

SCOPE OF WORK

Municipal Water Supply Study (Public Education)

A. SCOPE OF SERVICES

Oregon State University Institute for Natural Resources (INR) shall provide employees, materials and support necessary to develop two reports for use by the Oregon Forest Resources Institute: 1) *Systematic Review of the Effects of Forest Management on Municipal Water Supplies from Forested Watersheds in Oregon* and 2) *Catalog and Survey of Municipal Water Supplies from Forested Watersheds in Oregon*.

The funds from OFRI shall provide resources for faculty and staff time, travel and supplies.

1. *Systematic Review of the Effects of Forest Management on Municipal Water Supplies from Forested Watersheds in Oregon.*

Active forest management effects on water quality have long been debated and researched. Recent public opinion surveys show that Oregonians' highest concern regarding forest management is its impacts on potable water supplies. The Oregon Health Authority (OHA), Oregon Department of Environmental Quality (DEQ), and the Oregon Water Resources Department (WRD) have source water protection programs to address those concerns. This task will conduct a Systematic Review of research on water quality impacts from forested lands and their management to provide a credible source of information for agencies and the public. To accomplish this, INR will:

- a. Establish a 7 – 10 member Steering Committee for this project that represents a balance of stakeholders concerned with the effects of forest management on public water supplies. Invitees will include representatives from the forest industry, State agencies, and conservation groups. The Steering Committee will:
 - (1) Develop and define the questions evaluated in the Systematic Review;
 - (2) Determine the literature search inclusion/exclusion protocols, e.g., geographic area of interest (presumably the Pacific northwest), temporal considerations, and criteria for credible research (presumably peer-reviewed journal articles);
 - (3) Suggest potential research publications for review.
 - (4) Review and comment on the report outline, structured interview questionnaire, and draft results; and
 - (5) Insure that the project adheres to its scope and process.
- b. Develop an outline of the report that includes identified human and naturally occurring drivers such as timber harvest, road construction, herbicide spraying, landslides, climate change and wildfire. Identified impacts to water quality and quantity such as temperature, sediment, nutrient concentration, chemical contamination and stream flow will be included.

- c. Create a Systematic Review Matrix for the project that includes the questions being asked of the literature and the parameters used to rank publications for inclusion in the review.
- d. Use a systematic process to identify the literature for review and screen it through the Systematic Review Matrix.
- e. Review the selected literature, produce an annotated bibliography and synthesize the published information by drivers and impacts.
- f. Produce a draft report of the literature review that includes the process used, the synthesis and the annotated bibliography.
- g. Solicit reviews of the draft report by an external technical reviewer, OFRI, the project Steering Committee and others.
- h. Finalize the report addressing all pertinent comments, and provide the report to Steering Committee members, OFRI, and others.
- i. Reformat the Systematic Review and submit for publication in a peer-reviewed journal if appropriate.

2. *Catalog and Survey of Municipal Water Supplies from Forest Watersheds in Oregon.*

The Oregon Health Authority (OHA) regulates drinking water providers in Oregon. They list 337 providers who use surface waters, supplying almost 3.5 million Oregonians. The objective for this Task is to describe these providers to gain an understanding about how management activities in the supply watersheds affects their operations. To do this, INR will:

- a. Use the Oregon Health Authority's list of all municipal water systems in Oregon, to determine which ones include forested land, and identify the owners of such land.
- b. Use the Oregon Department of Environmental Quality (DEQ) Source Water Assessment data, and other published and internet information, to develop descriptions of each forested municipal water system.
- c. Develop a structured interview methodology and questionnaire seeking additional information from key municipal water supply managers including general concerns, knowledge of forest management, plans for future watershed management, and their partnerships/collaboration with other agencies and their communities.
- d. Stratify the provider list developed in (a) by type and size of provider, geographic region, treatment type, and other pertinent criteria. Sub-sample within these strata to interview up to 30 managers of forested water supply watershed systems via telephone using the survey questionnaire to obtain the needed information.

- e. Select three municipal watershed systems for case studies to represent a range of municipal and biophysical contexts; travel to each watershed for additional interview and photographic data collection.
- f. Produce a draft report that summarizes the survey data and includes the case studies of key watersheds.
- g. Have the draft report reviewed by OFRI, the project Steering Committee and others.
- h. Finalize the report, responding to pertinent comments, and provide to OFRI, the project Steering Committee, and others.
- i. Reformat the report as needed and submit for publication in a peer-reviewed journal if appropriate.

B. DELIVERY SCHEDULE & BUDGET

1. *Systematic Review of the Effects of Forest Management on Municipal Water Supplies from Forested Watersheds in Oregon.*

• Project begins	January 1, 2018
• Steering Committee established	February 1, 2018
• Outline developed, reviewed and accepted	March 30, 2018
• Systematic Review conducted to identify appropriate literature for review	April 30, 2018
• Select literature reviewed and draft annotated bibliography developed	August 30, 2018
• Draft literature synthesis provided for review.	October 30, 2018
• Final report to OFRI and the Steering Committee	December 31, 2018

2. *Catalog and Survey of Municipal Water Supplies from Forest Watersheds in Oregon.*

• List of all municipal water systems in Oregon developed	January 31, 2018
• Description of each forested municipal water system developed	March 31, 2018
• Interview questionnaire developed, reviewed and accepted	April 30, 2018
• Interview water supply managers implemented	June 30, 2018
• Survey data summarized, case studies developed & draft provided for review	September 30, 2018
• Final report submitted	November 15, 2018

College of Forestry - Oregon State University									
FORM EB3 - autofill									
Form rev 10/23/2017									
Begin Inflation Year 1									
yes (starting values at)									
Annual E salary									
PI 3%									
RA 3%									
GRA 2%									
< 0.5FTE 2%									
PDS 4%									
Ugrads 6%									
OPE 1%									
2%									
2%									
1%									
2%									
0%									
TOTALS									
YEAR 1									
YEAR 2									
YEAR 3									
BUDGET CATEGORIES									
ACADEMIC WAGES									
Base Salary (monthly)									
Lead PI - Souder	CY	0.5	3962	SU	SU	0.50	3,962	0.50	3,962
PI - Strimbu	SU	1.0	9431	SU	SU	1.00	9,431	1.00	9,431
PI - Bladon	SU	1.0	9472	SU	SU	1.00	9,472	1.00	9,472
PI - Daws	CY	1.8	12533	SU	SU	1.80	12,533	1.80	12,533
PI - Gaines	CY	0.5	5202	SU	SU	0.50	5,202	0.50	5,202
FRA - Behan		1.0	4464			1.00	4,464	1.00	4,464
FRA - TBD		2.8	11536			2.80	11,536	2.80	11,536
Other									
Other									
TOTAL SAL & WAGES		8.60	56,620			8.60	56,620	8.60	56,620
FRINGE BENEFITS/OPE									
Lead PI - Souder	Rate		2071	Rate			2,071		2,071
PI - Strimbu	52%		4527				4,527		4,527
PI - Bladon	48%		4547				4,547		4,547
PI - Daws	55%		6893				6,893		6,893
PI - Gaines	48%		2497				2,497		2,497
FRA - Behan	68%		3036				3,036		3,036
FRA - TBD	68%		7844				7,844		7,844
TOTAL OPE			31,415				31,415		31,415
TOTAL PERSONNEL COSTS			88,035				88,035		88,035
TRAVEL									
Travel / Domestic			2087				2,087		2,087
Travel / Domestic (worksheet)									
Travel / Foreign (worksheet)									
TOTAL TRAVEL			2,087				2,087		2,087
SERVICE, SUPPLIES, OTHER									
Materials & Supplies									
Publication Costs									
Consultant Services									
Computer Services									
Other Fees and Services			5050				5,050		5,050
Other - specify									
Other - specify									
Other - specify									
Other - specify									
TOTAL SVC & SUPPLIES			5,050				5,050		5,050
TOTAL DIRECT COSTS			95,172				95,172		95,172
INDIRECTS MTDC Method ** e excluded from base									
MTDC BASE			95,172				95,172		95,172
Total Exemptions									
INDIRECT COSTS		26.0%	24,745	47.0%		47.0%	24,745		24,745
TOTAL COSTS			119,917				119,917		119,917

C. BUDGET NARRATIVE (see Attached EB3)

Staffing Salaries and OPE: \$88,035

- a. *Dr. Jon A. Souder*, Principal Investigator (PI). Manages project; leads Steering Committee, provides GIS and research support for survey and catalog of water suppliers, authors and edits reports (0.5 month). \$6,053.
- b. *Dr. Lisa Gaines*, Co-PI. Provides INR oversight, participates in facilitating Steering Committee meetings and coordinating with stakeholders (0.5 months). \$7,699
- c. *Dr. Emily Jane Davis*, Co-PI. Facilitates Steering Committee meetings (0.3 month); creates structured interview questionnaire, conducts interviews and case studies and authors reports (1.8 month). \$18,347
- d. *Dr. Kevin Bladon*, Co-PI. Assists in development of Systematic Review protocol, identifies target research literature, assists in screening literature, evaluates pertinent literature and authors water quality and management effects section of Systematic Review (1.0 month). \$14,019
- e. *Dr. Bogdan Strimbu*, Co-PI. Assists in development of Systematic Review protocol, identifies target research literature, assists in screening literature, and evaluates pertinent literature and authors forest management effects for Systematic Review (1.0 month). \$13,958
- f. *Mr. Jeff Behan*, Faculty Research Assistant (FRA). Assists with development of search protocols, conducts literature searches and provides search results and authors search methodology section of Systematic Review (1.0 month). \$7,500
- g. *Faculty Research Assistant (To Be Determined)*. Conducts initial screening for pertinent literature, compiles data for Systematic Review Matrix and assists in preparation of the Systematic Review report (2.8 months). \$19,380

Travel: \$2,087

- a. For meetings with OFRI and partners, four trips from Davis's location (The Dalles) to Salem (262 miles round trip at \$.54/mile* four trips)
- b. For meeting between the PIs, one trip from Davis's location (The Dalles) to Corvallis (336 miles round trip at \$.54/mile for one trip)=\$181.44
- c. For three case studies of watersheds, three trips from Davis's location (The Dalles) totaling \$1,404.64.
Locations are not yet known but estimates are used based on potential sites and desired regions to cover in cases.
 - i. Southern Oregon case study—total \$564.28 for one overnight trip. Mileage from The Dalles to Ashland (632 miles round trip at \$.54/mile=\$341.28), one night lodging (\$111) and two days' per diem (\$56/day*2 days=\$112).
 - ii. Northwestern Oregon case study—total \$183.60 for two day trips. Mileage from The Dalles to Portland (170 miles round trip at \$.54/mile*2 trips).
 - iii. Northeastern Oregon case study—total \$656.76 for one overnight trip. Mileage from The Dalles to Joseph (494 miles round trip at \$.54/mile=\$266.76), two nights' lodging (\$222), and three days' per diem (\$56/day*3 days=\$168).

Other Supplies and Services: \$5,050

- a. Online transcription services (Rev.com) will be used at a rate of \$1/minute for an anticipated 1800 minutes of audio (60 minutes per interview, 30 interviews) = \$1,800
- b. Meeting expenses (room rental, refreshment, lunches) = 10 persons * \$25/person * 5 meetings = \$1,250
- c. External Reviewer Honorarium = \$2,000

Indirect costs: \$24,745

Indirect costs are calculated using OSU's state agency rate of 26%.

Total: \$119,917