

**Award Number:** P14AC01057

**Project Number**: CSUCP-149

**CFDA Number: 15.945**

**Park/NPS Unit:** Fire Management Program Center (FMPC), Division of Fire and Aviation

**Title of Project:** Application of strategic wildfire and fuel treatment analysis to national program decision support

**Administered through the:** Colorado Plateau Cooperative Ecosystem Studies Unit Cooperative Agreement Number H1200-09-0005

**CESU Partner:** Colorado State University

**PROJECT CONTACTS:**

**Principal Investigator:** *Dr. Douglas Rideout, Professor, Forest Economics, Colorado State University, 1472 Campus Deliver, Fort Collins, CO 80523-1472, Tel: (970) 491-7234 Fax: (970) 491-6754,* *Doug.rideout@colostate.edu*

**Partner Administrative Contact*:*** *Kristine Miller, Research Administrator, Sponsored Programs, Colorado State University, 2002 Campus Delivery, Fort Collins, CO 80523-2002, ph: 970.491.1552 | fax: 970.491.3292, email:**kris.miller@colostate.edu*

**NPS Certified ATR:** *Andy Kirsch, National Park Service, 3833 South Development Avenue*

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**FUNDING INFORMATION:**

**Amount Funded:** $ 200,000

**NPS Account Numbers (amounts in parentheses): 14X PPWOVPADD3 PF310WF85.Y00000**

**Fund Source (e.g., ONPS, FLREA, CRPP, CESU, etc.): Fire**

[x] NPS Funding

[ ]  Is this funded using a reimbursable account number? If yes, IMR contracting needs a copy of the Interagency Agreement.

**PROJECT DATES:**

**Start Date:** *June 30, 2014*

**End Date:** *June 30, 2016*

**NPS Administrative Contacts**

**Interim CESU Coordinator:** Todd Chaudhry, CPCESU Research Coordinator, Flagstaff, AZ, Phone: 928-523-6638; Fax: 928-523-2014

**Intermountain Region Administrative Contact:** Kelly Adams, Grants and Agreements Specialist, National Park Service, 12795 West Alameda Pkwy, Lakewood, CO 80228 Phone: 303-969-2303 Fax: 303-969-2992 Email: Kelly\_adams@nps.gov

**FEDERAL FINANCIAL REPORTS SCHEDULE:**

***Federal Financial Reports*** (Check as required for project based on spending plan, period of performance, risk, cooperator history, etc.)

{X} Quarterly {} Semi-annually {} Annually {X} Final

**Project SCHEDULE AND TECHNICAL REPORT DEADLINES:**

List all technical reports and products in sequential order as required in the scope (more lines and milestones can be added as needed):

*Project Start Date* – June 30, 2014

*Technical progress reports –* {} Quarterly { } Semi-annually {X} Annually

(Check as needed from PI to monitor progress of specific project. Content should be addressed in the scope.)

*Investigator’s Annual Report (IAR)* – June 30, 2016

*Database, Collections/Specimens, Archives, and Maps provided to the NPS ATR or Technical Expert* – June 30, 2016

*Draft Final Report* – January 1, 2016

*Final Report* – June 30, 2016

*Project End Date* – June 30, 2016

Final FFR is due within 90 days of Project End Date

**PAYMENTS**

**2 CFR PART 215.22*:*** Cash advance (drawdown) to recipient organization shall be limited to the minimum amounts needed and be timed to be in accordance with the actual immediate cash requirements of the recipient organization in carrying out the purpose of the approved program or project. The timing and amount of cash advances shall be as close as administratively feasible to the actual disbursements by the recipient organization for direct program or project costs and the proportionate share of any allowable indirect costs.

**2 CFR PART 215.25 (8)(e)(1):** Incur pre-award costs 90 calendar days prior to award or more than 90 calendar days with the prior approval of the Federal awarding agency. All pre-award costs are incurred at the recipient’s risk. (i.e. the Federal awarding agency is under no obligation to reimburse such costs if for any reason the recipient does not receive an award or if the award is less than anticipated and inadequate to cover such costs.)

**CPCESU REQUIRED PRODUCTS (may be different from those products required by the ATR – See Statement of Work for Products required by the NPS unit):**

The Principal Investigator will prepare a brief report abstract suitable for public distribution and two hard copies and an electronic version (in PDF file format) of the final report and mail all toTodd Chaudhry, CPCESU Research Coordinator, NAU P.O. Box 5765, Flagstaff, AZ 86011. Please be sure to include the project number (e.g.; NAU-###, UNM-###) and the P number on the cover page of the final report.

**PROJECT ABSTRACT:**

The investigators will continue to develop the STARFire system. STARFire is a scalable spatial fire planning and budgeting system. It operates at the local, state or national levels and combines the full spectrum of values (life, property, protection, and nature’s services) with fire behavior information. STARFire demonstrates return on investment, quantifies performance and the impact of budget changes. STARFire supports agencies, planners and managers with wildfire decision accountability including: 1) a risk assessment for the entire planning unit that spatially identifies values at risk and the resources that would benefit from fire and by how much; 2) locates fuel treatments to maximize value added and return on investment; 3) analyzes initial attack/preparedness budget options and demonstrates how dispatch locations and preparedness strategies reduce risk and respond to fuel treatment programs; and 4) provides the ability to include the cost of smoke and smoke impacts in strategic planning.

Using the STARFire system the investigators will implement a program of work to apply the fuel treatment analysis and the initial attack/preparedness budget analysis components of the STARFire system on approximately 40 units with the most wildfire workload. The project objective is to design and implement the integration of the outputs from these STARFire components with the NPS Planning Data System (PDS) analysis outputs to enrich budget allocation decisions. Reports will include a summary and evaluation of the STARFire outputs and their relevance to PDS metrics, along with the submission of project findings to professional literature. Reports and interpretation of all analysis outputs will be developed for affected parks.

**Scope of Work:**

The investigators previously completed a prototype phase of work that demonstrated the ability of the STARFire system to estimate the value added from fuel treatment and preparedness programs. The investigators also demonstrated how fuel treatment and preparedness budgets can be organized using the value added estimates generated from STARFire to most effectively respond to changes in funding levels and how to obtain the greatest return on investment. The process was demonstrated at seven parks (BICY, DINO, EVER, GRSM, SEKI, YELL).

The investigators will extend and enhance knowledge of the applications and limits of the updated analysis components developed in this prior phase (Project numbers: P12AC10224, P13AC00774, P13AC00203 to 40 units). These units represent the majority of parks sufficient to capture the bulk of the NPS fire wildland fire workload, especially parks with fire funded staff. This work will require the collection and generation of spatial files associated with the fire behavior and the identification of resources and their associated implicit attribute prices for each of the 40 units. The investigators will conduct scoping and informational sessions with field units and collaborate to acquire and process the geospatial data required for the analyses. Certain input and intermediate process calculations will be provided for validation by the subject field units as needed. The analytics of the system have been peer reviewed and published in scientific journals as listed in the “Literature Cited” to this section. The investigators will attempt to establish the relationship between various budget and staff inputs (from the PDS analysis) and the expected changes to landscape values that result. This work will support the development and defense of unit and regional wildland fire staffing and budget allocations. The investigators will develop a program of work for the analysis. Major components for this program of work will include using STARFire to generate a quantitative assessment of the current landscape condition (baseline) to identify the potential value added from preparedness or fuel treatment management actions for each unit. A broad range of preparedness and fuel treatment budgets will be analyzed. STARFire will be used to identify fuel treatments for each budget level that produce the most value added per unit cost until the budget is expended on each unit. The treatments will then be applied to the landscape. Ignition reductions will be applied using equations established in the previous phase of work that correspond to each preparedness budget level for each unit. The difference between the baseline expected landscape value and the preparedness or fuel treatment expected landscape value will estimate the value added generated by the management alternatives at each unit. The estimates will be used to generate graphs and summary statistics detailing the relationship between various budget and PDS inputs and the expected value added generated from the management alternatives. Reports including descriptive and interpretative displays of the analysis outputs (Maps depicting: 1) fuel treatment locations for each budgeting level 2) expected value added for each treatment scenario, 3) fire behavior outputs) will be developed and presented to the FMPC and field units. The work may be completed through site visits, conference calls, video conference or interviews. Travel must be in accordance of Federal Travel Regulations and will not be reimbursed beyond allowable expenses. The Cooperator will be working with NPS field units over the course of the agreement to develop and validate input data, produce iterative analysis to be evaluated and updated per field unit input, transmission of analysis results to end users, and development of reports interpreting analysis results.

Literature Cited

Rideout, DB, Wei, Y (2013) A probabilistic analysis supporting the management of unplanned ignitions at Sequoia and Kings Canyon National Parks. Journal of Forest Sustainability (In Press)

Rideout, DB, Ziesler, PS, Kling, R, Loomis, JB, Botti, SJ (2008) Estimating rates of substitution for protecting values at risk for initial attack planning and budgeting. Forest Policy and Economics 10, 205-219.

Rideout, D.B., R. Reich and P.S. Ziesler. 2014a. Using benefit transfer to estimate average relative marginal values for wildland fire program planning. Journal of Sustainable Forestry. 33, 387-406.

Rideout, D.B., P.S. Ziesler and Nicole J. Kernohan. 2014b. Valuing fire planning alternatives in forest restoration: using derived demand to integrate economics with ecological restoration. Journal of Environmental Management 141, 190-200.

**COOPERATIVE AGREEMENTS OR TASK AGREEMENTS INVOLVING COOPERATORS WORKING ON-SITE**

**Background**

In cooperative agreements or task agreements with universities where the university utilizes interns, student employees, research associates (RAs) or cooperators on-site (hereafter called “cooperator personnel”), these cooperator personnel sometimes work on government sites in close proximity to federal employees. It is illegal (without specific statutory authority) for federal employees to directly supervise the cooperator personnel or any university employees or for the students or other university employees to supervise federal employees. When cooperator personnel are working on an NPS site, it is important that there is a clear distinction between students and federal employees.

**Office Environment and Vehicles**

* The office space of the cooperator personnel and NPS personnel should be clearly labeled (Name and NPS or University affiliation on office or cubicle space).
* Cooperator personnel should be listed separately from NPS personnel in telephone lists, other identification or organizational rosters, and publication credits.
* Cooperator personnel should not receive “all-employee” e-mail or other communications intended for NPS personnel (unless it relates directly to the work the cooperator is doing for the NPS). When the e-mail does relate to the work being done, a copy of the same e-mail message should be sent to the University or cooperator’s supervisor.
* Cooperator personnel may use NPS e-mail systems when the communication relates directly to the work the cooperator is doing for the NPS. The e-mail addresses of the cooperator personnel must include a label associated with their NPS e-mail address that identifies the cooperator’s status (i.e., “Linda Webb, Cooperator” would be the label associated with the e-mail address, linda\_webb@contractor.nps.gov). Doing so clearly identifies this individual each time they send an e-mail message using the NPS system, and it identifies their status as a research associate, student intern or student employee in the e-mail directory.
* Unless stipulated in the agreement, cooperator personnel should not drive government vehicles.
* Unless stipulated in the agreement, cooperator personnel should not ride as a passenger in a government vehicle. When this is planned as part of the agreement, an appropriate amount of liability insurance should be negotiated.
* Prior written approval by the Park Superintendent or Center Manager must be obtained in order for a task to allow cooperator personnel to drive or ride in government vehicles.

**Supervision and Scheduling**

* Each task must specify the university’s/cooperator’s supervisor for the cooperator personnel.
* Unless stipulated in the agreement, NPS staff should not set hours for cooperator personnel, specify where the work should be done, or conduct performance appraisals. National Park Service staff may give performance feedback to the cooperator personnel supervisor.
* Cooperator personnel should report leave, scheduling, and other related issues to the university or cooperator’s supervisor, not to NPS employees. The supervisor of the cooperator personnel should then communicate with the NPS. National Park Service employees cannot directly supervise cooperator personnel on a day-to-day basis. Work should be given to the cooperator personnel (via the cooperator’s supervisor) on a “task basis.” Cooperators should work without NPS supervision to accomplish each task, although technical consultations and cooperation is permissible.
* The Cooperator will be responsible for any disciplinary action needed to correct student employee conduct or performance problems. The NPS agreements technical representative will inform the university/cooperator’s supervisor of any conduct or performance problems.
* The Cooperator will remove student employees from their positions if they fail to improve performance or address conduct issues.
* The NPS will review and provide feedback to students or interns regarding work assignments.
* The NPS will inform the cooperator of conduct or performance problems with cooperator personnel so that the university can counsel employees and correct the performance problems.
* The NPS will recommend to the cooperator dismissal of cooperator personnel based on conduct or performance issues.
* The Cooperator will hire students, interns or RAs to work on NPS tasks identified in the agreement. Hiring will be conducted in consultation with the NPS Agreements Technical Representative (ATR).
* The Cooperator will: pay students, interns or RAs for hours they have worked in support of the agreement.

**Representation and Communication**

* Cooperator personnel cannot in any way represent themselves to the public as NPS employees.
* Cooperator personnel are required to wear visible identification at all times.

**Other Issues**

* Cooperator personnel should not list an NPS affiliation on publications, but rather should list the cooperative agreement under which the work was performed.
* Cooperator personnel should not be invited to official NPS “social” events.
* Cooperator personnel are not authorized to purchase property and supplies with government funds.
* Cooperator personnel will follow the local policy of the facility when federal facilities are closed due to early release for holidays, snow days, etc.

**PRODUCTS:**

Products will include working with field units over the course of the agreement to develop and validate input data, produce iterative analysis to be evaluated and updated per field unit input, transmission of analysis results to end users, development of reports interpreting analysis results. For each unit analyzed, products will include a spatial analysis of the landscape assessment and relationship to budget and staff inputs. One report will cover all parks with GIS layers produced for each park.

Final report will be in electronic format, MSWord or the equivalent. All mapping will be in in ArcMap following Federal Geographic Data Committee (FGDC) standards and will be transferred to the National Park Service in digital format at the completion of the agreement

**BUDGET:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  SF Budget 2014-2016 | Year 1 | Year 2 | Total | Budget Notes (Y1) | Budget Notes (Y2) |
| Personnel Salaries |  |  |  |  |  |
|  Rideout | 32,538 | 16,758 | 49,296 | 3.0 months @ 10846/mo | 1.54 months |
|  Fringe | 8,232 | 4,240 | 12,472 | At 25.3% salary | At 25.3% salary |
|  Kernohan | 60,101 | 23,214 | 83,315 | 12 months @ 5008/mo | 4.63 months |
|  Fringe | 15,206 | 5,873 | 21,079 | At 25.3% salary | At 25.3% salary |
| Total Salary | 116,077 | 50,085 | 166,162 |  |  |
|  |  |  |  |  |  |
| Domestic Travel | 1,800 | 936 | 2,736 | Two trips to NIFC | One Trip to NIFC |
| Materials and Supplies | 1,100 | 215 | 1,315 | Dedicated computer and software | Dedicated software support |
|  |  |  |  |  |  |
| Total Direct Costs | 118,977 | 51,236 | 170,213 |  |  |
|  |  |  |  |  |  |
| Facilities and Administrative | 20,821 | 8,966 | 29,787 | At 17.5% | At 17.5% |
|  |  |  |  |  |  |
| Total  | 139,798 | 60,202 | 200,000 |  |  |

**Facilities and Administrative**: **The 17.5% indirect cost rate is as negotiated by CESU and applied to all direct costs.**

**Materials and supplies** includes acquisition and/or upgrades of specialized software and hardware to design and operate the STARFire system, to store park data, to generate project results, to manage data and to support the computer server environment for disseminating and storing results. Examples of such software include MS server starting at $200 per license and statistical processing software. A stable dedicated computing environment requires redundancy in systems.