2019

Data Management Plan for Social-Ecological Dynamics of Multi-Use Public Lands: The Role of Recreational Shooting in Shaping Recreation Communities, Management Decisions, and Trophic Interactions

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Data Management Plan for NSF Proposal "DISES: Social-ecological Dynamics of Multi-use Public Lands: the role of recreational shooting in shaping recreation communities, management decisions, and trophic interactions"

We recognize the importance of collecting and preserving high quality data – for our purposes here and for future researchers who might want to access the data for comparative work, ideally including a future assessment of the human and natural dynamics in our study system. We will work to ensure that all people working on this project will be thorough and careful through all steps of the data life cycle (i.e., https://www.dataone.org/data-life-cycle) from design acnd collection to proofing and archiving.

1. Types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project

Novel Data	Description	Format	# of files
Interviews/questionnaires	Key informant interviews, on-site survey, online survey	.xls then Access	3
Human Use Intensity Surveys	Standardized driving routes	.xls then Access, .shp	2
Wildlife Population Surveys (squirrels, raptors, ravens, curlews, larks)	Standardized driving routes, point count surveys, & mark-recapture	.xls then Access	4
Mammalian scavenger data	Camera traps for badgers	.jpeg for photo storage; .xls then Access	2 folders/files
Nest success data	Monitoring nest fate of curlews and larks	.xls then Access	2
Agent-based models	ABM built and annotated using NetLogo	.nlogo	1
R scripts for analyses	Clearly annotated, preserved, and shared	.R and .rmd	1 .rmd file/ analysis with .R scripts for specific steps
Maps – wildlife and human use	Predicted recreational use intensity (humans) and wildlife occupancy/density	.R and .rmd	1 .rmd file/map with .R scripts
Existing Data	Description	Format	# of files
Vegetation data (since 1987)	vegetation condition & trend	.mxd, .shp	1
Ground squirrel pop. surveys (2013)	Mark-recapture data	.xls then Access	1
Diurnal raptor surveys (2010)	Point count surveys	.xls then Access	1
Nest success data (2017)*	Standardized nest fate data for curlews (since 2017)	.xls then Access	1
MaxEnt model	Described in Pauli et al. 2019, used to classify human use intensity	maxent.jar, maxent.bat, .html, .jpeg/.zip	5

*We have Long-billed Curlew nest data from 2017-20 from within the study area (NCA), including from distinct regions of the NCA with varying human use intensities (also funded for 2021 by Bureau of Land Management).

2. Standards for data and metadata format and content
- Human elements data will be collected/maintained following Institutional Review Board (IRB) standards, including informed consent statements and ensuring confidentiality.

- Metadata – We will collect and share metadata, including contributors, locations, and taxa, using Data Documentation Initiative (social science) and Ecological Metadata Language (ecological).
- Data organization – All data collected in this study will be clearly labeled using a naming structure consisting of project name, date, and subset of data.
- Quality Assurance – All staff who collect data during the project will be trained to follow discipline-specific standard protocols for data collection and storage, including naming conventions. The PI and graduate students will check-in monthly to ensure data quality.
- Responsibility – The PI has primary responsibility for maintenance of the data record and securing and preserving the data. This includes surveys, datasheets, analyses, and final reports, and sensitive information about human subjects or animal activity. Collaborators will have access to the data. Boise State University will hold the copyright for the research data generated by its researchers but will grant redistribution rights for purposes of data sharing.
- Audience – Users of the data will include the Co-PIs of the study, collaborators, and agencies that manage the study site (IDARNG and Bureau of Land Management). When the study is complete and the data are shared, they will be useful for researchers studying integrated socio-environmental systems and for other agencies.

3. Policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements
- Human data will be stored on BSU servers and kept for 3 years after the study is closed, following the requirements of BSU's Institutional Review Board.
- Data, models, and analyses produced during the study will be disseminated on a free, publicly accessible site within two years of project completion. See details in section 5 (below).

4. Policies and provisions for re-use, re-distribution, and the production of derivatives
We will make research data accessible when the project is completed and all final reports and planned publications have been submitted - within 2 years of project conclusion. We will use a Creative Commons open license to ensure that all research data receive acknowledgement when used and to ensure that university, state, and federal regulations are met and that the authors and funding source are acknowledged. The primary data, the methods used to obtain them, and the procedures applied to the primary data to create analyses/models will be reported and follow standards for ethical research.

5. Plans for archiving data and research products, and for preservation of access to them
During the active phase of the research project, data will be stored on a shared networked drive managed by the Boise State's Office of Information Technology (OIT). Up to 25TB research allocation is provided at no cost to a researcher on OIT's centralized storage cluster, which includes a 2-copy disaster recovery configuration. The second copy is stored offsite on a backup cluster and includes daily snapshots and a 30-day retention policy. OIT cyberinfrastructure facilities use NetApp storage which ensures access controls (authorized personnel only), confidentiality, scheduled backups, and disaster recovery protection.

Within two years of the end of the grant project, data will be submitted to multiple data repositories, likely including: https://knb.ecoinformatics.org/ for ecological data, http://www.avianknowledge.net/ for bird-specific data, and https://dataverse.harvard.edu/ for human recreation data. We will use Github for collaborative models and analyses on a private repository, which we will make public once results are published. Additionally, biological data - not including human subjects or sensitive data - will be permanently stored and openly shared via ScholarWorks, Boise State's institutional research repository. Managed by Albertsons Library, ScholarWorks utilizes a hosted platform, optimized for open discovery. Once archived, descriptive metadata records and permanent DOIs will be created for each data set to ensure proper citation and permanent retrieval of the materials.