



**STATE OF NEVADA
Off-Highway Vehicles Program**

901 South Stewart Street, Suite 1003

Carson City, Nevada 89701

Telephone (775) 684-2794

Facsimile (775) 684-2715

www.nvohv.com



**NEVADA OFF-HIGHWAY VEHICLES PROGRAM
NEVADA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES**

2022 NEVADA OHV GRANT APPLICATION

(REQUEST FOR GRANT APPLICATIONS, APPENDIX A)

**APPLICATIONS DUE
November 19, 2021, 5:00 PM, PST**

Please mail early; Applications postmarked prior to 8:00 am on November 19, 2021, but not received prior to that time are untimely and will not be considered.

SUBMIT: ONE FULL COLOR COPY

BY MAIL OR HAND DELIVERY

(8.5" X 11" ONLY. MAPS MAY BE 11"X17" NO LARGER)

AND

ONE SINGLE ELECTRONIC FILE; PDF VIA EMAIL NNarkhede@ohv.nv.gov

OR MEMORY DEVICE ENCLOSED WITH APPLICATION

TO: NEVADA DEPT. OF CONSERVATION AND NATURAL
RESOURCES
OFF-HIGHWAY VEHICLES PROGRAM
ATTN: NIKHIL NARKHEDE
901 S. STEWART STREET, SUITE 1003
CARSON CITY, NV 89701

For questions please contact:

Nikhil Narkhede

(775) 684-2794

NNarkhede@ohv.nv.gov

NEVADA OFF-HIGHWAY VEHICLES PROGRAM
2022 GRANT APPLICATION
Nevada Commission on Off-Highway Vehicles
Nevada Department of Conservation and Natural Resources

This application has FIVE sections which are all REQUIRED to be filled out in full. To avoid disqualification, all application areas must be concise and complete; certifications must be signed and dated. Denied applications: correspondence will be sent to applicant by email describing the reason for declaring the application incomplete.

SECTION I - PROJECT AND APPLICANT INFORMATION

1. Project Name: Analysis of the Economic Impact of Outdoor Recreation in Nevada
2. Project Timeline: February 2022-March 2023
3. Applicant Name: Colin Robertson, Administrator, Nevada Division of Outdoor Recreation
Mailing address: 901 South Stewart Street, Ste. 1003, Carson City, NV 89701

Phone: 775.684.2700

Email: crobertson@ndor.nv.gov

4. Classification of Applicant: (check one)

☐ Federal ☒ State ☐ County ☐ Local/Municipal ☐ Other: _____
☐ Partnership ☐ Non-profit ☐ for Profit ☐ Individual

If the applicant is a corporate or legal entity, proof of good standing in the entity's state of incorporation is required. NAC 490.1345 (Note: grantees must have the capacity to implement and accomplish proposed project and properly administer awarded funds).



Applicant Signature
(Chairperson/President/Authorized Official)

11/19/2021
Date

5. Project Manager: Colin Robertson, Administrator, Nevada Division of Outdoor Recreation

Mailing address: 901 South Stewart St., Ste 1003, Carson City, NV 89701

Phone: 775.684.2700

Email: crobertson@ndor.nv.gov

6. Classification of Land Control: (check all that apply)

☐ Federally managed public land ☐ Private Land ☐ County ☐ City

☒ Other: Not applicable

☐ Lease; Attach copy of lease with expiration date.

☐ R&PP; Attach copy of lease with expiration date.

If the proposed project is to be carried out on public land, attach any applicable written agreement with any government entity having jurisdiction over that land, including permits, leases, easements, and rights-of-way. NAC 490.135

7. Landowner: Not applicable

Mailing address: _____

Phone: _____

Email: _____

8. THE LANDOWNER MUST PROVIDE A LETTER STATING THAT:

(See example Appendix B)

- a) Landowner has read the Request for Grant Application package.
- b) Landowner agrees with the application and the terms of the grant.
- c) Landowner holds an interest in the subject land that is sufficient in scope and authority to allow the applicant to complete the proposed project and operate and maintain the proposed project after its completion.
- d) Landowner is legally committing to maintain the trail/facility and will allow public motorized access to such trail/facilities for 25 years or the normal life of the project; and
- e) Landowner agrees to provide any match or other tasks in the application that are assigned to Landowner.

The State may require the landowner/agency to be co-grantee on the grant agreement/contract.

9. PROJECT COSTS:

(grant request and matching funds directly related to the project)

State OHV Grant Request: \$150,000

Matching Funds: \$150,000, Economic Development Administration

Total Project Amount : \$300,000

What are the sources or Partners for your leveraged (matching) funds?

☒ Federal ☐ Private ☐ In-kind ☐ City/County ☐ Other

Please describe additional funding source(s):

The Nevada Division of Outdoor Recreation was able to secure \$150,000 in American Rescue Plan Act funds from the Economic Development Administration's Travel, Tourism, and Outdoor Recreation Notice of Funding Opportunity specifically for a full-scale analysis of the economic impacts of outdoor recreation in Nevada. OHV Program grant funds would match federal dollars 1:1 and enable a deeper level of analysis

10. LETTERS OF SUPPORT FROM PARTNERS are required:

- a) Confirming they agree to the terms of the grant; and
- b) That they are committed to providing match/cash or other tasks in the application that are assigned to them.

**Additional Letters of Support may be attached at the end of this application (limit 3).
See Exhibits A and B, attached below.**

11. Project Type(s) (NRS 490.069 Sec.2c) check all that apply:

- ☒ Studies or planning for trails and facilities;
 - ☐ Environmental Assessments and Environmental Impact Studies.
 - ☒ Other studies Economic Impact Study of Outdoor Recreation in Nevada
- ☐ Acquisition of land for trails and facilities
- ☐ Mapping and signing of trails and facilities
- ☐ Reconstruction, enhancement or maintenance of existing trails and facilities
- ☐ Construction of new trails and facilities

- ☐ Restoration of areas that have been damaged by the use of off-highway vehicles.
- ☐ The construction of trail features, trailheads, parking, or other ancillary facilities which minimize impacts to environmentally sensitive areas or important wildlife habitat areas.
- ☐ Safety training and education related to the use of off highway vehicles and registration
- ☐ Compliance and enforcement (See Appendix C, Enforcement Strategy example)

12. ALL TRAIL USERS: (*check all that apply*)

- | | | | |
|--|---|---|--------------------------|
| <input type="checkbox"/> Mountain Biking | <input type="checkbox"/> Hiking/Backpacking | <input type="checkbox"/> Equestrian | <input type="checkbox"/> |
| Single track motorcycle | <input type="checkbox"/> Snowmobiling | <input type="checkbox"/> Snowshoe/ski | |
| <input type="checkbox"/> ATV quads | <input type="checkbox"/> Dune buggy | <input type="checkbox"/> UTV Side by side | |
| <input type="checkbox"/> Race Course | <input type="checkbox"/> Skills riding course | | |

Please explain how you intend to manage user interactions:

N/A

- 13. Scope of Work:** Please describe *exactly* what work will be completed. Programs, planning, NEPA, surveys, mapping, include miles of trail, trail type and other quantitative goals including a timeline for completing the work. NAC 490.1375. If purchase of equipment is included, please explain where/how it will be housed and maintained. (In order to avoid duplication, **do not include** justification or narrative in this section; refer to Section V, Scoring Narrative).

The Nevada Division of Outdoor Recreation will use OHV Program grant funds to commission a full-scale, third-party analysis of the economic impacts of outdoor recreation in Nevada and conduct an asset mapping inventory of outdoor recreation infrastructure/sites statewide to determine as comprehensively as possible the economic value added by outdoor recreation to the Nevada economy, including the economic impacts of the OHV/OSV/Off-Road industry clusters in the overall Nevada outdoor economy. The project deliverable will be a printed and web-accessible study similar to a study for the State of Washington (see Exhibit C linked below). Getting the analysis to the very most local level of detail (the county/USFS and BLM district/legislative district/tourism district levels) is key to ensuring the study is as comprehensive and detailed as possible. The intended project timeline would be to award a contract in Q1 2022 and receive a final deliverable product in Q1 2023, coinciding with the

start of the 2023 Nevada Legislative Session.

14. Standards/Guidelines that will be applied to your project:

- ☐ Universal Access to Outdoor Recreation - A Design Guide
- ☐ USFS Standard Specifications for Construction & Maintenance of Trails
- ☐ BLM Handbook 9114-1 Trails
- ☐ NOHVCC Handbooks

Other: _____

15. Has the applicant received funding from the OHV Program in the past?

☒ No ☐ Yes

Number of projects funded: _____

Amount of funding Received: \$ _____

Number of projects Completed: _____

SECTION II – LOCATION, MAPS, PHOTOS

Project Location:

County: Statewide

Nearest Municipality/Town/City: _____

Center of project: Latitude: _____ Longitude: _____ \

If the shape-files for the trail system are available, please submit them in the e-file. The shape-files of the trail will be required at project end. Program will assist in the collection of the data if needed.

MAPS ARE A VERY IMPORTANT PART OF THE APPLICATION. THEY ARE REQUIRED AND CONSIDERED PART OF THE FINAL AGREEMENT IF FUNDED.

Required Maps: for all maps please include a legend, north arrow, scale, and map name.

Topographic maps preferred. You may include *additional* aerial/google maps.

- ☐ General location map (showing project area within the state or county)

- ☐ Topographic map (7.5 minute series quadrangle, 1:24,000 scale) with project boundary and map name Township:_____ Range:_____ Sections_____
- ☐ Detail map indicating specific project elements (e.g., structures, trail alignment)
 - Maps larger than 11x17 will not be accepted

Please attach the following photographs:

- ☐ *At least two (2) overviews of the project area from different angles and distances. (Good photographs at trail level and google aerials help the scoring committee to understand the location, depth and breadth of your project.)*

SECTION III - Federal Lands or Other

Federal Environmental Compliance

A. If Federal funds or Land are a part of the project and NEPA was completed, indicate which document was produced, and **please attach the decision document to this application:**

- ☐ Record of Decision (ROD)
- ☐ Finding of No Significant Impact (FONSI)
- ☐ Categorical Exclusion (CX)
- ☐ SHPO 106 compliance/concurrence letter.
- ☐ Other compliance documents already completed. (do not attached the EA or EIS)

☐ **Not applicable**

If NEPA or planning is a part of the project describe the steps in the Scope Section I, #13.

SECTION IV - BUDGET

Proposed Budget: Provide your budget details to include at a minimum the items in the following table. You may create your own spreadsheet.

- Your budget must align clearly with your scope of work from #13. Be specific, as your application will rate higher.
- Reminder: Include all sources of funds for the completion of the project including federal, in-kind, private/city/county and state funds.
- **Attach copies of estimates to support your budget and identify what each contract will include.**

Please see Exhibit C, sample scope of work from Earth Economics, for a similar recent study. The scope of the Nevada project would be more extensive than this, and therefore more expensive, but the budget associated with Exhibit D was \$200,000.

EXAMPLE BUDGET

Item Description	OHV Grant Request	Other Matching Funds	Total Cost
Contracts: Environmental studies	\$150,000	\$150,000	\$300,000
Contracts: design, engineering & construction			
Direct labor costs Salaries, including fringe, actual costs			
Volunteer or donated labor/in-kind # Hrs. skilled labor @\$27.20/hr. (not required but is important for scoring higher)			
Purchase or rental of equipment - Specify type of equipment – cost- # of days. <i>Attach estimate or quote.</i>			
Materials – Purchase or rental of materials for project			
Travel Costs, Hotel Nights, Per -diem			
Vehicle gas and maintenance standard is now at .58 per mile. Estimate miles.			
Other: be specific			
Totals			
Percentages			100%

SECTION V – PRIORITIES AND SCORING NARRATIVE

Grants will be scored based on answers to the Ten (10) criteria listed below. Each criteria carries a weight determined by the OHV Commission, voted upon during the public meeting on 9/7/2021. Please reference scoring criteria form.

- 1. Law Enforcement Strategy that addresses registration enforcement, including Public Education & Outreach aimed at increasing renewals and new registrations:** *How will your project increase the number of OHV registrations on the district. How will the equipment and time be used to increase OHV safety and awareness? Please reference the Law Enforcement Statistics reporting form.*

New off-highway vehicle registrations and registration renewals of off-highway vehicles are among numerous categories related to direct and indirect contributions to the outdoor economy in Nevada. This proposal requests funding to conduct a full-scale economic impact analysis that would examine, among many other indicators, the economic value added by the sale and registration of off-highway vehicles and over-the-snow vehicles in Nevada. Knowing more clearly the direct and indirect economic impacts of the sale and registration of OHVs, as well as the economic impacts of Nevada OHV Program Grant projects on the ground, will help to further clarify the value of registration, and why further investment in law enforcement registration strategies may be advisable.

- 2. Enhancement or Maintenance of existing trails and facilities:** *How will maintenance needs be prioritized and how often will your project hold a maintenance/ trails enhancement event? HOW will your project be maintained and WHO has committed to the ongoing maintenance of the facility or trail (note: a minimum of 2 maintenance/ trail events are required per year).*

While the proposed project to conduct an analysis of the economic impacts of outdoor recreation would not enhance or maintain existing trails or facilities directly, the economic impact analysis will include an examination of the economic, environmental, and social benefits of recreational trails in Nevada, similar to **Exhibit D** (see attachment of this name linked below).

- 3. Training:** *Please describe the goals and objectives of your public safety training program. Is it a nationally recognized certification? What sets your safety training program apart from the others?*

This project does not address public safety training.

- 4. Trail mapping and signing of existing trails and facilities:** *If a mapping component is included in the grant, please describe how it will be integrated with the current web mapping application found on OHV.NV.GOV*

While the proposed project to conduct an analysis of the economic impacts of outdoor recreation would not map or sign existing trails or facilities directly, the proposed economic impact analysis will include an examination of the economic, environmental, and social benefits of recreational trails in Nevada, including OHV/OSV trails, similar to **Exhibit D**.

- 5. Connectivity/Loops:** *How will the project impact connectivity of OHV trails, facilities, and local communities? Please include maps of areas impacted by your project and describe those impacts.*

While the proposed project to conduct an analysis of the economic impacts of outdoor recreation would not augment trails directly, nor create connecting among trail systems, the proposed economic impact analysis will include an examination of the economic, environmental, and social benefits of recreational trails in Nevada, including OHV/OSV trails, similar to **Exhibit D**, estimating as accurately as possible the economic value of connected trail systems to Nevada and communities in the state.

- 6. Planning, Environmental Studies, Conservation:** *Describe how the environmental studies, conservation and/or planning will mitigate resources impacted by OHV recreation. How will your project contribute to the conservation of our natural resources, while enhancing OHV opportunities?*

The proposed project will include an analysis of the non-market economic impact of healthy lands and waters—known as ecosystem services—similar to the ecosystem services analysis of Washington State linked here (see pages 11-14 of the pdf):

https://static1.squarespace.com/static/561dc6e4b039470e9afc00/t/5f249326f05167773ab0774d/1596232557974/EconomicAnalysis-OutdoorRecreationWA_EarthEconomics_w0720-0.pdf

Knowing how much the non-market economic value of healthy natural resources will help demonstrate why and how investing in OHV-specific trail systems will not only improve OHV and other recreational experiences, but also develop information and data that can be used to communicate the benefit of healthy public lands and their conservation. (See also **Exhibit E**, linked below)

- 7. Access:** *Please describe how your project improves OHV access in the project area. Explain what access/opportunities would be lost or restricted if the project does not occur.*

Similar to #5 above, while the proposed project would not directly create or improve access, the goal will be to demonstrate the non-market economic value of all kinds of recreational trails, and by extension what value access to such trails provides.

- 8. Partnering and Leverage:** *Who else is involved in this project? Please describe outreach with stakeholders, partners and local governments, that you have communicated with in planning this project.*

Lead and coordinated by the Nevada Division of Outdoor Recreation, the project will also engage the Nevada Department of Tourism (Travel Nevada) and the Governor's Office of Economic Development. Upon completion of the economic impact study, NDOR and the Nevada Department of Conservation and Natural Resources will coordinate a media/social media campaign to announce the results and begin to use them to educate and inform stakeholders, policy makers, and partners about the results statewide.

- 9. Economic Integration:** *How will this project improve OHV recreation opportunities that help local, regional, or state economies grow?*

The proposed project will specifically and in detail addresses economic integration. A detailed and higher resolution understanding of the economic impacts of outdoor recreation in Nevada is needed, in general, at the local and regional level within Nevada. This project will demonstrate the specific economic impacts of all kinds of outdoor recreation in Nevada, and provide summary details of specific recreational activities or industry clusters similar to **Exhibit F** linked below).

10. Demand for New Facilities: *Please provide justification for **NEW** facility/program development: restrooms, trails, signs, and other amenities.*

Among many other desirable outcomes, if the proposed economic impact analysis is successful, the data it aggregates and analyzes will help to provide a baseline model for understanding the non-market economic value of recreational facilities, particularly trails, in Nevada, and will help create economic justifications and use cases/case studies for why and where new facilities may be warranted.

EXHIBITS

- A) Letter of Support, Nevada Outdoor Business Coalition (Attached Below)
- B) Letter of Support, U.S. Forest Service Humboldt-Toiyabe National Forest (Attached Below)
- C) Sample Scope of Work from Earth Economics (attached below)
- D) [Example Economic Impact Analysis of Recreational Trails in Washington State](#)
- E) [Example Economic Impact Analysis of Outdoor Recreation in Washington State](#)
- F) [Example Economic Impact Analysis of Snowmobiling in Utah](#)



November 19, 2021

Philip Fell, Chairman
Nevada Off-Highway Vehicles Commission
901 South Stewart Street, Ste. 1003
Carson City, NV 897801

RE: Prioritizing Analysis of the Economic Impact of Outdoor Recreation in Nevada

Dear Chairman Fell and Members of the Nevada Off-Highway Vehicles Commission:

We write this letter in support of a Nevada Off-Highway Vehicles Program grant application by the Nevada Division of Outdoor Recreation (NDOR) to study more specifically and locally the economic impacts of outdoor recreation in Nevada. Outdoor recreation is a major contributor to the overall American economy. Nationwide, in 2019 outdoor recreation generated some \$788 billion in economic output, comprised 2.1 percent of the United States Gross Domestic Product (GDP), and supported 5.2 million jobs. We also know from national statistics compiled by the U.S. Bureau of Economic Analysis (BEA) that in 2020 outdoor recreation accounted for 2.3 percent of the state of Nevada's overall GDP and was responsible for 49,501 jobs statewide—3.8 percent of all jobs in Nevada.

However, analysis of the economic impacts of outdoor recreation in Nevada at the state and especially at more local levels—such as the county or legislative district—are less clear. While we know that the economic contribution of outdoor recreation in Nevada as a whole is \$3.97 billion, it is not yet known exactly what the economic contributions of outdoor recreation are at the more granular level of the county, economic development district, or tourism region. We do not yet know exactly the extent to which specific recreational activities such as mountain biking, hiking, or off-highway vehicle (OHV) riding contribute to the Nevada economy or to the local economies of Nevada's communities—which are often gateways to some of the best recreational opportunities the state has to offer. Nor do we know what the non-market economic benefits of healthy lands and waters—known as ecosystem services—are to Nevada. All of this would be extremely helpful information to provide policy makers in considering future investments in all kinds of outdoor recreation in Nevada, including OHV trails, trailheads, and staging areas.

It takes a great deal of time and money to study economic contributions at these more local, granular levels. NDOR has been able to secure \$150,000 from the U.S. Economic Development Administration to study these contributions in greater detail. We write this letter to the OHV Commission to ask the Commission to consider matching 1:1 the federal investment being made in this effort. The results and information about these economic impacts are certain to be

valuable to numerous stakeholders, in addition to the Nevada Off-Highway Vehicles Program itself. The analysis would certainly be of value to the diverse communities across Nevada in which outdoor recreation on public lands plays a significant role in economic development, growth and resiliency, cultural vitality, community vibrancy, and public health.

Small businesses—retail, aftermarket suppliers, guides/outfitters, and rental companies, among many others—are the lifeblood of Nevada's outdoor recreation economy, many of which were forced to lay off staff or close entirely during the pandemic. Using these funds to study more comprehensively the real economic impacts of outdoor recreation in Nevada is an important way we can help support and nurture this important and growing sector of Nevada's economy.

Thank you for giving the application your full consideration.

Respectfully,



Nevada Outdoor Business Coalition



File Code: 1560; 2300
Date: November 18, 2021

Phillip Fell
Chairman, Commission of Off-Highway Vehicles
Nevada Off-Highway Vehicles Commission
901 South Stewart Street, Suite 1003
Carson City, NV 89701

Dear Chairman Fell and Members of the Nevada Off-Highway Vehicles Commission,

I write today in support of an OHV Program grant application by the Nevada Division of Outdoor Recreation (NDOR) to study more specifically and locally the economic impacts of outdoor recreation in Nevada. Outdoor recreation is a major contributor to the overall American economy. In 2019, outdoor recreation generated some \$788 billion in economic output, comprised 2.1 percent of the United States Gross Domestic Product (GDP), and supported 5.2 million jobs nationwide. We also know from national statistics compiled by the U.S. Bureau of Economic Analysis (BEA) that in 2020 outdoor recreation accounted for 2.3 percent of the state of Nevada's overall GDP, and was responsible for 49,501 jobs statewide—3.8 percent of all jobs in Nevada.

However, analysis of the economic impacts and benefits of outdoor recreation in Nevada at the state and especially at more local levels of measurement are less clear. While we know that the economic contribution of outdoor recreation in Nevada as a whole is \$3.97 billion, it isn't yet known exactly what the economic contributions of outdoor recreation are at the county, forest district, or tourism region. We do not yet know exactly how much specific recreational activities such as mountain biking, hiking, or off-highway vehicle riding contribute to the Nevada economy or to the local economies of Nevada's communities—which are often gateways to some of the best recreational opportunities the state has to offer. Nor do we know what the non-market economic benefits of healthy lands and waters—known as ecosystem services—are to Nevada. All of this would be extremely helpful information to provide policy makers in considering future investments in all kinds of outdoor recreation in Nevada, including OHV trails, trailheads, and staging areas.

It takes a great deal of time and money to study the economic impacts at these more local, granular levels. NDOR has been able to secure \$150,000 from the U.S. Economic Development Administration to study these contributions in greater detail. I write this letter to encourage the OHV Commission to consider this application, matching the 1:1 the federal investment being made in this effort. The data, results, and information about these economic impacts are certain to be valuable to numerous stakeholders, in addition to the Nevada Off-Highway Vehicles Program, and certainly very important to the diverse communities around Nevada in which outdoor recreation on public lands and waters plays a significant role in economic development, growth and resiliency, cultural vitality, community vibrancy, and public health.

Thank you for giving the application your full consideration.

Respectfully,

WILLIAM A. DUNKELBERGER
Forest Supervisor



PROJECT BACKGROUND

Earth Economics (EE) provides Washington State with data on the impact that outdoor recreation has on the state's economy. In 2020, released *Economic Analysis of Outdoor Recreation in Washington State*. The study quantified the amount of spending, number of jobs, and tax contributions of outdoor recreation in Washington State. Through this study, it was identified that several state agencies stood to improve the depth of recreation data currently collected – primarily visitation and spending data. The Washington Department of Fish and Wildlife (DFW), Washington State Parks and Recreation Commission (Parks), Washington State Department of Natural Resources (DNR), and Washington State Recreation and Conservation Office (RCO), henceforth referred to as 'Client', have been in discussions with EE to better understand visitation and consumer spending associated with outdoor recreation on state-managed lands.

New methods for estimating visitation and spending patterns have been emerging in the field of recreation economics. For instance, researchers are now beginning to associate geo-referenced social media activity with visitation to national parks and national wildlife refuges^{1,2}. In Oregon, EE acquired anonymized and aggregated cellular application data to better understand visitors to 10 recreation sites. The data revealed insights such as visitor use, visitor origin, and length of stay; this data was later used to estimate economic contributions of outdoor recreation in Oregon. EE is now proposing to acquire and analyze a statewide cellular dataset for Washington to better understand the economic contribution of outdoor recreation in Washington. The tasks outlined below describe how EE proposes to fill current data gaps and highlight new insights in the outdoor recreation economy.

TASK 1 PROJECT KICKOFF AND FACILITATED PROJECT UPDATES

TIMELINE: April 15, 2021 – August 30, 2021

EE will schedule a kick-off meeting with the Client to finalize the goals of the study and other contextual issues related to the project, including developing consensus on definitions and analysis parameters, and detailing the methodology for the analysis. EE will also host check-in calls at set intervals to update project partners and stakeholders on the progress of the analysis, and request assistance from experts where barriers exist.

TASK 2 DATA COLLECTION

TIMELINE: April 15, 2021 – May 15, 2021

EE will work with the Client to obtain participation data currently collected by the agencies. EE is aware of data currently collected by the Client, including Parks' visitation data, DNR site-specific trail and car counters, and DFW harvest and fishing license reports. This data will be used to inform the models for determining use on non-monitored sites. Visitation data will be standardized to *participant trips*.

In concerns to consumer spending data, EE will use outputs from a recently conducted consumer spending survey of recreationists in Washington, which used Parks camping permit and Discover Pass users. Spending data will be categorized by NAICS, and specific to the agency and geography.

¹ Tenkanen, H., Di Minin, E., Heikinheimo, V. et al. Instagram, Flickr, or Twitter: Assessing the usability of social media data for visitor monitoring in protected areas. *Sci Rep* 7, 17615 (2017). <https://doi.org/10.1038/s41598-017-18007-4>

² Dagan, D.T., Brownlee, M.T.J., Henry, C., & Wood, S.A. (2020). Enhancing visitor estimation on National Wildlife Refuges: Phase one report. Technical report submitted to the U.S. Fish and Wildlife Service. In partial fulfillment of Research Work Order No. 104.

Finally, EE has already gathered GIS data for all three agencies but will verify that the acreage totals and naming conventions are in-line with each agency's current records.

TASK 3 ACQUIRE, CLEAN, AND ANALYZE ANONYMIZED CELL PHONE LOCATION DATA

TIMELINE: April 15, 2021 – June 15, 2021

The first step of our analysis will be to acquire and clean hundreds of millions of anonymized cellular data points for the years 2019 and 2020. Using unique cellular IDs, EE will identify devices that 'ping' within the defined Client geographies. Devices that do not ping within these bounds would be removed from the dataset.

Next, EE will develop visitor profiles for each unique geography within the dataset. Research has shown that two leading factors determine how much a consumer spends when visiting a recreation site – distance travelled and duration of the trip. Therefore, each unique device ID will be categorized as 1) local or nonlocal (travelling more than 50 miles to reach the site), and 2) day visitor, overnight visitor staying at the site, or overnight visitor staying in the area. Visitor origins will be associated at the census block level, which will allow analysis outputs to include census-block specific data on topics such as sex, age, race, Hispanic or Latino origin, household relationship, household type, group quarters population, housing occupancy, and housing tenure. To protect anonymity, and minimum-data thresholds will be developed as a second safeguard for anonymity.

Finally, EE will use regression analysis to associate data currently collected by agencies with anonymized cellular data. The analysis will be agency and geographically associated to limit biases that may exist in the dataset (e.g., Parks' visitors may show up more frequently in the cellular dataset than DNR visitors; western Washington and eastern Washington visitors may have different cellular use patterns.)

Outputs of the analysis will include these site-specific data for 2019 and 2020:

- 1) The number of recreation days occurring on state-managed lands.
- 2) The origin of recreation visitors (aggregated by county or census-block origin).
- 3) Average length of stay by recreation visitors, by above grouping (local/nonlocal, day/overnight).

Using participation rates and associated spending profiles, EE will estimate the annual spending associated with visitation to Client lands. EE will analyze the economic effects linked to the consumer spending of visitors, including total economic output, jobs, income, taxes, and associated economic multipliers. To measure these effects, we will use input-output (I-O) modeling, which characterizes links between industries within regional economies. Simply put, I-O modeling shows how spending in one industry ripples throughout the economy.

EE uses IMPLAN software—the industry-standard for I-O modeling—which draws on data from the U.S. Department of Commerce, the U.S. Bureau of Labor Statistics, and other agencies to model how expenditures in one industry continue to circulate throughout regional economies. The direct, indirect, and induced economic effects driven by outdoor recreation-related expenditures will be reported as economic output, jobs, income, and taxes.

SUB TASK: COVID-19 Analysis

In addition to providing the Client with 2019 and 2020 data, EE can use the cellular data to identify how much time park visitors are spending in adjacent communities, further revealing how the economy has changed due to COVID. Through this behavioral analysis, EE will identify all commercial parcels associated with the outdoor recreation economy in Washington State (e.g., hotels, gas stations, retail) and then observe whether park visitor pings are identified within those parcels. This analysis would show whether park visitors are spending

more, less, or the same amount of time in park-adjacent communities (e.g., when they would have spent time at the local brewery, they may now forego this trip to practice social distancing).

While not the intent of this analysis, the outputs would also connect unique parks and recreation lands with adjacent industries, a useful tool in developing relationships with industries in the community. For instance, the analysis would show what percent of park visitors visited retail stores in the park-adjacent community.

TASK 4 ANALYSIS RESULTS

The data provided by EE can be a powerful tool in providing site-specific insights into recreation lands. The presentation of the data can be as important as the data itself, and can be provided to the state lands team in several formats, listed below:

Option 1: Update to RCO Study

TIMELINE: July 1, 2021 – August 1, 2021

EE will update the 2020 Economic Analysis of Outdoor Recreation in Washington State with the economic estimates produced in the prior analysis. An errata will be added to the current report to reflect these changes.

Option 2: Standalone Economic Report

TIMELINE: July 1, 2021 – August 30, 2021

EE will provide a fully designed report that details the economic contribution of Client lands. The results will be presented in a report consisting of an executive summary, introduction, methods for collecting data, analysis results, and references.

Option 3: Economic Dashboard

TIMELINE: July 1, 2021 – August 30, 2021

The outputs of the analysis will be provided to the Client in a Tableau dashboard. Using tableau will allow the Client to generate their own economic reports given a set of parameters. For instance, users could run a report to identify the economic impact that nonlocal visitors have on DFW lands in Chelan County. Dashboard metrics will include geospatial (i.e., maps) and tabular data outputs. This output form allows users to interact with and deeply explore the data.

The Dashboard would be hosted on Tableau public, which would give the public access to the final dataset, analysis outputs, and total use of the tool. If the Client desires to keep the data on a private server, Tableau offers this as an annual fee.

ORGANIZATIONAL BACKGROUND

Founded in 1998, EE is a 501(c)3 nonprofit based in Tacoma, Washington. Our mission is to quantify and value the benefits that nature provides. Through a better understanding of these benefits, communities can make more effective, long-term decisions about their natural assets, balance nature with development, and protect community resources. EE has provided economic valuation and policy support services to governments, tribes, firms, and communities in the U.S. and around the world for over 20 years. Our systems-thinking approach supports economic and community development while protecting critical natural assets such as watersheds, parks, and green infrastructure.

EE excels at leveraging new data and methods to better understand the complex interactions between social, environmental, and economic activities. We combine tools such as IMPLAN's input-output models for

economic impact studies, ESRI's ArcMap geospatial processing suite, and our proprietary EVToolkit database with local data and custom-built models based on the latest peer-reviewed literature. We collaborate with local experts and stakeholders to ensure that the right questions are answered in ways that produce actionable results. Our analyses can be applied by local communities, leaders, and advocates to foster more robust discussions and inform policy and budget development.

ORGANIZATIONAL EXPERIENCE

Recreation and Reservoirs: Economic Analysis of the Larimer County Department of Natural Resources Reservoir Parks

Authors: Trygve Madsen, Johnny Mojica, Jordan Wildish

Period of Performance: 7/10/2019 – Ongoing Engagement Support

Reference: Kenneth Brink: kbrink@larimer.org, 970-619-4555

Project Summary: EE used input-output modeling to show how spending in one industry affects the regional economy of Larimer. By measuring both the direct and indirect effects of spending associated with reservoir recreation, EE estimates the monetary value of four different reservoirs. The spending associated with reservoir park recreation totals \$164 million per year and goes on to support \$285 million in associated spending within Larimer County. Based on these calculations, EE estimated the effects of a lowering water level. By understanding the impacts of less reservoir surface area on the economy, the region can more accurately delegate water rights and prepare for any economic consequences.

Economic Contribution Analysis of City of Memphis Investments into Parks and Neighborhoods

Authors: Erin Mackey, Johnny Mojica, Trygve Madsen

Period of Performance: 07/01/2019 – Present

Reference: Will Younger: william.younger@prosconsulting.com, 317-679-4907

Project Summary: EE used input-output modeling to estimate the regional economic contribution of operational and capital investments by City of Memphis into the Parks and Neighborhoods Division from 2017 to 2019. Through direct and indirect effects, Memphis Parks spending supported an average of \$70.7 million of economic activity, 577 full- and part-time jobs, and \$2 million in state and local tax revenue every year. For every dollar Memphis Parks spent, an additional \$0.81 in economic activity was supported. This report is part of the 2020 Master Plan for the Parks and Neighborhoods Division and will inform local decision makers on the economic significance of investments into Parks.

Economic Analysis of Outdoor Recreation in Washington State – 2020 Update

Authors: Johnny Mojica and Angela Fletcher

Period of Performance: 1/10/2020 – 10/05/2020

Reference: Wendy Brown, Policy Director of Washington State Recreation and Conservation Office, 360-902-3021, wendy.brown@rco.wa.gov

Project Summary: Washington offers hundreds of outdoor recreation activities that are enjoyed by residents and tourists alike. These include activities such as hiking, biking, rock climbing, horseback riding, hunting, fishing, snowmobiling, camping, dirt biking, off-road vehicle (ORV), and beachcombing. Building off an analysis conducted in 2015, our [Economic Analysis of Outdoor Recreation in Washington State](#) demonstrated updated data in the estimated economic contribution of outdoor recreation, as well as non-monetary benefits (ecosystem service values) that stem from public recreation lands. Outdoor recreation spending diversifies Washington's economy through outdoor recreation expenditures, spending effects, consumer surplus, and environmental benefits.

This report estimates that outdoor recreation in Washington supports \$26.5 billion in annual expenditures. This analysis estimated these benefits through an economic contribution analysis, using input-output (I-O) modeling to measure the financial linkages between industries within a regional economy. These concepts and methods allowed for valuing the economic contribution of outdoor recreation and the economic benefits that stem from public recreation lands.

PROJECT TEAM

JOHNNY MOJICA PROJECT DIRECTOR

As a Project Director at EE, Johnny specializes in holistic economic analyses of public lands and in developing community-based partnerships around access to and funding for these critical public spaces. He works to assess the impact of policy, management, and business decisions by using economic tools such as input-output modeling and benefit-cost analysis. He has completed formal training to conduct IMPLAN analysis, as well as training on benefit-cost analyses for federal agencies. Johnny uses his training to incorporate economic, social, and environmental benefits into the decision-making framework.

Johnny has driven the outdoor recreation economics community to new heights through his innovative analyses and approaches to measuring consumer behavior. He has worked with economists from the University of Washington, the U.S. Forest Service, Army Corps of Engineers, Bureau of Reclamation, and industry groups to measure the significance of outdoor recreation assets throughout the country. Coupled with his deep experience as a Project Director at EE, his passion for driving the science forward is why he is the ideal candidate to lead this work.

TRYGVE MADSEN SENIOR RESEARCH ANALYST

Trygve uses applied economics to examine public policy and investment decisions in order to maximize community benefits and build resilience. With a background in quantitative and qualitative analysis, he has conducted recreation analyses for governmental agencies in Oregon, Washington, and Colorado, input-output modeling for economic contribution analysis, and regression and scenario analyses. Trygve uses his background in public policy to examine ways to improve benefit-cost analyses and ensure that decisions are made using the most complete information available.

Trygve will oversee the collection, cleaning, and organizing of golfer participation and spending data. He will communicate with the City to gather this data. While Trygve is a natural problem solver, is a humble analyst, and isn't afraid to confer with the project team to overcome hurdles. This, paired with his detail-oriented workstyle makes him well suited for this work.

ALICE LIN GIS MANAGER

Alice oversees the spatial component of EE' work and leads our GIS team. Using her background in geoscience, she employs a holistic approach to synthesizing data from diverse sources to produce simplified models of landscape characteristics for economic valuation. In addition to mapping ecosystems, Alice develops innovative approaches to further leverage GIS, whether through analysis of anonymized cell phone data, remote sensing of vegetation health, or mapping population demographics.

Alice has worked with Johnny over the past year to develop methods and approaches for analyzing anonymized cellular data. She has a natural ability for building in scalability to projects, allowing her to complete tasks in an efficient matter. Alice never ceases to amaze the project team with her cartographic abilities, meaning the end-product will be sure to impress both the City and external report readers.

MATT CHADSEY TABLEAU DESIGNER

Matt has over 30 years of experience navigating the interface between critical environmental issues, a balanced economy, and truly resilient communities. Matt's career has spanned challenges from water conservation and reuse to estuary protection and wetland restoration, including previously serving as EE' Executive Director. He has extensive experience helping non-profits, public companies, and government agencies find innovative, practical solutions to their most critical challenges through data-driven analysis, consultation, and workshop facilitation. Throughout Matt's career, he has worked across different types of organizations (government, non-profit, consulting, academic research, and corporate), learning how their structure and goals contribute to the systems within which they exist. Matt believes that complex systems analysis, portfolio planning, and data visualization are drastically under-utilized as tools to better understand and address our greatest challenges at all scales.

Matt, now a contractor for EE, will work with EE and the Client to design and build the Tableau Dashboard.