



Cannabis Cultivation

Scientific (Peer-Reviewed) Papers focusing on impacts associated with Cannabis cultivation on National Forest Lands & other public landscapes

2022

Paper Title: *Combined field and clinical methods clarify mortality causes and survival patterns of Pacific martens*

Key Discoveries: First report of a marten exposed to pesticides associated with cultivation sites.

Citation: Martin, Marie E., Matthew S. Delheimer, Mourad W. Gabriel, Greta M. Wengert, and Katie M. Moriarty. "Combined field and clinical methods clarify mortality causes and survival patterns of Pacific martens." *The Journal of Wildlife Management* 86, no. 1 (2022): e22131.

URL Link: <https://wildlife.onlinelibrary.wiley.com/doi/pdf/10.1002/jwmg.22131>

USFS Employee Authors: Mourad Gabriel: Co-Author, Matt Delheimer: Co-Author

2021

Paper Title: *Distribution of trespass cannabis cultivation and its risk to sensitive forest predators in California and Southern Oregon*

Key Discoveries: A modeling approach to predict areas of the high likelihood of cultivation activity.

Citation: Wengert, Greta M., J. Mark Higley, Mourad W. Gabriel, Heather Rustigian-Romsos, Wayne D. Spencer, Deana L. Clifford, and Craig Thompson. "Distribution of trespass cannabis cultivation and its risk to sensitive forest predators in California and Southern Oregon." *Plos one* 16, no. 9 (2021): e0256273.

URL Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0256273>

USFS Employee Authors: Mourad Gabriel: Co-Author, Craig Thompson: Co-Author

2019

Paper Title: *Anticoagulant rodenticides in Strix owls indicate widespread exposure in west coast forests.*

Key Discoveries: Report of owls throughout the western states exposed to pesticides associated with cultivation sites.

Citation: Wiens, J. David, Krista E. Dilione, Collin A. Eagles-Smith, Garth Herring, Damon B. Lesmeister, Mourad W. Gabriel, Greta M. Wengert, and David C. Simon. "Anticoagulant rodenticides

in Strix owls indicate widespread exposure in west coast forests." *Biological Conservation* 238 (2019): 108238.

URL Link: <https://www.sciencedirect.com/science/article/pii/S0006320719309346>

USFS Employee Authors: Damon Lesmeister: Co-author, Mourad Gabriel: Co-Author

2018

Paper Title: *Exposure to rodenticides in Northern Spotted and Barred Owls on remote forest lands in northwestern California: evidence of food web contamination*

Key Discoveries: Large-scale project highlighting exposures in northern spotted owls and a surrogate species, barred owls to pesticides associated with cannabis sites

Citation: Gabriel, Mourad, Lowell Diller, John Dumbacher, Greta Wengert, John Higley, Robert Poppenga, and Shannon Mendia. "Exposure to rodenticides in Northern Spotted and Barred Owls on remote forest lands in northwestern California: evidence of food web contamination." *Avian Conservation and Ecology* 13, no. 1 (2018).

URL Link: <https://www.ace-eco.org/vol13/iss1/art2/>

USFS Employee Authors: Mourad Gabriel: Lead-Author

2017

Paper Title: *An ever-changing ecological battlefield: marijuana cultivation and toxicant use in western forests*

Key Discoveries: Overview of impacts specifically on National Forest Lands

Citation: Thompson, Craig M., Mourad W. Gabriel, and Kathryn L. Purcell. "An ever-changing ecological battlefield: marijuana cultivation and toxicant use in western forests." *The Wildlife Professional*. 11 (3): 42-46 11, no. 3 (2017): 42-46.

URL Link: <https://wildlife.org/an-ever-changing-ecological-battlefield-from-the-wildlife-professional/>

USFS Employee Authors: Craig Thompson: Lead Author, Mourad W Gabriel: Co-Author, Kathryn Purcell: Co-Author

Paper Title: *Grass is not always greener: rodenticide exposure of a threatened species near marijuana growing operations*

Key Discoveries: First report of a federally protected northern spotted owl exposed to and suspected to have died from pesticides associated with cultivation.

Citation: Franklin, Alan B., Peter C. Carlson, Angela Rex, Jeremy T. Rockweit, David Garza, Emily Culhane, Steven F. Volker et al. "Grass is not always greener: rodenticide exposure of a threatened species near marijuana growing operations." *BMC research notes* 11, no. 1 (2018): 1-7.

URL Link: <https://bmcresearchnotes.biomedcentral.com/articles/10.1186/s13104-018-3206-z>

USFS Employee Authors: Mourad Gabriel: Co-Author

2016

Paper Title: *Mortality Risks and Limits to Population Growth of Fishers*

Key Discoveries: Overview of mortality factors for fishers, including pesticide mortalities.

Citation: Sweitzer, Rick A., Viorel D. Popescu, Craig M. Thompson, Kathryn L. Purcell, Reginald H. Barrett, Greta M. Wengert, Mourad W. Gabriel, and Leslie W. Woods. "Mortality risks and limits to population growth of fishers." *The Journal of Wildlife Management* 80, no. 3 (2016): 438-451.

URL Link: <https://wildlife.onlinelibrary.wiley.com/doi/pdfdirect/10.1002/jwmq.1020>

USFS Employee Authors: Craig Thompson: Co-Author, Kathryn Purcell: Co-Author, Mourad W Gabriel: Co-Author

2015

Paper Title: *Patterns of natural and human-caused mortality factors of a rare forest carnivore, the fisher (Pekania pennanti) in California.*

Key Discoveries: First report to record the amount of mortality in a fisher population attributed to cultivation sites.

Citation: Gabriel, Mourad W., Leslie W. Woods, Greta M. Wengert, Nicole Stephenson, J. Mark Higley, Craig Thompson, Sean M. Matthews et al. "Patterns of natural and human-caused mortality factors of a rare forest carnivore, the fisher (Pekania pennanti) in California." *PLoS One* 10, no. 11 (2015): e0140640.

URL Link: <https://doi.org/10.1371/journal.pone.0140640>

USFS Employee Authors: Mourad W Gabriel: Lead Author, Craig Thompson: Co-Author, Kathryn Purcell: Co-Author

2014

Paper Title: *Impacts of rodenticide and insecticide toxicants from marijuana cultivation sites on fisher survival rates in the Sierra National Forest, California.*

Key Discoveries: Link the reduction of survival of threatened fishers with pesticides used at NFS cultivation sites.

Citation: Thompson, Craig, Richard Sweitzer, Mourad Gabriel, Kathryn Purcell, Reginald Barrett, and Robert Poppenga. "Impacts of rodenticide and insecticide toxicants from marijuana cultivation sites on fisher survival rates in the Sierra National Forest, California." *Conservation Letters* 7, no. 2 (2014): 91-102.

URL Link: <https://conbio.onlinelibrary.wiley.com/doi/pdfdirect/10.1111/conl.12038>

USFS Employee Authors: Craig Thompson: Lead Author, Mourad Gabriel: CoAuthor, Kathryn Purcell: Co-Author

2013

Paper Title: *Silent forests." Rodenticides on illegal marijuana crops harm wildlife*

Key Discoveries: A review of impacts and research hurdles associated with cultivation sites on public lands.

Citation: Gabriel, Mourad W., Greta M. Wengert, J. Mark Higley, Shane Krogan, Warren Sargent, and Deana L. Clifford. "Silent forests." *Rodenticides on illegal marijuana crops harm wildlife*. *Wildlife Professional* 7 (2013): 46-50.

URL Link: https://www.ierceecology.org/wp-content/uploads/2013/03/Silent_Forests_by_Mourad_W._Gabriel_et_al.TWP_Spring_2013.pdf

USFS Employee Authors: Mourad W Gabriel: Lead Author

2012

Paper Title: *Anticoagulant Rodenticides on our Public and Community Lands: Spatial Distribution of Exposure and Poisoning of a Rare Forest Carnivore*

Key Discoveries: First paper to link a threatened species to pesticides used at cannabis cultivation sites. First report of exposure and poisoning of fishers from cultivation pesticides.

Citation: Gabriel MW, Woods LW, Poppenga R, Sweitzer RA, Thompson C, Matthews SM, et al. (2012) Anticoagulant Rodenticides on our Public and Community Lands: Spatial Distribution of Exposure and Poisoning of a Rare Forest Carnivore. *PLoS ONE* 7(7): e40163.
<https://doi.org/10.1371/journal.pone.0040163>

URL Link: <https://doi.org/10.1371/journal.pone.0040163>

USFS Employee Authors: Mourad W Gabriel: Lead Author, Craig Thompson: Co-Author, Kathryn Purcell: Co-Author

Book Chapters & Contributions

Gabriel, M.W., and Wengert, G.M., (2020), Introduction and Foreword, SPECIAL ISSUE Impacts of Cannabis Cultivation on Fish and Wildlife Resources Introduction, 106: 10-12

Gabriel, M.W., and Wengert, G.M., (2019) *Battling the Decay of Truth: Barriers to the Investigation and Disclosure of Environmental Impacts Associated with Cannabis Cultivation* in *Routledge Handbook of Interdisciplinary Cannabis Research*.

Wengert, G.M., Gabriel, M.W., Thompson, C, J.M. Higley, (2018) Ecological impacts across the landscape from trespass marijuana cultivation on western public lands. in *Where There's Smoke: The Environmental Science, Public Policy, and Politics of Marijuana*. Pgs. 29-39. C. Miller editor, University Press of Kansas

Thompson C., M.W.Gabriel, J.M. Higley, and G.M. Wengert, (2018) Effects of illegal marijuana cultivation on wildlife. Pesticide exposure in a native carnivore and consequences for the species survival. in *Where There's Smoke: The Environmental Science, Public Policy, and Politics of Marijuana*. Pgs. 40-57. C. Miller editor, University Press of Kansas

Higley J.M., M.W.Gabriel, C.Thompson, G.M. Wengert, (2018) The Marijuana Green Rush is Anything but Green on Hoopa Tribal Lands. in *Where There's Smoke: The Environmental Science, Public Policy, and Politics of Marijuana*. Pgs. 58-68. C. Miller editor, University Press of Kansas

OIG Audit Link: <https://www.oversight.gov/sites/default/files/oig-reports/08003-0001-22.pdf>