# Benjamin H. Becker

Science Advisor | Marine Ecologist | Research Coordinator Californian Cooperative Ecosystem Studies Unit, National Park Service - UC Berkeley

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#### **Positions**

### U.S. National Park Service - Pacific West Region

Science Advisor, Californian Cooperative Ecosystems Studies Unit

Visiting Scholar, UC Berkeley Dept. of Env. Science, Policy and Management

U.S. National Park Service - Point Reyes National Seashore

Natural and Cultural Resources Lead

Science Division Lead

Director and Marine Ecologist, Pacific Coast Science and Learning Center

2021-Present

#### Education

Ph.D. Environmental Science, Policy and Management, University of California, Berkeley 2001
M.F.S. Conservation Biology, Yale School of the Environment
B.A. Geography, B.A. Environmental Studies, University of California, Los Angeles
1994

#### **Publications**

### Peer-Reviewed Research Papers (Students in bold italics) h-index 14

Parsons, LS, S.R. Fuqua, M. K. Spaeth, B.H. **Becker**. In Revision. *Lingering legacy effects of plant invader and removal approach complicate coastal dune ecosystem restoration efforts*. **Restoration Ecology.** 

Cormier, R., B.H. **Becker**, et al. In Revision. Northern Spotted Owl occupancy in the southern end of the range: 2000 – 2019. (co-first authors). **J. Wildlife Management**.

Felis, J., J. Adams, B.H. **Becker**. 2023. Status, trend, and monitoring effectiveness of Marbled Murrelet (Brachyramphus marmoratus) at-sea abundance and reproductive output off central California, 1999–2021. USGS Open File Report.

Seher, V.L., B.A. Holzman, E. Hines, P. Warzybok, R. W. Bradley & B.H. Becker. 2022. Ocean-influenced estuarine habitat buffers high interannual variation in seabird reproductive success. Marine Ecology Progress Series 689:155-167. https://doi.org/10.3354/meps14028

- Lau, M.J., B.H. **Becker**, and D.T. Press. 2021. Common raven density negatively impacts snowy plover nest and fledge success. **Human-Wildlife Interactions** 15(3):1-13.
- Parsons, L.S. and B.H. **Becker**. 2021. *Invasion by* Ammophila arenaria *alters soil chemistry*, leaving lasting legacy effects on restored coastal dunes in California. **Invasive Plant Science and Management** 14: 75 91. DOI: https://doi.org/10.1017/inp.2021.16
- Miner, C.M., J.L. Burnaford, K. Ammann, B.H. **Becker**, S.C. Fradkin, S. Ostermann-Kelm, J.R. Smith, S.G. Whitaker, and P.T. Raimondi. 2021. *Latitudinal variation in long-term stability of North American rocky intertidal communities*. **Journal of Animal Ecology** 90:2077–2093. https://doi.org/10.1111/1365-2656.13504
- Voeller, D., Ketcham, B., and B.H. **Becker**. 2021. *Improved microbial water quality associated with best management practices on coastal dairies and livestock grazing operations*. **Rangeland Ecology and Management** 76:139-149. https://doi.org/10.1016/j.rama.2021.02.011
- Hughes B.B., Wasson K., Tinker M.T., Williams S.L., Carswell L.P., Boyer K.E., Beck M.W., Eby R., Scoles R., Staedler M., Espinosa S., Hessing-Lewis M., Rechsteiner E.U., Beheshti K., Grimes T.M., **Becker** B.H., Needles L., Tomoleoni J.A., Rudebusch J., Hines E., Silliman B.R. 2019. Species recovery and recolonization of past habitats: lessons for science and conservation from sea otters in estuaries. **PeerJ** 7:e8100 https://doi.org/10.7717/peerj.8100
- Manugian, S., D. Greig, D. Lee, B.H. Becker, S. Allen, M. Lowry, J.T. Harvey. 2017. Survival probabilities and movements of harbor seals in north-central California. Marine Mammal Science 33:154-171. https://doi.org/10.1111/mms.12350
- Becker, B.H., H.R. Carter, R.P. Henderson, A.M. Weinstein, and M.W. Parker. 2016. Status and Monitoring of Ashy Storm-Petrels Oceanodroma Homochroa at Point Reyes National Seashore, California, 2012-2015. Marine Ornithology 44: 63-70.
- **Becker**, B.H., C.M. *Moi*, T.J. Maguire, R. Atkinson, and N.B. Gates. 2012. *Effects of hikers, boats on tule elk behavior in a national park wilderness area*. **Human-Wildlife Interactions** 6:147-154. https://doi.org/10.26077/pve7-yb42
- Becker, B.H., D.T. Press, and S. G. Allen. 2011. Evidence for long-term spatial displacement of breeding and pupping harbour seals by shellfish aquaculture over three decades. Aquatic Conservation: Marine and Freshwater Ecosystems 21:247-260. https://doi.org/10.1002/aqc.1181
- Becker, B.H., D.T. Press and S.G. Allen. 2009. Modeling the impacts of El Niño, density-dependence, and disturbance on harbor seal counts in Drakes Estero, California: 1997 2007. Marine Mammal Science 25:1-18. https://doi.org/10.1111/j.1748-7692.2008.00234.x
- Peery, M.Z., L.A. Henkel, S.H. Newman, B.H. **Becker**, J.T. Harvey, C.W. Thompson, and S.R. Beissinger. 2008. *Effects of rapid flight-feather molt on postbreeding dispersal in a pursuit-diving seabird*. **Auk** 125:113-123. https://doi.org/10.1525/auk.2008.125.1.113
- Anderson, S.D., B.H. **Becker**, and S.G. Allen. 2008. Observations and Prey of White Sharks, Carcharodon carcharias, at Point Reyes National Seashore: 1982 2004. California Fish and Game 94:33-43.
- Becker, B.H., S.H. Newman, S. Inglis, and S.R. Beissinger. 2007. Diet-feather stable isotope (15N and 13C) fractionation in Common Murres and other seabirds. Condor 109:451-456. https://doi.org/10.1093/condor/109.2.451

- Peery, M.Z., B.H. **Becker**, and S.R. Beissinger. 2007. Age ratios as estimators of productivity: testing assumptions on an endangered seabird, the Marbled Murrelet. **Auk** 124:224-240. https://doi.org/10.1093/auk/124.1.224
- Becker, B.H., M.Z. Peery, and S.R. Beissinger. 2007. Ocean climate and prey availability affect the trophic level and reproductive success of the Marbled Murrelet, an endangered seabird. Marine Ecology Progress Series 329:267-279. https://doi.org/10.3354/meps329267
- Peery, M.Z., B.H. **Becker**, and S.R. Beissinger. 2006. Combining demographic and count-based approaches to identify source-sink dynamics: An example using an endangered seabird. **Ecological Applications** 16:1516-1528. https://doi.org/10.1890/1051-0761(2006)016%5B1516: CDACAT%5D2.0.CO;2
- Becker, B.H., and S.R. Beissinger. 2006. Centennial decline in the trophic level of an endangered seabird after fisheries decline. Conservation Biology 20:470-479. https://doi.org/10.1111/j. 1523-1739.2006.00379.x (Article featured in Science "Random Samples" (01/27/06) and Nature "Conservation at a Distance: Atomic Detectives" (08/03/06)).
- Peery, M.Z., S.R. Beissinger, S.H. Newman, B.H. **Becker**, E. Burkett, and T. Williams. 2004. *Inland flight behavior of Marbled Murrelets: implications for population monitoring.* **Condor** 106:344-353. https://doi.org/10.1093/condor/106.2.344
- **Becker**, B.H., and S.R. Beissinger. 2003. Scale-dependent habitat selection by a nearshore seabird, the Marbled Murrelet, in a highly dynamic upwelling system. Marine Ecology Progress Series 256:243-255. https://doi.org/10.3354/meps256243
- **Becker**, B.H., S.R. Beissinger, and H.R. Carter. 1997. At-sea density monitoring of Marbled Murrelets in central California: methodological considerations. Condor 99:743-755. https://doi.org/10.2307/1370485

### Research Papers in Preparation

- Chen, M., N. Wahl, G. Emmons, S. Wakamiya, and B.H. Becker. Peregrine Falcon recolonization impedes Prairie Falcon occupancy and reproduction. In Prep for J. Raptor Research.
- S. N. M. Hamilton, T. M. Tinker, J. Tomoleoni, M. Kenner, J. Yee, T. Bell, M. Castorani, **B.H. Becker**, and B. B. Hughes. *Predicting Top Predator Recovery Using a Habitat-Specific Predator-Prey Model*. In Prep for Conservation Biology.
- **Jackson**, J. and 10 others. Characterizing food webs in northeast Pacific estuaries through the lens of sea otter recovery.
- **Becker**, B.H. and S.R. Beissinger. A century of increased nitrogen fixation in the central California Current: 1880 2007.
- **Becker**, B.H., S. Codde, T. Ellis, A. Ryan and B. Ketcham. Recovery of eelgrass varies with disturbance level in a wilderness estuary after removal of aquaculture.
- **Becker**, B.H., S.G. Allen, S. Codde, et. al. State-space models and mark-resight tags concur on inter-colony movement in Northern Elephant Seals.
- Allen, S.G., S. Codde, S. *Gifford*, B.H. Becker. Colony structure of Harbor Seals in central California determined using state-space models.

**Becker**, B.H., S. Codde and S.G. Allen. Using Bayesian integrated population models to estimate population structure, survivorship, and population projections of Northern Elephant Seals.

### Peer-Reviewed Software Package

**Becker**, B.H., D. Voeller, et al. Forage, an R package for simulating residual dry matter on dairy and beef ranches. 2020. In General Management Plan Amendment – Final Environmental Impact Statement, Point Reyes National Seashore, National Park Service, US Department of the Interior.

### Agency Reports, Data Releases, and Invited Reviews (2005 - Present)

Felis, J.J., Adams, J., Peery, M.Z., Henry, R.W., Henkel, L.A., **Becker**, B.H., and Halbert, P., 2022, Annual marbled murrelet abundance and productivity surveys off central California (Zone 6), 1999–2021: U.S. Geological Survey data release. https://doi.org/10.5066/F75B01RW.

**Becker**, B.H., S. Codde, A. Ryan, T. Ellis, and B. Ketcham. 2020. Drakes Estero Restoration Project Eelgrass Monitoring Report: Year 3. Report to the SF Regional Water Quality Control Board, Nat. Marine Fisheries Service, CA Coastal Commission and USACE. 27 pp.

Felis, J.J., Adams, J., Peery, M.Z., Henry, R.W., Henkel, L.A., **Becker**, B.H., and Halbert, P., 2020, Annual marbled murrelet abundance and productivity surveys off central California (Zone 6), 1999-2019 (ver. 3.0, March 2020): U.S. Geological Survey data release, https://doi.org/10.5066/F75B01RW.

**Becker**, B.H., S. Codde, A. Ryan, and T. Ellis. 2019. Drakes Estero Restoration Project Eelgrass Monitoring Report: Year 2. Report to the SF Regional Water Quality Control Board, Nat. Marine Fisheries Service, CA Coastal Commission and USACE. 25 pp.

Fong, D., B. **Becker**, M. Reichmuth. 2018. Summary and analysis of Salmonid data, Muir woods national monument, 1995 to 2016. Unpublished NPS Report.

**Becker**, B.H., S. Codde, A. Ryan, and T. Ellis. 2018. Drakes Estero Restoration Project Eelgrass Monitoring Report: Year 1. 72 pp. Report to the SF Regional Water Quality Control Board, Nat. Marine Fisheries Service, CA Coastal Commission and USACE.

Eckdahl, K., D. Fong, and B. **Becker**. 2015. National Park Service Protocol for Long-term Black Abalone Monitoring at Point Reyes National Seashore and Golden Gate National Recreation Area. 17 pp.

Ammann, K., P. Raimondi, B. **Becker**, D. Roberts, D. Fong, D. Press, and M. Koenen. 2011. Long-term monitoring protocol for rocky intertidal communities of Golden Gate National Recreation Area and Point Reyes National Seashore, California. Natural Resource Report NPS/SFAN/NRR—2011/348. National Park Service, Fort Collins, Colorado.

Greene, H. G., C. Endris, B. **Becker**, B. Dieter, N. Mayer, J. Cross, H. Ryan, and F. Harmsen. 2011. Marine Benthic Habitat Mapping of the Point Reyes National Seashore. Unpublished report, maps, and GIS project.

Eckdahl, K., A. Henry, D. Fong, and B. **Becker**. 2011. Black abalone inventory for Point Reyes National Seashore and Golden Gate National Recreation Area. National Park Service Unpublished Report. 127 pp.

Fong, D., and B. **Becker**. 2010. Summary report and environmental factors related to tidewater goby (Eucyclogobius newberryi) density in Rodeo Lagoon, Golden Gate National Recreation

Area, Marin Co., during 1995 – 2000 and 2005 – 2009. Unpublished report for the National Park Service and the US Fish and Wildlife Service. 58 pp.

**Becker**, B.H. 2007. Invited Review of: Mason, J. W., et al. 2007. At-sea distribution and abundance of seabirds off southern California: a 20-year comparison. Studies in Avian Biology No. 33. Marine Ornithology 35:85.

**Becker**, B., W. Fields, J. Kinyon, and D. George. 2005. Inventory of aquatic invertebrates on Lagunitas Creek, Marin County, California: a comparison of biodiversity in 1978 and 2004. Unpublished report for the Marin Municipal Water District. 22 pp.

### Graduate Committees (#Thesis published in peer-reviewed journal)

Name	University	Degree	Year	Thesis	Current Position
Sarila Young	SFSU	MS	2024	Tunicate invasions and gene flow	In Progress
Margaret Whitlock	SFSU	MS	2023	Sea level rise impacts on Pacific harbor seals	In Progress
Joseph Jackson#	SSU	MS	2021	Characterizing food webs in northeast Pacific estuaries through the lens of sea otter recovery	Env Consulting
Hali Rederer	CSUS	MS	2020	Herring spawning habitat preferences in Tomales Bay	CalTrans
Jamie LeFevre	CSUS	MS	2019	Ecology of Fog Lichens	Bureau of Reclamation
Victoria Seher#	SFSU	MS	2016	Pigeon Guillemot Nesting Behavior	National Park Service.
Suzanne Manugian#	Moss Landing Marine Labs	MS	2013	A comparison of wild harbor seal survival during the first and second years of life	Bureau of Reclamation
Christopher Moi#	UCB	MS	2009	An Approach for Park Managers to Identify Areas of Recreation-Wildlife Conflict	Sequoia Riverlands Trust

# Students and Interns Mentored, and Current Position (as of 2022)

Year	Student/Intern	Institution	Position	Current Position (2022)
2022	CeeCee Chen Agnes Villaroman Adrian Fontao Thuy-Tien Bui Noor Wahle	UC Berkeley UC Berkeley UC Berkeley UC Berkeley UC Berkeley	Data Science Science Comm. Science Comm. Science Comm. Data Science	
2021	Silas Gifford Brandon Suen Kaitlyn Du Ryan Ohkawahira Josh Roy	UC Berkeley UC Berkeley UC Berkeley UC Berkeley UC Berkeley	Data Science Data Science Data Science Data Science Data Science	UCB Data Science MS
Pre-2021	Jerimiah Oetting	NPS	Science Comm.	NPR Santa Cruz (KAZU)
	Bella Reyes	NPS	Marine Ecology	Univ florida (NSF Fellow)
	Lillian Pearson	NPS	Science Comm.	Univ. of S. Miss. & Cal. Acad.
	Leslie Willoughby Victoria Kentner	NPS NPS	Science Comm. Remote Sensing	Carnegie Institution NOAA
	Rex Sanders Cassandra Brooks Amy West Willis Logsdon Amy Henry	NPS NPS NPS NPS NPS	Science Comm. Science Comm. Science Comm. Science Comm. Abalone	USGS - Retired Faculty CU Boulder SALT Project Director SFPUC UC Irvine
	Kari Eckdahl	NPS	Abalone	Indep. Marine Scientist
	Jessica Luo	NPS	Marine Science	NOAA Geophysical Lab (NSF Fellow)
	Ben Bettenhausen Sean Stasio Chris Bente	NPS NPS NPS	Science Comm. GIS GIS	Mahalo Filming City of SF CA High Speed Rail Authority

# Fellowships and Awards

NPS Performance-based or STAR award	2002-2022	
Within-Grade Quality Step Increase (Requires NPS Regional Director Approval)		
DOI National Conservation Award (Multi-Agency Rocky Intertidal Network)		
NPS Pacific West Regional Director's Award for Natural Resources Research		
DOI Env. Achievement Award for excellence (Pac Coast Sci & Learning Cntr)		
Post-Doctoral Fellowship (Declined) - Institute of Marine Science, UC Santa Cruz		
Best Student Poster, Pacific Seabird Group Meeting		
University Block Fellowship, UC Berkeley (tuition and stipend)	1999-2000	

Collection Study Grant, American Museum of Natural History Vice-Chancellor's Research Fund Grant, UC Berkeley Frank M. Chapman Research Grant, American Museum of Natural History Mewaldt-King Student Research Award, Cooper Ornithological Society Starker Leopold Research Fellowship, UC Berkeley University Travel Fellowships, UC Berkeley (3), Yale (1) RW Schreiber Ornithological Research Award, L.A. Audubon Society  Recent Symposia and Lecture Series Organized	2000 2000 1999 1999 1999 1995-2001 1994
Co-organizer and Session Moderator, Beyond the Golden Gate Research Symposium. 2016, 2022	2012,
Organizer, Monthly Science Lecture Series at Point Reyes National Seashore	2006-2021
Co-organizer, Tomales Bay Watershed Council State of the Bay Science Symposium (years)	(every 2-4 2010-2020
Session Moderator, Measuring & monitoring change, San Francisco Bay Area Natio Science and Natural Resources Symposium.	nal Parks 2019
Mammals Session Chair, Western Section of the Wildlife Society Annual Meeting	2018
Co-organizer, State of Bolinas Lagoon Symposium.	2017
Selected Invited Talks and Lectures (2009 - Present)	
UC Berkeley Beahrs Environmental Leadership Program (International Environment sionals). The US National Park System, Challenges and Opportunities.	2022 og Ate My 2021 ion in the 2020 d Cultural 2020 oration of 2017-2021 cal Profes- 2013-2019 co16, 2018 National 2018 2018 t. 2017 s Climate 2017

Bodega Marine Lab Seminar Series. What is Driving Apparent Long-term Trophic Level Decline in California Current Seabirds?

SFSU Estuary and Ocean Science Center Seminar Series. What is Driving Apparent Long-term Trophic Level Decline in California Current Seabirds? 2017

Three Presentations for the Chinese National Park Service. Preserving and Restoring Native Ecosystems in National Parks; The Role of Science in National Parks; Community Science in National Parks.

2016-2017

UC Natural Reserve System Mildred Mathias Symposium. Long-term Trophic Level Variation in California Current Seabirds.

Golden Gate Marine Protected Area Collaborative.\* The Science of Marine Protected Areas.\* 2016

UC Berkeley – Wildlife and Conservation Biology Seminar. Science for Parks: 50 Years of UC Research Guiding Park Management at Point Reyes National Seashore. 2015

Point Blue Conservation Science. Long-term Trophic Level Variation in California Current Seabirds.

Lawrence Hall of Science, Berkeley. Science Opportunities for K-12 Teachers in National Parks. 2015

SFSU Department of Geography. The science of marine protected areas. 2004-2014

U.S. Marine Mammal Commission. Interactions between shellfish aquaculture and harbor seals. 2010

U.S. National Academy of Sciences. *Interactions between shellfish aquaculture and harbor seals*. 2009

### Selected Professional Presentations (Presenting Author Only, 2010-Present)

Beyond the Golden Gate Research Symposium. Seabird Feathers Track Diet and Sources of Oceanographic Carbon and Nitrogen in the Greater Farallones from 1880 - 2005. 2022

Beyond the Golden Gate Research Symposium. Ecological Restoration of Drakes Estero California.

San Francisco Bay Area Network Science and Natural Resources Symposium. My dog ate my data: dealing with missing data in long-term monitoring programs. 2021

Western Section of the Wildlife Society. Northern elephant seals: a tale of imminent extinction and assisted recovery over 50 years: Using state-space models to estimate population structure and growth.

San Francisco Bay Area Network Science and Natural Resources Symposium. Drakes Estero restoration and eelgrass recovery.

Western Section of the Wildlife Society. Estimating growth rates and inter-colony structure of harbor seals at Point Reyes National Seashore.

2018

San Francisco Bay Area Network Science and Natural Resources Symposium. Restoration Monitoring of Drakes Estero: Pre-Restoration Assessment of Eelgrass, Marine Debris, and Non-Native Species.

2017

Beyond the Golden Gate Research Symposium. Restoration monitoring of Drakes Estero:

pre-restoration assessment of eelgrass, marine debris, and non-native species. (Poster) 2016

San Francisco Bay Area Network Science and Natural Resources Symposium. Long-term Trophic Level Variation of California Current Seabirds from 1880 – 2005.

Pacific Seabird Group Annual Meeting. Long-term Trophic Level Variation of California Current Seabirds from 1880 – 2005.

George Wright Society - Evidence for long-term spatial displacement of breeding and pupping harbor seals by shellfish aquaculture over three decades.

2011

State of Tomales Bay Conference. Overview of the Last Decade of Ecological Research on Tomales Bay.

2010

San Francisco Bay Area Network Science and Natural Resources Symposium. Can We Infer Causation from Long-Term Observational Datasets? 2010

NPS Pacific West Region Natural Resources Conference. Behavioral and distributional response of elk and seals in Wilderness: Using monitoring data for management? 2010

### Peer Review Service

Editorial Board Park Science

2023-Present

### Journals, Granting Agencies, and Textbooks

Ecosphere, Frontiers in Ecology and Evolution, Journal of Wildlife Management, Journal of Animal Ecology, Marine Ecology Progress Series, The Condor, The Auk, Marine Mammal Science, Wildlife Research, Communications in Mass Spectrometry, Range Ecology and Management, Prentice-Hall Textbooks, Marine Ornithology, Marine Biology, Functional Ecology, Endangered Species Research, Bulletin of Marine Science, Journal of Raptor Research, Human-Wildlife Interactions, Aquatic Mammals, Journal of Environmental Quality, National Science Foundation - Office of Polar Programs, California Sea Grant, USGS.

### Working Groups and Advisory Committees

UC Natural Reserve System Environmental Monitoring and Data Science Panel 2022-2023

California Biodiversity Network - 30x30 Sentinal Site Working Group 2022-Present

Greater Farallones National Marine Sanctuary Advisory Council 2016-Present

Tomales Bay Watershed Council (Science Committee Chair). Lead writer for successful integrated coastal watershed planning grant (\$540,000). 2005-Present

Marin County Marine Protected Area Watch 2014-Present

Seabird Protection Network Science Advisory Team 2014-Present

Ocean Protection Council Estuary MPA Management Advisory Committee 2020-Present

UC-Natural Reserve System – Natural Areas and UC Researcher Partnerships 2019-Present

Science Advisor to the NPS San Francisco Bay Area Inventory and Monitoring Program 2012-Present

Cordell Bank National Marine Sanctuary condition report data indicator Science Team 2015-2021

NPS Arctic - Pacific Ocean Plan Working Group 2020-2021

West Marin Advisory Group 2020-2021

OneTam Health of the Mountain/Peak Health Planning Committee 2020-2021

Golden Gate Biosphere Reserve Working Group 2019-2021

Bolinas Lagoon Advisory Council 2017-2021

Golden Gate Marine Protected Area (MPA) Collaborative 2015-2021

### **Teaching**

Co-lead: *Ecological Society of America SEEDS program*. 4-day field course at Point Reyes Field Station 2023

Co-instructor: Introduction to R for Natural Resources, One-day statistics, data analysis, and data visualization programming primer for 35 NPS staff and partners with individual follow up. 2018

Co-instructor, *Marine Spatial Planning*, for US Department of State, NOAA, and NPS for 30 Chilean and Peruvian Environmental Managers (Santiago, Chile).

Pro-bono high school tutor, Subjects include SAT, Statistics, Math, ACT. 2005-2020

Lecturer, Principles of Conservation Biology, UC Berkeley. 2001

Graduate Student Instructor, *Principles of Conservation Biology*, UC Berkeley. 2001

Graduate Student Instructor, Wildlife Ecology, UC Berkeley. 1998

Middle School Science Teacher, Life Science, Greenwich Academy, Greenwich, CT. 1996-1997

Test Prep Instructor, *GRE*, Kaplan Test Prep, Stamford, CT. 1996-1997