

Avian predation research in the Columbia River Basin

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Theses and dissertations

Anderson, S. K. 2003. Foraging ecology, colony attendance, and chick provisioning of Caspian tern (*Sterna caspia*) in the Columbia River estuary. Master's thesis. Oregon State University, Corvallis, Oregon. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/mk61rk766

Antolos, M. 2002. Breeding and foraging ecology of Caspian terns (*Sterna caspia*) in the mid-Columbia River: predation on juvenile salmonids and management implications. Master's thesis. Oregon State University, Corvallis, Oregon. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/mk61rk766

Hostetter, N. J. 2009. Susceptibility of juvenile salmonids to avian predation: Are Caspian terns and double-crested cormorants only taking the sick and injured? Master's thesis. Oregon State University, Corvallis, Oregon. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/3197xr26d

Lyons, D. E. 2004. Foraging ecology of Caspian terns and double-crested cormorants in the Columbia River estuary. Master's thesis. Oregon State University, Corvallis, Oregon. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/vm40xv63m

Lyons, D. E. 2010. Bioenergetics-based predator-prey relationships between piscivorous birds and juvenile salmonids in the Columbia River estuary. Doctoral dissertation. Oregon State University, Corvallis, Oregon. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/08612r341

Myers, A. M. 2007. Evaluating the fatty acid signature technique for studies of diet composition in piscivorous waterbirds. Master's thesis. Oregon State University, Corvallis, Oregon. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/cz30pw84g

Ryan, B. A. 2005. A system-wide assessment of avian predation on juvenile Salmonids in the Columbia River Basin based on passive integrated transponder tag recoveries. Doctoral dissertation. Portland State University, Portland, Oregon. <http://www.worldcat.org/oclc/61155085>

Schniedermeier, E. 2018. The response of Caspian terns to managed reductions in nesting habitat in the Columbia Plateau region, Washington State, USA. Master's thesis. Oregon State University, Corvallis, Oregon. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/v692tc482

Suzuki, Y. 2012. Piscivorous colonial waterbirds in the Columbia River estuary : demography, dietary contaminants, and management. Doctoral dissertation. Oregon State University, Corvallis, Oregon. https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/47429c39b

Reports, books, and conference proceedings

Adrean, L. 2013. Oregon Department of Fish and Wildlife Avian Predation Program 2012 final report. Oregon Department of Fish and Wildlife, Tillamook, Oregon. <https://www.dfw.state.or.us/conservationstrategy/docs/2012AvianPredationReport.pdf>

Anchor QEA, LGL Limited, and Turnstone Environmental Consultants. 2017. Double-crested cormorant (DCCO) monitoring report: avian predation program monitoring. Report to U.S. Army Corps of Engineers, Portland, Oregon. <https://usace.contentdm.oclc.org/utills/getfile/collection/p16021coll3/id/788>

Bayer, R. D. 2003. Review: Bird predation of juvenile salmonids and management of birds near 14 Columbia Basin dams. Gahmken Press, Newport, Oregon.
<https://ir.library.oregonstate.edu/concern/defaults/jh343t74q>

Bird Research Northwest. 2013. Implementation and effects of double-crested cormorant dissuasion research at East Sand Island, Columbia River estuary, 2008-2012. Technical memorandum to U.S. Army Corps of Engineers, Portland, Oregon. <http://www.birdresearchnw.org/Dissauision%202008-2012.pdf>

Bird Research Northwest. 2014. East Sand Island biological assessment, 2010-2012. Final technical memorandum to U.S. Army Corps of Engineers, Portland, Oregon.
<http://www.birdresearchnw.org/Final%20Biological%20Assessment.v4.pdf>

Bonneville Power Administration. 2001. Avian predation on juvenile salmonids in the lower Columbia River Research Project: Finding of No Significant Impact (FONSI). Bonneville Power Administration, Portland, Oregon.
https://www.bpa.gov/efw/Analysis/NEPADocuments/nepa/Avian_Predation/finalf.pdf

Collis, K., A. Evans, J. Tennyson, A. Turecek, Q. Payton, and R. Bhatt. 2020. Avian predation in the Columbia Plateau Region: management, monitoring, and evaluation: 2019 final annual report. Report to Grant County Public Utility District and the Priest Rapids Coordinating Committee.
<http://www.birdresearchnw.org/2019%20GPUD%20Final%20Report.pdf>

Collis, K. M. Hawbecker, D. Roby, C. Couch, J. Wolf, and C. Anderson. 2001. Pelican, cormorant, and pinniped use of pile dikes and jetties at the mouth of the Columbia River estuary, 2000: 2000 final data report. http://www.birdresearchnw.org/2000_Pile_Dike_Report.pdf

Collis, K., M. Hawbecker, D. D. Roby, M. Thompson, C. Faustino, C. Cardoni, C. D. Anderson, and D. E. Lyons. 2002. Cormorant and brown pelican use of excluder-fitted pile dikes in the Columbia River estuary, 2001: 2001 final report. http://www.birdresearchnw.org/2001_Pile_Dike_Report.pdf

Collis, K., D. D. Roby, C. Couch, G. Dorsey, K. Fischer, D. E. Lyons, A. M. Myers, S. K. Nelson, J. Y. Adkins, A. Evans, and M. Hawbecker. 2006. Piscivorous waterbird research on the Columbia River: final 2004 season summary. Report to Bonneville Power Administration and U.S. Army Corps of Engineers, Portland, Oregon. http://www.birdresearchnw.org/04_Season_Summary.pdf

Collis, K., D. D. Roby, N. J. Hostetter, A. F. Evans, D. E. Lyons, J. Y. Adkins, Y. Suzuki, P. Loschl, and T. Lawes. 2012. Caspian tern colony site assessment: management opportunities in western North America. Report to U.S. Army Corps of Engineers, Walla Walla, Washington.
http://www.birdresearchnw.org/IAPMP_site_assessment_report%20v18.pdf

David C. Smith and Associates, Statewide Land Surveying, and Harris Environmental Group. 2016. Enumeration and monitoring surveys of double-crested cormorants in the lower Columbia River estuary for the 2015 nesting season. Report to U.S. Army Corps of Engineers, Portland, Oregon.
<https://usace.contentdm.oclc.org/utills/getfile/collection/p16021coll3/id/789>

Dare, M. R., C. S. McCutcheon, and R. J. Richmond. 2002. Manual PIT tag collection at the Caspian tern colony on Crescent Island, Washington. Report to U.S. Army Corps of Engineers, Walla Walla, Washington. <https://catalog.cbflw.org/cgi-bin/koha/opac-detail.pl?biblionumber=3925>

Double-Crested Cormorant Subcommittee and Pacific Flyway Nongame Migratory Bird Technical Committee. 2012. A framework for the management of double-crested cormorant depredation on fish resources in the Pacific flyway. Report to Pacific Flyway Council, Portland, Oregon.
http://pacificflyway.gov/Documents/Dcc_plan.pdf

Evans, A. F., N. J. Hostetter, and K. Collis. 2013. Caspian tern predation on upper Columbia River steelhead in the Priest Rapids Project: a retrospective analysis of data from 2008-2010. Report to Public Utility District No. 2 of Grant County, Ellensburg, Washington and Blue Leaf Environmental.
http://www.birdresearchnw.org/Evans%20et%20al%202013_GPUD%20Final%20Avian%20Predation%202008%20to%202010.pdf

Evans, A., Q. Payton, A. Turecek, B. Cramer, K. Collis, D. Roby, P. Loschl, J. Skalski, R. Townsend, L. Sullivan, and M. Weiland. 2015. Avian predation on juvenile salmonids in the Columbia River: a spatial and temporal analysis of impacts in relation to fish survival. Report to Public Utility District No. 2 of Grant County, Ephrata, Washington.
http://www.birdresearchnw.org/Evans%20et%20al%202015_Avian%20Predation%20on%20AT%20smolts%20_Final%20Report.pdf

Evans, A., Q. Payton, B. Cramer, K. Collis, D. Lyons, and P. Loschl. 2016. Predation impacts on juvenile salmonids by double-crested cormorants and Caspian terns nesting on East Sand Island in the Columbia River Estuary. Report to U.S. Army Corps of Engineers, Portland, Oregon.
<http://www.birdresearchnw.org/2015%20ESI%20PIT%20Recovery%20FINAL%20Report.pdf>

Harper, J. and K. Collis. 2018. 2018 hazing and dissuasion of Caspian terns in the lower Columbia estuary: season end summary report. Report to U.S. Army Corps of Engineers, Portland, Oregon.
<http://www.birdresearchnw.org/FinalAvianPredationSummaryReport2018.pdf>

Independent Multidisciplinary Science Team. 1998. Pinniped and seabird predation : implications for recovery of threatened stocks of salmonids in Oregon under the Oregon Plan for Salmon and Watersheds. Report to the Oregon Plan for Salmon and Watersheds, Salem, Oregon.
https://ir.library.oregonstate.edu/concern/technical_reports/j9602070t

Jones, S. T., G. M. Starke, and R. J. Stansell. 1995-1999. Predation by gulls and effectiveness of predation control measures at Bonneville, The Dalles, and John Day Dams. Report to U.S. Army Corps of Engineers, Cascade Locks, Oregon. <https://catalog.cbfwl.org/cgi-bin/koha/opac-detail.pl?biblionumber=31775>

Lyons, D. E., A. F. Evans, N. J. Hostetter, A. Piggott, L. Weitkamp, T. P. Good, D. D. Roby, K. Collis, P. J. Loschl, and B. Cramer. 2014. Factors influencing predation on juvenile salmonids by double-crested cormorants in the Columbia River estuary: a retrospective analysis. Report to U.S. Army Corps of Engineers, Portland, Oregon.
<http://www.birdresearchnw.org/ESI%20DCCO%20Revised%20Retrospective%20Analysis%202014%2011%2007.pdf>

Lyons, D. E., D. D. Roby, A. F. Evans, N. J. Hostetter, and K. Collis. 2011. Benefits to Columbia River anadromous salmonids from potential reductions in avian predation on the Columbia Plateau. Report to U.S. Army Corps of Engineers, Walla Walla, Washington.
<http://www.birdresearchnw.org/inland%20avian%20predation%20benefits%20analysis.pdf>

Lyons, D. E., D. D. Roby, A. F. Evans, N. J. Hostetter, and K. Collis. 2014. Benefits to Columbia River anadromous salmonids from potential reductions in predation by double-crested cormorants nesting at the East Sand Island colony in the Columbia River estuary. Report to U.S. Army Corps of Engineers, Portland, Oregon. <http://www.birdresearchnw.org/final%20esi%20dcco%20benefits%20analysis.pdf>

National Marine Fisheries Service. 2002-2010. Detection of Passive Integrated Transponder (PIT) tags on piscivorous bird colonies in the Columbia River basin. Report to U.S. Army Corps of Engineers, Walla Walla, Washington.

2002: https://www.webapps.nwfsc.noaa.gov/assets/26/322_05292009_180446_Birds.2002.Accessible.pdf

2006: https://www.webapps.nwfsc.noaa.gov/assets/26/976_06012009_111527_Birds2006-Accessible.pdf

2010: https://www.webapps.nwfsc.noaa.gov/assets/26/7603_04252014_153837_Birds-2010.pdf

Payton, Q., A. Evans, and B. Cramer. 2016. Effects of biotic and abiotic factors on juvenile steelhead survival in the middle Columbia River, 2008-2015. Report to Public Utility District No. 2 of Grant County, Ephrata Washington and Blue Leaf Environmental, Ellensburg, Washington.

http://www.birdresearchnw.org/Final%20Report_Steelhead%20Survival%20Covariate%20Analysis.pdf

Roby, D. D., K. Collis, T. J. Lawes, K. S. Bixler, D. E. Lyons, O. Bailey, A. Turecek, and M. Hawbecker. 2020. Monitoring and evaluation of efforts to reduce predation on ESA-listed salmonids by Caspian terns nesting at East Sand Island, Columbia River estuary. Report to Bonneville Power Administration and Northwest Power and Conservation Council, Portland, Oregon.

<https://www.cbfish.org/Document.mvc/Viewer/P171786>.

Roby, D. D., K. Collis, and D. E. Lyons. 2005. Conservation and management for fish-eating birds and endangered salmon. USDA Forest Service General Technical Report PSW-GTR-191, Pages 161– 165. U.S. Forest service, Washington, D.C.

https://www.fs.fed.us/psw/publications/documents/psw_gtr191/psw_gtr191_0161-0165_roby.pdf

Roby, D. D., K. Collis, D. E. Lyons, J. Y. Adkins, P. Loschl, Y. Suzuki, T. Marcella, L. Kerr, A. Evans, B. Cramer, N. Hostetter, B. P. Sandford, R. D. Ledgerwood, D. R. Kuligowski, and S. Sebring. 2011. Impacts of avian predation on salmonid smolts from the Columbia and Snake rivers: 2004-2009 synthesis report. Report to U.S. Army Corps of Engineers, Walla Walla, Washington.

<http://www.birdresearchnw.org/Avian%20Predation%20Synthesis%20Report%202004-2009%20Final%20v2.pdf>

Schaeffer, L. 1992. Avian predators at ODFW hatcheries: their identification and control. Oregon Department of Fish and Wildlife, Portland, Oregon.

<https://digital.osl.state.or.us/islandora/object/osl:18430>

Steuber, J. E., M. E. Pitzler, and J. G. Oldenburg. 1995. Protecting juvenile salmonids from gull predation using wire exclusion below hydroelectric dams. Great Plains Wildlife Damage Control Workshop Proceedings. 452. <https://digitalcommons.unl.edu/gpawdcwp/452>

Suzuki, Y., J. Heinrichs, D. E. Lyons, D. D. Roby, and N. Schumaker. 2018. Modeling the Pacific Flyway population of Caspian terns to investigate current population dynamics and evaluate future management options: phase 3 model results. Report to Bonneville Power Administration and Northwest Power & Conservation Council, Portland, Oregon.

<https://www.cbfish.org/Document.mvc/Viewer/P161235>

Tiller, B. L., I. D. Welch, C. A. McKinstry, and J. E. Bernhard. 2004. Assessment of potential juvenile salmon predation by American white pelicans in the vicinity of McNary Dam, 2002-2003. Battelle, Richland, Washington. <https://catalog.cbfiwl.org/cgi-bin/koha/opac-detail.pl?biblionumber=6738>

Turecek, A., J. Tennyson, K. Collis, and B. Cramer. 2018. Double-crested cormorant monitoring on East Sand Island, 2017. Report to U.S. Army Corps of Engineers, Portland, Oregon.
<https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll3/id/791>

Turecek, A., J. Tennyson, P. von Weller, K. Collis, and B. Cramer. Double-crested cormorant monitoring on East Sand Island and in the Columbia River estuary, 2018. Report to U.S. Army Corps of Engineers, Portland, Oregon.
<http://www.birdresearchnw.org/2018%20ESI%20DCCO%20Monitoring%20%20Annual%20Report%20Final%20Final.pdf>

U.S. Army Corps of Engineers. 2015. Double-crested cormorant management plan to reduce predation of juvenile salmonids in the Columbia River estuary: final environmental impact statement. U.S. Army Corps of Engineers, Portland, Oregon.
<https://usace.contentdm.oclc.org/digital/collection/p16021coll7/id/2203>

U.S. Army Corps of Engineers, 2014. Inland avian predation management plan environmental assessment. U.S. Army Corps of Engineers, Walla Walla, Washington.
https://www.nww.usace.army.mil/Portals/28/docs/programsandprojects/IAPMP/Final_IAPMP_EA_Fullpackage%20vs1.pdf

U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Portland District; and NOAA Fisheries. 2005. Caspian tern management to reduce predation of juvenile salmonids in the Columbia River estuary : final environmental impact statement. U.S. Fish and Wildlife Service, Portland, Oregon.
https://www.fws.gov/pacific/migratorybirds/pdf/Caspian_Tern_Final_EIS.pdf

Various authors. 1997-1998. Avian predation on juvenile salmonids in the lower Columbia River. Report to Bonneville Power Administration and U.S. Army Corps of Engineers, Portland, Oregon.
1997: <https://www.cbfish.org/Document.mvc/Viewer/33475-1>
1998: <https://www.cbfish.org/Document.mvc/Viewer/33475-2>

Various authors. 2005-2014. Research, monitoring, and evaluation of avian predation on salmonid smolts in the lower and mid-Columbia River. Report to Bonneville Power Administration and U.S. Army Corps of Engineers.
2005: http://www.birdresearchnw.org/05_Final_Season_Summary.pdf
2006: <https://www.cbfish.org/Document.mvc/Viewer/P112125>
2007: <https://www.cbfish.org/Document.mvc/Viewer/P109811>
2008: <https://www.cbfish.org/Document.mvc/Viewer/P113764>
2009: <https://www.cbfish.org/Document.mvc/Viewer/P116942>
2010: <https://www.cbfish.org/Document.mvc/Viewer/P124726>
2011: <https://www.cbfish.org/Document.mvc/Viewer/P127303>
2012: <https://www.cbfish.org/Document.mvc/Viewer/P134121>
2013: <https://www.cbfish.org/Document.mvc/Viewer/P142427>
2014: <https://www.cbfish.org/Document.mvc/Viewer/P144588>

Various authors. 2014-2018. Implementation of the inland avian predation management plan. Report to U.S. Army Corps of Engineers and U.S. Bureau of Reclamation.
2014: http://www.birdresearchnw.org/2014_IAPMP_Final_Report_v2.pdf
2015: <http://www.birdresearchnw.org/2015%20IAPMP%20Final%20Report.pdf>
2016: <http://www.birdresearchnw.org/2016%20IAPMP%20Final%20Report.pdf>
2017: <http://www.birdresearchnw.org/2017%20IAPMP%20Final%20Report.pdf>
2018: http://www.birdresearchnw.org/2018%20IAPMP%20Final%20Report_v5.pdf

Various authors. 2015-2016. Evaluation of foraging behavior, dispersal, and predation on ESA-listed salmonids by Caspian terns displaced from managed colonies in the Columbia Plateau Region. Annual report to Grant County Public Utility District/Priest Rapids Coordinating Committee, Ephrata, Washington.

2015: http://www.birdresearchnw.org/FINAL_2015_GPUD_Report.pdf

2016: http://www.birdresearchnw.org/FINAL_2016_GPUD_Report_v3.pdf

Various authors. 2017-2018. Implementation and evaluation of efforts to reduce predation on ESA-listed salmonids by Caspian tern nesting at East Sand Island, Columbia River estuary. Report to Bonneville Power Administration and Northwest Power and Conservation Council, Portland, Oregon.

2017: http://www.birdresearchnw.org/Final_2017_BPA_Annual%20Report.pdf

2018: <https://www.cbfish.org/Document.mvc/Viewer/P165399>

Various authors. 2017-2018. East Sand Island passive integrated transponder tag recovery and avian predation rate analysis. Report to U.S. Army Corps of Engineers, Portland, Oregon.

2017: <https://usace.contentdm.oclc.org/digital/collection/p16021coll3/id/790>

2018: <http://www.birdresearchnw.org/2018%20ESI%20PIT%20Recovery%20Final%20Report.pdf>

Various authors. 2000-2003. Caspian tern research on the lower Columbia River : final season summary. Report to Bonneville Power Administration, Portland, Oregon.

2000: <http://www.birdresearchnw.org/00SeasonSummary.pdf>

2001: <http://www.birdresearchnw.org/01SeasonSummary.pdf>

2002: http://www.birdresearchnw.org/02_Season_Summary.pdf

2003: http://www.birdresearchnw.org/03_Season_Summary.pdf

Various authors. 2015-2016. Avian predation on juvenile salmonids: evaluation of the Caspian tern management plan in the Columbia River estuary. Report to Bonneville Power Administration, Portland, Oregon.

2015: <https://www.cbfish.org/Document.mvc/Viewer/P161024>

2016: <https://www.cbfish.org/Document.mvc/Viewer/P154709>

Zorich, N. A., M. R. Jonas, and P. L. Madson. 2010. Avian predation at John Day Dam 2009 : estimated fish consumption using direct observation with diet analysis. U.S. Army Corps of Engineers, Cascade Locks, Oregon. <http://www.worldcat.org/oclc/809207992>

Zorich, N. A., M. R. Jonas, and P. L. Madson. 2011. Avian predation at John Day and the Dalles Dams, 2010 : estimated fish consumption using direct observation with diet analysis. U.S. Army Corps of Engineers, Cascade Locks, Oregon. <http://www.worldcat.org/oclc/797563762>

Zorich, N. A., M. R. Jonas, and P. L. Madson. 2012. Avian predation at John Day and the Dalles Dams 2011 : estimated fish consumption using direct observation. U.S. Army Corps of Engineers, Cascade Locks, Oregon. <http://www.worldcat.org/oclc/809213225>

Journal Articles

Anderson, S. K., D. D. Roby, D. E. Lyons, and K. Collis. 2007. Relationship of Caspian tern foraging ecology to nesting success in the Columbia River estuary, Oregon, USA. *Estuarine, Coastal and Shelf Science* 73(3-4):447-456. <https://doi.org/10.1016/j.ecss.2007.02.006>

Antolos, M., D. D. Roby, D. E. Lyons, K. Collis, A. F. Evans, M. Hawbecker, and B. A. Ryan. 2005. Caspian tern predation on juvenile salmonids in the mid-Columbia River. *Transactions of the American Fisheries Society* 134(2):466-480. <https://doi.org/10.1577/T04-043.1>

Clemens, B. J., S. P. Clements, M. D. Karnowski, D. B. Jepsen, A. I. Gitelman, and C. B. Schreck. 2009. Effects of transportation and other factors on survival estimates of juvenile salmonids in the unimpounded lower Columbia River. *Transactions of the American Fisheries Society* 138(1):169-188. <https://doi.org/10.1577/T07-090.1>

Collis, K., Roby, D. D., D. P. Craig, S. Adamany, J. Y. Adkins, and D. E. Lyons. 2002. Colony size and diet composition of piscivorous waterbirds on the lower Columbia River: implications for losses of juvenile salmonids to avian predation. *Transactions of the American Fisheries Society* 131(3):537-550. [https://doi.org/10.1577/1548-8659\(2002\)131<0537:CSADCO>2.0.CO;2](https://doi.org/10.1577/1548-8659(2002)131<0537:CSADCO>2.0.CO;2)

Collis, K., D. D. Roby, D. P. Craig, B. A. Ryan, and R. D. Ledgerwood. 2001. Colonial waterbird predation on juvenile salmonids tagged with passive integrated transponders in the Columbia River estuary: vulnerability of different salmonid species, stocks, and rearing types. *Transactions of the American Fisheries Society* 130(3):385-396. [https://doi.org/10.1577/1548-8659\(2001\)130<0385:CWPOJS>2.0.CO;2](https://doi.org/10.1577/1548-8659(2001)130<0385:CWPOJS>2.0.CO;2)

Evans, A. F., N. J. Hostetter, D. D. Roby, K. Collis, D. E. Lyons, B. P. Sandford, R. D. Ledgerwood, and S. Sebring. 2012. Systemwide evaluation of avian predation on juvenile salmonids from the Columbia River based on recoveries of passive integrated transponder tags. *Transactions of the American Fisheries Society* 141(4):975-989. <https://doi.org/10.1080/00028487.2012.676809>

Evans, A. F., Q. Payton, B. M. Cramer, K. Collis, N. J. Hostetter, D. D. Roby, and C. Dotson. 2019. Cumulative effects of avian predation on upper Columbia River steelhead. *Transactions of the American Fisheries Society* 148(5):896-913. <https://doi.org/10.1002/tafs.10197>

Evans, A. F., Q. Payton, A. Turecek, B. Cramer, K. Collis, D. D. Roby, P. J. Loschl, L. Sullivan, J. Skalski, M. Weiland, and C. Dotson. 2016. Avian predation on juvenile salmonids: spatial and temporal analysis based on acoustic and passive integrated transponder tags. *Transactions of the American Fisheries Society* 145(4):860-877. <https://doi.org/10.1080/00028487.2016.1150881>

Haeseker, S. L., G. Scheer, and J. McCann. 2020. Avian predation on steelhead is consistent with compensatory mortality. *Journal of Wildlife Management* 84(6):1164-1178. <https://doi.org/10.1002/jwmg.21880>

Hostetter, N. J., A. F. Evans, B. M. Cramer, K. Collis, D. E. Lyons, and D. D. Roby. 2015. Quantifying avian predation on fish populations: integrating predator-specific deposition probabilities in tag recovery studies. *Transactions of the American Fisheries Society* 144(2):410-422. <https://doi.org/10.1080/00028487.2014.988882>

Hostetter, N. J., A. F. Evans, D. D. Roby, and K. Collis. 2012. Susceptibility of juvenile steelhead to avian predation: the influence of individual fish characteristics and river conditions. *Transactions of the American Fisheries Society* 141(6):1586-1599. <https://doi.org/10.1080/00028487.2012.716011>

Kennedy, B. M., W. L. Gale, and K. G. Ostrand. 2007. Relationship between smolt gill Na⁺, K⁺ ATPase activity and migration timing to avian predation risk of steelhead trout (*Oncorhynchus mykiss*) in a large estuary. *Canadian Journal of Fisheries and Aquatic Sciences* 64(11):1506-1516. <https://doi.org/10.1139/f07-117>

Lyons, D. E., D. D. Roby, and K. Collis. 2007. Foraging patterns of Caspian terns and double-crested cormorants in the Columbia River Estuary. *Northwest Science* 81(2):91-103. <https://doi.org/10.3955/0029-344X-81.2.91>

Maranto, C. J., T. P. Good, F. K. Wiese, and J. K. Parrish. 2011. Impact of the Potholes Reservoir Caspian tern breeding colony on out-migrating juvenile salmonids in the mid-Columbia River. *Transactions of the American Fisheries Society* 139(2):362-381. <https://doi.org/10.1577/T09-095.1>

Meyer, K. A., C. L. Sullivan, P. Kennedy, D. J. Schill, D. M. Teuscher, A. F. Brimmer, and D. T. King. 2016. Predation by American white pelicans and double-crested cormorants on catchable-sized hatchery rainbow trout in select Idaho lentic waters. *North American Journal of Fisheries Management* 36(2):294-308. <https://doi.org/10.1080/02755947.2015.1120835>

Payton, Q., N. J. Hostetter, and A. F. Evans. 2019. Jointly estimating survival and mortality: integrating recapture and recovery data from complex multiple predator systems. *Environmental & Ecological Statistics* 26(2):107–125. <https://doi.org/10.1007/s10651-019-00421-8>

Phillips, E. M., J. K. Horne, and J. E. Zamon. 2017. Predator–prey interactions influenced by a dynamic river plume. *Canadian Journal of Fisheries and Aquatic Sciences* 74(9):1375-1390. <https://doi.org/10.1139/cjfas-2016-0302>

Roby, D. D., D. E. Lyons, D. P. Craig, K. Collis, and G. H. Visser. 2003. Quantifying the effect of predators on endangered species using a bioenergetics approach: Caspian terns and juvenile salmonids in the Columbia River estuary. *Canadian Journal of Zoology* 81(2):250–265. <https://doi.org/10.1139/z02-242>

Ruggerone, G. T. 1986. Consumption of migrating juvenile salmonids by gulls foraging below a Columbia River dam. *Transactions of the American Fisheries Society* 115(5):736-742. [https://doi.org/10.1577/1548-8659\(1986\)115<736:COMJSB>2.0.CO;2](https://doi.org/10.1577/1548-8659(1986)115<736:COMJSB>2.0.CO;2)

Ryan, B. A., J. W. Ferguson, R. D. Ledgerwood, and E. P. Nunnallee. 2001. Detection of passive integrated transponder tags from juvenile salmonids on piscivorous bird colonies in the Columbia River basin. *North American Journal of Fisheries Management* 21(2): 417-421. [https://doi.org/10.1577/1548-8675\(2001\)021<0417:DOPITT>2.0.CO;2](https://doi.org/10.1577/1548-8675(2001)021<0417:DOPITT>2.0.CO;2)

Ryan, B. A., S. G. Smith, J. A. M. Butzerin, and J. W. Ferguson. 2003. Relative vulnerability to avian predation of juvenile salmonids tagged with passive integrated transponders in the Columbia River estuary, 1998-2000. *Transactions of the American Fisheries Society* 132(2):275-288. [https://doi.org/10.1577/1548-8659\(2003\)132<0275:RVTAPO>2.0.CO;2](https://doi.org/10.1577/1548-8659(2003)132<0275:RVTAPO>2.0.CO;2)

Schniedermeier, E., D. D. Roby, D. E. Lyons, Y. Suzuki, and K. Collis. 2020. Caspian tern response to managed reductions in nesting habitat. *Wildlife Society Bulletin* 44(3):468–479. <https://doi.org/10.1002/wsb.1111>

Schreck, C. B., T. P. Stahl, L. E. Davis, D. D. Roby, and B. J. Clemens. 2006. Mortality estimates of juvenile spring-summer chinook salmon in the lower Columbia River and estuary, 1992-1998: evidence for delayed mortality? *Transactions of the American Fisheries Society* 135(2):457-475. <https://doi.org/10.1577/T05-184.1>

Sebring, S. H., M. C. Carper, R. D. Ledgerwood, B. P. Sandford, G. M. Matthews, and A. F. Evans. 2013. Relative vulnerability of PIT-tagged subyearling fall chinook salmon to predation by Caspian terns and double-crested cormorants in the Columbia River estuary. *Transactions of the American Fisheries Society* 142(5):1321-1334. <https://doi.org/10.1080/00028487.2013.806952>

Wiese, F. K., J. K. Parrish, C. W. Thompson, and C. Maranto. 2008. Ecosystem-based management of predator-prey relationships: piscivorous birds and salmonids. *Ecological Applications* 18(3):681–700. <https://doi.org/10.1890/06-1825.1>