


# James K. Sheppard PhD.

## Ecologist & Conservation Biologist


 (+1) 760-270-8326

 spatialecologist@gmail.com

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 United States citizen

 <http://jamesksheppard.com>

 ResearchGate: <https://bit.ly/2J7cEN8>

 [linkedin.com/in/sheppardecology](https://www.linkedin.com/in/sheppardecology)

 @jk\_sheppard

I am a conservation biologist with extensive expertise and experience researching the ecology of diverse international wildlife and habitats, including giant pandas, California condors, dugongs, and Hawaiian birds. My research interests lie in the application of cutting-edge technologies, such as biotelemetry, GIS, and remote sensing to characterize the ecology of threatened species and ecosystems with a view to enhancing strategies for their conservation management. My research has a strong applied component and has informed government and private sector management efforts, including the zoning of habitat protection areas and the mitigation of renewable energy development impacts on wildlife. I have established collaborations with a wide range of partners that have resulted in highly innovative solutions to conservation challenges and I have managed and mentored diverse teams under challenging conditions to boost program revenues and achieve lasting success.

## Education

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|------|--|
| 2007 | <b>James Cook University, Doctor of Philosophy</b><br>Environmental Science                            |
| 2002 | <b>University of Auckland, Masters of Science</b><br>Environmental & Marine Science (1st Class Honors) |
| 2000 | <b>University of Auckland, Bachelor of Science</b><br>Biology  |
| 2017 | <b>University of California San Diego, Certificate</b><br>Sustainable Business Practices               |

## Experience

- |                |  |
|----------------|--|
| 2017 - present | <b>Scientist</b><br><i>San Diego Zoo Institute for Conservation Research</i><br>Founder and Director of the Ellen Browning Scripps Spatial Ecology Lab at the San Diego Zoo Institute for Conservation Research<br>( <a href="#">link to more info</a> ) |
| 2018 - present | <b>Biostatistician</b><br><i>AECOM Technical Services Inc.</i>   |
| 2018 - present | <b>Affiliate Faculty</b><br><i>University of Hawaii</i>  |
| 2012 - 2017    | <b>Senior Researcher</b><br><i>San Diego Zoo Institute for Conservation Research</i>   |
| 2010 - 2012    | <b>Ecologist</b><br><i>AECOM Technical Services Inc.</i>   |
| 2007 - 2012    | <b>Postdoctoral Fellow</b><br><i>San Diego Zoo Institute for Conservation Research</i>   |
| 2006 - 2007    | <b>Research Officer</b><br><i>James Cook University</i>  |
| 2006 - 2007    | <b>Species Conservation Officer</b><br><i>Great Barrier Reef Marine Park Authority</i>   |
| 2006 - 2007    | <b>Fisheries Biologist</b><br><i>Queensland Department of Primary Industries &amp; Fisheries</i>   |



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- Sheppard JK**, McGann A, Lanzone M, & Swaisgood RR. (2015) An autonomous GPS geofence alert system to curtail avian fatalities at wind farms. *Animal Biotelemetry*, 3(43).
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- Zhang Z, **Sheppard JK**, Swaisgood RR, Wang G, Nie Y, Wei W, Zhao N, & Wei F. (2014) Ecological scale and seasonal heterogeneity in the spatial behaviors of giant pandas. *Integrative Zoology*, 9: 46–60.
- Sheppard JK**, Walenski M, Wallace MP, Velazco JJV, Porrás C, & Swaisgood RR. (2013) Hierarchical dominance structure in reintroduced California condors: correlates, consequences, and dynamics. *Behavioral Ecology and Sociobiology*. 67: 1–12.
- Marmontel M, Morales-Vela B, & **Sheppard JK**. (2012) Delineating sirenian habitat. In E. Hines, J. E. Reynolds, L. Aragonés, A. A. Mignucci-Giannoni, & M. Marmontel, editors. *Sirenian Conservation: Issues and Strategies in Developing Countries*, University Press of Florida, USA.
- Morales-Vela B, Marmontel M, Reid J, & **Sheppard JK**. (2012) Tagging and Movement of Sirenians. In E. Hines, J. E. Reynolds, L. Aragonés, A. A. Mignucci-Giannoni, & M. Marmontel, editors. *Sirenian Conservation: Issues and Strategies in Developing Countries*, University Press of Florida, USA.
- Grech A, **Sheppard JK**, & Marsh H. (2011) Informing species conservation at multiple scales using data collected for marine mammal stock assessments. *PLoS ONE*. 6(3): e17993.
- Swaisgood RR, & **Sheppard JK**. (2011). Hope springs eternal: biodiversity conservation requires that we see the glass as half full. *BioScience*, 61(6): 427-428.
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- Swaisgood RR & **Sheppard JK**. (2010) The Culture of Conservation Biologists: Show Me the Hope! *BioScience*. 60: 626–630.
- Sheppard JK**, Marsh H, Jones RE, & Lawler IR. (2010) Dugong habitat use in relation to seagrass nutrients, tides, and diel cycles. *Marine Mammal Science*. 26: 855–879.
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- Maitland RN, Lawler IR, & **Sheppard JK**. (2007) Assessing the risk of boat strike on dugongs (*Dugong dugon*) at Burrum Heads, Queensland, Australia. *Pacific Conservation Biology*. 12: 321-327.
- Sheppard JK**, Preen AR, Marsh H, Lawler IR, Whiting SD, & Jones RE. (2006) Movement heterogeneity of dugongs, *Dugong dugon* (Müller) over large spatial scales. *Journal of Experimental Marine Biology and Ecology*. 334: 64-83.
- Sheppard JK**, Bruce MP, & Jeffs AG. (2002) Optimal feed pellet size for culturing juvenile spiny lobster *Jasus edwardsii* (Hutton, 1875) in New Zealand. *Aquaculture Research* 33: 913-916.



- Tracey JA, **Sheppard JK**, Zhu J, Sinkovits R, Chourasia A, & Lockwood G. (2015) R package: *mkde*. Functions to compute and visualize movement-based kernel density estimates (MKDEs) for animal utilization distributions in 2 or 3 spatial dimensions. ([link to more info](#))



## Technological innovations

Co-development and implementation of an autonomous GSM/GPS **geofence alert system** to minimize the risk of telemetered birds suffering collision injuries with wind energy turbines. ([more info link](#)) ([media coverage link](#))

Provisional patent: Sheppard JK. 2015, 'Geofence Alert and Autonomous Aversion System', Attorney docket No. 116688.8001.US00. Submitted by Perkins Coie LLP.



## Project Funding

2002	Reef CRC, ATP Marine mammal conservation research – dugong ecology, Australia: <b>\$10,000</b>
2002	Society of Marine Mammals, Marine mammal conservation research – dugong ecology, Australia: <b>\$5,000</b>
2002	Rothwell Wildlife Preservation Trust, Marine mammal conservation research – dugong ecology, Australia: <b>\$5,000</b>
2002	Norman Wettenhall Foundation, Marine mammal conservation research – dugong ecology, Australia: <b>\$2,000</b>
2002	Great barrier Reef Marine Park Authority, Augmentative Grant Marine mammal conservation research – dugong ecology, Australia: <b>\$1,000</b>
2004	Torres Strait CRC, Dugong ecology research in the Torres Strait, Australia: \$44,000
2008	Planet Action – SPOT, California condor conservation research, Mexico: <b>\$80,000</b>
2009	Ocelots, California condor conservation research, Mexico: <b>\$5,000</b>
2010	GeoEye Foundation, California condor conservation research, Mexico: <b>\$10,000</b>
2012	Ellen Browning Scripps Foundation, establish the Spatial Ecology Lab at the San Diego Zoo Institute for Conservation Research: <b>\$100,000</b>
2014	Bailey Wildlife Foundation, California condor spatial ecology & conservation research: <b>\$100,000</b>
2014	Ellen Browning Scripps Foundation, Expand & enhance the SDZ-ICR Spatial Ecology Lab: <b>\$106,000</b>
2015	Bailey Wildlife Foundation, California condor spatial ecology & conservation research: <b>\$100,000</b>
2016	INova, Ecological impact monitoring & mitigation of the Energía Sierra Juarez wind energy project in northern Baja California, Mexico: <b>\$198,000</b>
2016	Ellen Browning Scripps Foundation, Spatial ecology & nutritional ecology conservation research: <b>\$106,300</b>
2016	Bailey Wildlife Foundation, California condor spatial ecology & conservation research: <b>\$117,000</b>
2016	Dorrance Family Foundation, Hawaiian 'io hawk conservation research: <b>\$25,000</b>
2017	SDZG Wildlife Conservancy, Thick-billed parrot conservation research: <b>\$40,000</b>
2017	Dorrance Family Foundation, Hawaiian 'io hawk conservation research: <b>\$46,000</b>
2018	Ellen Browning Scripps Foundation, Spatial ecology conservation research: <b>\$110,000</b>
2018	INova, Ecological impact monitoring & mitigation of the Energía Sierra Juarez wind energy project in northern Baja California, Mexico: <b>\$73,600</b>
	<b>TOTAL: \$1,273,900</b>



## Project Leadership Examples

2015 - present	<p><b>San Diego Zoo Global</b></p> <p><i>Project Lead</i></p> <ul style="list-style-type: none"> <li>• <b>Task:</b> Develop and deploy unmanned aerial systems (drones) in collaboration with Northrop Grumman Corporation for remote surveying of wildlife habitats using a suite of high-tech sensors to enable high-resolution 3D landscape mapping.</li> <li>• <b>Role:</b> Initiate collaboration, provide scientific guidance and oversight, manage team logistics and project budgets. Landscapes surveyed include the Canadian arctic sea ice as habitat for polar bears and rainforests in Panama and Hawaii as habitat for primates and endangered birds (<a href="#">Link to media coverage</a>).</li> </ul>
2010 - present	<p><b>San Diego Zoo Global</b></p> <p><i>Project Co-lead</i></p> <ul style="list-style-type: none"> <li>• <b>Task:</b> Lead the spatial ecology component of the critically endangered Hawaiian 'alala crow reintroduction program.</li> <li>• <b>Role:</b> Co-developed the spatial ecology and telemetry tracking component of the Hawaiian 'alala crow reintroduction program with partner organizations to monitor the movements and survivability of the released birds.</li> </ul>
2008 - 2017	<p><b>San Diego Zoo Global</b></p>

#### *Project Lead*

- **Task:** Mitigating environmental impacts of the 155MW Energía Sierra Juárez Wind Project in Baja California, Mexico. A \$400 million renewable energy project managed by IEnova, a subsidiary of Sempra.
- **Role:** Direct the monitoring of the ecological impacts of the wind farm and manage a team to conduct aerial surveys of raptor populations. Develop and deploy new technologies to minimize risk of avian collisions with turbines, with specific application to eagles and reintroduced California condors.

2008 - present

### **San Diego Zoo Global**

#### *Project Co-lead*

- **Task:** Lead the Giant panda spatial ecology component of San Diego Zoo Global's collaboration with the China Academy of Sciences, China.
- **Role:** Technical assistance, scientific guidance and data analyses of giant panda spatial behaviors and habitat use to inform and enhance panda conservation management within the Foping Nature Reserve, China.

2004 - 2005

### **James Cook University**

#### *Project Lead*

- **Task:** Tagging and tracking of wild dugongs with Indigenous Islanders in the Torres Strait, northern Australia.
- **Role:** Liaise with the Torres Strait Islander community to organize and direct an expedition to conduct the first GPS-tracking study of dugongs in the region. Collect ecological data on dugongs in the Torres Strait to enhance conservation strategies for dugongs that also inform traditional hunting.



## **Environmental Consulting Examples**

2018

**AECOM:** Pine Tree Wind Condor Habitat Conservation Plan. **Role:** Scientific guidance and oversight of the development of a habitat conservation plan to mitigate the potential negative impacts of wind energy developments in the Tehachapi region of California. Liaise with U.S. Fish and Wildlife Service and the Los Angeles Department of Water and Power to design and implement effective avian collision mitigation technologies, techniques and procedures.

2009

**AECOM:** Caltrans State Route 76 East Highway Improvement Project, San Diego County Wildcat Canyon Road Enhancement Project, U.S. Department of the Navy Preliminary Draft Baseline Avian Use and Risk Assessment for the San Nicolas Island Wind Energy Project. **Role:** Scientific oversight of sampling and surveys and reviews of environmental impact reports.

2005

**Queensland Environmental Protection Agency:** Zoning of the Great Sandy Marine Park, Queensland, Australia. **Role:** Provision of technical assistance concerning the location and design of Habitat Protection Areas within the Marine Park. Recommendations on mitigating impacts of proposed aquaculture developments on marine mammals. Design of boat 'go-slow' zones to minimize marine mammal collision risk.



## **Synergistic Activities**

**Committee member:** Institutional Animal Care and Use Committee (IACUC), San Diego Zoo Global (2018+)

**Editorial Advisory Board member:** The Wildlife Professional (2016+)

**Chair:** Spatial Ecology & Telemetry Working Group, The Wildlife Society (2010+)

**Associate Editor:** The Journal of Wildlife Management (2013+)

**Founding Member:** San Diego Zoo Global Wildlife Trafficking Taskforce (2017+)

**Founding Member:** San Diego Zoo Global 'Grrreen Team' for improving organization sustainability practices (2017+)

**Graduate Student Supervisor:** 2016 Masters student (UCSD). 2012 - 2017 PhD student (Pontificia Universidad Javeriana, Colombia).

**Intern Mentoring:** Mentored interns from the Palomar College GIS program who assisted San Diego Zoo Global conservation projects. *Year 2016:* Least terns & snowy plover conservation management. *Year 2017:* Andean bear conservation research. *Year 2018:* Endemic plant conservation management.

**Lecturer:** Part-time faculty, Palomar College, Biology-201 course (2011)

**Guest Lecturer:** Graduate GIS classes at San Diego State University and undergrad ecology classes at Point Loma Nazarene University, San Diego (2010+)

**Lecturer and Lab Assistant:** Designed and presented lectures and co-led labs for undergraduate Conservation Biology and GIS courses at James Cook University, Australia (2005 – 2008)

**Professional Membership:** The Wildlife Society, Society for Conservation GIS, Society for Conservation Biology, Ecological Society of America, Sirenian International.

**Panel Member:** AFRI A6123 Sustainable Bioenergy, Wildlife and Pollinator Panel of USDA, National Institute of Food and Agriculture (NIFA), Institute of Bioenergy, Climate and Environment (2012)

**Founder/Administrator:** Wildlife Biotelemetry public Facebook page for sharing news, perspectives, tips and techniques in the rapidly growing field of wildlife tracking via remote telemetry and remote sensing.

## Awards

- 2015 Winner: BMC Ecology Image Competition - Theoretical Ecology and Models ([link to more info](#))
- 2015 Scholarship for the UC San Diego Extension Sustainable Business Practices Certificate program.

## Media & Outreach

20+ local, regional and national radio interviews; 7 Television Interviews; 13 Newspaper interviews and articles; 3 Magazine Articles; Multiple online articles, interviews and blogs. Recent examples with links:

- 2018 ZooNooz - *New Tools for Conservation Research: Unmanned Aerial Systems*
- 2016 WILDTECH - *Can a virtual fence help protect birds from human structures?*
- 2015 MOTHERBOARD - *Virtual Fences Around Wind Farms Could Reduce Bird Deaths*
- 2014 Audubon - *Keep Calm and Conserve On*
- 2014 MONGABAY - *Why conservationists need a little hope*

## General Skills & Training

Proficient in: GIS and imaging software including: ArcGIS, ArcScene, ArcCatalog, QGIS, SAGA, Global Mapper, ERDAS Imagine, GRASS, EnterVol, Voxler, ParaView. Adobe products, including Illustrator, Photoshop and Acrobat Reader. Statistical and modelling software, e.g., R, JMP, Statistica, SPSS.

Workshop Certificate: Open Standards for the Practice of Conservation to Plan and Produce Enduring Conservation Outcomes, Instructors: Quinn Shurtliff (Wastren Advantage, Inc.), Robert Sutter (Enduring Conservation Outcomes), and Andrew Bridges (Institute for Wildlife Studies), 2017.

Drone University, UAS operators Certificate of Proficiency, 2016. PrecisionHawk, Unmanned Aerial System Certificate of Training, 2015.

Human-Wildlife conflict management workshop, The Wildlife Society, Snowbird, Utah, 2010.

Marine animal stranding workshop, the Great Barrier Reef Marine Park Authority and Queensland EPA, 2006.

Negotiation skills workshop. Director Peter Raffles, Conflict Solutions Ltd. James Cook University. 2002.

Media training, Reef CRC. Course leader: Chip Henriss-Anderson, Director GBRMPA Public Relations. 2002.

Emergency First Aid certification and Oxygen providers certification, Advanced/Rescue PADI divers certification, Marine radio operators certificate of proficiency

## References

**Dr. James Danoff-Burg** Director of Conservation - The Living Desert Zoo  
47900 Portola Ave, Palm Desert, CA 92260, USA.  
[www.livingdesert.org](http://www.livingdesert.org)  
Office: (+1) 760-346-9130 x2103 or Mobile: (+1) 760-690-6530  
[jdanoffburg@livingdesert.org](mailto:jdanoffburg@livingdesert.org)

**Dr. Jennifer Germano** Technical Adviser Ecology / Kiwi Recovery Group Leader - NZ Dept. of Conservation  
Whakatū / Nelson Office, 186 Bridge Street, Nelson 7010 / Private Bag 5, Nelson 7042  
<https://goo.gl/udcAsn>  
DDI: +64 7 858 1671 or Mobile: 027 886 3855  
[jgermano@doc.govt.nz](mailto:jgermano@doc.govt.nz)

**Dr. Ivan Lawler** Assistant Director, Australian Government, Department of the Environment and Energy  
John Gorton Building, King Edward Terrace, Parkes, ACT 2600, Australia  
[www.environment.gov.au](http://www.environment.gov.au)  
+61 2 6275 9121 or +61 0432 031126  
[ivan.lawler@environment.gov.au](mailto:ivan.lawler@environment.gov.au)