

ADDITIONAL PROJECT PROPOSALS- Unspent Funds

LWAG- Landscape and Wildlife Scientific Advisory Group

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| Project Name | Sensitive Site and Amphibian Use Investigation from Existing Study Data |
| Workplan Critical Questions Addressed | <p>Can the methods used to identify and characterize sensitive sites be improved?</p> <p>Are rule-identified sites valuable for amphibians?</p> <p>Are sites important to amphibians correctly identified by rule?</p> |
| Project Elements | <p>LWAG proposes to use existing data from the Type N Experimental Buffer Treatment in Hard Rock Lithologies (hereafter, Type N Hard Rock) Project and any other relevant CMER-funded projects to develop data summaries and comparisons for:</p> <ol style="list-style-type: none"> 1) Numbers, locations and characteristics of sensitive sites in Type Np basins (i.e., Type Np intersections, headwall seeps, side-slope seeps, headwater springs) and temporal changes, including annual variability in location and hydrological footprints of seeps; 2) Characteristics of other streamside hydrologic features in Type Np basins that do not meet the definitions for either seep sensitive site category under current Forest Practices Rules; and 3) Amphibian use of above features. |
| Responsible SAG and Project Manager | <p>LWAG</p> <p>Project Manager – Heather Gibbs</p> |
| Principal Investigator(s) | WDFW |
| Status | <p>This project is currently proposed in the CMER Work Plan as a part of the Type N Riparian Effectiveness Program. Data from the Type N Hard Rock Project has focused predominantly on evaluations of a basin-wide response. This is an opportunity to look at sensitive site-specific characteristics and amphibian use to give a broader understanding of within-site variability.</p> |
| Project timeline | <p>March 2020: project charter development</p> <p>April 2020: contract finalization</p> <p>April – June 2020: identify all relevant projects and data and begin report development</p> <p>July – October 2020: develop summary report</p> <p>October 2020: draft report for review</p> <p>LWAG is confident that the proposed products can be developed this biennium.</p> |
| Complementary Projects and project sequencing | <p>Type N Experimental Buffer Treatment Project in Hard Rock Lithologies, SAA Sensitive Sites Identification Methods, SAA Detection/Relative Abundance Methodology, Dunn’s Salamander, Buffer Integrity-Shade Effectiveness, Amphibian Recovery</p> |

Project Summary and Purpose

The Type N Study Hard Rock Project addressed the effectiveness of riparian prescriptions in Type Np basins using a robust BACI design at a basin scale. The proposed work will use existing data from this study to examine sensitive sites for an increased understanding of characteristics and amphibian use. Four of the Type N sensitive site categories will be examined, including Type Np intersections, headwall seeps, side-slope seeps, and headwater springs. While there has been interest in this topic among some CMER and Timber, Fish and Wildlife (TFW) Policy caucuses and/or members, it has not been addressed to date as this information was outside of the scope of the original study objective. Information on sensitive sites and identification under Forest Practices rules and relative use by amphibians, has the potential to inform important Policy discussions, including those of the Technical Type Np Prescriptions Workgroup that was recently convened to

develop alternative Riparian Management Zone (RMZ) buffer prescriptions for Type Np streams in western Washington for Policy's consideration.

Project Objectives

Ultimately, project findings will inform whether current rules support the Overall Performance Goal of maintaining the long-term viability of stream-associated amphibians. Specifically, this product will support the work currently being conducted by the Technical Type Np Prescriptions Workgroup by evaluating if the methods used to identify and characterize sensitive sites can be improved; whether rule-identified sites are valuable for amphibians; and if sites important to amphibians are correctly identified by the rule.

Budget

| Total budget spent to date | FY 20 | FY 21 |
|----------------------------|----------|----------|
| \$0 | \$22,522 | \$22,522 |

Cost details by year

| | FY20 | FY21 | Biennium Total |
|-------------------|----------|----------|----------------|
| Salaries | \$12,359 | \$12,359 | \$24,718 |
| Employee Benefits | \$4,927 | \$4,927 | \$9,854 |
| Indirect | \$5,236 | \$5,236 | \$10,472 |
| TOTAL | \$22,522 | \$22,522 | \$45,044 |

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| Project Name | Van Dyke's Salamander Project – Scoping and GIS database cleanup |
| Workplan Critical Questions Addressed | <p>What are the common findings and inconsistencies in published studies on the habitat associations of Dunn's and Van Dyke's salamanders? (addressed by the Phase I literature review of the Van Dyke's Salamander Project)</p> <p>How does large wood and decay class affect the distribution and abundance of Van Dyke's salamander? (addressed, in part, by the Phase I literature review of the Van Dyke's Salamander Project)</p> |
| Project Elements | <p>(1) Review the GIS database of known Van Dyke Salamander occurrences and remove and/or combine duplicative records.</p> <p>(2) Develop a scoping document for possible future work.</p> |
| Responsible SAG and Project Manager | <p>LWAG</p> <p>Project Manager – Heather Gibbs</p> |
| Principal Investigator(s) | WDFW |
| Status | A literature review for the Van Dyke's Salamander was completed in FY2018, which included the creation of a GIS database of known occurrence locations. This project has not been scoped. |
| Project timeline | <p>FY20: Refine GIS database of occurrence information.</p> <p>FY21: Develop scoping document.</p> <p>LWAG is confident that the proposed products can be developed this biennium.</p> |
| Complementary Projects and project sequencing | Type N Experimental Buffer Treatment Project in Hard Rock Lithologies, SAA Sensitive Sites Identification Methods, Dunn's Salamander, Buffer Integrity-Shade Effectiveness |
| Project Summary and Purpose | |
| <p>One of the four Overall Performance Goals of the Forest Practices Habitat Conservation Plan (FP HCP) is to support the long-term viability of FP-covered species, which includes the Van Dyke's salamander, a species endemic to Washington State. Forest management implications for the Van Dyke's Salamander are not fully understood and previous CMER research has not focused on this topic. This species has a cool-adapted life history, which may make it vulnerable to Forest Practices activities, perhaps especially under future probable climate change scenarios for the Pacific Northwest.</p> <p>As part of the Literature Review of the Van Dyke's Salamander Project, all known site occurrence information was collected in a GIS database. The database currently includes approximately 2,000 points acquired from federal, state and private partners. Because information was gathered from as many sources as could be identified, many site localities are represented by more than one point. As a result, the historic status of the species in the state is not fully understood due to: 1) the duplicative nature of the site localities in the database, and 2) poor accuracy information for some historic sites. To address duplicity and poor accuracy, funding would support an effort to review the GIS database of known Van Dyke Salamander occurrences and remove and/or combine duplicative records (i.e., the same site, with multiple observations through time). This effort will contribute to a comprehensive understanding of the distribution of historic site localities for the species.</p> <p>LWAG also proposes to develop a scoping document with the intent of refining objectives and developing alternatives for possible future study plan development.</p> | |
| Project Objectives | |

Proposed work is for two discrete products that are part of the Van Dyke’s Salamander Project proposed in the current CMER Work Plan. Ultimately, this project seeks to inform the Overall Performance Goal of supporting the long-term viability of stream-associated amphibians.

- (1) Refine the existing database of known Van Dyke’s occurrences to better understand historic distribution of the species. This information will be useful for potential future work including occupancy modeling, site selection and monitoring occupancy for the species through time. (proposed for FY20), and
- (2) Develop a scoping document for future work (proposed for FY21).

Budget

| Total budget spent in prior FYs | FY18 Budget | FY19 Budget | FY20 Budget | FY21 Budget |
|---------------------------------|-------------|-------------|-------------|-------------|
| \$44,443 | \$0 | \$0 | \$18,220 | \$11,432 |

Cost details by year

| | FY20 | FY21 | Biennium Total |
|-------------------|----------|----------|----------------|
| Salaries | \$9,817 | \$6,288 | \$16,105 |
| Employee Benefits | \$4,167 | \$2,486 | \$6,635 |
| Indirect | \$4,236 | \$2,658 | \$6,894 |
| TOTAL | \$18,220 | \$11,432 | \$29,652 |

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| Project Name | LWAG Strategy Development |
| Workplan Critical Questions Addressed | N/A |
| Project Elements | Develop a SAG Strategy for LWAG |
| Responsible SAG and Project Manager | LWAG PM: Heather Gibbs |
| CMER Scientist and Principal Investigator(s) | TBD |
| Status/Phase | Proposed for unspent FY20 CMER Funds |
| Project timeline | <ul style="list-style-type: none"> - Development of LWAG Strategy Statement of Scope – April 2020 - Submit first draft Strategy to LWAG for review – June 2020 - Submit second draft Strategy to LWAG for review – August 2020 - Submit third draft/LWAG approved draft of Strategy to CMER for review – September 2020 - Presentation to CMER (discretionary) - Submit final draft of Strategy to CMER for final review – November 2020 - CMER approval of Strategy – December 2020 |
| Complementary Projects and project sequencing | Wetland Research and Monitoring Strategy Deep-seated Landslide Research Strategy |

Project Summary and Purpose

Develop SAG Strategy for LWAG. Identify future scope, objectives and study priorities to address scientific uncertainty and identify risks to resources.

Project Objectives

LWAG is interested in developing a strategy for future work under the Adaptive Management Program. The SAG has many projects at or near completion, and several more remain in the CMER Work Plan, including some proposed in recent years. Currently proposed projects included continued work on the Van Dyke’s Salamander, future possible work on the Type N Experimental Buffer Treatment in Hard Rock Lithologies, and an Eastside Amphibian Evaluation, among other priorities. Historically, LWAG has participated primarily in the Type N Riparian Prescription Rule Group, specifically the Sensitive Site Program and Type N Amphibian Response Program. LWAG was also identified as one of two SAGs (alongside ISAG) equipped to address Rule Group Critical Questions under the Pesticides Rule Group, Wetlands Rule Group, and Wildlife Rule Group.

The objective of the proposed work is to develop an integrated strategy for research and monitoring, including prioritization of studies currently proposed in the CMER Work Plan, identification of additional contributions and/or study opportunities to include in the Work Plan in the future, identification of opportunities to contribute in meaningful ways to other SAG projects in either an advisory or implementation capacity. Outcomes of the work will include a focused and efficient direction for future LWAG work, and possibly, a broadening of our current active membership, which has declined in recent years. Overall, LWAG wants to ensure that they remain relevant and useful to the CMER Adaptive Management Program, with the shared vision and goal of reducing scientific uncertainty and identification of risks to resources, for the future benefit of the Overall Performance Goals of the Forest Practices Habitat Conservation Plan.

Budget

| FY 20 | FY 21 | FY 22 | FY 23 | FY 24 | FY 25 | FY 26 | Total budget |
|---------|---------|-------|-------|-------|-------|-------|--------------|
| \$9,072 | \$8,684 | | | | | | \$17,756 |

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| Project Name | Eastside Amphibian Evaluation Project |
| Workplan Critical Questions Addressed | Does sufficient stream-associated amphibian-occupied area exist in Eastside managed lands that is under FFR jurisdiction to justify study attention? Does the distribution of stream-associated amphibians on Forests and Fish lands across Eastern Washington warrant inclusion in CMER effectiveness research? |
| Project Elements | Occurrence of covered amphibian species in Forest Practices (FP) Habitat Conservation Plan (HCP)-managed forestlands in eastern Washington. |
| Responsible SAG and Project Manager | TBD (LWAG and/or SAGE) Project Manager – TBD |
| Principal Investigator(s) | TBD |
| Status | LWAG recommends a literature review and compilation of species distribution information for FP-designated stream-associated amphibians in eastern Washington (Coastal Tailed Frog and Rocky Mountain Tailed Frog). This project is currently in the CMER Work Plan under the Type N Amphibian Response Program (Effectiveness). This project has not been initiated. |
| Project timeline | FY 2021: Literature review and occurrence mapping. LWAG is confident that the proposed products can be developed this biennium. |
| Complementary Projects and project sequencing | Type N Experimental Buffer Treatment Project in Hard Rock Lithologies , SAA Sensitive Sites Identification Methods, SAA Detection/Relative Abundance Methodology, Dunn’s Salamander, Buffer Integrity-Shade Effectiveness, Amphibian Recovery |

Project Summary and Purpose

Previous CMER-supported research informing the effectiveness of Forest Practices in meeting the Overall Performance Goal of maintaining long-term viability of other covered species focused entirely on managed landscapes in western Washington. The reason for this focus is based on the fact that most FFR-designated amphibians have westside distributions and the assumption that those with eastside distributions have little overlap with eastside managed landscapes. However, this latter assumption is based on limited coarse-level data available from Washington GAP Analysis modeling. As a preliminary step to inform potential future project scoping for the Eastside Amphibian Evaluation Project, LWAG proposed to conduct a literature review and develop a distribution map overlaying the occurrences of FP-designated amphibians with FP-managed lands in eastern Washington. Two FP-designated amphibians, Coastal Tailed Frog and Rocky Mountain Tailed Frog, are known to occur in eastern Washington. To date, no CMER study has evaluated amphibians in eastern Washington or the Rocky Mountain Tailed Frog, which in Washington occurs only in the east. These products will help inform FP-designated amphibian distribution on eastside managed landscapes as well as priorities for future CMER work. While this project is currently listed under Type N Amphibian Response Program, its footprint likely encompasses some of the Type F landscape.

Project Objectives

This project will look at the literature and distribution of FP-designated amphibians in eastern Washington to determine if their currently known distribution on the managed landscapes, or gaps in knowledge, support continued study in the future. This project addresses the Overall Performance Goal of maintaining long-term viability of stream-associated amphibians, including for one species (Rocky Mountain Tailed Frog) that has yet to be studied in terms of the FP HCP.

Budget

| Total to date | FY20 Budget | FY 21 Budget |
|---------------|-------------|--------------|
| \$0 | \$0 | \$18,870 |

Cost details by year

| | FY20 | FY21 | Biennium Total |
|------------------------------|-------------|-------------|---------------------------|
| Salaries | \$0 | \$10,357 | \$10,357 |
| Employee Benefits | \$0 | \$4,057 | \$4,057 |
| Indirect | \$0 | \$4,366 | \$4,366 |
| TOTAL | \$0 | \$18,780 | \$18,780 |

UpSAG- Upslope Scientific Advisory Group

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| Project Name | CMER Land LiDAR Acquisition |
| Workplan Critical Questions Addressed | <ul style="list-style-type: none"> • Are unstable landforms being correctly and uniformly identified and evaluated for potential hazard? • Does harvesting of the recharge area of a glacial deep-seated landslide promote its instability? • Can relative levels of response to forest practices be predicted by key characteristics of glacial deep-seated landslide and/or their groundwater recharge areas? |
| Project Elements | Forest practices effects and response levels on deep-seated landslides. |
| Responsible SAG and Project Manager | SAG: UPSAG Project Manager: Ben Flint |
| CMER Scientist and Principal Investigator(s) | CMER Scientist(s): Greg Stewart Principal Investigators: TBD |
| Status/Phase | The LiDAR will initially support UPSAGs Deep-Seated Landslide Research Strategy Project 4.5. It will also supplement and accelerate the WGS planned acquisitions for the state. Lidar has been acquired for much of the lands covered by the forest practices rules, but the lidar is of varying quality. Some remaining areas in western Washington have been given a lower priority while the DNR focuses on data collection in areas with no existing lidar. A few significant areas remain that will be covered by this project to facilitate future landslide mapping. |
| Project timeline | Lidar will be acquired during the leaf-off period (typically before mid-April) in 2020. The DNR has a contract in place with a lidar provider that may allow us to expand their existing scope of work to quickly move forward with is project. We are optimistic that this project would be completed during FY 2020. |
| Expenditures | No expenditures to date on the DSL mapping and classification project, for which \$125,000 is currently allocated for FY 2020. However, this money will not be utilized as planned. Instead, we propose to use the \$125,000 for the LiDAR acquisition and fund the remaining cost (\$65,000) with surplus funds under this request. |
| Complementary Projects and project sequencing | The lidar acquisition will support several projects in the Deep-Seated Landslide Strategy, including projects currently being scoped. The data could also be used for other CMER projects that require high resolution topographic data. |

Project Summary and Purpose

The project will fund lidar acquisition for approximately 112,000 acres in King and 78,000 acres in Lewis counties (**Figure 1**). The acquisition for these counties could be split into three separate projects, depending on available funding. These areas are considered a priority for mapping and analysis of a variety of deep-seated landslides and evaluating the effects of forest practices on different types of deep-seated slides. High quality lidar (~1 ground return per 1 meter pixel) is expected to cost approximately \$1 per acre.

Project Objectives

The project will complete topographic data collection for areas of interest in the deep-seated landslide mapping and classification projects. The topographic data will be used to define landslide boundaries and measure various physical attributes that will be important for developing classes of deep-seated landslides.

| FY 20 | FY 21 | FY 22 | FY 23 | FY 24 | FY 25 | FY 26 | Total budget |
|------------|-------|-------|-------|-------|-------|-------|--------------|
| \$190,000* | | | | | | | \$190,000 |

* The proposed LiDAR acquisition detail here will cost \$190,000. However, we currently have \$125,000 allocated for FY 20 for the UPSAG Deep-Seated Landslide Mapping Project. The \$125,000 will not be utilized as originally planned. Therefore, we propose to use these funds instead for the LiDAR data.

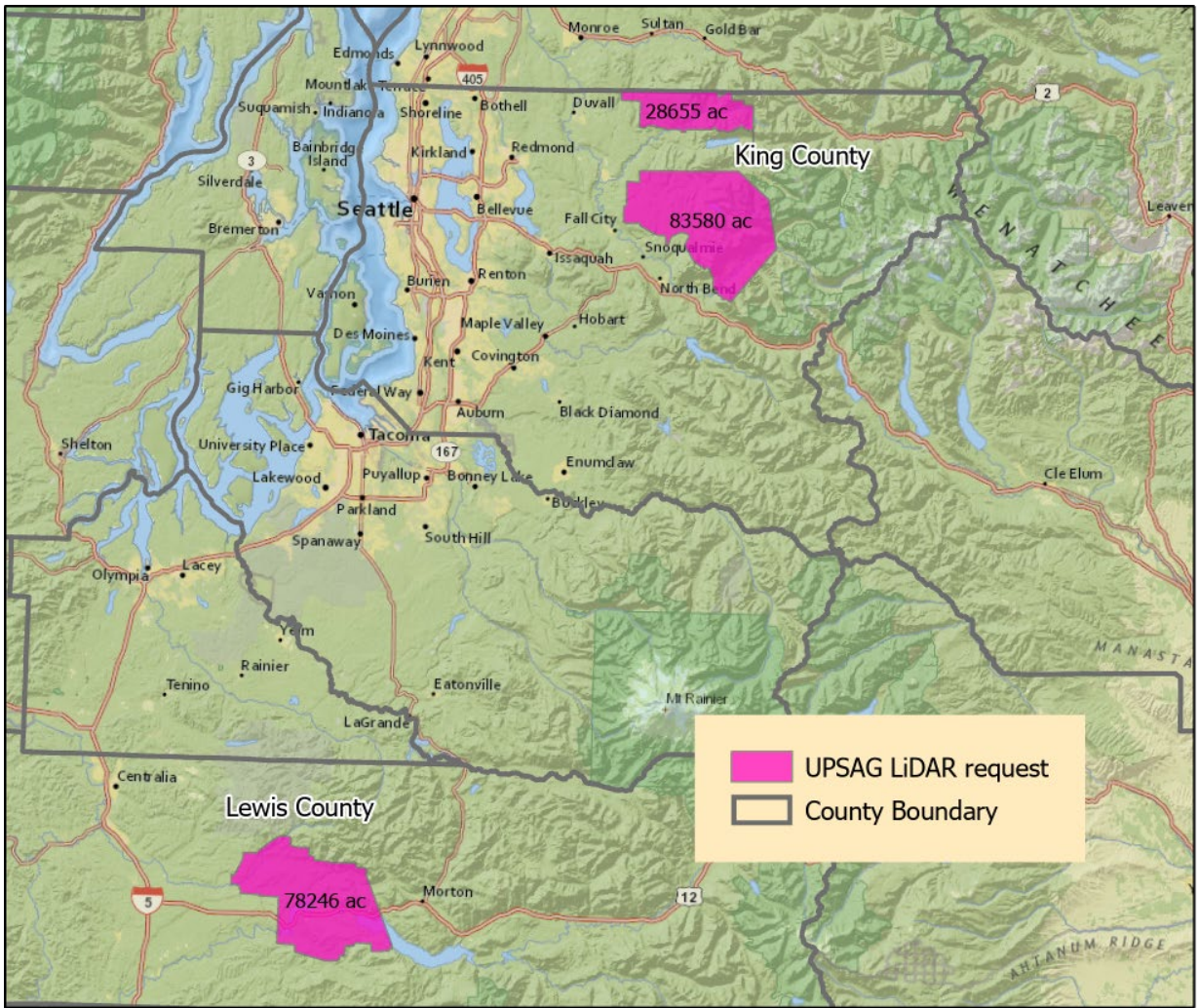


FIGURE 1. UPSAG proposed LiDAR acquisition areas to support the deep-seated landslide mapping and classification project.

RSAG- Riparian Scientific Advisory Group

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| Project Name | Windthrow spatial data extraction and compilation |
| Workplan Critical Questions Addressed | How do survival and growth rates of riparian leave trees change following Type Np buffer treatments? What is the frequency and distribution of windthrow in forest practices buffers? What site and habitat conditions are associated with sites with significant blowdown? |
| Project Elements | Stream buffer types, windthrow, wood recruitment, channel type, state region, timber type, Type F and N riparian forest stand conditions |
| Responsible SAG and Project Manager | RSAG PM: TBD |
| CMER Scientist and Principal Investigator(s) | TBD |
| Status/Phase | Scoping |
| Project timeline | February 2020 - June 2020 |
| Expenditures | None |
| Complementary Projects and project sequencing | All CMER riparian buffer studies |

Project Summary and Purpose

Review existing CMER and DNR data regarding the relationship between windthrow and contemporary forest management. Then complete a meta analysis that summarizes the range of windthrow and the attributes that may be associated with it. Create a geospatial database showing where data have been collected and studied. Information from this project would complement a future Windthrow Literature Review, both of which would inform Section 5.2.6.5 of the CMER Workplan, Windthrow Distribution and Effects Project; 5.3.8.6 Wood Recruitment Volume and Source Distances from Riparian Buffers Project; and 5.3.7 Westside Type F Riparian Effectiveness.

Project Objectives

Utilize existing CMER and DNR windthrow data to summarize the range of windthrow by: region, harvest type, topography, tree species, and other factors that emerge from the data. Build a database that shows geospatial location of relevant data. Identify the gaps in attribute and spatial coverage.

Budget

| FY 20 | Total budget |
|----------|--------------|
| \$35,000 | \$35,000 |

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| Project Name | Extensive Riparian Status and Trends Monitoring- Vegetation, Type F/N- Westside and Eastside Project (Add on to an active project) |
| Workplan Critical Questions Addressed | What are current riparian stand attributes on FP HCP lands, and how are stand conditions changing over time as the forest practices prescriptions are implemented? |
| Project Elements | Type F and N riparian forest stand conditions, shade, riparian vegetation type, large wood supply potential, channel measurements. |
| Responsible SAG and Project Manager | RSAG Project Manager – Teresa Miskovic |
| CMER Scientist and Principal Investigator(s) | CMER scientist: None PI: Precision Forestry Cooperative, University of Washington (UW) – Dr. Monika Moskal and Andrew Cooke |
| Status/Phase | Completed testing Mashel watershed riparian forest model using Lidar and field data collected by DNR in a watershed in the Olympic Experimental State Forest (OESF). This project would build upon this work. |
| Project timeline | This project is proposed to be implemented in four steps which should occur in sequential order but can be completed as separate phases as funding is available: <ol style="list-style-type: none"> 1) Summarize existing plot and LIDAR data and test two modelling approaches: 4.5 months 2) Develop enhanced database with additional modeling approaches: 3 months 3) Develop Model Validation Plan: 1.5 months 4) Model Validation: 7 months |
| Expenditures | FY 16-18: \$351,712. These funds were used to complete the literature synthesis, remote sensing pilot in the Mashel watershed, and the scoping for an implementation pilot study. FY 19 and 20: \$43,778 has been spent to date testing the Mashel watershed model. |
| Complementary Projects and project sequencing | Extensive Riparian Status and Trends – Temperature, Type F/N Westside and Eastside; Riparian Characteristics and Shade Response Study; Mass Wasting Landscape Scale Extensive Monitoring. |
| Project Summary and Purpose | |
| This project would build upon previous riparian extensive vegetation monitoring work completed by UW. This project would utilize existing plot and LIDAR data to test two modelling approaches, develop an enhanced data base with additional modeling approaches, develop a model validation plan and then validate the model in the field. | |
| Project Objectives | |
| Previous Riparian Extensive Vegetation Monitoring work identified that the linear regression modeling approach used in the Pilot Study and the Model Transferability Report may be a limiting factor to using models outside of the forest conditions in which they were developed. It is possible with the currently existing plot and LIDAR data to test alternative modeling approaches for the basal area, diameter, and plot density models. These alternative approaches include linear regression using principal components rather than lidar metrics, and regression tree models, most likely, random forest. | |
| There are four separate components included. | |
| <ol style="list-style-type: none"> 1. A base project to assemble existing summarized plot and lidar data into a database and test two modeling approaches. 2. Develop an enhanced database with raw plot and lidar data, and explore if there are additional modeling approaches to test. 3. Develop a model validation plan. 4. Performing model validation in the field. | |

Budget

| FY 20 | FY 21 | Total budget |
|---------------------------|-------------------------------|---------------------|
| \$40,159 (component 1) | \$120,875 (components 2-4) | \$161,134 |

SAGE- Scientific Advisory Group- Eastside

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| Project Name | Eastside Riparian Extensive Vegetation Monitoring, Model Transferability Testing |
| Workplan Critical Questions Addressed | |
| Project Elements | Lidar to measure Riparian and upland DBH, BA, Stand Density, Tree Height, Canopy Cover |
| Responsible SAG and Project Manager | SAG: SAGE Project Manager: Teresa Miskovic |
| CMER Scientist and Principle Investigator(s) | Principal Investigator: Precision Forestry Cooperative, University of Washington (PFC) – Dr. Monika Moskal and Andrew Cooke CMER scientist: Possibly eastside scientist, Malia Volke |
| Status/Phase | Midyear Project Proposal to utilized FY 20 unspent funds |
| Project timeline | FY20-FY21 |
| Expenditures | None at this time. |
| Complementary Projects and project sequencing | Riparian Extensive Vegetation Monitoring, Model Transferability Testing, Extensive Riparian Status and Trends Monitoring – Vegetation, Type F/N Westside and Eastside Projects, |
| Project Summary and Purpose | |
| This project would test the transferability of several forest inventory models developed in the Mashel watershed as part of the Riparian Extensive Vegetation Monitoring Pilot Study. Models will be tested using inventory plots established in Eastern Washington. This project will test the DBH, Basal Area, and Stand Density data against the Mashel watershed inventory data and Pilot Study results. | |
| Project Objectives | |
| <ul style="list-style-type: none"> • Identify up to 40 plots for model testing; these plots need to be accessible in March and May for geo-location. • Acquire existing inventory plot data from the eastside. • Technicians will measure plot locations using survey grade GPS receivers; plots must be measured by the end of June. GPS receivers will be provided by UW. • Post process GPS locations for each plot and build plot boundary dataset using GPS location data. • Clip 2012 and 2014 LIDAR data sets for appropriate plots using plot location dataset, and use Fusion to develop LIDAR metrics for each plot. • Use Mashel DBH, Basal Area, and Stand Density models to predict eastside plot values and the model accuracies will be compared to those in the Mashel watershed. • Use the Mashel height model to run and canopy cover calculations without accuracy assessment; the field data does not exist to test model accuracy for these metrics, but literature shows LIDAR is excellent at estimating them. • Time permitting, develop DBH, Basal Area, and Stand Density models, using eastside inventory and LIDAR, and apply them to Mashel plots. • Write and revise project report • Final presentation to SAGE and CMER | |

Budget

| FY 20 | FY 21 | FY 22 | FY 23 | FY 24 | FY 25 | FY 26 | Total budget |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------------|
| \$50,000 | \$15,000 | | | | | | \$65,000 |

