General Information

Project Title	Beaver Habitat Analysis and Management in Eastern Washington
Project Short Description	The Lands Council (TLC) will develop a model of habitat suitability and restoration potential for beaver in Eastern Washington that would help locate suitable beaver project focus areas and evaluate population dynamics and trends. This would lead to decision criteria for future beaver management decisions related to nuisance management, relocations, and research, and could be modified for any region. TLC will also perform various beaver management activities in local watersheds.
Project Long Description	Beavers have been established increasingly as ecosystem engineers as their activities broadly influence many plants and other animals and offer significant environmental benefits. They are especially important in the Western US where riparian and wetland habitats comprise less than 2% of the landscape yet support up to 86% of wildlife species. Beaver dams retain excess sediment and create wetlands, while plant communities supported by wetlands utilize excess nutrients in the water, making for cleaner water downstream. Beaver-created wetlands also provide important habitat for fish rearing, migratory water fowl, and many other species of fauna. A complex network of beaver dams improves water storage and attenuates flooding events in the spring, while slowly releasing this water in the summer and fall, improving late-season flow. The Lands Council, along with representatives of the US Forest Service, Department of Transportation, Washington Department of Fish and Wildlife (WDFW), and trappers alike, recently participated in a statewide beaver management forum in order to share information, latest technologies, and obstacles of beaver management in Washington. The group identified desired outcomes to improve management, and a primary outcome is the improvement of beaver habitat suitability modeling. This would inform beaver management officials throughout the state where suitable habitat needs to increase, what sort of marginal habitat beaver are currently occupying, locations of potential relocation sites, and more. The Lands Council has the background and experience to improve this sort of habitat modeling. In 2011, TLC staff worked with state legislators to pass a bill to improve beaver management and record keeping throughout the state, which we will use in our analysis. Our work will expand on present models, such as that implemented by the Lands Council in 2009 and the BRAT model used in Utah by the Grand Canyon Trust. The model will use data from a variety of sources, including USGS data on land cover, land use, and protected areas; WDFW data on beaver trapping, nuisance complaints, and beaver relocations; USFS data on riparian vegetation; and data collected by TLC regarding vegetative habitat type currently in use by beaver. This will create a model that has implications and usefulness for other groups working in beaver management across the state and country. Simultaneously we have the capacity to carry out on-the-ground management techniques to resolve beaver and landowner conflict in order to retain maximum ecosystem services. Currently calls to the local WDFW offices regarding nuisance beaver can be directed to us and we receive over 10 cases annually to

General Information

work with. We will perform beaver management activities in local watersheds that include installing pond-leveling devices and culvert protectors to reduce property damage while retaining ecosystem services. In some cases we will relocate nuisance beaver populations to suitable habitat in the Colville National Forest in order to maximize the chances of water storage and riparian enhancement. Biologists in the Colville National Forest are supportive of our project and allow relocations to take place within the forest and share habitat information with us.
This project has been discussed and approved by the Spokane Regional Watersheds group, consisting of WRIAs 54, 55/57, and 56. Nuisance management in order to protect beaver maintained streams and wetlands will occur within these watersheds, while GIS analysis will take place across Eastern Washington.

Total Cost	$53,000.00*	Total Eligible Cost $46,000.00*
Effective Date	7/1/2015	Expiration Date 6/30/2017
Ecology Program	Water Resources	

Project Category*

Infrastructure and Water Management Construction (Efficiency Improvements)
Surface and Sub Surface Storage Feasibility Study and Construction
Water Acquisition or Water Bank/Exchange Development
Water Measuring Devices
✔ Other

Will Environmental Monitoring Data be collected? No

Overall Goal

While statewide beaver management has improved, opportunities to take advantage of beaver ecosystem services are still missed. Analyzing spatial data showing nuisance complaints filed with WDFW will show any hotspots of activity where citizens need assistance and education regarding beaver benefits. Analyzing the vegetative habitat used by beaver will show what sort of marginal habitat beaver currently occupy which will help inform decisions regarding criteria for relocation sites. Further analysis will reveal habitat corridors used by beaver and where riparian restoration of one area would potentially connect two larger areas of habitat. By developing this model we hope to answer these questions and more and share our methods with other beaver management groups throughout the country to help optimize beaver management. By simultaneously enacting beaver management such as beaver relocations we hope to continue our work toward habitat improvement and water storage in Eastern Washington.

Recipient Contacts

Project Manager	Amanda Parrish Amanda Parrish Watershed Program Director 25 W Main Ave ste. 222 Spokane, Washington 99201 (509) 209-2408 aparrish@landscouncil.org
Authorized Signatory	Mike Petersen Mike Petersen Executive Director 25 West Main Ave. Suite 222 Spokane, Washington 99201 (509) 209-2406 mpetersen@landscouncil.org
Billing Contact	Debra Boswell Debra Boswell Administrative Director 25 W Main Ave Ste 222 Spokane, Washington 99201 (509) 838-4912 (509) 838-5155 dboswell@landscouncil.org

Other recipient signatures on printed agreement

To Add a Row
Enter a name and title
When done, click the **SAVE** button

To Delete a Row
In the row you want to delete, remove the information in the Name and Title textboxes

Recipient Contacts

After SAVE, a new row will appear

Name

When done, click the **SAVE** button
After SAVE, the row will be deleted
Title

Location Information

Statewide * Yes ✔ No

Ecology Region *	Eastern	100%
Click here to view map:		
County *	SPOKANE	25%
	LINCOLN	15%
	PEND OREILLE	20%
	STEVENS	20%
	FERRY	20%
Click here to view map:		
Congressional District *	District 05	100%
Click here to view map:		
Legislative District *	District 07	65%
	District 03	10%
	District 04	10%
	District 06	10%
	District 09	5%
Click here to view map:		
WRIA *	43 - Upper Crab-Wilson	2%
	52 - Sanpoil	2%
	53 - Lower Lake Roosevelt	2%
	54 - Lower Spokane	20%
	55 - Little Spokane	20%
	56 - Hangman	20%
	57 - Middle Spokane	15%
	58 - Middle Lake Roosevelt	2%
	59 - Colville	5%
	60 - Kettle	5%
	61 - Upper Lake Roosevelt	5%
	62 - Pend Oreille	2%
Click here to view map:		
Ecology Region	Statewide	100%
County	Statewide	100%
Congressional District	Statewide	100%
Legislative District	Statewide	100%

Location Information

WRIA	Statewide	100%

Latitude (expressed in decimals)

Longitude (expressed in decimals)

Facility Site ID

Facility Site Link

Scope of Work - Task 1 Project Admin: 1

Task Number	1		
Task Title	Project Administration/Management	Task Cost	$4,000.00

Task Description

A. The RECIPIENT will administer the project. Responsibilities will include, but not be limited to: maintenance of project records; submittal of requests for reimbursement and corresponding backup documentation, progress reports and recipient closeout report (including photos); compliance with applicable procurement, contracting, and interlocal agreement requirements; application for, receipt of, and compliance with all required permits, licenses, easements, or property rights necessary for the project; and submittal of required performance items.

B. The RECIPIENT must manage the project. Efforts will include: conducting, coordinating, and scheduling project activities and assuring quality control. Every effort will be made to maintain effective communication with the RECIPIENT's designees; the DEPARTMENT; all affected local, state, or federal jurisdictions; and any interested individuals or groups. The RECIPIENT must carry out this project in accordance with any completion dates outlined in this agreement.

Task Goal Statement

Properly managed project that meets agreement and Ecology administrative requirements.

Task Expected Outcomes

* Timely and complete submittal of requests for reimbursement, quarterly progress reports and recipient closeout report.
* Properly maintained project documentation

Recipient Task Coordinator

Debra Boswell

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When done, click the SAVE button
After SAVE a new row will appear
Repeat these steps for each deliverable

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When done, click the SAVE button

Deliverable #	Description	Due Date	Received? (ECY Use	EIM Study ID	EIM System Link	Latitude	Longitude	Location Address

			Only)
1.1	Progress Reports	10/1/2015	
1.2	Recipient Closeout Report	6/30/2017	

Task Number 2

Task Title GIS framework Task Cost $22,000.00*

Task Description Building on existing models, create a GIS framework for beaver habitat suitability modeling in Eastern Washington

Task Goal Statement To develop a GIS model that will better inform beaver management decisions, optimize beaver ecosystem services, and that can be used by beaver management professionals across the country

Task Expected Outcomes A compilation of GIS layers within a geodatabase, to be submitted to Ecology along with metadata and a report describing the methods and analysis

Recipient Task Coordinator Amanda Parrish
06/30/17

Deliverables

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When done, click the SAVE button
After SAVE a new row will appear
Repeat these steps for each deliverable

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Delete data entered in a row
When done, click the SAVE button

Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	EIM System Link	Latitude	Longitude	Location Address
2.1	GIS geodatabase, metadata, and report to be submitted to	6/30/2017						

Ecology

Task Number 3

Task Title Beaver management Task Cost $14,000.00*

Task Description Perform beaver management activities, including in-stream device installation and relocation when necessary

Task Goal Statement To resolve nuisance beaver issues in order to maximize beaver ecosystem services and water storage , including installation of pond leveling devices in cases of flood and relocation if necessary

Task Expected Outcomes Install in-stream management devices that will protect a minimum of 2 miles of beaver-managed stream habitat per year (approximately 3 devices per year), and perform at least 2 relocations per year

Recipient Task Coordinator Amanda Parrish

06/30/17

Deliverables

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When done, click the SAVE button
After SAVE a new row will appear
Repeat these steps for each deliverable

To Delete a Row
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When done, click the SAVE button

Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	EIM System Link	Latitude	Longitude	Location Address
3.1	install devices to protect a minimum of 2 miles of beaver-managed stream habitat annually	6/30/2017						
3.2	perform a minimum	6/30/2017						

of 2 relocation per year

Task Number	4
Task Title	Monitoring and maintenance
Task Cost	$6,000.00*
Task Description	Monitor installed devices and relocation sites, and maintain as necessary
Task Goal Statement	To assess efficacy of devices installed and relocations performed, and adapt if necessary
Task Expected Outcomes	Report on management methods used and what works best, and report on habitat of relocation sites and success of relocation after initial year.
Recipient Task Coordinator	Amanda Parrish
06/30/17	

Deliverables

To Add a Row
Enter a deliverable
When done, click the SAVE button
After SAVE a new row will appear
Repeat these steps for each deliverable

To Delete a Row
Delete data entered in a row
When done, click the SAVE button

Deliverable #	Description	Due Date	Received? (ECY Use Only)	EIM Study ID	EIM System Link	Latitude	Longitude	Location Address
4.1	Report management methodology and success	6/30/2017						

Organization: The Lands Council **WRPIFA-1517-TLC-00044**

Scope of Work Summary

Task Title	Task Cost
Project Administration/Management	$4,000.00
GIS framework	$22,000.00
Beaver management	$14,000.00
Monitoring and maintenance	$6,000.00
	$46,000.00

Total Eligible Costs
(from the General Information Form)
$46,000.00

Budget Proposal

Estimate your proposal's total budget needs by task and by element for FY 16, FY17 and beyond.

FY 16 - July 1, 2015 to June 30, 2016 FY 17 - July 1, 2016 to June 30, 2017

Total Eligible Costs (from General Information form)
$46,000.00

By Task

Task Title	Task Cost	*FY 16	*FY 17	Additional Fiscal Years	Total
Project Administration/Management	$4,000.00	$2,000.00	$2,000.00		
GIS framework	$22,000.00	$16,000.00	$6,000.00		
Beaver management	$14,000.00	$7,000.00	$7,000.00		
Monitoring and maintenance	$6,000.00	$3,000.00	$3,000.00		
Total	$46,000.00	$28,000.00	$18,000.00	$0	$46,000.00

By Element

Element	*FY 16	FY 17	Additional Fiscal Years	Total
Salaries - 1				$0
Benefits - 1				$0
Salaries and Benefits Combined - 1	$17,500.00	$12,500.00		$30,000.00
Contracts	$5,000.00			$5,000.00
Travel	$1,400.00	$1,400.00		$2,800.00
Equipment - 2	$2,100.00	$2,100.00		$4,200.00
Goods/services - 3				$0
Overhead - 4	$2,000.00	$2,000.00		$4,000.00
Total	$28,000.00	$18,000.00	$0	$46,000.00

If you receive a grant, you are responsible for procuring professional, personal, or other services using sound business judgment and good administrative procedures consistent with applicable state, and local laws, orders, regulations, and permits. This includes issuance of invitation of bids, requests for proposals, selection of contractors, award of sub-agreements, and other related procurement matters.

1 Fill in either the "Salaries" field and the "Benefits" field or fill in the "Salaries and Benefits Combined" field

2 Upload an itemized list of all equipment and explain why the equipment is needed. Equipment is defined as tangible property other than land, buildings, improvements other than buildings, or infrastructure, which is used in operations and with a useful life of more than one year. Examples are furnishings, equipment, and software.

3 Upload an itemized list of all Goods and Services

4 Overhead cannot exceed 25% of salaries/benefits

Upload Documents
Click the Browse button
Select your file
Click Save, your file will appear in the List of uploaded documents
Repeat for each file
To Delete a file, select the Delete checkbox next to the file and click SAVE

_Upload/19172-PIFA2015_equipment.docx

Additional Comments
A $5,000 contract will go toward hiring a GIS intern during the first fiscal year to assist with GIS analysis.
Travel was estimated as follows:
3 in-stream devices sites x 60 miles round trip x 4 visits annually x 0.55$ per mile = approximately $400 per year
2 relocation sites x 300 miles round trip x 3 visits annually x 0.55$ per mile = approximately $1,000 per year

OTHER PROJECT TYPE INFORMATION

Instructions:
Please fill in the appropriate fields.
Required fields are marked with an *.
When done, click the **SAVE** button.

Project Location

* Stream reach mile or location: Analysis in Eastern WA; management in WRIA 54 ,55/57, 56; relocations in Colville Nat'l Forest

Funding Source Information

* Known (in-hand), estimated or potential funding that is or may be part of the total project provided by sources other than this program

Amount	$7,000.00
Percentage of project budget	13 %

* Identify sources and type of funding other than through this grant. Include expected dates of participation. Upload letters of commitment, offer letters, application approvals or other supporting information.

Source and type of Funding

Amount	Percentage	Status	Known or expected date funds will be available
$3,000.00	6 %	confirmed	in-kind consulting from USFS & WDFW
$3,000.00	6 %	confirmed	in-kind volunteer assistance w/ beaver manag
$1,000.00	1 %	confirmed	in-kind volunteers assistance w/ maintenance
	%		

Upload Documents
Click the Browse button
Select your file
Click Save, your file will appear in the List of uploaded documents
Repeat for each file
To Delete a file, select the Delete checkbox next to the file and click SAVE

Estimated Total Water Savings

* Estimate the water to be conserved through efficiency gains from this project. Provide engineering or technical analyses to support your estimates.

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
QA (ACRE-FEET)			50	50	75	75	100	100	150	100	50		750
QI (CFS)													0

Instream Flow or Habitat Benefits

* Briefly describe anticipated instream flow or habitat benefits as a result of funding this project proposal:

Estimates for water conserved are derived from the following formula:
4 dams/mile x 2 miles x 30.5 acre feet/dam = 244 acre feet annually from preventative management.
Approximately half of that is estimated to be conserved from 2 annual beaver relocations.
A study by Glynnis Hood and Suzanne Bailey, Beaver mitigate the effects of climate on the area of open water in boreal wetlands in western Canada, 2007, shows that in similar drought years in the same region, there was 1.6 times more open water when beaver were present then when they were absent. Dams will help store spring runoff and release water later in the year, increasing summer flows. Beaver dams create heterogeneous, complex riparian areas and wetlands, while plant communities supported by wetlands utilize excess nutrients in the water, making for cleaner water downstream. The implications of our GIS analysis will further improve beaver management so that these ecosystem services can be maximized across the state.

991 of 1000

Resources currently committed to ensure long-term performance of the proposal

* Who will be responsible for long-term operations and maintenance of the project?

The Lands Council will be responsible for long-term maintenance in some instances, and we will work with landowners in other instances. In terms of tree protection, once TLC does the initial installation, landowners will be responsible for tree fencing going forward. The pond-leveling devices need to be checked 3-4 times per year initially, but only once per year in the future. TLC staff, interns, and volunteers will check to make sure the inlets are not plugged and device still functions. The beaver dams themselves are inherently temporary, and while staff will monitor sites to record beaver activity, extent of surface water inundation, and more, the beavers will naturally maintain the ecosystems without assistance.

726 of 1000

* Have operations and maintenance costs been identified? (•) Yes ( ) No

* Summarize the estimated costs on an annual basis below if possible at this time:

In the first two years, maintenance costs approximately $3,000 annually for staff time, with an estimated 25 hours per year of volunteer help valued at $500 annually. After two years, maintenance will cost approximately $500 worth of staff time and travel reimbursement per site.

279 of 1000