- 75 Van Wilgenburg S, Hobson K, Bayne E, Koper N. 2013. Estimated Avian Nest Loss Associated with Oil and Gas Exploration and Extraction in the Western Canadian Sedimentary Basin. *Avian Conservation and Ecology*. 8(2). doi:10.5751/ACE-00585-080209.
- 77 Wasser SK, Keim JL, Taper ML, Lele SR. 2011. The influences of wolf predation, habitat loss, and human activity on caribou and moose in the Alberta oil sands. *Frontiers in Ecology and the Environment*. 9(10):546-551. doi:10.1890/100071.
- 79 Wilson S, Saracco JF, Flockhart DTT, Godwin CM, Foster KR. 2018. Drivers of demographic decline across the annual cycle of a threatened migratory bird. *Scientific Reports*. 8(7316). doi:10.1038/s41598-018-25633-z.
- 80 Wilson SJ, Bayne EM. 2018. Use of an acoustic location system to understand how presence of conspecifics and canopy cover influence ovenbird (*Seiurus aurocapilla*) space use near reclaimed wellsites in the boreal forest of alberta. *Avian Conserv Ecol*. 13(2). doi:10.5751/ACE-01248-130204.
- 81 Zhang J, Kissling WD, He F. 2013. Local forest structure, climate and human disturbance determine regional distribution of boreal bird species richness in Alberta, Canada. *Journal of Biogeography*. 40(6):1131-1142. doi:10.1111/jbi.12063.
- 82 Zhang J, Mayor SJ, He F. 2014. Does disturbance regime change community assembly of angiosperm plant communities in the boreal forest? *J Plant Ecol*. 7(2):188-201. doi:10.1093/jpe/rtt068.
- 83 Davidson SJ, Goud EM, Franklin C, Nielsen SE, Strack M. 2020. Seismic line disturbance alters soil physical and chemical properties across boreal forest and peatland soils. *Front Earth Sci*. 8:281. doi:10.3389/feart.2020.00281.
- 84 Strack M, Softa D, Bird M, Xu B. 2018. Impact of winter roads on boreal peatland carbon exchange. *Global Change Biology*. 24(1):e201–e212. doi:10.1111/gcb.13844.
- 85 Lovitt J, Rahman MM, Saraswati S, McDermid GJ, Strack M, Xu B. 2018. UAV remote sensing can reveal the effects of low-impact seismic lines on surface morphology, hydrology, and methane (CH₄) release in a boreal treed bog. *Journal of Geophysical Research: Biogeosciences*. 123(3):1117–1129. doi:10.1002/2017JG004232.

Infrastructure

- 20 Dunne BM, Quinn MS. 2009. Effectiveness of above-ground pipeline mitigation for moose (*Alces alces*) and other large mammals. *Biol Conserv*. 142(2):332–343. doi:10.1016/j.biocon.2008.10.029.
- 52 Muhly T, Serrouya R, Neilson E, Li H, Boutin S. 2015. Influence of in-situ oil sands development on caribou (*Rangifer tarandus*) movement. *PLoS One*. 10(9):e0136933. doi:10.1371/journal.pone.0136933.
- 62 Shonfield J, Bayne E. 2017. The effect of industrial noise on owl occupancy in the boreal forest at multiple spatial scales. *Avian Conservation and Ecology*. 12(2). doi:10.5751/ACE-01042-120213.

- 63 Shonfield J, Bayne EM. 2019. Effects of industrial disturbance on abundance and activity of small mammals. *Can J Zool.* 97(11):1013–1020. doi:10.1139/cjz-2019-0098.

Non-oil sands

- 2 Arienti MC, Cumming SG, Krawchuk MA, Boutin S. 2009. Road network density correlated with increased lightning fire incidence in the Canadian western boreal forest. *Int J Wildl Fire.* 18(8):970. doi:10.1071/wf08011.
- 3 Ball J, Sólymos P, Schmiegelow F, Hache S, Schieck J, Bayne E. 2016. Regional habitat needs of a nationally listed species, Canada Warbler (*Cardellina canadensis*), in Alberta, Canada. *Avian Conservation and Ecology.* 11(2):10. doi:10.5751/ACE-00916-110210.
- 4 Barber QE, Parisien MA, Whitman E, Stralberg D, Johnson CJ, St-Laurent MH, DeLancey ER, Price DT, Arseneault D, Wang X, et al. 2018. Potential impacts of climate change on the habitat of boreal woodland caribou. *Ecosphere.* 9(10). doi:10.1002/ecs2.2472.
- 8 Cadieux P, Boulanger Y, Cyr D, Taylor AR, Price DT, Sólymos P, Stralberg D, Chen H, Brecka A, Tremblay JA. 2020. Projected effects of climate change on boreal bird community accentuated by anthropogenic disturbances in western boreal forest, Canada. *Divers Distrib.*:1–15. doi:10.1111/ddi.13057.
- 13 Dawe KL, Bayne EM, Boutin S. 2014. Influence of climate and human land use on the distribution of white-tailed deer (*Odocoileus virginianus*) in the western boreal forest. *Can J Zool.* 92(4):353–363. doi:10.1139/cjz-2013-0262.
- 14 Dawe KL, Boutin S. 2016. Climate change is the primary driver of white-tailed deer (*Odocoileus virginianus*) range expansion at the northern extent of its range; land use is secondary. *Ecol Evol.* 6(18):6435–6451. doi:10.1002/ece3.2316.
- 15 Dickie M, McNay SR, Sutherland GD, Cody M, Avgar T. 2020. Corridors or risk? Movement along, and use of, linear features varies predictably among large mammal predator and prey species. *J Anim Ecol.* 89(2):623–634. doi:10.1111/1365-2656.13130.
- 23 Fernie KJ, Marteinson SC, Chen D, Palace V, Peters L, Soos C, Smits JEG. 2019. Changes in thyroid function of nestling tree swallows (*Tachycineta bicolor*) in relation to polycyclic aromatic compounds and other environmental stressors in the Athabasca Oil Sands Region. *Environ Res.* 169(November 2018):464–475. doi:10.1016/j.envres.2018.11.031.
- 24 Fernie KJ, Marteinson SC, Soos C, Chen D, Cruz-Martinez L, Smits JEG. 2018. Reproductive and developmental changes in tree swallows (*Tachycineta bicolor*) are influenced by multiple stressors, including polycyclic aromatic compounds, in the Athabasca Oil Sands. *Environ Pollut.* 238:931–941. doi:10.1016/j.envpol.2018.03.074.
- 25 Fisher JT, Burton AC, Nolan L, Roy L. 2020. Influences of landscape change and winter severity on invasive ungulate persistence in the Nearctic boreal forest. *Sci Rep.* 10(1):1–11. doi:10.1038/s41598-020-65385-3.
- 26 Fisher JT, Burton AC. 2018. Wildlife winners and losers in an oil sands landscape. *Frontiers in Ecology and the Environment.* 16(6):323–328. doi:10.1002/fee.1807.

- 27 Foster KR, Godwin CM, Pyle P, Saracco JF. 2017. Reclamation and habitat-disturbance effects on landbird abundance and productivity indices in the oil sands region of northeastern Alberta, Canada. *Restoration Ecology*. 25(4):532-538. doi:10.1111/rec.12478.
- 28 Godwin CM, Barclay RMR, Smits JEG. 2019. Tree Swallow (*Tachycineta bicolor*) nest success and nestling growth near oil sands mining operations in northeastern Alberta, Canada. *Can J Zool*. 97(6):547-557. doi:10.1139/cjz-2018-0247.
- 32 Hebert CE, Campbell D, Kindopp R, MacMillan S, Martin P, Neugebauer E, Patterson L, Shatford J. 2013. Mercury trends in colonial waterbird eggs downstream of the oil sands region of Alberta, Canada. *Environ Sci Technol*. 47(20):11785-11792. doi:10.1021/es402542w.
- 34 Hebert CE. 2019. The river runs through it: The Athabasca River delivers mercury to aquatic birds breeding far downstream. *PLoS One*. 14(4):1-19. doi:10.1371/journal.pone.0206192.
- 37 Latham ADM, Latham MC, Boyce MS, Boutin S. 2011. Movement responses by wolves to industrial linear features and their effect on woodland caribou in northeastern Alberta. *Ecol Appl*. 21(8):2854-2865. doi:10.1890/11-0666.1.
- 38 Latham ADM, Latham MC, Boyce MS, Boutin S. 2013. Spatial relationships of sympatric wolves (*Canis lupus*) and coyotes (*C. latrans*) with woodland caribou (*Rangifer tarandus caribou*) during the calving season in a human-modified boreal landscape. *Wildl Res*. 40(3):250-260. doi:10.1071/WR12184.
- 39 Latham ADM, Latham MC, Boyce MS. 2011. Habitat selection and spatial relationships of black bears (*Ursus americanus*) with woodland caribou (*Rangifer tarandus caribou*) in northeastern Alberta. *Can J Zool*. 89(4):267-277. doi:10.1139/z10-115.
- 40 Latham ADM, Latham MC, Knopff KH, Hebblewhite M, Boutin S. 2013. Wolves, white-tailed deer, and beaver: Implications of seasonal prey switching for woodland caribou declines. *Ecography (Cop)*. 36(12):1276–1290. doi:10.1111/j.1600-0587.2013.00035.x.
- 44 Lundin JI, Riffell JA, Wasser SK. 2015. Polycyclic aromatic hydrocarbons in caribou, moose, and wolf scat samples from three areas of the Alberta oil sands. *Environ Pollut*. 206:527-534. doi:10.1016/j.envpol.2015.07.035.
- 46 Mahon CL, Holloway G, Sólymos P, Cumming SG, Bayne EM, Schmiegelow FKA, Song SJ. 2016. Community structure and niche characteristics of upland and lowland western boreal birds at multiple spatial scales. *Forest Ecology and Management*. 361:99-116. doi:10.1016/j.foreco.2015.11.007.
- 54 Nielsen SE, Dennett JM, Bater CW. 2020. Landscape patterns of rare vascular plants in the lower athabasca region of alberta, Canada. *Forests*. 11(6):699. doi:10.3390/f11060699.
- 57 Riva F, Acorn JH, Nielsen SE. 2018a. Distribution of Cranberry Blue Butterflies (*Agriades optilete*) and Their Responses to Forest Disturbance from In Situ Oil Sands and Wildfires. *Diversity*. 10(4). doi:10.3390/d10040112.
- 59 Riva F, Pinzon J, Acorn JH, Nielsen SE. 2020. Composite Effects of Cutlines and Wildfire Result in Fire Refuges for Plants and Butterflies in Boreal Treed Peatlands. *Ecosystems*. 23(3):485–497. doi:10.1007/s10021-019-00417-2.
- 64 Singer H V., Slattery SM, Armstrong L, Witherly S. 2020. Assessing breeding duck population trends relative to anthropogenic disturbances across the Boreal plains of Canada, 1960–2007. *Avian Conserv Ecol*. 15(1):1. doi:10.5751/ACE-01493-150101.

- 68 Stewart FEC, Nowak JJ, Micheletti T, McIntire EJB, Schmiegelow FKA, Cumming SG. 2020. Boreal Caribou Can Coexist with Natural but Not Industrial Disturbances. *J Wildl Manage.* 84(8):1435–1444. doi:10.1002/jwmg.21937.
- 69 Tattersall ER, Burgar JM, Fisher JT, Burton AC. 2020. Boreal predator co-occurrences reveal shared use of seismic lines in a working landscape. *Ecol Evol.* 10(3):1678–1691. doi:10.1002/ece3.6028.
- 70 Tattersall ER, Burgar JM, Fisher JT, Burton AC. 2020. Mammal seismic line use varies with restoration: Applying habitat restoration to species at risk conservation in a working landscape. *Biol Conserv.* 241:108295. doi:10.1016/j.biocon.2019.108295.
- 76 Ward EM, Gorelick SM. 2018. Drying drives decline in muskrat population in the Peace-Athabasca Delta, Canada. *Environ Res Lett.* 13(12):124026. doi:10.1088/1748-9326/aaf0ec.
- 77 Wasser SK, Keim JL, Taper ML, Lele SR. 2011. The influences of wolf predation, habitat loss, and human activity on caribou and moose in the Alberta oil sands. *Frontiers in Ecology and the Environment.* 9(10):546-551. doi:10.1890/100071.
- 81 Zhang J, Kissling WD, He F. 2013. Local forest structure, climate and human disturbance determine regional distribution of boreal bird species richness in Alberta, Canada. *Journal of Biogeography.* 40(6):1131-1142. doi:10.1111/jbi.12063.

Stressor

Contaminants - Mercury

- 18 Dolgova S, Popp BN, Courtoeil K, Espie RHM, Maclean B, McMaster M, Straka JR, Tetreault GR, Wilkie S, Hebert CE. 2018. Spatial trends in a biomagnifying contaminant: Application of amino acid compound-specific stable nitrogen isotope analysis to the interpretation of bird mercury levels. *Environ Toxicol Chem.* 37(5):1466-1475. doi:10.1002/etc.4113.
- 21 Eccles KM, Thomas PJ, Chan HM. 2020. Relationships between mercury concentrations in fur and stomach contents of river otter (*Lontra canadensis*) and mink (*Neovison vison*) in Northern Alberta Canada and their applications as proxies for environmental factors determining mercury bioavailability. *Environ Res.* 181:108961. doi:10.1016/j.envres.2019.108961.
- 30 Golzadeh N, Barst BD, Basu N, Baker JM, Auger JC, McKinney MA. 2020. Evaluating the concentrations of total mercury, methylmercury, selenium, and selenium:mercury molar ratios in traditional foods of the Bigstone Cree in Alberta, Canada. *Chemosphere.* 250:126285. doi:10.1016/j.chemosphere.2020.126285.
- 32 Hebert CE, Campbell D, Kindopp R, MacMillan S, Martin P, Neugebauer E, Patterson L, Shatford J. 2013. Mercury trends in colonial waterbird eggs downstream of the oil sands region of Alberta, Canada. *Environ Sci Technol.* 47(20):11785-11792. doi:10.1021/es402542w.

- 33 Hebert CE, Weseloh DVC, Macmillan S, Campbell D, Nordstrom W. 2011. Metals and polycyclic aromatic hydrocarbons in colonial waterbird eggs from Lake Athabasca and the Peace-Athabasca Delta, Canada. *Environ Toxicol Chem*. 30(5):1178-1183. doi:10.1002/etc.489.

Contaminants - Other

- 5 Bartels SF, Gendreau-Berthiaume B, Macdonald SE. 2019. The impact of atmospheric acid deposition on tree growth and forest understory vegetation in the Athabasca Oil Sands Region. *Sci Total Environ*. 696:133877. doi:10.1016/J.SCITOTENV.2019.133877.
- 6 Berger RG, Aslund MW, Sanders G, Charlebois M, Knopper LD, Bresee KE. 2016. A multiple lines of evidence approach for the ecological risk assessment of an accidental bitumen release from a steam assisted gravity drainage (SAGD) well in the Athabasca oil sands region. *Sci Total Environ*. 542:495–504. doi:10.1016/j.scitotenv.2015.10.050.
- 10 Cho S, Dinwoodie G, Fu Y, Abboud S, Turchenek L. 2019. An assessment of long-term soil acidification trends in Alberta, Canada. *Ecol Indic*. 98(August 2018):712–722. doi:10.1016/j.ecolind.2018.11.020.
- 45 MacKenzie MD, Dietrich ST. 2020. Atmospheric sulfur and nitrogen deposition in the Athabasca oil sands region is correlated with foliar nutrient levels and soil chemical properties. *Sci Total Environ*. 711:134737. doi:10.1016/j.scitotenv.2019.134737.
- 61 Savard MM, Bégin C, Marion J. 2014. Modelling carbon isotopes in spruce trees reproduces air quality changes due to oil sands operations. *Ecological Indicators*. 45:1-8. doi:10.1016/j.ecolind.2014.03.005.
- 71 Thomas PJ, Eccles KM, Mundy LJ. 2017. Spatial modelling of non-target exposure to anticoagulant rodenticides can inform mitigation options in two boreal predators inhabiting areas with intensive oil and gas development. *Biol Conserv*. 212:111–119. doi:10.1016/j.biocon.2017.06.005.
- 78 Watmough SA, Bird A, McDonough A, Grimm E. 2019. Forest Fertilization Associated with Oil Sands Emissions. *Ecosystems*. 22(1):1–14. doi:10.1007/s10021-018-0249-x.

Contaminants - PACs

- 7 Boutin C, Carpenter DJ. 2017. Assessment of wetland/upland vegetation communities and evaluation of soil-plant contamination by polycyclic aromatic hydrocarbons and trace metals in regions near oil sands mining in Alberta. *Sci Total Environ*. 576:829-839. doi:10.1016/j.scitotenv.2016.10.062.
- 11 Cruz-Martinez L, Fernie KJ, Soos C, Harner T, Getachew F, Smits JEG. 2015. Detoxification, endocrine, and immune responses of tree swallow nestlings naturally exposed to air contaminants from the Alberta oil sands. *Sci Total Environ*. 502:8-15. doi:10.1016/j.scitotenv.2014.09.008.

- 22 Fernie KJ, Marteinson SC, Chen D, Eng A, Harner T, Smits JEG, Soos C. 2018. Elevated exposure, uptake and accumulation of polycyclic aromatic hydrocarbons by nestling tree swallows (*Tachycineta bicolor*) through multiple exposure routes in active mining-related areas of the Athabasca oil sands region. *Sci Total Environ.* 624:250-261. doi:10.1016/j.scitotenv.2017.12.123.
- 23 Fernie KJ, Marteinson SC, Chen D, Palace V, Peters L, Soos C, Smits JEG. 2019. Changes in thyroid function of nestling tree swallows (*Tachycineta bicolor*) in relation to polycyclic aromatic compounds and other environmental stressors in the Athabasca Oil Sands Region. *Environ Res.* 169(November 2018):464–475. doi:10.1016/j.envres.2018.11.031.
- 24 Fernie KJ, Marteinson SC, Soos C, Chen D, Cruz-Martinez L, Smits JEG. 2018. Reproductive and developmental changes in tree swallows (*Tachycineta bicolor*) are influenced by multiple stressors, including polycyclic aromatic compounds, in the Athabasca Oil Sands. *Environ Pollut.* 238:931-941. doi:10.1016/j.envpol.2018.03.074.
- 31 Graney JR, Landis MS, Puckett KJ, Studabaker WB, Edgerton ES, Legge AH, Percy KE. 2017. Differential accumulation of PAHs, elements, and Pb isotopes by five lichen species from the Athabasca Oil Sands Region in Alberta, Canada. *Chemosphere.* 184:700-710. doi:10.1016/j.chemosphere.2017.06.036.
- 43 Laxton DL, Watmough SA, Aherne J, Straker J. 2010. An assessment of nitrogen saturation in *Pinus banksiana* plots in the Athabasca Oil Sands Region, Alberta. 1.:171-180. doi:10.4081/jlimnol.2010.s1.171.
- 44 Lundin JI, Riffell JA, Wasser SK. 2015. Polycyclic aromatic hydrocarbons in caribou, moose, and wolf scat samples from three areas of the Alberta oil sands. *Environ Pollut.* 206:527-534. doi:10.1016/j.envpol.2015.07.035.
- 72 Thomas PJ, Newell EE, Eccles K, Holloway AC, Idowu I, Xia Z, Hassan E, Tomy G, Quenneville C. 2021. Co-exposures to trace elements and polycyclic aromatic compounds (PACs) impacts North American river otter (*Lontra canadensis*) baculum. *Chemosphere.* 265:128920. doi:10.1016/j.chemosphere.2020.128920.

Contaminants - Trace elements

- 29 Godwin CM, Smits JEG, Barclay RMR. 2016. Metals and metalloids in nestling tree swallows and their dietary items near oilsands mine operations in Northern Alberta. *Sci Total Environ.* 562:714-723. doi:10.1016/j.scitotenv.2016.04.069.
- 30 Golzadeh N, Barst BD, Basu N, Baker JM, Auger JC, McKinney MA. 2020. Evaluating the concentrations of total mercury, methylmercury, selenium, and selenium:mercury molar ratios in traditional foods of the Bigstone Cree in Alberta, Canada. *Chemosphere.* 250:126285. doi:10.1016/j.chemosphere.2020.126285.
- 72 Thomas PJ, Newell EE, Eccles K, Holloway AC, Idowu I, Xia Z, Hassan E, Tomy G, Quenneville C. 2021. Co-exposures to trace elements and polycyclic aromatic compounds (PACs) impacts North American river otter (*Lontra canadensis*) baculum. *Chemosphere.* 265:128920. doi:10.1016/j.chemosphere.2020.128920.

Disturbance - Areal / Polygonal

- 3 Ball J, Sólymos P, Schmiegelow F, Hache S, Schieck J, Bayne E. 2016. Regional habitat needs of a nationally listed species, Canada Warbler (*Cardellina canadensis*), in Alberta, Canada. *Avian Conservation and Ecology*. 11(2):10. doi:10.5751/ACE-00916-110210.
- 15 Dickie M, McNay SR, Sutherland GD, Cody M, Avgar T. 2020. Corridors or risk? Movement along, and use of, linear features varies predictably among large mammal predator and prey species. *J Anim Ecol*. 89(2):623–634. doi:10.1111/1365-2656.13130.
- 19 Domahidi Z, Shonfield J, Nielsen SE, Spence JR, Bayne EM. 2019. Spatial distribution of the boreal owl and northern saw-whet owl in the Boreal region of Alberta, Canada. *Avian Conserv Ecol*. 14(2). doi:10.5751/ACE-01445-140214.
- 26 Fisher JT, Burton AC. 2018. Wildlife winners and losers in an oil sands landscape. *Frontiers in Ecology and the Environment*. 16(6):323-328. doi:10.1002/fee.1807.
- 38 Latham ADM, Latham MC, Boyce MS, Boutin S. 2013. Spatial relationships of sympatric wolves (*Canis lupus*) and coyotes (*C. latrans*) with woodland caribou (*Rangifer tarandus caribou*) during the calving season in a human-modified boreal landscape. *Wildl Res*. 40(3):250-260. doi:10.1071/WR12184.
- 39 Latham ADM, Latham MC, Boyce MS. 2011. Habitat selection and spatial relationships of black bears (*Ursus americanus*) with woodland caribou (*Rangifer tarandus caribou*) in northeastern Alberta. *Can J Zool*. 89(4):267-277. doi:10.1139/z10-115.
- 53 Neilson EW, Boutin S. 2017. Human disturbance alters the predation rate of moose in the Athabasca oil sands. *Ecosphere*. 8(8):e01913. doi:10.1002/ecs2.1913.
- 57 Riva F, Acorn JH, Nielsen SE. 2018a. Distribution of Cranberry Blue Butterflies (*Agriades optilete*) and Their Responses to Forest Disturbance from In Situ Oil Sands and Wildfires. *Diversity*. 10(4). doi:10.3390/d10040112.
- 58 Riva F, Acorn JH, Nielsen SE. 2018b. Localized disturbances from oil sands developments increase butterfly diversity and abundance in Alberta's boreal forests. *Biological Conservation*. 217:173-180. doi:10.1016/j.biocon.2017.10.022.
- 64 Singer H V., Slattery SM, Armstrong L, Witherly S. 2020. Assessing breeding duck population trends relative to anthropogenic disturbances across the Boreal plains of Canada, 1960–2007. *Avian Conserv Ecol*. 15(1):1. doi:10.5751/ACE-01493-150101.
- 73 Toews M, Juanes F, Burton AC. 2017. Mammal responses to human footprint vary with spatial extent but not with spatial grain. *Ecosphere*. 8(3). doi:10.1002/ecs2.1735.
- 74 Toews M, Juanes F, Burton AC. 2018. Mammal responses to the human footprint vary across species and stressors. *Journal of Environmental Management*. 217:690-699. doi:10.1016/j.jenvman.2018.04.009.
- 80 Wilson SJ, Bayne EM. 2018. Use of an acoustic location system to understand how presence of conspecifics and canopy cover influence ovenbird (*Seiurus aurocapilla*) space use near reclaimed wellsites in the boreal forest of alberta. *Avian Conserv Ecol*. 13(2). doi:10.5751/ACE-01248-130204.

Disturbance - Extraction

- 65 Singhroy V, Li J, Samsonov S, Shen L, Pearse J. 2014. InSAR monitoring of surface deformation induced by steam injection in the Athabasca oil sands, Canada. In: 2014 IEEE Geoscience and Remote Sensing Symposium. IEEE. p. 4796-4799.

Disturbance - Linear

- 1 Abib TH, Chasmer L, Hopkinson C, Mahoney C, Rodriguez LCE. 2019. Seismic line impacts on proximal boreal forest and wetland environments in Alberta. *Sci Total Environ.* 658:1601–1613. doi:10.1016/j.scitotenv.2018.12.244.
- 2 Arienti MC, Cumming SG, Krawchuk MA, Boutin S. 2009. Road network density correlated with increased lightning fire incidence in the Canadian western boreal forest. *Int J Wildl Fire.* 18(8):970. doi:10.1071/wf08011.
- 3 Ball J, Sólymos P, Schmiegelow F, Hache S, Schieck J, Bayne E. 2016. Regional habitat needs of a nationally listed species, Canada Warbler (*Cardellina canadensis*), in Alberta, Canada. *Avian Conservation and Ecology.* 11(2):10. doi:10.5751/ACE-00916-110210.
- 9 Cameron EK, Bayne EM. 2009. Road age and its importance in earthworm invasion of northern boreal forests. *J Appl Ecol.* 46(1):28-36. doi:10.1111/j.1365-2664.2008.01535.x.
- 12 Dawe CA, Filicetti AT, Nielsen SE. 2017. Effects of linear disturbances and fire severity on velvet leaf blueberry abundance, vigor, and berry production in recently burned jack pine forests. *Forests.* 8(10):398. doi:10.3390/f8100398.
- 15 Dickie M, McNay SR, Sutherland GD, Cody M, Avgar T. 2020. Corridors or risk? Movement along, and use of, linear features varies predictably among large mammal predator and prey species. *J Anim Ecol.* 89(2):623–634. doi:10.1111/1365-2656.13130.
- 16 Dickie M, Serrouya R, DeMars C, Cranston J, Boutin S. 2017. Evaluating functional recovery of habitat for threatened woodland caribou. *Ecosphere.* 8(9):e01936. doi:10.1002/ecs2.1936.
- 17 Dickie M, Serrouya R, McNay RS, Boutin S. 2017. Faster and farther: wolf movement on linear features and implications for hunting behaviour. du Toit J, editor. *J Appl Ecol.* 54(1):253-263. doi:10.1111/1365-2664.12732.
- 19 Domahidi Z, Shonfield J, Nielsen SE, Spence JR, Bayne EM. 2019. Spatial distribution of the boreal owl and northern saw-whet owl in the Boreal region of Alberta, Canada. *Avian Conserv Ecol.* 14(2). doi:10.5751/ACE-01445-140214.
- 26 Fisher JT, Burton AC. 2018. Wildlife winners and losers in an oil sands landscape. *Frontiers in Ecology and the Environment.* 16(6):323-328. doi:10.1002/fee.1807.
- 36 Kansas J, Charlebois M, Skatter H. 2015. Vegetation recovery on low impact seismic lines in Alberta's oil sands and visual obstruction of wolves and woodland caribou. *Can Wildl Biol Manag.* 4(2):137–149.

- 37 Latham ADM, Latham MC, Boyce MS, Boutin S. 2011. Movement responses by wolves to industrial linear features and their effect on woodland caribou in northeastern Alberta. *Ecol Appl.* 21(8):2854-2865. doi:10.1890/11-0666.1.
- 38 Latham ADM, Latham MC, Boyce MS, Boutin S. 2013. Spatial relationships of sympatric wolves (*Canis lupus*) and coyotes (*C. latrans*) with woodland caribou (*Rangifer tarandus caribou*) during the calving season in a human-modified boreal landscape. *Wildl Res.* 40(3):250-260. doi:10.1071/WR12184.
- 39 Latham ADM, Latham MC, Boyce MS. 2011. Habitat selection and spatial relationships of black bears (*Ursus americanus*) with woodland caribou (*Rangifer tarandus caribou*) in northeastern Alberta. *Can J Zool.* 89(4):267-277. doi:10.1139/z10-115.
- 53 Neilson EW, Boutin S. 2017. Human disturbance alters the predation rate of moose in the Athabasca oil sands. *Ecosphere.* 8(8):e01913. doi:10.1002/ecs2.1913.
- 56 Riva F, Acorn JH, Nielsen SE. 2018. Narrow anthropogenic corridors direct the movement of a generalist boreal butterfly. *Biol Lett.* 14(2):20170770. doi:10.1098/rsbl.2017.0770.
- 57 Riva F, Acorn JH, Nielsen SE. 2018a. Distribution of Cranberry Blue Butterflies (*Agriades optilete*) and Their Responses to Forest Disturbance from In Situ Oil Sands and Wildfires. *Diversity.* 10(4). doi:10.3390/d10040112.
- 58 Riva F, Acorn JH, Nielsen SE. 2018b. Localized disturbances from oil sands developments increase butterfly diversity and abundance in Alberta's boreal forests. *Biological Conservation.* 217:173-180. doi:10.1016/j.biocon.2017.10.022.
- 59 Riva F, Pinzon J, Acorn JH, Nielsen SE. 2020. Composite Effects of Cutlines and Wildfire Result in Fire Refuges for Plants and Butterflies in Boreal Treed Peatlands. *Ecosystems.* 23(3):485–497. doi:10.1007/s10021-019-00417-2.
- 60 Roberts D, Ciuti S, Barber QE, Willier C, Nielsen SE. 2018. Accelerated seed dispersal along linear disturbances in the Canadian oil sands region. *Scientific Reports.* 8(1):4828. doi:10.1038/s41598-018-22678-y.
- 64 Singer H V., Slattery SM, Armstrong L, Witherly S. 2020. Assessing breeding duck population trends relative to anthropogenic disturbances across the Boreal plains of Canada, 1960–2007. *Avian Conserv Ecol.* 15(1):1. doi:10.5751/ACE-01493-150101.
- 66 Stern ER, Riva F, Nielsen SE. 2018. Effects of Narrow Linear Disturbances on Light and Wind Patterns in Fragmented Boreal Forests in Northeastern Alberta. *Forests.* 9(8):486. doi:10.3390/f9080486.
- 67 Stevenson CJ, Filicetti AT, Nielsen SE. 2019. High precision altimeter demonstrates simplification and depression of microtopography on seismic lines in treed peatlands. *Forests.* 10(4):295. doi:10.3390/f10040295.
- 69 Tattersall ER, Burgar JM, Fisher JT, Burton AC. 2020. Boreal predator co-occurrences reveal shared use of seismic lines in a working landscape. *Ecol Evol.* 10(3):1678–1691. doi:10.1002/ece3.6028.
- 70 Tattersall ER, Burgar JM, Fisher JT, Burton AC. 2020. Mammal seismic line use varies with restoration: Applying habitat restoration to species at risk conservation in a working landscape. *Biol Conserv.* 241:108295. doi:10.1016/j.biocon.2019.108295.

- 73 Toews M, Juanes F, Burton AC. 2017. Mammal responses to human footprint vary with spatial extent but not with spatial grain. *Ecosphere*. 8(3). doi:10.1002/ecs2.1735.
- 74 Toews M, Juanes F, Burton AC. 2018. Mammal responses to the human footprint vary across species and stressors. *Journal of Environmental Management*. 217:690-699. doi:10.1016/j.jenvman.2018.04.009.
- 77 Wasser SK, Keim JL, Taper ML, Lele SR. 2011. The influences of wolf predation, habitat loss, and human activity on caribou and moose in the Alberta oil sands. *Frontiers in Ecology and the Environment*. 9(10):546-551. doi:10.1890/100071.
- 83 Davidson SJ, Goud EM, Franklin C, Nielsen SE, Strack M. 2020. Seismic line disturbance alters soil physical and chemical properties across boreal forest and peatland soils. *Front Earth Sci*. 8:281. doi:10.3389/feart.2020.00281.
- 84 Strack M, Softa D, Bird M, Xu B. 2018. Impact of winter roads on boreal peatland carbon exchange. *Global Change Biology*. 24(1):e201–e212. doi:10.1111/gcb.13844.
- 85 Lovitt J, Rahman MM, Saraswati S, McDermid GJ, Strack M, Xu B. 2018. UAV remote sensing can reveal the effects of low-impact seismic lines on surface morphology, hydrology, and methane (CH₄) release in a boreal treed bog. *Journal of Geophysical Research: Biogeosciences*. 123(3):1117–1129. doi:10.1002/2017JG004232.

Disturbance - Unspecified / Non-oil sands

- 2 Arienti MC, Cumming SG, Krawchuk MA, Boutin S. 2009. Road network density correlated with increased lightning fire incidence in the Canadian western boreal forest. *Int J Wildl Fire*. 18(8):970. doi:10.1071/wf08011.
- 3 Ball J, Sólymos P, Schmiegelow F, Hache S, Schieck J, Bayne E. 2016. Regional habitat needs of a nationally listed species, Canada Warbler (*Cardellina canadensis*), in Alberta, Canada. *Avian Conservation and Ecology*. 11(2):10. doi:10.5751/ACE-00916-110210.
- 8 Cadieux P, Boulanger Y, Cyr D, Taylor AR, Price DT, Sólymos P, Stralberg D, Chen H, Brecka A, Tremblay JA. 2020. Projected effects of climate change on boreal bird community accentuated by anthropogenic disturbances in western boreal forest, Canada. *Divers Distrib.*:1–15. doi:10.1111/ddi.13057.
- 13 Dawe KL, Bayne EM, Boutin S. 2014. Influence of climate and human land use on the distribution of white-tailed deer (*Odocoileus virginianus*) in the western boreal forest. *Can J Zool*. 92(4):353-363. doi:10.1139/cjz-2013-0262.
- 14 Dawe KL, Boutin S. 2016. Climate change is the primary driver of white-tailed deer (*Odocoileus virginianus*) range expansion at the northern extent of its range; land use is secondary. *Ecol Evol*. 6(18):6435-6451. doi:10.1002/ece3.2316.
- 19 Domahidi Z, Shonfield J, Nielsen SE, Spence JR, Bayne EM. 2019. Spatial distribution of the boreal owl and northern saw-whet owl in the Boreal region of Alberta, Canada. *Avian Conserv Ecol*. 14(2). doi:10.5751/ACE-01445-140214.

- 25 Fisher JT, Burton AC, Nolan L, Roy L. 2020. Influences of landscape change and winter severity on invasive ungulate persistence in the Nearctic boreal forest. *Sci Rep.* 10(1):1–11. doi:10.1038/s41598-020-65385-3.
- 26 Fisher JT, Burton AC. 2018. Wildlife winners and losers in an oil sands landscape. *Frontiers in Ecology and the Environment.* 16(6):323-328. doi:10.1002/fee.1807.
- 27 Foster KR, Godwin CM, Pyle P, Saracco JF. 2017. Reclamation and habitat-disturbance effects on landbird abundance and productivity indices in the oil sands region of northeastern Alberta, Canada. *Restoration Ecology.* 25(4):532-538. doi:10.1111/rec.12478.
- 35 Hedley RW, McLeod LJT, Yip DA, Farr D, Knaga P, Drake KL, Bayne E. 2020. Modeling the occurrence of the yellow rail (*Coturnicops noveboracensis*) in the context of ongoing resource development in the oil sands region of Alberta. *Avian Conserv Ecol.* 15(1):1–14. doi:10.5751/ACE-01538-150110.
- 38 Latham ADM, Latham MC, Boyce MS, Boutin S. 2013. Spatial relationships of sympatric wolves (*Canis lupus*) and coyotes (*C. latrans*) with woodland caribou (*Rangifer tarandus caribou*) during the calving season in a human-modified boreal landscape. *Wildl Res.* 40(3):250-260. doi:10.1071/WR12184.
- 39 Latham ADM, Latham MC, Boyce MS. 2011. Habitat selection and spatial relationships of black bears (*Ursus americanus*) with woodland caribou (*Rangifer tarandus caribou*) in northeastern Alberta. *Can J Zool.* 89(4):267-277. doi:10.1139/z10-115.
- 42 Latifovic R, Pouliot D. 2014. Monitoring cumulative long-term vegetation changes over the Athabasca Oil Sands region. *IEEE J Sel Top Appl Earth Obs Remote Sens.* 7(8):3380-3392. doi:10.1109/JSTARS.2014.2321058.
- 46 Mahon CL, Holloway G, Sólymos P, Cumming SG, Bayne EM, Schmiegelow FKA, Song SJ. 2016. Community structure and niche characteristics of upland and lowland western boreal birds at multiple spatial scales. *Forest Ecology and Management.* 361:99-116. doi:10.1016/j.foreco.2015.11.007.
- 47 Mahon CL, Holloway GL, Bayne EM, Toms JD. 2019 May 23. Additive and interactive cumulative effects on boreal landbirds: winners and losers in a multi-stressor landscape. *Ecol Appl.*:e01895. doi:10.1002/eap.1895.
- 48 Mao L, Dennett J, Bater CW, Tompalski P, Coops NC, Farr D, Kohler M, White B, Stadt JJ, Nielsen SE. 2018. Using airborne laser scanning to predict plant species richness and assess conservation threats in the oil sands region of Alberta's boreal forest. *For Ecol Manage.* 409:29–37. doi:10.1016/j.foreco.2017.11.017.
- 49 Mayor SJ, Boutin S, He F, Cahill JF. 2015. Limited impacts of extensive human land use on dominance, specialization, and biotic homogenization in boreal plant communities. *BMC Ecology.* 15(1):5. doi:10.1186/s12898-015-0037-9.
- 50 Mayor SJ, Cahill JF, He F, Sólymos P, Boutin S. 2012. Regional boreal biodiversity peaks at intermediate human disturbance. *Nat Commun.* 3:1142. doi:10.1038/ncomms2145.
- 51 Morissette JL, Bayne EM, Kardynal KJ, Hobson KA. 2019. Regional variation in responses of wetland-associated bird communities to conversion of boreal forest to agriculture. *Avian Conserv Ecol.* 14(1). doi:10.5751/ACE-01355-140112.

- 58 Riva F, Acorn JH, Nielsen SE. 2018b. Localized disturbances from oil sands developments increase butterfly diversity and abundance in Alberta's boreal forests. *Biological Conservation*. 217:173-180. doi:10.1016/j.biocon.2017.10.022.
- 64 Singer H V., Slattery SM, Armstrong L, Witherly S. 2020. Assessing breeding duck population trends relative to anthropogenic disturbances across the Boreal plains of Canada, 1960–2007. *Avian Conserv Ecol*. 15(1):1. doi:10.5751/ACE-01493-150101.
- 68 Stewart FEC, Nowak JJ, Micheletti T, McIntire EJB, Schmiegelow FKA, Cumming SG. 2020. Boreal Caribou Can Coexist with Natural but Not Industrial Disturbances. *J Wildl Manage*. 84(8):1435–1444. doi:10.1002/jwmg.21937.
- 73 Toews M, Juanes F, Burton AC. 2017. Mammal responses to human footprint vary with spatial extent but not with spatial grain. *Ecosphere*. 8(3). doi:10.1002/ecs2.1735.
- 74 Toews M, Juanes F, Burton AC. 2018. Mammal responses to the human footprint vary across species and stressors. *Journal of Environmental Management*. 217:690-699. doi:10.1016/j.jenvman.2018.04.009.
- 75 Van Wilgenburg S, Hobson K, Bayne E, Koper N. 2013. Estimated Avian Nest Loss Associated with Oil and Gas Exploration and Extraction in the Western Canadian Sedimentary Basin. *Avian Conservation and Ecology*. 8(2). doi:10.5751/ACE-00585-080209.
- 79 Wilson S, Saracco JF, Flockhart DTT, Godwin CM, Foster KR. 2018. Drivers of demographic decline across the annual cycle of a threatened migratory bird. *Scientific Reports*. 8(7316). doi:10.1038/s41598-018-25633-z.
- 81 Zhang J, Kissling WD, He F. 2013. Local forest structure, climate and human disturbance determine regional distribution of boreal bird species richness in Alberta, Canada. *Journal of Biogeography*. 40(6):1131-1142. doi:10.1111/jbi.12063.
- 82 Zhang J, Mayor SJ, He F. 2014. Does disturbance regime change community assembly of angiosperm plant communities in the boreal forest? *J Plant Ecol*. 7(2):188-201. doi:10.1093/jpe/rtt068.

Infrastructure - Noise

- 62 Shonfield J, Bayne E. 2017. The effect of industrial noise on owl occupancy in the boreal forest at multiple spatial scales. *Avian Conservation and Ecology*. 12(2). doi:10.5751/ACE-01042-120213.
- 63 Shonfield J, Bayne EM. 2019. Effects of industrial disturbance on abundance and activity of small mammals. *Can J Zool*. 97(11):1013–1020. doi:10.1139/cjz-2019-0098.

Infrastructure - Physical

- 20 Dunne BM, Quinn MS. 2009. Effectiveness of above-ground pipeline mitigation for moose (*Alces alces*) and other large mammals. *Biol Conserv*. 142(2):332–343. doi:10.1016/j.biocon.2008.10.029.

- 52 Muhly T, Serrouya R, Neilson E, Li H, Boutin S. 2015. Influence of in-situ oil sands development on caribou (*Rangifer tarandus*) movement. PLoS One. 10(9):e0136933. doi:10.1371/journal.pone.0136933.

Non-oil sands - Climate change

- 4 Barber QE, Parisien MA, Whitman E, Stralberg D, Johnson CJ, St-Laurent MH, DeLancey ER, Price DT, Arseneault D, Wang X, et al. 2018. Potential impacts of climate change on the habitat of boreal woodland caribou. *Ecosphere*. 9(10). doi:10.1002/ecs2.2472.
- 8 Cadieux P, Boulanger Y, Cyr D, Taylor AR, Price DT, Sólymos P, Stralberg D, Chen H, Brecka A, Tremblay JA. 2020. Projected effects of climate change on boreal bird community accentuated by anthropogenic disturbances in western boreal forest, Canada. *Divers Distrib.*:1–15. doi:10.1111/ddi.13057.
- 13 Dawe KL, Bayne EM, Boutin S. 2014. Influence of climate and human land use on the distribution of white-tailed deer (*Odocoileus virginianus*) in the western boreal forest. *Can J Zool*. 92(4):353–363. doi:10.1139/cjz-2013-0262.
- 14 Dawe KL, Boutin S. 2016. Climate change is the primary driver of white-tailed deer (*Odocoileus virginianus*) range expansion at the northern extent of its range; land use is secondary. *Ecol Evol*. 6(18):6435–6451. doi:10.1002/ece3.2316.
- 76 Ward EM, Gorelick SM. 2018. Drying drives decline in muskrat population in the Peace-Athabasca Delta, Canada. *Environ Res Lett*. 13(12):124026. doi:10.1088/1748-9326/aaf0ec.

Non-oil sands - Weather / Climate

- 2 Arienti MC, Cumming SG, Krawchuk MA, Boutin S. 2009. Road network density correlated with increased lightning fire incidence in the Canadian western boreal forest. *Int J Wildl Fire*. 18(8):970. doi:10.1071/wf08011.
- 23 Fernie KJ, Marteinson SC, Chen D, Palace V, Peters L, Soos C, Smits JEG. 2019. Changes in thyroid function of nestling tree swallows (*Tachycineta bicolor*) in relation to polycyclic aromatic compounds and other environmental stressors in the Athabasca Oil Sands Region. *Environ Res*. 169(November 2018):464–475. doi:10.1016/j.envres.2018.11.031.
- 24 Fernie KJ, Marteinson SC, Soos C, Chen D, Cruz-Martinez L, Smits JEG. 2018. Reproductive and developmental changes in tree swallows (*Tachycineta bicolor*) are influenced by multiple stressors, including polycyclic aromatic compounds, in the Athabasca Oil Sands. *Environ Pollut*. 238:931–941. doi:10.1016/j.envpol.2018.03.074.
- 25 Fisher JT, Burton AC, Nolan L, Roy L. 2020. Influences of landscape change and winter severity on invasive ungulate persistence in the Nearctic boreal forest. *Sci Rep*. 10(1):1–11. doi:10.1038/s41598-020-65385-3.
- 28 Godwin CM, Barclay RMR, Smits JEG. 2019. Tree Swallow (*Tachycineta bicolor*) nest success and nestling growth near oil sands mining operations in northeastern Alberta, Canada. *Can J Zool*. 97(6):547–557. doi:10.1139/cjz-2018-0247.

- 32 Hebert CE, Campbell D, Kindopp R, MacMillan S, Martin P, Neugebauer E, Patterson L, Shatford J. 2013. Mercury trends in colonial waterbird eggs downstream of the oil sands region of Alberta, Canada. *Environ Sci Technol.* 47(20):11785-11792. doi:10.1021/es402542w.
- 34 Hebert CE. 2019. The river runs through it: The Athabasca River delivers mercury to aquatic birds breeding far downstream. *PLoS One.* 14(4):1-19. doi:10.1371/journal.pone.0206192.
- 37 Latham ADM, Latham MC, Boyce MS, Boutin S. 2011. Movement responses by wolves to industrial linear features and their effect on woodland caribou in northeastern Alberta. *Ecol Appl.* 21(8):2854-2865. doi:10.1890/11-0666.1.
- 40 Latham ADM, Latham MC, Knopff KH, Hebblewhite M, Boutin S. 2013. Wolves, white-tailed deer, and beaver: Implications of seasonal prey switching for woodland caribou declines. *Ecography (Cop).* 36(12):1276–1290. doi:10.1111/j.1600-0587.2013.00035.x.
- 81 Zhang J, Kissling WD, He F. 2013. Local forest structure, climate and human disturbance determine regional distribution of boreal bird species richness in Alberta, Canada. *Journal of Biogeography.* 40(6):1131-1142. doi:10.1111/jbi.12063.

Non-oil sands - Wildfire

- 44 Lundin JI, Riffell JA, Wasser SK. 2015. Polycyclic aromatic hydrocarbons in caribou, moose, and wolf scat samples from three areas of the Alberta oil sands. *Environ Pollut.* 206:527-534. doi:10.1016/j.envpol.2015.07.035.
- 57 Riva F, Acorn JH, Nielsen SE. 2018a. Distribution of Cranberry Blue Butterflies (*Agriades optilete*) and Their Responses to Forest Disturbance from In Situ Oil Sands and Wildfires. *Diversity.* 10(4). doi:10.3390/d10040112.
- 59 Riva F, Pinzon J, Acorn JH, Nielsen SE. 2020. Composite Effects of Cutlines and Wildfire Result in Fire Refuges for Plants and Butterflies in Boreal Treed Peatlands. *Ecosystems.* 23(3):485–497. doi:10.1007/s10021-019-00417-2.
- 68 Stewart FEC, Nowak JJ, Micheletti T, McIntire EJB, Schmiegelow FKA, Cumming SG. 2020. Boreal Caribou Can Coexist with Natural but Not Industrial Disturbances. *J Wildl Manage.* 84(8):1435–1444. doi:10.1002/jwmg.21937.
- 77 Wasser SK, Keim JL, Taper ML, Lele SR. 2011. The influences of wolf predation, habitat loss, and human activity on caribou and moose in the Alberta oil sands. *Frontiers in Ecology and the Environment.* 9(10):546-551. doi:10.1890/100071.

Pathway

Barriers & connectivity

- 20 Dunne BM, Quinn MS. 2009. Effectiveness of above-ground pipeline mitigation for moose (*Alces alces*) and other large mammals. *Biol Conserv.* 142(2):332–343. doi:10.1016/j.biocon.2008.10.029.

- 52 Muhly T, Serrouya R, Neilson E, Li H, Boutin S. 2015. Influence of in-situ oil sands development on caribou (*Rangifer tarandus*) movement. PLoS One. 10(9):e0136933. doi:10.1371/journal.pone.0136933.

Bioaccumulation

- 18 Dolgova S, Popp BN, Courtoreille K, Espie RHM, Maclean B, McMaster M, Straka JR, Tetreault GR, Wilkie S, Hebert CE. 2018. Spatial trends in a biomagnifying contaminant: Application of amino acid compound-specific stable nitrogen isotope analysis to the interpretation of bird mercury levels. Environ Toxicol Chem. 37(5):1466-1475. doi:10.1002/etc.4113.
- 21 Eccles KM, Thomas PJ, Chan HM. 2020. Relationships between mercury concentrations in fur and stomach contents of river otter (*Lontra canadensis*) and mink (*Neovison vison*) in Northern Alberta Canada and their applications as proxies for environmental factors determining mercury bioavailability. Environ Res. 181:108961. doi:10.1016/j.envres.2019.108961.
- 22 Fernie KJ, Marteinson SC, Chen D, Eng A, Harner T, Smits JEG, Soos C. 2018. Elevated exposure, uptake and accumulation of polycyclic aromatic hydrocarbons by nestling tree swallows (*Tachycineta bicolor*) through multiple exposure routes in active mining-related areas of the Athabasca oil sands region. Sci Total Environ. 624:250-261. doi:10.1016/j.scitotenv.2017.12.123.
- 23 Fernie KJ, Marteinson SC, Chen D, Palace V, Peters L, Soos C, Smits JEG. 2019. Changes in thyroid function of nestling tree swallows (*Tachycineta bicolor*) in relation to polycyclic aromatic compounds and other environmental stressors in the Athabasca Oil Sands Region. Environ Res. 169(November 2018):464–475. doi:10.1016/j.envres.2018.11.031.
- 24 Fernie KJ, Marteinson SC, Soos C, Chen D, Cruz-Martinez L, Smits JEG. 2018. Reproductive and developmental changes in tree swallows (*Tachycineta bicolor*) are influenced by multiple stressors, including polycyclic aromatic compounds, in the Athabasca Oil Sands. Environ Pollut. 238:931-941. doi:10.1016/j.envpol.2018.03.074.
- 44 Lundin JI, Riffell JA, Wasser SK. 2015. Polycyclic aromatic hydrocarbons in caribou, moose, and wolf scat samples from three areas of the Alberta oil sands. Environ Pollut. 206:527-534. doi:10.1016/j.envpol.2015.07.035.

Contaminant exposure

- 5 Bartels SF, Gendreau-Berthiaume B, Macdonald SE. 2019. The impact of atmospheric acid deposition on tree growth and forest understory vegetation in the Athabasca Oil Sands Region. Sci Total Environ. 696:133877. doi:10.1016/J.SCITOTENV.2019.133877.
- 6 Berger RG, Aslund MW, Sanders G, Charlebois M, Knopper LD, Bresee KE. 2016. A multiple lines of evidence approach for the ecological risk assessment of an accidental bitumen release from a steam assisted gravity drainage (SAGD) well in the Athabasca oil sands region. Sci Total Environ. 542:495–504. doi:10.1016/j.scitotenv.2015.10.050.

- 7 Boutin C, Carpenter DJ. 2017. Assessment of wetland/upland vegetation communities and evaluation of soil-plant contamination by polycyclic aromatic hydrocarbons and trace metals in regions near oil sands mining in Alberta. *Sci Total Environ.* 576:829-839. doi:10.1016/j.scitotenv.2016.10.062.
- 11 Cruz-Martinez L, Fernie KJ, Soos C, Harner T, Getachew F, Smits JEG. 2015. Detoxification, endocrine, and immune responses of tree swallow nestlings naturally exposed to air contaminants from the Alberta oil sands. *Sci Total Environ.* 502:8-15. doi:10.1016/j.scitotenv.2014.09.008.
- 30 Golzadeh N, Barst BD, Basu N, Baker JM, Auger JC, McKinney MA. 2020. Evaluating the concentrations of total mercury, methylmercury, selenium, and selenium:mercury molar ratios in traditional foods of the Bigstone Cree in Alberta, Canada. *Chemosphere.* 250:126285. doi:10.1016/j.chemosphere.2020.126285.
- 31 Graney JR, Landis MS, Puckett KJ, Studabaker WB, Edgerton ES, Legge AH, Percy KE. 2017. Differential accumulation of PAHs, elements, and Pb isotopes by five lichen species from the Athabasca Oil Sands Region in Alberta, Canada. *Chemosphere.* 184:700-710. doi:10.1016/j.chemosphere.2017.06.036.
- 32 Hebert CE, Campbell D, Kindopp R, MacMillan S, Martin P, Neugebauer E, Patterson L, Shatford J. 2013. Mercury trends in colonial waterbird eggs downstream of the oil sands region of Alberta, Canada. *Environ Sci Technol.* 47(20):11785-11792. doi:10.1021/es402542w.
- 33 Hebert CE, Weseloh DVC, Macmillan S, Campbell D, Nordstrom W. 2011. Metals and polycyclic aromatic hydrocarbons in colonial waterbird eggs from Lake Athabasca and the Peace-Athabasca Delta, Canada. *Environ Toxicol Chem.* 30(5):1178-1183. doi:10.1002/etc.489.
- 34 Hebert CE. 2019. The river runs through it: The Athabasca River delivers mercury to aquatic birds breeding far downstream. *PLoS One.* 14(4):1-19. doi:10.1371/journal.pone.0206192.
- 43 Laxton DL, Watmough SA, Aherne J, Straker J. 2010. An assessment of nitrogen saturation in *Pinus banksiana* plots in the Athabasca Oil Sands Region, Alberta. 1.:171-180. doi:10.4081/jlimnol.2010.s1.171.
- 44 Lundin JI, Riffell JA, Wasser SK. 2015. Polycyclic aromatic hydrocarbons in caribou, moose, and wolf scat samples from three areas of the Alberta oil sands. *Environ Pollut.* 206:527-534. doi:10.1016/j.envpol.2015.07.035.
- 45 MacKenzie MD, Dietrich ST. 2020. Atmospheric sulfur and nitrogen deposition in the Athabasca oil sands region is correlated with foliar nutrient levels and soil chemical properties. *Sci Total Environ.* 711:134737. doi:10.1016/j.scitotenv.2019.134737.
- 55 Proemse BC, Maynard DG, Mayer B. 2016. Foliage Chemistry of *Pinus balsiana* in the Athabasca Oil Sands Region, Alberta, Canada. *Forests.* 7(12):312. doi:10.3390/f7120312.
- 71 Thomas PJ, Eccles KM, Mundy LJ. 2017. Spatial modelling of non-target exposure to anticoagulant rodenticides can inform mitigation options in two boreal predators inhabiting areas with intensive oil and gas development. *Biol Conserv.* 212:111–119. doi:10.1016/j.biocon.2017.06.005.

- 72 Thomas PJ, Newell EE, Eccles K, Holloway AC, Idowu I, Xia Z, Hassan E, Tomy G, Quenneville C. 2021. Co-exposures to trace elements and polycyclic aromatic compounds (PACs) impacts North American river otter (*Lontra canadensis*) baculum. *Chemosphere*. 265:128920. doi:10.1016/j.chemosphere.2020.128920.
- 78 Watmough SA, Bird A, McDonough A, Grimm E. 2019. Forest Fertilization Associated with Oil Sands Emissions. *Ecosystems*. 22(1):1–14. doi:10.1007/s10021-018-0249-x.

Food availability / sources

- 38 Latham ADM, Latham MC, Boyce MS, Boutin S. 2013. Spatial relationships of sympatric wolves (*Canis lupus*) and coyotes (*C. latrans*) with woodland caribou (*Rangifer tarandus caribou*) during the calving season in a human-modified boreal landscape. *Wildl Res*. 40(3):250–260. doi:10.1071/WR12184.
- 40 Latham ADM, Latham MC, Knopff KH, Hebblewhite M, Boutin S. 2013. Wolves, white-tailed deer, and beaver: Implications of seasonal prey switching for woodland caribou declines. *Ecography (Cop)*. 36(12):1276–1290. doi:10.1111/j.1600-0587.2013.00035.x.

Habitat change

- 3 Ball J, Sólymos P, Schmiegelow F, Hache S, Schieck J, Bayne E. 2016. Regional habitat needs of a nationally listed species, Canada Warbler (*Cardellina canadensis*), in Alberta, Canada. *Avian Conservation and Ecology*. 11(2):10. doi:10.5751/ACE-00916-110210.
- 8 Cadieux P, Boulanger Y, Cyr D, Taylor AR, Price DT, Sólymos P, Stralberg D, Chen H, Brecka A, Tremblay JA. 2020. Projected effects of climate change on boreal bird community accentuated by anthropogenic disturbances in western boreal forest, Canada. *Divers Distrib*.:1–15. doi:10.1111/ddi.13057.
- 35 Hedley RW, McLeod LJT, Yip DA, Farr D, Knaga P, Drake KL, Bayne E. 2020. Modeling the occurrence of the yellow rail (*Coturnicops noveboracensis*) in the context of ongoing resource development in the oil sands region of Alberta. *Avian Conserv Ecol*. 15(1):1–14. doi:10.5751/ACE-01538-150110.
- 51 Morissette JL, Bayne EM, Kardynal KJ, Hobson KA. 2019. Regional variation in responses of wetland-associated bird communities to conversion of boreal forest to agriculture. *Avian Conserv Ecol*. 14(1). doi:10.5751/ACE-01355-140112.
- 70 Tattersall ER, Burgar JM, Fisher JT, Burton AC. 2020. Mammal seismic line use varies with restoration: Applying habitat restoration to species at risk conservation in a working landscape. *Biol Conserv*. 241:108295. doi:10.1016/j.biocon.2019.108295.
- 75 Van Wilgenburg S, Hobson K, Bayne E, Koper N. 2013. Estimated Avian Nest Loss Associated with Oil and Gas Exploration and Extraction in the Western Canadian Sedimentary Basin. *Avian Conservation and Ecology*. 8(2). doi:10.5751/ACE-00585-080209.
- 76 Ward EM, Gorelick SM. 2018. Drying drives decline in muskrat population in the Peace-Athabasca Delta, Canada. *Environ Res Lett*. 13(12):124026. doi:10.1088/1748-9326/aaf0ec.

- 80 Wilson SJ, Bayne EM. 2018. Use of an acoustic location system to understand how presence of conspecifics and canopy cover influence ovenbird (*Seiurus aurocapilla*) space use near reclaimed wellsites in the boreal forest of Alberta. *Avian Conserv Ecol.* 13(2). doi:10.5751/ACE-01248-130204.

[Human access](#)

- 77 Wasser SK, Keim JL, Taper ML, Lele SR. 2011. The influences of wolf predation, habitat loss, and human activity on caribou and moose in the Alberta oil sands. *Frontiers in Ecology and the Environment.* 9(10):546-551. doi:10.1890/100071.

[Invasive species](#)

- 7 Boutin C, Carpenter DJ. 2017. Assessment of wetland/upland vegetation communities and evaluation of soil-plant contamination by polycyclic aromatic hydrocarbons and trace metals in regions near oil sands mining in Alberta. *Sci Total Environ.* 576:829-839. doi:10.1016/j.scitotenv.2016.10.062.
- 9 Cameron EK, Bayne EM. 2009. Road age and its importance in earthworm invasion of northern boreal forests. *J Appl Ecol.* 46(1):28-36. doi:10.1111/j.1365-2664.2008.01535.x.
- 50 Mayor SJ, Cahill JF, He F, Sólymos P, Boutin S. 2012. Regional boreal biodiversity peaks at intermediate human disturbance. *Nat Commun.* 3:1142. doi:10.1038/ncomms2145.

[Land deformation](#)

- 65 Singhroy V, Li J, Samsonov S, Shen L, Pearse J. 2014. InSAR monitoring of surface deformation induced by steam injection in the Athabasca oil sands, Canada. In: 2014 IEEE Geoscience and Remote Sensing Symposium. IEEE. p. 4796-4799.
- 67 Stevenson CJ, Filicetti AT, Nielsen SE. 2019. High precision altimeter demonstrates simplification and depression of microtopography on seismic lines in treed peatlands. *Forests.* 10(4):295. doi:10.3390/f10040295.

[Light penetration](#)

- 66 Stern ER, Riva F, Nielsen SE. 2018. Effects of Narrow Linear Disturbances on Light and Wind Patterns in Fragmented Boreal Forests in Northeastern Alberta. *Forests.* 9(8):486. doi:10.3390/f9080486.

Microclimate

- 60 Roberts D, Ciuti S, Barber QE, Willier C, Nielsen SE. 2018. Accelerated seed dispersal along linear disturbances in the Canadian oil sands region. *Scientific Reports.* 8(1):4828. doi:10.1038/s41598-018-22678-y.
- 66 Stern ER, Riva F, Nielsen SE. 2018. Effects of Narrow Linear Disturbances on Light and Wind Patterns in Fragmented Boreal Forests in Northeastern Alberta. *Forests.* 9(8):486. doi:10.3390/f9080486.

Natural disturbance regime

- 2 Arienti MC, Cumming SG, Krawchuk MA, Boutin S. 2009. Road network density correlated with increased lightning fire incidence in the Canadian western boreal forest. *Int J Wildl Fire.* 18(8):970. doi:10.1071/wf08011.
- 4 Barber QE, Parisien MA, Whitman E, Stralberg D, Johnson CJ, St-Laurent MH, DeLancey ER, Price DT, Arseneault D, Wang X, et al. 2018. Potential impacts of climate change on the habitat of boreal woodland caribou. *Ecosphere.* 9(10). doi:10.1002/ecs2.2472.
- 38 Latham ADM, Latham MC, Boyce MS, Boutin S. 2013. Spatial relationships of sympatric wolves (*Canis lupus*) and coyotes (*C. latrans*) with woodland caribou (*Rangifer tarandus caribou*) during the calving season in a human-modified boreal landscape. *Wildl Res.* 40(3):250-260. doi:10.1071/WR12184.
- 46 Mahon CL, Holloway G, Sólymos P, Cumming SG, Bayne EM, Schmiegelow FKA, Song SJ. 2016. Community structure and niche characteristics of upland and lowland western boreal birds at multiple spatial scales. *Forest Ecology and Management.* 361:99-116. doi:10.1016/j.foreco.2015.11.007.
- 59 Riva F, Pinzon J, Acorn JH, Nielsen SE. 2020. Composite Effects of Cutlines and Wildfire Result in Fire Refuges for Plants and Butterflies in Boreal Treed Peatlands. *Ecosystems.* 23(3):485–497. doi:10.1007/s10021-019-00417-2.
- 68 Stewart FEC, Nowak JJ, Micheletti T, McIntire EJB, Schmiegelow FKA, Cumming SG. 2020. Boreal Caribou Can Coexist with Natural but Not Industrial Disturbances. *J Wildl Manage.* 84(8):1435–1444. doi:10.1002/jwmg.21937.
- 82 Zhang J, Mayor SJ, He F. 2014. Does disturbance regime change community assembly of angiosperm plant communities in the boreal forest? *J Plant Ecol.* 7(2):188-201. doi:10.1093/jpe/rtt068.

Physical & chemical soil properties

- 10 Cho S, Dinwoodie G, Fu Y, Abboud S, Turchenek L. 2019. An assessment of long-term soil acidification trends in Alberta, Canada. *Ecol Indic.* 98(August 2018):712–722. doi:10.1016/j.ecolind.2018.11.020.

- 45 MacKenzie MD, Dietrich ST. 2020. Atmospheric sulfur and nitrogen deposition in the Athabasca oil sands region is correlated with foliar nutrient levels and soil chemical properties. *Sci Total Environ.* 711:134737. doi:10.1016/j.scitotenv.2019.134737.
- 78 Watmough SA, Bird A, McDonough A, Grimm E. 2019. Forest Fertilization Associated with Oil Sands Emissions. *Ecosystems.* 22(1):1–14. doi:10.1007/s10021-018-0249-x.
- 83 Davidson SJ, Goud EM, Franklin C, Nielsen SE, Strack M. 2020. Seismic line disturbance alters soil physical and chemical properties across boreal forest and peatland soils. *Front Earth Sci.* 8:281. doi:10.3389/feart.2020.00281.
- 84 Strack M, Softa D, Bird M, Xu B. 2018. Impact of winter roads on boreal peatland carbon exchange. *Global Change Biology.* 24(1):e201–e212. doi:10.1111/gcb.13844.
- 85 Lovitt J, Rahman MM, Saraswati S, McDermid GJ, Strack M, Xu B. 2018. UAV remote sensing can reveal the effects of low-impact seismic lines on surface morphology, hydrology, and methane (CH₄) release in a boreal treed bog. *Journal of Geophysical Research: Biogeosciences.* 123(3):1117–1129. doi:10.1002/2017JG004232.

Predator-prey dynamics

- 4 Barber QE, Parisien MA, Whitman E, Stralberg D, Johnson CJ, St-Laurent MH, DeLancey ER, Price DT, Arseneault D, Wang X, et al. 2018. Potential impacts of climate change on the habitat of boreal woodland caribou. *Ecosphere.* 9(10). doi:10.1002/ecs2.2472.
- 36 Kansas J, Charlebois M, Skatter H. 2015. Vegetation recovery on low impact seismic lines in Alberta's oil sands and visual obstruction of wolves and woodland caribou. *Can Wildl Biol Manag.* 4(2):137–149.
- 38 Latham ADM, Latham MC, Boyce MS, Boutin S. 2013. Spatial relationships of sympatric wolves (*Canis lupus*) and coyotes (*C. latrans*) with woodland caribou (*Rangifer tarandus caribou*) during the calving season in a human-modified boreal landscape. *Wildl Res.* 40(3):250–260. doi:10.1071/WR12184.
- 39 Latham ADM, Latham MC, Boyce MS. 2011. Habitat selection and spatial relationships of black bears (*Ursus americanus*) with woodland caribou (*Rangifer tarandus caribou*) in northeastern Alberta. *Can J Zool.* 89(4):267–277. doi:10.1139/z10-115.
- 41 Latham ADM, Latham MC, Mccutchen NA, Boutin S. 2011. Invading white-tailed deer change wolf-caribou dynamics in northeastern Alberta. *J Wildl Manage.* 75(1):204–212. doi:10.1002/jwmg.28.
- 53 Neilson EW, Boutin S. 2017. Human disturbance alters the predation rate of moose in the Athabasca oil sands. *Ecosphere.* 8(8):e01913. doi:10.1002/ecs2.1913.
- 77 Wasser SK, Keim JL, Taper ML, Lele SR. 2011. The influences of wolf predation, habitat loss, and human activity on caribou and moose in the Alberta oil sands. *Frontiers in Ecology and the Environment.* 9(10):546–551. doi:10.1890/100071.

Response

Community - Cover / Structure

- 1 Abib TH, Chasmer L, Hopkinson C, Mahoney C, Rodriguez LCE. 2019. Seismic line impacts on proximal boreal forest and wetland environments in Alberta. *Sci Total Environ.* 658:1601–1613. doi:10.1016/j.scitotenv.2018.12.244.
- 42 Latifovic R, Pouliot D. 2014. Monitoring cumulative long-term vegetation changes over the Athabasca Oil Sands region. *IEEE J Sel Top Appl Earth Obs Remote Sens.* 7(8):3380-3392. doi:10.1109/JSTARS.2014.2321058.

Community - Diversity / Richness

- 7 Boutin C, Carpenter DJ. 2017. Assessment of wetland/upland vegetation communities and evaluation of soil-plant contamination by polycyclic aromatic hydrocarbons and trace metals in regions near oil sands mining in Alberta. *Sci Total Environ.* 576:829-839. doi:10.1016/j.scitotenv.2016.10.062.
- 46 Mahon CL, Holloway G, Sólymos P, Cumming SG, Bayne EM, Schmiegelow FKA, Song SJ. 2016. Community structure and niche characteristics of upland and lowland western boreal birds at multiple spatial scales. *Forest Ecology and Management.* 361:99-116. doi:10.1016/j.foreco.2015.11.007.
- 48 Mao L, Dennett J, Bater CW, Tompalski P, Coops NC, Farr D, Kohler M, White B, Stadt JJ, Nielsen SE. 2018. Using airborne laser scanning to predict plant species richness and assess conservation threats in the oil sands region of Alberta's boreal forest. *For Ecol Manage.* 409:29–37. doi:10.1016/j.foreco.2017.11.017.
- 49 Mayor SJ, Boutin S, He F, Cahill JF. 2015. Limited impacts of extensive human land use on dominance, specialization, and biotic homogenization in boreal plant communities. *BMC Ecology.* 15(1):5. doi:10.1186/s12898-015-0037-9.
- 50 Mayor SJ, Cahill JF, He F, Sólymos P, Boutin S. 2012. Regional boreal biodiversity peaks at intermediate human disturbance. *Nat Commun.* 3:1142. doi:10.1038/ncomms2145.
- 54 Nielsen SE, Dennett JM, Bater CW. 2020. Landscape patterns of rare vascular plants in the lower athabasca region of alberta, Canada. *Forests.* 11(6):699. doi:10.3390/f11060699.
- 58 Riva F, Acorn JH, Nielsen SE. 2018b. Localized disturbances from oil sands developments increase butterfly diversity and abundance in Alberta's boreal forests. *Biological Conservation.* 217:173-180. doi:10.1016/j.biocon.2017.10.022.
- 59 Riva F, Pinzon J, Acorn JH, Nielsen SE. 2020. Composite Effects of Cutlines and Wildfire Result in Fire Refuges for Plants and Butterflies in Boreal Treed Peatlands. *Ecosystems.* 23(3):485–497. doi:10.1007/s10021-019-00417-2.

- 78 Watmough SA, Bird A, McDonough A, Grimm E. 2019. Forest Fertilization Associated with Oil Sands Emissions. *Ecosystems*. 22(1):1–14. doi:10.1007/s10021-018-0249-x.
- 82 Zhang J, Mayor SJ, He F. 2014. Does disturbance regime change community assembly of angiosperm plant communities in the boreal forest? *J Plant Ecol*. 7(2):188–201. doi:10.1093/jpe/rtt068.

Distribution - Abundance

- 3 Ball J, Sólymos P, Schmiegelow F, Hache S, Schieck J, Bayne E. 2016. Regional habitat needs of a nationally listed species, Canada Warbler (*Cardellina canadensis*), in Alberta, Canada. *Avian Conservation and Ecology*. 11(2):10. doi:10.5751/ACE-00916-110210.
- 4 Barber QE, Parisien MA, Whitman E, Stralberg D, Johnson CJ, St-Laurent MH, DeLancey ER, Price DT, Arseneault D, Wang X, et al. 2018. Potential impacts of climate change on the habitat of boreal woodland caribou. *Ecosphere*. 9(10). doi:10.1002/ecs2.2472.
- 8 Cadieux P, Boulanger Y, Cyr D, Taylor AR, Price DT, Sólymos P, Stralberg D, Chen H, Brecka A, Tremblay JA. 2020. Projected effects of climate change on boreal bird community accentuated by anthropogenic disturbances in western boreal forest, Canada. *Divers Distrib*.:1–15. doi:10.1111/ddi.13057.
- 9 Cameron EK, Bayne EM. 2009. Road age and its importance in earthworm invasion of northern boreal forests. *J Appl Ecol*. 46(1):28–36. doi:10.1111/j.1365-2664.2008.01535.x.
- 19 Domahidi Z, Shonfield J, Nielsen SE, Spence JR, Bayne EM. 2019. Spatial distribution of the boreal owl and northern saw-whet owl in the Boreal region of Alberta, Canada. *Avian Conserv Ecol*. 14(2). doi:10.5751/ACE-01445-140214.
- 27 Foster KR, Godwin CM, Pyle P, Saracco JF. 2017. Reclamation and habitat-disturbance effects on landbird abundance and productivity indices in the oil sands region of northeastern Alberta, Canada. *Restoration Ecology*. 25(4):532–538. doi:10.1111/rec.12478.
- 35 Hedley RW, McLeod LJT, Yip DA, Farr D, Knaga P, Drake KL, Bayne E. 2020. Modeling the occurrence of the yellow rail (*Coturnicops noveboracensis*) in the context of ongoing resource development in the oil sands region of Alberta. *Avian Conserv Ecol*. 15(1):1–14. doi:10.5751/ACE-01538-150110.
- 41 Latham ADM, Latham MC, Mccutchen NA, Boutin S. 2011. Invading white-tailed deer change wolf-caribou dynamics in northeastern Alberta. *J Wildl Manage*. 75(1):204–212. doi:10.1002/jwmg.28.
- 47 Mahon CL, Holloway GL, Bayne EM, Toms JD. 2019 May 23. Additive and interactive cumulative effects on boreal landbirds: winners and losers in a multi-stressor landscape. *Ecol Appl*.:e01895. doi:10.1002/eap.1895.
- 51 Morissette JL, Bayne EM, Kardynal KJ, Hobson KA. 2019. Regional variation in responses of wetland-associated bird communities to conversion of boreal forest to agriculture. *Avian Conserv Ecol*. 14(1). doi:10.5751/ACE-01355-140112.
- 57 Riva F, Acorn JH, Nielsen SE. 2018a. Distribution of Cranberry Blue Butterflies (*Agriades optilete*) and Their Responses to Forest Disturbance from In Situ Oil Sands and Wildfires. *Diversity*. 10(4). doi:10.3390/d10040112.

- 58 Riva F, Acorn JH, Nielsen SE. 2018b. Localized disturbances from oil sands developments increase butterfly diversity and abundance in Alberta's boreal forests. *Biological Conservation*. 217:173-180. doi:10.1016/j.biocon.2017.10.022.
- 64 Singer H V., Slattery SM, Armstrong L, Witherly S. 2020. Assessing breeding duck population trends relative to anthropogenic disturbances across the Boreal plains of Canada, 1960–2007. *Avian Conserv Ecol*. 15(1):1. doi:10.5751/ACE-01493-150101.
- 68 Stewart FEC, Nowak JJ, Micheletti T, McIntire EJB, Schmiegelow FKA, Cumming SG. 2020. Boreal Caribou Can Coexist with Natural but Not Industrial Disturbances. *J Wildl Manage*. 84(8):1435–1444. doi:10.1002/jwmg.21937.
- 73 Toews M, Juanes F, Burton AC. 2017. Mammal responses to human footprint vary with spatial extent but not with spatial grain. *Ecosphere*. 8(3). doi:10.1002/ecs2.1735.
- 74 Toews M, Juanes F, Burton AC. 2018. Mammal responses to the human footprint vary across species and stressors. *Journal of Environmental Management*. 217:690-699. doi:10.1016/j.jenvman.2018.04.009.
- 76 Ward EM, Gorelick SM. 2018. Drying drives decline in muskrat population in the Peace-Athabasca Delta, Canada. *Environ Res Lett*. 13(12):124026. doi:10.1088/1748-9326/aaf0ec.
- 77 Wasser SK, Keim JL, Taper ML, Lele SR. 2011. The influences of wolf predation, habitat loss, and human activity on caribou and moose in the Alberta oil sands. *Frontiers in Ecology and the Environment*. 9(10):546-551. doi:10.1890/100071.
- 79 Wilson S, Saracco JF, Flockhart DTT, Godwin CM, Foster KR. 2018. Drivers of demographic decline across the annual cycle of a threatened migratory bird. *Scientific Reports*. 8(7316). doi:10.1038/s41598-018-25633-z.
- 80 Wilson SJ, Bayne EM. 2018. Use of an acoustic location system to understand how presence of conspecifics and canopy cover influence ovenbird (*Seiurus aurocapilla*) space use near reclaimed wellsites in the boreal forest of alberta. *Avian Conserv Ecol*. 13(2). doi:10.5751/ACE-01248-130204.
- 81 Zhang J, Kissling WD, He F. 2013. Local forest structure, climate and human disturbance determine regional distribution of boreal bird species richness in Alberta, Canada. *Journal of Biogeography*. 40(6):1131-1142. doi:10.1111/jbi.12063.

Distribution - Behaviour

- 15 Dickie M, McNay SR, Sutherland GD, Cody M, Avgar T. 2020. Corridors or risk? Movement along, and use of, linear features varies predictably among large mammal predator and prey species. *J Anim Ecol*. 89(2):623–634. doi:10.1111/1365-2656.13130.
- 16 Dickie M, Serrouya R, DeMars C, Cranston J, Boutin S. 2017. Evaluating functional recovery of habitat for threatened woodland caribou. *Ecosphere*. 8(9):e01936. doi:10.1002/ecs2.1936.
- 17 Dickie M, Serrouya R, McNay RS, Boutin S. 2017. Faster and farther: wolf movement on linear features and implications for hunting behaviour. du Toit J, editor. *J Appl Ecol*. 54(1):253-263. doi:10.1111/1365-2664.12732.

- 20 Dunne BM, Quinn MS. 2009. Effectiveness of above-ground pipeline mitigation for moose (*Alces alces*) and other large mammals. *Biol Conserv.* 142(2):332–343. doi:10.1016/j.biocon.2008.10.029.
- 37 Latham ADM, Latham MC, Boyce MS, Boutin S. 2011. Movement responses by wolves to industrial linear features and their effect on woodland caribou in northeastern Alberta. *Ecol Appl.* 21(8):2854-2865. doi:10.1890/11-0666.1.
- 41 Latham ADM, Latham MC, Mccutchen NA, Boutin S. 2011. Invading white-tailed deer change wolf-caribou dynamics in northeastern Alberta. *J Wildl Manage.* 75(1):204-212. doi:10.1002/jwmg.28.
- 52 Muhly T, Serrouya R, Neilson E, Li H, Boutin S. 2015. Influence of in-situ oil sands development on caribou (*Rangifer tarandus*) movement. *PLoS One.* 10(9):e0136933. doi:10.1371/journal.pone.0136933.
- 53 Neilson EW, Boutin S. 2017. Human disturbance alters the predation rate of moose in the Athabasca oil sands. *Ecosphere.* 8(8):e01913. doi:10.1002/ecs2.1913.
- 56 Riva F, Acorn JH, Nielsen SE. 2018. Narrow anthropogenic corridors direct the movement of a generalist boreal butterfly. *Biol Lett.* 14(2):20170770. doi:10.1098/rsbl.2017.0770.

Distribution - Dispersal / Migration

- 60 Roberts D, Ciuti S, Barber QE, Willier C, Nielsen SE. 2018. Accelerated seed dispersal along linear disturbances in the Canadian oil sands region. *Scientific Reports.* 8(1):4828. doi:10.1038/s41598-018-22678-y.

Distribution - Occupancy

- 9 Cameron EK, Bayne EM. 2009. Road age and its importance in earthworm invasion of northern boreal forests. *J Appl Ecol.* 46(1):28-36. doi:10.1111/j.1365-2664.2008.01535.x.
- 12 Dawe CA, Filicetti AT, Nielsen SE. 2017. Effects of linear disturbances and fire severity on velvet leaf blueberry abundance, vigor, and berry production in recently burned jack pine forests. *Forests.* 8(10):398. doi:10.3390/f8100398.
- 13 Dawe KL, Bayne EM, Boutin S. 2014. Influence of climate and human land use on the distribution of white-tailed deer (*Odocoileus virginianus*) in the western boreal forest. *Can J Zool.* 92(4):353-363. doi:10.1139/cjz-2013-0262.
- 14 Dawe KL, Boutin S. 2016. Climate change is the primary driver of white-tailed deer (*Odocoileus virginianus*) range expansion at the northern extent of its range; land use is secondary. *Ecol Evol.* 6(18):6435-6451. doi:10.1002/ece3.2316.
- 15 Dickie M, McNay SR, Sutherland GD, Cody M, Avgar T. 2020. Corridors or risk? Movement along, and use of, linear features varies predictably among large mammal predator and prey species. *J Anim Ecol.* 89(2):623–634. doi:10.1111/1365-2656.13130.

- 16 Dickie M, Serrouya R, DeMars C, Cranston J, Boutin S. 2017. Evaluating functional recovery of habitat for threatened woodland caribou. *Ecosphere*. 8(9):e01936. doi:10.1002/ecs2.1936.
- 17 Dickie M, Serrouya R, McNay RS, Boutin S. 2017. Faster and farther: wolf movement on linear features and implications for hunting behaviour. du Toit J, editor. *J Appl Ecol*. 54(1):253-263. doi:10.1111/1365-2664.12732.
- 25 Fisher JT, Burton AC, Nolan L, Roy L. 2020. Influences of landscape change and winter severity on invasive ungulate persistence in the Nearctic boreal forest. *Sci Rep*. 10(1):1–11. doi:10.1038/s41598-020-65385-3.
- 26 Fisher JT, Burton AC. 2018. Wildlife winners and losers in an oil sands landscape. *Frontiers in Ecology and the Environment*. 16(6):323-328. doi:10.1002/fee.1807.
- 38 Latham ADM, Latham MC, Boyce MS, Boutin S. 2013. Spatial relationships of sympatric wolves (*Canis lupus*) and coyotes (*C. latrans*) with woodland caribou (*Rangifer tarandus caribou*) during the calving season in a human-modified boreal landscape. *Wildl Res*. 40(3):250-260. doi:10.1071/WR12184.
- 39 Latham ADM, Latham MC, Boyce MS. 2011. Habitat selection and spatial relationships of black bears (*Ursus americanus*) with woodland caribou (*Rangifer tarandus caribou*) in northeastern Alberta. *Can J Zool*. 89(4):267-277. doi:10.1139/z10-115.
- 40 Latham ADM, Latham MC, Knopff KH, Hebblewhite M, Boutin S. 2013. Wolves, white-tailed deer, and beaver: Implications of seasonal prey switching for woodland caribou declines. *Ecography (Cop)*. 36(12):1276–1290. doi:10.1111/j.1600-0587.2013.00035.x.
- 69 Tattersall ER, Burgar JM, Fisher JT, Burton AC. 2020. Boreal predator co-occurrences reveal shared use of seismic lines in a working landscape. *Ecol Evol*. 10(3):1678–1691. doi:10.1002/ece3.6028.
- 70 Tattersall ER, Burgar JM, Fisher JT, Burton AC. 2020. Mammal seismic line use varies with restoration: Applying habitat restoration to species at risk conservation in a working landscape. *Biol Conserv*. 241:108295. doi:10.1016/j.biocon.2019.108295.

Health - Condition

- 5 Bartels SF, Gendreau-Berthiaume B, Macdonald SE. 2019. The impact of atmospheric acid deposition on tree growth and forest understory vegetation in the Athabasca Oil Sands Region. *Sci Total Environ*. 696:133877. doi:10.1016/J.SCITOTENV.2019.133877.
- 12 Dawe CA, Filicetti AT, Nielsen SE. 2017. Effects of linear disturbances and fire severity on velvet leaf blueberry abundance, vigor, and berry production in recently burned jack pine forests. *Forests*. 8(10):398. doi:10.3390/f8100398.
- 24 Fernie KJ, Marteinson SC, Soos C, Chen D, Cruz-Martinez L, Smits JEG. 2018. Reproductive and developmental changes in tree swallows (*Tachycineta bicolor*) are influenced by multiple stressors, including polycyclic aromatic compounds, in the Athabasca Oil Sands. *Environ Pollut*. 238:931-941. doi:10.1016/j.envpol.2018.03.074.
- 28 Godwin CM, Barclay RMR, Smits JEG. 2019. Tree Swallow (*Tachycineta bicolor*) nest success and nestling growth near oil sands mining operations in northeastern Alberta, Canada. *Can J Zool*. 97(6):547-557. doi:10.1139/cjz-2018-0247.

- 61 Savard MM, Bégin C, Marion J. 2014. Modelling carbon isotopes in spruce trees reproduces air quality changes due to oil sands operations. *Ecological Indicators*. 45:1-8. doi:10.1016/j.ecolind.2014.03.005.
- 78 Watmough SA, Bird A, McDonough A, Grimm E. 2019. Forest Fertilization Associated with Oil Sands Emissions. *Ecosystems*. 22(1):1–14. doi:10.1007/s10021-018-0249-x.
- 84 Davidson SJ, Goud EM, Franklin C, Nielsen SE, Strack M. 2020. Seismic line disturbance alters soil physical and chemical properties across boreal forest and peatland soils. *Front Earth Sci*. 8:281. doi:10.3389/feart.2020.00281.

Health - Function

- 6 Berger RG, Aslund MW, Sanders G, Charlebois M, Knopper LD, Bresee KE. 2016. A multiple lines of evidence approach for the ecological risk assessment of an accidental bitumen release from a steam assisted gravity drainage (SAGD) well in the Athabasca oil sands region. *Sci Total Environ*. 542:495–504. doi:10.1016/j.scitotenv.2015.10.050.
- 11 Cruz-Martinez L, Fernie KJ, Soos C, Harner T, Getachew F, Smits JEG. 2015. Detoxification, endocrine, and immune responses of tree swallow nestlings naturally exposed to air contaminants from the Alberta oil sands. *Sci Total Environ*. 502:8-15. doi:10.1016/j.scitotenv.2014.09.008.
- 23 Fernie KJ, Marteinson SC, Chen D, Palace V, Peters L, Soos C, Smits JEG. 2019. Changes in thyroid function of nestling tree swallows (*Tachycineta bicolor*) in relation to polycyclic aromatic compounds and other environmental stressors in the Athabasca Oil Sands Region. *Environ Res*. 169(November 2018):464–475. doi:10.1016/j.envres.2018.11.031.

Health - Reproduction

- 24 Fernie KJ, Marteinson SC, Soos C, Chen D, Cruz-Martinez L, Smits JEG. 2018. Reproductive and developmental changes in tree swallows (*Tachycineta bicolor*) are influenced by multiple stressors, including polycyclic aromatic compounds, in the Athabasca Oil Sands. *Environ Pollut*. 238:931-941. doi:10.1016/j.envpol.2018.03.074.
- 27 Foster KR, Godwin CM, Pyle P, Saracco JF. 2017. Reclamation and habitat-disturbance effects on landbird abundance and productivity indices in the oil sands region of northeastern Alberta, Canada. *Restoration Ecology*. 25(4):532-538. doi:10.1111/rec.12478.
- 28 Godwin CM, Barclay RMR, Smits JEG. 2019. Tree Swallow (*Tachycineta bicolor*) nest success and nestling growth near oil sands mining operations in northeastern Alberta, Canada. *Can J Zool*. 97(6):547-557. doi:10.1139/cjz-2018-0247.
- 72 Thomas PJ, Newell EE, Eccles K, Holloway AC, Idowu I, Xia Z, Hassan E, Tomy G, Quenneville C. 2021. Co-exposures to trace elements and polycyclic aromatic compounds (PACs) impacts North American river otter (*Lontra canadensis*) baculum. *Chemosphere*. 265:128920. doi:10.1016/j.chemosphere.2020.128920.

Health - Stress

- 77 Wasser SK, Keim JL, Taper ML, Lele SR. 2011. The influences of wolf predation, habitat loss, and human activity on caribou and moose in the Alberta oil sands. *Frontiers in Ecology and the Environment*. 9(10):546-551. doi:10.1890/100071.