

Aaron David Flesch

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EDUCATION

Ph.D. – Organismal Biology and Ecology – 2013, Division of Biological Sciences, University of Montana, Missoula, MT. Advisor: Richard Hutto.

M.S. – Wildlife Biology – 2003, School of Natural Resources and the Environment, University of Arizona, Tucson, AZ. Advisor: Robert Steidl.

B.A. – Environmental Studies – 1995, Prescott College, Prescott, AZ. Advisor: Walt Anderson.

POSITIONS

Research Scientist, School of Natural Resources and the Environment, University of Arizona, Tucson, AZ (2014 – Present)

- Managing all aspects of multifaceted international research program in applied ecology, population biology, and conservation biology.

Senior Research Specialist, School of Natural Resources and the Environment, University of Arizona, Tucson, AZ (2003 – 2014)

- Managed multifaceted international research program.

Graduate Research and Teaching Assistant, Division of Biological Sciences, University of Montana, Missoula, MT (2008 – 2013)

- Teaching Assistant for Ecology, Ornithology, and Rocky Mountain Flora.
- Dissertation title: *Effects of local and landscape processes on animal distribution and abundance.*

Graduate Research Assistant, School of Natural Resources, University of Arizona, Tucson, AZ. (2000 – 2003)

- Thesis title: *Distribution, abundance, and habitat of ferruginous pygmy-owls in Sonora, Mexico.*

Biological Consultant, Recon Environmental, Inc., Tucson, AZ (2006 – 2007)

- Designed phase I of ecological monitoring program for Pima County AZ.

Biological Science Technician, U.S. Fish and Wildlife Service, Alaska Region, Southeast AK (2000)

- Bird surveys, vegetation measurements, and backcountry river navigation.

Biological Consultant, A.D. Flesch and Associates, Tucson, AZ (1996 – 2000)

- Implemented research and monitoring programs mainly for public natural resource agencies.
- Wildlife and plant surveys, Clean Water Act permitting, and biological evaluations.

Biological Science Technician, U.S. Geological Survey, Ft. Collins, CO (1999)

- Supervised field crew and surveyed wintering grassland birds in southeast Arizona

Nongame Biologist, Arizona Game and Fish Department, Phoenix, AZ (1997 and 1998)

- Arizona Breeding Bird Atlas Program field crew.

PUBLICATIONS

Forthcoming:

- Flesch, A.D. *In Review*. Patterns and drivers of long-term changes in breeding bird communities in a global biodiversity hotspot and biogeographic transition zone in Mexico. *submitted to Diversity and Distributions*

- Flesch, A.D., C. Jarchow, and P. Nagler. *In Prep*. Interactive effects of climatic flux and land-use change on distributional dynamics of a threatened Sonoran Desert predator.
- Gallo-Reynoso, J.-P., L. Armenta-Méndez, A.D. Flesch, M. Montiel-Herrera, and J. Egido-Villarreal. *In Prep*. Distribution and habitat of golden eagle (*Aquila chrysaetos*) in Sonora, Mexico.

Refereed Articles:

1. Peters, R., M. Moskwik, W.J. Ripple, C. Wolf, G. Carreón-Arroyo, G. Ceballos, A. Córdova, R. Dirzo, P.R. Ehrlich, A.D. Flesch, R. List, T.E. Lovejoy, R.F. Noss, J. Pacheco, J.K. Sarukhán, M.E. Soulé, E.O. Wilson, and J.R.B. Miller. 2018. Nature divided, scientists united: U.S.-Mexico border wall threatens biodiversity and binational conservation. *BioScience* (in press).
2. Flesch, A.D. 2017. Effects of local and landscape factors on distributional dynamics: A species-centered fitness-based approach. *Proceedings of the Royal Society of London B: Biological Sciences* 284:20171001; DOI: 10.1098/rspb.2017.1001. (with cover)
3. Flesch, A.D., P.C. Rosen, and P. Holm. 2017. Long-term changes in abundances of Sonoran Desert lizards reveal complex responses to climatic variation. *Global Change Biology* 23: 5492–5508; DOI: 10.1111/gcb.13813.
4. Flesch, A.D., C. González Sánchez, J. Valenzuela Amarillas. 2016. Abundance and habitat relationships of breeding birds in the Sky Islands and adjacent Sierra Madre Occidental of northwest Mexico. *Journal of Field Ornithology* 87:176-195.
5. Flesch, A.D., P. Warshall, and S. Jacobs. 2015. Avian richness, status, and conservation in the northwestern Neotropics in Sonora, Mexico. *Natural Areas Journal* 35:288-296. (with cover)
6. Flesch, A.D., R.L. Hutto, W.J.D. van Leeuwen, K. Hartfield, and S. Jacobs. 2015. Spatial, temporal, and density-dependent components of habitat quality for a desert owl. *PLoS ONE* 10(3): e0119986.
7. Flesch, A.D. 2014. Spatiotemporal trends and drivers of population dynamics in a declining desert predator. *Biological Conservation* 175:110-118.
8. Hutto, R.L., A.D. Flesch, and M.A. Fylling. 2014. A bird's-eye view of forest restoration: do changes reflect success? *Forest Ecology and Management* 327:1-9.
9. Van Devender, T.R., A.L. Reina-Guererro, A.D. Flesch, S. Jacobs, and M.F. Wilson. 2014. Additions to the flora of Sonora, Mexico. *Phytoneuron* 76: 1-8.
10. Van Devender, T.R., R. Spellenberg, A.D. Flesch, S. Jacobs, and A.L. Reina-Guererro. 2013. Northern distributional limits of the Mexican willow oak (*Quercus viminea*) in Arizona, Sonora, and Chihuahua. *Phytoneuron* 48:1–7.
11. Rosenzweig, M.L., F. Drumlevitch, K.L. Borgmann, A.D. Flesch, S.M. Grajeda, G. Johnson, K. Mackay, K.L. Nicholson, V. Patterson, B.M. Pri-Tal, N. Ramos, and K.P. Serrano. 2012. An ecological telescope to view future terrestrial vertebrate diversity. *Evolutionary Ecology Research* 14:247-268.
12. Flesch, A.D., and R.J. Steidl. 2010. Importance of environmental and spatial gradients on patterns and consequences of resource selection. *Ecological Applications* 20:1021-1039.
13. Flesch, A.D., D.E. Swann, D.S. Turner, and B.F. Powell. 2010. Herpetofauna of the Rincon Mountains, Arizona. *Southwestern Naturalist* 55:240-253.
14. Snyder, N.F.R., H.A. Snyder, N. Moore-Craig, A.D. Flesch, R.W. Wagner, and R.A. Rowlett. 2010. Short-tailed hawks nesting in the Sky Islands of the southwest. *Western Birds* 41:202-230. (with cover)
15. Flesch, A.D., C.W. Epps, J.W. Cain, M. Clark, P.R. Krausman, and J.R. Morgart. 2010. Potential effects of the

United States-Mexico border fence on wildlife. *Conservation Biology* 24:171-181.

16. Flesch, A.D. 2008. Distribution and status of breeding landbirds in northern Sonora, Mexico. *Studies in Avian Biology* 37:28-45. (invited)
17. Flesch, A.D., and R.J. Steidl. 2007. Detectability and response rates of ferruginous pygmy-owls. *Journal of Wildlife Management* 71:981-990.
18. Flesch, A.D., and R.J. Steidl. 2006. Population trends and implications for monitoring cactus ferruginous pygmy-owls in northern Mexico. *Journal of Wildlife Management* 70:867-871.
19. Flesch, A.D. 2003. Perch-site selection and spatial use by cactus ferruginous pygmy-owls in south-central Arizona. *Journal of Raptor Research* 37:151-157.

Book Chapters:

20. Villaseñor-Gómez, J.F., O. Hinojosa-Huerta, E. Gómez-Limón, D. Krueper, and A.D. Flesch. 2010. Avifauna. Pages 385-420 in F. E. Molina-Freaner and T. R. Van Devender (editors), The biological diversity of Sonora Mexico. Universidad Nacional Autónoma de Mexico, Mexico City, Mexico (in Spanish).

Non-refereed Articles:

21. Gutiérrez-González C., M.A. Gómez-Ramírez, D. Gutierrez-Garcia, J. Valenzuela, J.C. Rorabaugh, and A. D. Flesch. 2016. Interactions between Sonoran Desert Toads (*Incilius alvarius*) and mammalian predators at the Northern Jaguar Reserve, Sonora, Mexico. *Sonoran Herpetologist* 29(2):26-27.
22. Ferguson, G.M., A.D. Flesch, and T.R. Van Devender. 2013. Biogeography and diversity of pines in the Madrean Archipelago. Pages 197-203 in Gottfried, G. J et al. (compilers), Merging science and management in a rapidly changing world: biodiversity and management of the Madrean Archipelago III, RMRS-P-67. U.S. Department of Agriculture, Forest Service.
23. Van Devender, T.R., S. Avila-Villegas, M. Emerson, D. Turner, A.D. Flesch, and N.S. Deyo. 2013. Biodiversity in the Madrean Archipelago of Sonora, Mexico. Pages 10-16 in Gottfried, G. J et al. (compilers), Merging science and management in a rapidly changing world: biodiversity and management of the Madrean Archipelago III, RMRS-P-67. U.S. Department of Agriculture, Forest Service. (invited plenary)
24. Warshall, P. and A.D. Flesch. 2013. Bird ecology and conservation on the Northern Jaguar Reserve: Recent lessons. Pages 91-96 in Gottfried, G.J. et al. (compilers), Merging science and management in a rapidly changing world: biodiversity and management of the Madrean Archipelago III, RMRS-P-67. U.S. Department of Agriculture, Forest Service.
25. Flesch, A.D. 2011. Life on the line: conservation and complexity in the U.S.-Mexico borderlands. *The Wildlife Professional* 5(4):6. (invited guest editorial)
26. Flesch, A.D. 2010. Ferruginous pygmy-owls in the Sonoran Desert. *Bulletin of the Ecological Society of America* 91:446-449. (invited)
27. Flesch, A.D. 2010. Research and recovery of ferruginous pygmy-owls in the Sonoran Desert. *Vermillion Flycatcher* 55(2):14-15. (invited)
28. Flesch, A.D., and L.E. Hahn. 2005. Distribution of birds and plants at the western and southern edges of the Madrean Sky Island region in Sonora, Mexico. Pages 80-87 in Gottfried G. J. et al. (editors), Connecting mountain islands and desert seas: biodiversity and management of the Madrean Archipelago II, RMRS-P-36. U.S. Department of Agriculture, Forest Service.

Technical Reports:

29. Flesch, A.D., I Murray, and B.F Powell. 2017. Application of distance sampling for Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*) population estimation and monitoring. Final report for Arizona Department of Agriculture, Section 6 Grant Program. Project segment 19, 2015-2017-04.

30. Boone, J.D. and A.D. Flesch. 2017. Elf owl home range and habitat study, 2015 annual report. Annual report for Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Boulder City, NV.
31. Flesch, A.D., P. Nagler, and C. Jarchow. 2017. Population trends, extinction risk, and conservation guidelines for ferruginous pygmy-owls in the Sonoran Desert. Final report for Science Support Partnership Project for U.S. Geological Survey and U.S. Fish and Wildlife Service. Cooperative Agreement No. G15AC00133
32. Noson, A. and A.D. Flesch. 2015. Trends in riparian bird populations and habitat conditions along the Madison and Missouri Rivers from 2004-2015. Report to Northwestern Energy Wildlife Committee. University of Montana Bird Ecology Lab, Missoula, MT.
33. Flesch, A.D. 2014. Distribution, abundance, habitat, and biogeography of breeding birds in the Sky Islands and adjacent Sierra Madre Occidental of northwest Mexico. Final report to U.S. National Park Service and U.S. Fish and Wildlife Service, CESU Agreement P08AC00077/J1212080048; FWS Cooperative Agreement F12AP00566. School of Natural Resources and the Environment, University of Arizona, Tucson, AZ, and Division of Biological Sciences, University of Montana, Missoula, MT. DOI: 10.13140/2.1.4938.5765
34. Flesch, A.D., R.L. Hutto, C.G. Morris, T. Hare, and S. Avila. 2014. Restoration of priority habitats for Neotropical migratory birds in the Madrean Sky Islands region, northwest Mexico. Final report to U.S. Fish and Wildlife Service, Neotropical Migratory Bird Conservation Act grant 5139. Division of Biological Sciences, University of Montana, Missoula, MT, and Sky Island Alliance, Tucson, AZ.
35. Flesch, A.D. and S.L. Jacobs. 2013. Bird surveys and habitat assessments along the Aros-Yaqui river corridor on and around the Northern Jaguar Reserve. Report to Northern Jaguar Project and Naturalia A.C.
36. Flesch, A.D. 2010. Population trends of ferruginous pygmy-owls in northern Sonora, Mexico and implications for Organ Pipe Cactus National Monument. Report to Organ Pipe Cactus National Monument.
37. Flesch, A.D. 2010. Avian communities of the Northern Jaguar Reserve east-central Sonora, Mexico. Report to Northern Jaguar Project and Naturalia A.C.
38. Flesch, A.D. 2009. Landbird monitoring in the Sonoran Desert Network: Status report 2008. Natural Resource Technical Report NPS /NRTR-2009. National Park Service, Fort Collins, CO.
39. Flesch, A.D. 2009. Breeding, migratory, and wintering birds of the Northern Jaguar Reserve east-central Sonora, Mexico. Report to Northern Jaguar Project and Naturalia A.C.
40. Flesch, A.D. 2008. Distribution and status of birds of conservation interest and identification of important bird areas in Sonora Mexico. U.S. Fish and Wildlife Service, Sonoran Joint Venture, Tucson, AZ. Cooperative Agreement No. 201816J827.
41. Flesch, A.D. 2008. Population and community dynamics of lizards and rodents in Organ Pipe Cactus National Monument 1989-2006 and implications for future monitoring. Report to Organ Pipe Cactus National Monument and Desert Southwest Cooperative Ecosystems Studies Unit, NPS Cooperative Agreement No. H1200050003.
42. Flesch, A.D. 2008. Population and demographic trends of ferruginous pygmy-owls in northern Sonora Mexico 2000-2008. Progress report to program sponsors.
43. Flesch, A.D. 2008. Migratory and resident birds of the Northern Jaguar Reserve of east-central Sonora, Mexico. Report to Northern Jaguar Project and Naturalia A.C.
44. Flesch, A.D. 2008. Status and population size of breeding grassland birds on Rancho Los Fresnos, northern Sonora, Mexico. Report to Biodiversidad y Desarrollo Armónica A.C.
45. Flesch, A.D. 2008. Population and demographic trends of ferruginous pygmy-owls in northern Sonora Mexico 2000-2007 and implications for recovery in Arizona. Progress report to program sponsors.

46. Flesch, A.D. and R.J. Steidl. 2007. Association between roadways and cactus ferruginous pygmy-owls in northern Sonora Mexico. Report to Arizona Department of Transportation, A.G. Contract No. KR02-1957TRN, JPA 02-156.
47. Powell, B.F., L. Woods, and A.D. Flesch. 2007. Draft effectiveness monitoring plan for Pima County: Phase I. Report to Pima County by Recon Environmental Inc., RECON No. 4115B/3272B.
48. Flesch, A.D. 2007. Population and demographic trends of ferruginous pygmy-owls in northern Sonora Mexico and implications for recovery in Arizona. Report to Defenders of Wildlife, Tucson Audubon Society, Rincon Chapter of the Sierra Club, and Center for Biological Diversity.
49. Powell, B.F., A.D. Flesch, D. Angell, K. Beaupre, and W.L. Halvorson. 2007. Landbird monitoring protocol for the Sonoran Desert Network. Version 1.02. Natural Resource Report NPS/SODN/NRTR-2007/00X. National Park Service, Fort Collins, CO.
50. O'Brien, C, A.D. Flesch, E. Wallace, M. Bogan, S.E. Carrillo-Percástegui, S. Jacobs, and C. van Riper III. 2006. Biological Inventory of the Rio Aros, Sonora, Mexico. School of Natural Resources and U.S. Geological Survey, Southwest Biological Science Center, Sonoran Desert Research Station.
51. Flesch, A. D, D. E. Swann, and B. F. Powell. 2006. Chapter 4: Amphibian and reptile inventory. Pages 26-42 in B. F. Powell, W. L. Halvorson, and C. A. Schmidt, editors. Vascular plant and vertebrate inventory of Saguaro National Park, Rincon Mountain District, Open File Report 2006-1075. U.S. Geological Survey, Southwest Biological Science Center, Sonoran Desert Research Station, University of Arizona, Tucson, AZ.
52. Flesch, A.D. and R.J. Steidl. 2006. Population trends of ferruginous pygmy-owls in northern Mexico and implications for Tumacácori and other Arizona National Park Units. Report to Desert Southwest Cooperative Ecosystems Studies Unit and Tumacácori National Historic Park.
53. Flesch, A.D. and R.J. Steidl. 2005. Trends and productivity of cactus ferruginous pygmy-owls in northern Sonora, Mexico: Implications for Organ Pipe Cactus National Monument. Report to Desert Southwest Cooperative Ecosystems Studies Unit, Intermountain Region International Conservation Programs Office, and Organ Pipe Cactus National Monument.
54. Flesch, A.D. and R.J. Steidl. 2002. Nest-site selection by cactus ferruginous pygmy-owls in northern Sonora Mexico. Report to U.S. Fish and Wildlife Service, Sonoran Joint Venture, Tucson, AZ. Cooperative Agreement No.1448-20181-01-J862.
55. Flesch, A.D. and R.J. Steidl. 2001. Cactus ferruginous pygmy-owl and nongame bird surveys on the Cabeza Prieta National Wildlife Refuge, 2001. Report to U.S. Fish and Wildlife Service Cabeza Prieta National Wildlife Refuge, Ajo, AZ. Cooperative Agreement No. 1448-20181-00-G918.
56. Flesch, A.D. 1999. Cactus ferruginous pygmy-owl surveys and nest monitoring on and around the Buenos Aires National Wildlife Refuge, Altar Valley, Arizona. Report to U.S. Fish and Wildlife Service, Buenos Aires National Wildlife Refuge, Sasabe, AZ. Cooperative Agreement No. 1448-00002-99-G943.
57. Flesch, A.D. 1999. Grassland bird community monitoring on the Buenos Aires National Wildlife Refuge 1998. Report to U.S. Fish and Wildlife Service, Buenos Aires National Wildlife Refuge, Sasabe, AZ.
58. Flesch, A.D. 1998. Avian community monitoring along Arivaca Creek, Buenos Aires National Wildlife Refuge, 1998. Report to U.S. Fish and Wildlife Service, Buenos Aires National Wildlife Refuge, Sasabe, AZ. Reference No. R2-8-0854, Order No. 201818M147.
59. Flesch, A.D. 1998. Cactus ferruginous pygmy-owl surveys on the San Bernardino National Wildlife Refuge 1998. Report to U.S. Fish and Wildlife Service, San Bernardino National Wildlife Refuge, Douglas, AZ.
60. Flesch, A.D. 1997. Distribution and abundance of grassland birds on the Buenos Aires National Wildlife Refuge: A monitoring program. Report to U.S. Fish and Wildlife Service, Buenos Aires National Wildlife Refuge, Sasabe, AZ.

TEACHING EXPERIENCE

Classes Taught:

- Ornithology Lab – Biology 470. Two sections; Spring 2009, 2011, & 2013, University of Montana.
- Ecology Lab – Biology 341. Fall 2009 & 2010, University of Montana.
- Rocky Mountain Flora Lab – Biology 350. Fall 2008, University of Montana.

Invited Lectures:

- Flesch, A.D. 2018. Cavity-nesting bird research in Reserva Monte Mojino: Methods and Design. Instructional lecture for Nature and Culture International staff and collaborators, Alamos, Mexico (in Spanish).
- Flesch, A.D. 2017. Influence of U.S.-Mexico border development on wildlife: A framework and case study. Guest Lecture for University of Arizona graduate class: Natural and Human Impacts on Aridlands, Tucson, AZ.
- Flesch, A.D. 2017. Potential effects of U.S.-Mexico border development on wildlife. Invited lecture for Sierra Club - Grand Canyon Chapter - Wildlife Activist Group, The Historic Y, Tucson, AZ.
- Flesch, A.D. and S.L. Jacobs. 2016. Ecology, bird communities, and river adventures on the Northern Jaguar Reserve, Sonora, Mexico. REI Lecture Series, Tucson, AZ.
- Flesch, A.D. 2016. Population dynamics and effects of climatic variation on lizards over 25 years in a Sonoran Desert transition zone. Guest Lecture for Prescott College undergraduate class: Wildlife Management, Brown Canyon Environmental Education Center.
- Flesch, A.D. 2015. Applications of the Madrean Archipelago Biodiversity Assessment database. Invited Lecture for the Friends of the Madrean Archipelago, The Desert Laboratory, Tucson, AZ.
- Flesch, A.D. 2011. Habitat selection and the theory of animal distribution. Guest lecturer for Wildlife Habitat Modeling, Wildlife Biology Program, University of Montana, Missoula, MT.
- Flesch, A.D. 2010. Distance sampling: concept and application. Guest lecturer and computer lab in Field Techniques for Avian Biology, Division of Biological Sciences, University of Montana, Missoula, MT.
- Flesch, A.D. 2008. Linking monitoring and management: concept and application for wildlife. Guest lecturer in undergraduate class: Wildlife Management, Prescott College, Prescott, AZ.
- Flesch, A.D. 2008. Physiography, vegetation, and avifauna of Sonora, Mexico. Guest lecturer in Human Dimensions of Natural Resource Conservation, School of Natural Resources, University of Arizona, Tucson, AZ.

Invited Seminars:

- Flesch, A.D. 2016. Ecology and habitat of small owls on Tumamoc Hill and beyond. Science Café, The Desert Laboratory Tumamoc Hill, University of Arizona, Tucson, AZ.
- Flesch, A.D., P.C. Rosen, and P. Holm. 2015. Population and community dynamics of lizards over 25 years in a Sonoran Desert transition zone. Science Café, The Desert Laboratory Tumamoc Hill, University of Arizona, Tucson, AZ.
- Flesch, A.D. 2015. Madrean Archipelago Biodiversity Assessment Database: Potential applications and recent accomplishments. Presentation to researchers, NGOs, and public agencies, The Desert Laboratory -Tumamoc Hill, University of Arizona, Tucson, AZ.
- Flesch, A.D. 2013. Ecology and conservation of Ferruginous Pygmy-Owls in the Sonoran Desert. Presentaion to Five Valleys Audubon Society, University of Montana, Missoula, MT.
- Flesch, A.D. 2013. Local vs. landscape drivers of animal distribution patterns. Organismal Biology and Ecology Program Seminar Series, Division of Biological Sciences, University of Montana, Missoula, MT.

- Flesch, A.D. 2011. Spatial, temporal, and density-dependent drivers of habitat quality. Organismal Biology and Ecology Program Seminar Series, Division of Biological Sciences, University of Montana, Missoula, MT.
- Flesch, A.D. 2010. Local vs. landscape drivers of animal distribution patterns. Organismal Biology and Ecology Program Seminar Series, Division of Biological Sciences, University of Montana, Missoula, MT.
- Flesch, A.D. 2010. Population and community dynamics of lizards and rodents in Organ Pipe Cactus National Monument 1989-2006 and implications for monitoring. U.S. National Park Service and U.S. Geological Survey, Tucson, AZ.
- Flesch, A.D. 2010. Status, natural history, and recovery of ferruginous pygmy-owls in the Sonoran Desert. Living with Nature Lecture Series, Tucson Audubon Society, Tucson, AZ.
- Flesch, A.D. 2007. Concept and application for monitoring and managing landbirds in the San Pedro River Valley of Sonora Mexico. Presentation to Biodiversidad y Desarrollo Armónica and Comisión Nacional de Áreas Naturales Protegidas, Rancho Los Fresnos, Sonora, Mexico.
- Flesch, A.D. 2007. Identification and habitat of birds in the San Pedro River Valley in Sonora Mexico. Presentation to Biodiversidad y Desarrollo Armónica and Comisión Nacional de Áreas Naturales Protegidas, Rancho Los Fresnos, Sonora, Mexico. (in Spanish).
- Flesch, A.D., and B.F. Powell. 2006. Potential monitoring parameters for the Pima County Ecological Monitoring Program: Assumptions and survey design. Presentation to vertebrate experts assembled by Pima County, Tucson, AZ.
- Flesch, A.D., and B.F. Powell. 2006. Adaptive management: concept and application. Presentation to natural resource managers assembled by Pima County, Tucson, AZ.
- Flesch, A.D. 2006. Patterns and consequences of nest-site selection by ferruginous pygmy-owls and application to management using nest boxes. Presentation to USFWS Ecological Services Field Office, Buenos Aires National Wildlife Refuge, and Arizona Game and Fish Department, Sasabe, AZ.
- Flesch, A.D., C. O'Brien, and J.E. Wallace. 2006. A river unknown: flora and fauna of the Rio Aros Valley. Presentation to the Arizona Native Plant Society, Tucson, AZ.
- Flesch, A.D. 2003. Distribution, habitat, and management of cactus ferruginous pygmy-owls in the Altar Valley and beyond. Presentation to Altar Valley Conservation Alliance and USFWS, Robles Junction, AZ.

CONFERENCE PAPERS

- Flesch, A.D. 2018. Interactive effects of climate, landcover, and habitat quality on ferruginous pygmy-owl populations in the U.S and Mexico. American Ornithological Society Annual Meeting, Tucson, AZ. (invited).
- Flesch, A.D. 2018. Patterns and drivers of long-term changes in breeding bird communities in the Madrean Sky Islands and Sierra Madre, Mexico. Biodiversity and Management of the Madrean Archipelago IV Tucson, AZ.
- J. Gicklhorn, Flesch, A.D., B. Powell, and I. Murray. 2018. Efficacy of distance sampling to estimate and monitor populations of the endangered Pima pineapple cactus. Biodiversity and Management of the Madrean Archipelago IV Tucson, AZ.
- Flesch, A.D., J. Gicklhorn, B. Powell, and I. Murray. 2018. Utilizing distance sampling to monitor and estimate population density of a cryptic species. Colorado River Terrestrial and Riparian Meeting, Laughlin, NV.
- Flesch, A.D., and J. Boone. 2018. Factors influencing detection probability of Elf Owls and implications for survey design. Colorado River Terrestrial and Riparian Meeting, Laughlin, NV.

- Boone, J., Flesch, A.D., and D. Vander Pluym. 2017. Distribution and habitat of Elf Owls in riparian environments in Arizona. Arizona Field Ornithologists, Annual Meeting, Cottonwood, AZ.
- Boone, J., Flesch, A.D., and D. Vander Pluym. 2017. Distribution and habitat of Elf Owls in lowland riparian and adjacent upland environments of southern and western Arizona. Colorado River Terrestrial and Riparian Meeting, Laughlin, NV.
- Flesch, A.D., P.C. Rosen, and P. Holm. 2016. Impacts of climatic variation on population dynamics of lizards over 25 years in a Sonoran Desert transition zone. Tri-national Sonoran Desert Symposium, Ajo, AZ.
- Flesch, A.D., R.L. Hutto, L. Misztal, and C. González Sánchez. 2012. Patterns and drivers of bird species distribution in the Madrean Sky Islands of Sonora, Mexico. Biodiversity and management of the Madrean Archipelago III. Tucson, AZ.
- Warshall, P., and A.D. Flesch. 2012. Lessons learned concerning management and conservation of birds on the Northern Jaguar Reserve. Biodiversity and management of the Madrean Archipelago III. Tucson, AZ.
- Ferguson, G.M., T.R. Van Devender, and A.D. Flesch. 2012. Biogeography and diversity of pines in the Madrean Archipelago. Biodiversity and management of the Madrean Archipelago III. Tucson, AZ.
- Van Devender, T.R., S. Avila Villegas, M. Emerson, D. Turner, A.D. Flesch, N.S. Deyo. 2012. Biodiversity in the Madrean Archipelago of Sonora, Mexico. Biodiversity and management of the Madrean Archipelago III. Tucson, AZ. (invited plenary)
- Langner, H., E. Greene, and A.D. Flesch. 2011. Mercury and selenium in a mining-affected watershed of the Rocky Mountain northwest. American Geophysical Union annual conference, San Francisco, CA. (poster)
- Flesch, A.D., and M. Clark. 2009. Potential effects of the U.S-Mexico border fence on ferruginous pygmy-owls and implications for other species. Carnivores 2009: Carnivore conservation in a changing world, Defenders of Wildlife national conference, Denver, CO. (invited)
- Hinojosa-Huerta, O., J.F. Villaseñor-Gómez, D. Krueper, E. Gómez-Limón, and A.D. Flesch. 2008. The birds of Sonora, Mexico: a review and update. Western Field Ornithologists annual meeting, San Mateo, CA.
- Flesch, A.D., and R.J. Steidl. 2007. Population and demographic trends of ferruginous pygmy-owls in northern Mexico and implications for recovery in Arizona. The Wildlife Society annual meeting, Tucson, AZ.
- Flesch, A.D. 2006. Distribution and abundance of birds of conservation interest in the borderlands of Sonora Mexico. Fourth North American Ornithological Conference, Borderlands Symposium, Veracruz, Mexico.
- Flesch, A.D., and R.J. Steidl. 2005. Nest selection by cactus ferruginous pygmy-owls in Sonora, Mexico and implications for management and recovery. Arizona-New Mexico Chapter of The Wildlife Society annual meeting, Gallup, NM.
- Flesch, A.D., and L.E. Hahn. 2004. Distribution of birds and plants and the western and southern edges of the Madrean Sky Island region in Sonora, Mexico. Biodiversity and management of the Madrean Archipelago II, Tucson, AZ.
- Flesch, A.D., and R.J. Steidl. 2002. Distribution, abundance, and habitat of cactus ferruginous pygmy-owls in Sonora, Mexico. The Wildlife Society annual meeting, Bismarck, ND.
- Flesch, A.D., R.J. Steidl, E. Lopez Saavedra, and G. Valencia Ortega. 2002. Distribution and relative abundance of cactus ferruginous pygmy-owls in Sonora, Mexico. Arizona-New Mexico Chapter of The Wildlife Society annual meeting, Safford, AZ. (best student paper).

GRANTS & AWARDS

- Status, distribution, habitat, and stressors of the Sonoran talussnail, 2018-2021. Arizona Game and Fish Department, Heritage Fund Grant Program, \$56,305 (with H.W. Herrmann and Pima County).
- Riparian bird community and habitat monitoring on the Madison and Missouri rivers, Montana, 2017-2018. University of Montana, \$9,500.
- Aros/Yaqui rivers habitat conservation Phase V, 2017-2019. U.S. Fish and Wildlife Service, Division of Bird Habitat Conservation, \$99,950 (with Northern Jaguar Project).
- Abundance and habitat of vulnerable cavity-nesting birds in Reserva Monte Mojino in southeastern Sonora, Mexico, 2017-2018. U.S. Fish and Wildlife Service, Sonoran Joint Venture, \$12,655 (with Nature and Culture International).
- Cactus ferruginous pygmy-owl monitoring and habitat on Pima County conservation lands, 2016-2018. Pima County Office of Sustainability and Conservation, \$26,852
- Restoration of priority habitats for Neotropical migratory birds in the Madrean Sky Islands of northwest Mexico II, 2016-2018. U.S. Fish and Wildlife Service, Division of Bird Habitat Conservation, \$169,131 (with Borderlands Restoration).
- Elf owl home range, habitat use, and detectability study, 2016-2018, supplemental. U.S. Bureau of Reclamation - Lower Colorado River Multi-species Conservation Program, \$107,749 (with Great Basin Bird Observatory).
- Ecology and monitoring of ferruginous pygmy-owls in northern Sonora, 2016. BBC – British Broadcasting Corporation, \$6,400 (with S. Jacobs and R. Villa).
- Review of statistical procedures for ecological monitoring program, 2015-2018. U.S. National Park Service, Organ Pipe Cactus National Monument, \$20,000.
- Application of distance sampling for Pima Pineapple Cactus population enumeration and monitoring, 2015-2017. ESA Section 6 Research for Threatened and Endangered AZ Plants, \$17,009 (with Pima County).
- Riparian bird community and habitat monitoring on the Madison and Missouri rivers, Montana, 2015-2016. Northwest Energy, Bureau of Land Management, and University of Montana, \$78,161 (with A. Noson).
- Population trends, extinction risk, and conservation guidelines for ferruginous pygmy-owls in the Sonoran Desert, 2015-2017. Science Support Partnership Program - U.S. Geological Survey and U.S. Fish and Wildlife Service, \$24,981 (with P. Nagler and S. Richardson).
- Elf owl home range, habitat use, and detectability study, 2014-2018. U.S. Bureau of Reclamation - Lower Colorado River Multi-species Conservation Program, \$601,551 (with Great Basin Bird Observatory).
- Extinction risk and conservation guidelines for endangered pygmy-owls in the Sonoran Desert, 2014-2015. Shared Earth Foundation, \$6,902.
- Plant species response to climate change in the Sonoran Desert, 2014-2015. U.S. National Park Service, Organ Pipe Cactus National Monument, \$60,000 (with P. Rosen and E. Larios).
- Analysis of ecological monitoring data from Sonoran Desert Parks, 2013-2015. U.S. National Park Service Intermountain Region, Mexican-American Border Conservation Office, \$65,000 (with P. Rosen).
- Ecology of small desert owls in the Sonoran Desert, 2013. NHK – Japan Public Broadcasting Corporation, \$13,771 (with S. Jacobs).
- Population trends of ferruginous pygmy-owls in northern Sonora, Mexico 2013. Defenders of Wildlife, \$650.

- Distribution, abundance, and habitat of Madrean breeding birds in the northern Sierra Madre Occidental and adjacent Sky Islands, 2012-2013. U.S. Fish and Wildlife Service, Southwest Region Migratory Bird Office and Sonoran Joint Venture, \$31,640.
- Restoration of priority habitats for Neotropical migratory birds in the Madrean Sky Islands region, 2011-2014. U.S. Fish and Wildlife Service, Division of Bird Habitat Conservation, \$189,810 (with R.L. Hutto and Sky Island Alliance).
- Status and seasonal variation in bird distribution and abundance in thornscrub and riparian environments of east-central Sonora, 2011-2013. Northern Jaguar Project and U.S. Fish and Wildlife Service, Division of Bird Habitat Conservation, \$18,820.
- Bertha Morton Graduate Fellowship, 2011-2012. University of Montana, Graduate College, \$5,000.
- Besancon Graduate Fellowship for Science, Technology, Engineering, and Mathematics, 2011-2012. University of Montana, Graduate College, \$20,000.
- Clancy Gordon Environmental Scholarship, 2010-2011. University of Montana, Graduate College, \$2,300.
- Migratory and resident birds of the Northern Jaguar Reserve of Sonora Mexico, 2011. Northern Jaguar Project and U.S. Fish and Wildlife Service, Division of Bird Habitat Conservation, \$12,875.
- Habitat quality and status of ferruginous pygmy-owls in northern Sonora Mexico. 2009-2012. Tucson Audubon Society and Defenders of Wildlife, \$13,000.
- Migratory and resident birds of the Northern Jaguar Reserve of Sonora Mexico. 2009-2010. Northern Jaguar Project and U.S. Fish and Wildlife Service, Division of Bird Habitat Conservation, \$14,450.
- Bertha Morton Graduate Scholarship. 2009-2010. University of Montana, Graduate College, \$2,000.
- Status, distribution, and biogeography of birds in the Sky Islands of northern Sonora Mexico. 2009-2012. Sky Island Alliance and Veolia Environment Foundation, \$15,500.
- Population trends of ferruginous pygmy-owls in northern Sonora Mexico. 2009. Center for Biological Diversity and Global Owl Project, \$2,000.
- Status, distribution, and biogeography of birds in the Sky Islands of northern Sonora Mexico. 2008-2013. Rocky Mountain and Desert Southwest Cooperative Ecosystem Studies Units and Intermountain Region International Conservation Programs Office, National Park Service, \$102,890 (with R. L. Hutto).
- Population and demographic trends of ferruginous pygmy-owls in northern Sonora, Mexico and implications for Organ Pipe Cactus National Monument. 2008-2009. Desert Southwest Cooperative Ecosystem Studies Unit and Organ Pipe Cactus National Monument, National Park Service, \$20,000.
- Migratory and resident birds of the Northern Jaguar Reserve of Sonora Mexico. 2008. Northern Jaguar Project and U.S. Fish and Wildlife Service, Division of Bird Habitat Conservation, \$11,200.
- Population trends of ferruginous pygmy-owls in northern Sonora Mexico. 2008. Global Owl Project, Arizona Zoological Society, and Rincon Chapter of the Sierra Club, \$5,250.
- Implementation of bird monitoring for the Sonoran Desert Network of National Parks. 2008. National Park Service Inventory and Monitoring Program - Sonoran Desert Network, \$34,566.
- Population trends of rodents and lizards at Organ Pipe Cactus NM 1989-2006 and implications for future efforts. 2008. National Park Service Inventory and Monitoring Program - Sonoran Desert Network and Organ Pipe Cactus National Monument, \$11,600.

- Analysis of monitoring data for rodents and lizards at Organ Pipe National Monument and implications for future efforts. 2007. Desert Southwest Cooperative Ecosystem Studies Unit, National Park Service, \$14,800 (with B.F. Powell and R.J. Steidl).
- Implications of transboundary development on movements and conservation of wildlife in the United States-Mexico borderlands. 2007. Defenders of Wildlife, \$4,000.
- Status and population size of breeding grassland birds on Rancho Los Fresnos in the Upper San Pedro River Valley. 2007. Biodiversidad y Desarrollo Armónica, \$2,275.
- Migratory and resident birds of the Northern Jaguar Reserve of Sonora Mexico. 2007. Northern Jaguar Project and U.S. Fish and Wildlife Service, Division of Bird Habitat Conservation, \$4,385.
- Workshop on monitoring and identification of birds in the San Pedro River Valley and Rancho Los Fresnos in Sonora Mexico. 2007. Biodiversidad y Desarrollo Armónica, \$500.
- Population and demographic trends of ferruginous pygmy-owls in northern Sonora Mexico and implications for recovery in Arizona. 2006. Defenders of Wildlife, T&E, Inc., and Center for Biological Diversity, \$8,500.
- Distribution and abundance of birds of conservation interest and identification of important bird areas in Sonora Mexico. 2006-2008. U. S. Fish and Wildlife Service - Sonoran Joint Venture and T&E, Inc., \$9,250.
- Population and demographic trends of ferruginous pygmy-owls in northern Sonora Mexico and implications for recovery in Arizona. 2006. Defenders of Wildlife, Tucson Audubon Society, Rincon Chapter of the Sierra Club, and Center for Biological Diversity, \$10,000.
- Population trends of ferruginous pygmy-owls in northern Mexico and implications for management in Tumacácori National Historical Park and other Arizona National Park Units. 2005. Desert Southwest Cooperative Ecosystem Studies Unit, National Park Service, \$7,250 (with R.J. Steidl).
- Population and productivity trends of cactus ferruginous pygmy-owls in northern Sonora Mexico. 2005. T&E, Inc., \$2,500 (with R.J. Steidl).
- Trends and productivity of cactus ferruginous pygmy-owls in northern Sonora, Mexico: implications for Organ Pipe Cactus National Monument. 2004. Desert Southwest Cooperative Ecosystem Studies Unit and Intermountain Region International Conservation Programs Office, National Park Service, \$10,000 (with R.J. Steidl).
- Population trends of cactus ferruginous pygmy-owls in northern Sonora Mexico and implications for recovery in Arizona. 2004. T&E, Inc., \$2,500 (with R.J. Steidl).
- Association between roadways and cactus ferruginous pygmy-owls in northern Sonora, Mexico. 2002-2005. Arizona Department of Transportation, \$279,271 (with R.J. Steidl).
- Nesting habitat of cactus ferruginous pygmy-owls in the Sonoran Desert. 2001. U.S. Fish and Wildlife Service, Sonoran Joint Venture, \$7,500 (with R.J. Steidl).
- Nesting habitat and surveys for cactus ferruginous pygmy-owls in the Sonoran Desert. 2001. U.S. Fish and Wildlife Service, \$8,000 (with R.J. Steidl).
- Survey of breeding and migratory birds on Cabeza Prieta National Wildlife Refuge. 2000. U.S. Fish and Wildlife Service, \$8,000 (with R.J. Steidl).
- Distribution, relative abundance, and habitat of cactus ferruginous pygmy-owls in Sonora, Mexico. 2000. U.S. Fish and Wildlife Service, \$141,302.

- Grassland bird monitoring on the Buenos Aires National Wildlife Refuge. 1999. U.S. Fish and Wildlife Service, Buenos Aires NWR, \$1,885.
- Gray hawk surveys and nest monitoring and yellow-billed cuckoo surveys in the Altar Valley. 1999. U.S. Fish and Wildlife Service, Buenos Aires NWR, \$2,960.
- Surveys, nest searching and monitoring, and habitat use of cactus ferruginous pygmy-owls in the Altar Valley. 1999. U.S. Fish and Wildlife Service, Region II and Buenos Aires NWR, \$25,114.
- Cactus ferruginous pygmy-owl surveys on the San Bernardino National Wildlife Refuge. 1998. U.S. Fish and Wildlife Service, San Bernardino NWR, \$500.
- Arivaca Creek and Arivaca Cienega avian monitoring program for the Buenos Aires National Wildlife Refuge. 1998. U.S. Fish and Wildlife Service, Buenos Aires NWR, \$3,945.
- Grassland bird monitoring on the Buenos Aires National Wildlife Refuge. 1998. U.S. Fish and Wildlife Service, Buenos Aires NWR, \$2,870.
- Distribution and abundance of grassland birds on the Buenos Aires National Wildlife Refuge: A monitoring program. 1997. U.S. Fish and Wildlife Service, Buenos Aires NWR, \$2,267.
- Vegetation communities of the Theodore Roosevelt Memorial Bird Sanctuary: a quantitative description. 1996. National Audubon Society, \$976.
- Marlin Perkins Scholarship. 1995. Mutual of Omaha Wildlife Heritage Center, \$1,000.

SERVICE (sample)

- Reviewer for: *Global Change Biology, Ecology, Conservation Biology, Journal of Animal Ecology, Scientific Reports, Biological Conservation, Ecosphere, Plant Ecology, Biological Journal of the Linnean Society, Ecology and Evolution, Basic and Applied Ecology, PLoS ONE, Journal of Mammalogy, Environmental Management, Journal of Wildlife Management, Journal of Field Ornithology, Journal of Raptor Research, Wilson Journal of Ornithology, Southwestern Naturalist, Ornithologia Neotropical, Bird Study.*
- Session Organizer and Moderator – Ecological and environmental change, Madrean Conference, 2018.
- Session Organizer and Moderator – Incentives for conservation on private lands, Madrean Conference, 2018.
- Board of Directors, and Science Chair – 2014-current. Northern Jaguar Project, Tucson, Arizona.
- Science Advisory Network and Madrean Archipelago Science Team – Sky Island Alliance.
- Facilitated two documentaries on Sonoran Desert wildlife for Japan Public Broadcasting Corporation and one for the British Broadcasting Corporation
- Prescott College 2020 Strategic Planning Committee – Curricula Subcommittee
- Sonoran Desert Conservation Plan, contributor.
- Comisión Nacional de Áreas Naturales Protegidas, Ajos-Bavispe Reserve, volunteer.
- Interpretive naturalist and field trip leader for Tucson Audubon Society 1997-2001.
- Border Ecological Symposium, invited participant, Wildlands Project and Defenders of Wildlife.

MEDIA COVERAGE (sample)

- High Country News: The desert divided. Maya Kapoor, March 19, 2018.
- Zocalo: Border wall will stop wildlife migration but do little otherwise. Craig Baker, 2018 (Vol. 93:7-9)
- BioScience: Border walls and biodiversity. Lesley Evans Ogden 2017 (Vol 67:498)
- KNAU: Scientists struggle to study border wall's effects on wildlife. Melissa Sevigny, 2017
- Scientific American: Trump's wall may threaten thousands of species. Cally Carswell, 2017
- Popular Science: A border wall of solar panels is not good for the environment. Kendra Pierre-Louis, 2017
- Texas Tribune: Scientists say Trump's border wall will stop animals but not people. Kiah Collier 2017
- Agence France-Presse: Trump wall threatens animals without borders. Yemeli Ortega, 2017

- Nature: Trump's border-wall pledge threatens delicate desert ecosystems. Brian Owens, 2016 (Vol. 536:260)
- Last Week Tonight with John Oliver: Contributed to program about border wall and wildlife, 2016
- Slate Magazine: Trump's Wall? Also terrible for conservation and scientific collaboration, M. Soniak, 2016
- Congressional Quarterly: Border wall blues: Barriers lead to environmental problems, S. Zeller, 2016
- Outside Magazine: Donald Trump environmental scorecard, C. Solomon, 2016
- Arizona Illustrated (Episode 119). US-Mexico border development and wildlife, Tony Paniagua, 2015
- Churea. In search of the Pygmy-Owl, Carlos Gonzalez. July-August 2014.
- Vermilion Flycatcher. Ferruginous pygmy-owl & climate adaptation, Matt Clark and Chris McVie. 59(4), 2014
- The All-Bird Bulletin. Aros/Yaqui Habitat Conservation, Megan Southern. Spring 2014
- Sonorensis Magazine. Into the Mexican Sky Islands, by Sky Jacobs. Winter 2013
- Terra Magazine. Rivers in rough country, by Sky Jacobs. 2012
- University of Arizona News. Border fence blocks wildlife movement, by Alan Fischer. June 2010.
- American Scientist. Science observer - don't fence me out, by Anna Lena Phillips. November-December 2009.
- The Wildlife Professional. Science in short – border fence impacts, by The Wildlife Society. Fall 2009.
- Birding Magazine. News and notes - birds of northern Sonora, by Paul Hess. July 2009.
- Discovery News. U.S.-Mexico border fence may snag wildlife, by Jessica Marshall. July 2009.
- Los Angeles Times. U.S.-Mexico border fence isolates wildlife, by Amy Littlefield. July 2009.
- Science Daily. U.S.-Mexico border wall could threaten wildlife species. July 2009.
- Audubon Magazine. The borderlands - border jumpers, by Judy Leibach September - October 2007.