Rogue Restoration Action Plan

ROGUE BASIN
PARTNERSHIP

Rogue Restoration Action Plan

Version 1.1

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Any errors or omissions are the responsibility of the Rogue Basin Partnership.
Please contact the managing director at info@roguebasinpartnership.org if errors are found.

Rogue Restoration Action Plan
2015-2025

Preface

The Rogue Restoration Action Plan (Action Plan) is designed to identify priorities and to help accelerate the scale and effectiveness of conservation and restoration/enhancement in the Rogue River Basin, for the benefit of water quality, water quantity, and fish and wildlife habitats over the next ten years (2015-2025). It supports interested nonprofit and government organizations, by focusing and aligning efforts on high priority activities (projects and programs) that benefit the Basin, while considering the impacts of climate change on the landscape and water resources.

The Plan does not replace existing plans, programs, initiatives, policies or regulations currently underway in the Basin. It is intended to consolidate and build upon former work, and complement parallel efforts such as the *Rogue Basin Forest Restoration Strategy* under development by the Southern Oregon Forest Restoration Collaborative. The *Rogue Basin Action Plan for Resilient Forests and Watersheds in a Changing Climate* (SOFRC, 2013) contains excellent, detailed information and analysis of the Basin. Please refer to it for specificity on the impacts of climate change on the region's natural resources (especially forests) and economy; such information is not repeated here. In addition, the *Southern Oregon California Coast Coho Recovery Plan* (NOAA, 2014) contains detailed information specific to Coho salmon recovery, with recommendations that will benefit multiple species and wildlife, and the *Oregon Statewide Barrier Assessment Priority List* (ODFW, 2013) identifies the top priority barriers for removal in the Rogue, and the Rogue Estuary Strategic Plan (Timchak & Meyers, 2015) identifies restoration potential in the estuary.

While the planning process strove to be inclusive, and capture critical elements of landscape-scale ecological management, the Action Plan tends to focus on specific conservation and restoration actions that are within the purview of the participating organizations to address. As implementation practices and organizational collaboration improve over time through a coordinated approach, the various local, regional and basinwide planning and implementation efforts should converge and become mutually reinforcing, regardless of what plan they are documented in.

Flexible in approach, this Action Plan encourages focus on preserving and restoring systems-based processes, rather than shorter term fixes. Recognizing the funding scarcity, the participating partners prioritized actions based on ecological quality, resiliency, and need first, but also considered social and economic factors that influence successful project and program implementation. Failure to stay the course over a longer period of time (at least ten years) will diminish the value of this Action Plan and impact the ability to see measureable results. It is imperative that participating organizations commit fully to delivering on their responsibilities in the Plan, and that other organizations and agencies encourage and assist them in achieving their assignments. While actions may be localized, the sum of the parts will benefit the whole of the Rogue.

Famed fisheries biologist and author of Salmon without Rivers, Jim Lichatowich shared his observation of the need "to focus on the importance of the relationships between parts of an ecosystem in maintaining its health and ensuring the survival of all of its members. Animals don't go extinct because someone shoots the last one, or a bulldozer scrapes away the last of their habitat…rather, they go extinct because the web of relationships supporting that animal begins to unravel, and "they die from the loss of ecological companionship." The essential work of watershed restoration, then, lies not so much in changing the physical habitat of streams and riparian zones, but in rebuilding the relationships that serve as a safety net and prevent species from disappearing." (BEF, 2012)

Participating Organizations

Applegate Partnership and Watershed Council
Bonneville Environmental Foundation
Cow Creek Band of the Umpqua Tribe
Illinois Valley Watershed Council and SWCD
Geos Institute
Jackson SWCD
Klamath Bird Observatory
Lower Rogue Watershed Council
Medford Water Commission
Rogue Basin Partnership
Rogue Riverkeeper
Rogue River Watershed Council (formerly Bear Creek Watershed Council, Little Butte Creek Watershed Council, Upper Rogue Watershed Association, and Stream Restoration Alliance of the Middle Rogue)
Rogue Valley Council of Governments
Seven Basins Watershed Council
Southern Oregon Forest Restoration Collaborative
Southern Oregon Land Conservancy
Sustainable Northwest
The Freshwater Trust
The Nature Conservancy
Trout Unlimited
WaterWatch of Oregon
Williams Creek Watershed Council

Katalyst, Inc.
Patton Environmental LLC.

Action Plan and Organizational Capacity Funders

(Major Funder)

Meyer Memorial Trust
Carpenter Foundation
Oregon Watershed Enhancement Board
Bonneville Environmental Foundation (in-kind)

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Introduction

Overview: The Rogue River Basin encompasses one of the most iconic landscapes in Oregon. It hosts an extensive native salmon fishery, Wild and Scenic River designation, unique biodiversity, and local communities passionate about their resources. The Rogue Restoration Action Plan (Action Plan) serves as a roadmap for achieving desired conservation outcomes, identified by the partners participating in the planning process. Rather than attempting to consolidate the activities of multiple groups and agencies, this effort seeks to identify priorities and areas of collaboration looking forward, while supporting a common overarching vision of improved watershed health of the Rogue Basin and greater social and economic engagement in its recovery.

Process: Through a series of thirteen meetings and numerous conference calls and webinars starting in January 2013, over twenty organizations from across the Rogue Basin met to develop a cooperative, prioritized strategy for conservation and restoration. Over the course of two and a half years, local organizations convened and:

- Identified organizational strengths, weaknesses, niche(s), and staff expertise
- Developed a vision, goals and objectives for the Action Plan
- Gathered / organized available watershed and climate change data, and completed gap analyses
- Developed a Basin conceptual model to capture ecologic, social and economic considerations
- Documented existing and planned future needs and actions
- Determined geographic and programmatic focus areas
- Fostered commitment to support and deliver on the Plan's identified actions
- Identified specific metrics, monitoring and adaptive management strategies to assess success

Building off the gains of three major dam removals, regulatory mitigation for flows and temperature, and ongoing efforts to engage landowners in local watersheds, participants were eager to develop an integrated plan of action that would serve them over the next decade (2015-2025). The process was designed to align activities and organizations to increase conservation and restoration effectiveness and delivery efficiencies, as well as increase the likelihood of outside funding to the Basin over time.

In addition to the focus of identifying priority conservation and restoration actions, efforts to streamline and fill organizational gaps were initiated by some partner organizations. Three key advances in this area were:

- The consolidation of four of the inland Rogue watershed councils to form the Rogue River Watershed Council.
- The retooling of an existing 501(c)3, to form the Rogue Basin Partnership to serve as a backbone organization that will continue the convening of the partners and assist with plan implementation for basinwide activities.
- The pursuit of a water rights negotiator to serve the Rogue on flow management via Trout Unlimited, to close a significant gap in technical capacity within the Basin.

Plan Updates: Annual evaluation of progress and adjustment to approaches will be an ongoing, collaborative practice of organizations implementing this Action Plan. To minimize planning fatigue, and maintain momentum among participants interested in on-the-ground results, it is recommended this Plan be reviewed and adjusted as necessary in 2020, and a new version be prepared in 2025 that accounts for actions completed and lessons learned. Planning for actions in timeframes longer than a decade is not practical, given the personnel changes within organizations and the ongoing scientific information being generated that should inform restoration efforts.

Basin Vision, Goals and Objectives

Rogue River Basin Vision

"The Rogue River Basin remains resilient and supports viable populations of native fish and wildlife. Ecological processes, as well as social and economic benefits, are conserved and enhanced through collaborative, coordinated efforts of willing stakeholders."

Goal and Objectives

Ecological: Address the key limiting factors affecting native fish and wildlife, water quality, and flows in the Basin by conserving and enhancing the ecological processes upon which they rely. The restoration objectives to achieve this goal are:

1. Flow Conservation and Restoration: Increase in-stream flows to ecologically significant levels in all priority streams to support fish and water quality by 2025. Reduce hydrologic modification of flows year-round to support fish and wildlife, channel and floodplain processes, and to buffer the impacts of climate change in priority stream reaches. Increase protection of existing in-stream flows in priority streams.

2. Upland Water Quality Improvements: Improve water quality and quantity management by increasing the implementation of effective best management practices for stormwater, agricultural, and forestry runoff in priority watersheds/stream/riparian corridors by 2025. Prioritized management locations will address the greatest pollutant loads and hydrologic modification risk, to increase effective implementation of Total Maximum Daily Load (TMDL) requirements for point and nonpoint sources in place to restore water quality.
    a. Stormwater will be treated and hydrologically managed on 100% of all new sites developed, and a minimum of 4 of existing untreated direct river/stream discharge sites will be retrofitted each year until a minimum of 80% of all pre-existing high-load impervious sites are treated and controlled.
    b. Agricultural runoff will be treated and hydrologically managed or eliminated through improved irrigation practices on 80% of irrigated agricultural lands in basinwide priority watersheds. Livestock access to stream/river riparian corridors or flowing/connected drainage/irrigation ditches will be reduced by 80% of their current access frontage and grazing management will be improved on floodplains to reduce nutrient loading and groundwater impacts on 50% of sites in priority watersheds.
    c. Forestry practices will reduce erosion on 80% of forestry logging roads/acreage, increase/maintain stream canopy and diversity to 80% of reference condition, and remove / repair 100 miles of logging roads (out of the 1293 miles identified as highest priority (KS Wild, 2010)) in the basinwide priority watersheds.

3. Passage / Migration Restoration: Remove and/or modify a minimum of 30 of the 65 ODFW identified highest priority human-caused fish passage and wildlife barriers (dams and/or culverts) and 20 others along priority stream and river corridors of the Basin by 2025 to improve access to high value habitat and sediment/wood transport processes. Open a minimum of 500 miles of ESA-listed and other priority fish habitat by removing or modifying the more than 596 barriers (KS Wild, 2010) documented by ODFW.

4. Aquatic Habitat Restoration: Implement channel and floodplain reconnection in priority stream and river reaches. Utilize beaver and natural process improvements over short-term structure use and target areas where other limiting factors (flow, water quality) have already been addressed, and the action is a critical final element of system recovery. Complete 30 miles / 100 acres of instream habitat / floodplain reconnection activities by 2025.

5. Riparian Corridor Enhancement: Increase native canopy cover and diversity along priority riparian corridors to within 80% of reference condition, reduce invasive species to less than 10% in treated corridors, and linearly connect 40 miles worth of gaps in canopy along the stream/river by 2025. Complete 40 miles of riparian livestock or farming exclusion, 60 miles / 800 acres of riparian revegetation, 60 miles / 600 acres of riparian invasives control/thinning/management.

6. Terrestrial Habitat Restoration: Increase the resiliency and health of oak woodlands, dryland conifer forests, and grasslands, by promoting a mosaic of forest/land cover classes across the landscape to reduce the risk of high intensity wildfire and restore the use of fire as a land management tool in the Basin. Treat a minimum of 10,000 acres of forest (out of the 166,000 acres identified by KS Wild, 2010) and prairie habitat.

7. Land Conservation: Increase riparian corridor and high priority / high biodiversity terrestrial habitat in conservation ownership and/or management (private or public) by 20,000 acres by 2025 to help ensure high quality habitats remain intact and instream flow rights are preserved or increased.

Social: Promote landowner stewardship, public awareness, technical capacity, and institutional collaboration regarding the Rogue's natural resources. The objectives to achieve this goal are:

1. Secure commitment of 250 landowners along the Rogue River and streams to support restoration of their riparian areas, remove passage barriers, manage their water rights for water quality and fish recovery, and/or improve the health of their forests. Target 50 landowners per year through 2025.

2. Secure commitment of 20 restoration organizations, local, state, and federal land managers to work together and fund common, prioritized projects when it is within their jurisdictional authority to do so by October 2015.

3. Develop a single, but nested public awareness and media campaign strategy to run a minimum of 7 years, to galvanize support for restoring the Rogue (in conjunction with economic objectives below) beginning in October 2015 and launch by May 2016.

4. Offer a minimum of four learning and collaboration opportunities annually for Rogue basin natural resource organizations to engage and connect restoration oriented professionals and groups.

5. Provide a coordinated student and adult education curriculum focused on watershed issues. Based on population and resource concerns in each region of the Basin, partner organizations offer a minimum of one education opportunity per month combined. Drought (water management) and fire/fire risk (forest health) are galvanizing community topics in which to integrate the message of restoration.

6. Increase the institutional alignment and coordination of plans and policies to support conservation and restoration/enhancement activities. Review and/or update ordinances/rules to improve

resource management across the Basin. Work with State and Federal regulators, to streamline permit processes for restoration activities.

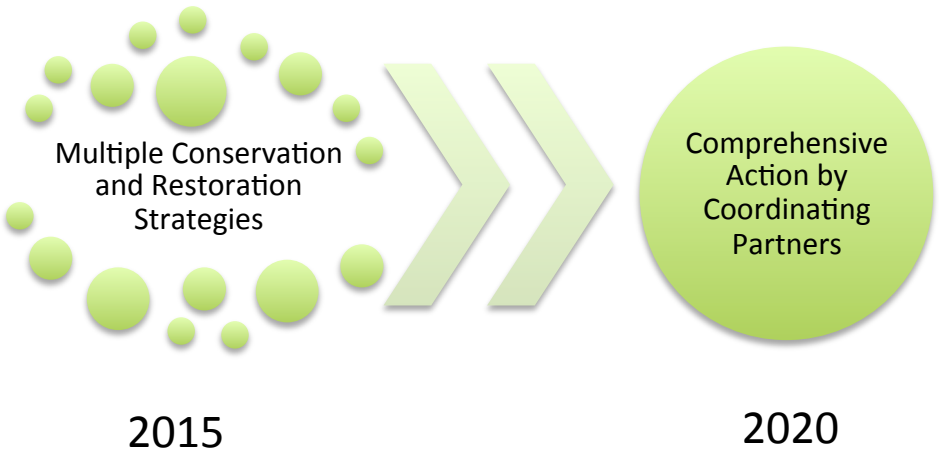
Economic: Create sustained funding mechanisms for restoration in the Rogue Basin.

Objectives:

1. Increase and diversify funding from local entities (businesses, local governments, recreation groups) by a total of $1,000,000 annually by 2020 through intensive awareness, coordinated asks, and local funding levies or voluntary user fees dedicated to restoration. A portion of funds could be used to help build an endowment for Rogue restoration and would be used to support partners in the implementation of this Action Plan.

2. Increase and diversify funding from outside stakeholders, foundations, and non-local agencies (excluding OWEB) by a total of $1,000,000 annually by 2020 through intensive marketing and coordinated challenge-based asks. A portion of funds could be used to help to build an endowment for Rogue restoration and would be used to support partners in the implementation of this Action Plan.

3. Increase awareness of the economic benefits of conservation and restoration/enhancement actions on the local economy (measure through a baseline economic evaluation, and a professional social attitude and willingness to pay survey).



All of the ecological goals and objectives and landowner outreach outlined above are to be implemented in the basinwide network of priority watersheds, corridors and confluences (Map 28) identified through this planning process. As working groups develop workplans for either a basinwide restoration action or specific priority area, the actions will be further refined to articulate the number of barriers, cubic feet per second of water flow, acres planted, etc. for programmatic implementation. Some priority areas like Elk creek and the Rogue estuary have well-developed subwatershed plans ready for implementation already and could be used as templates for other priority areas.

Basin Assessment

The Rogue Basin, located in southwest Oregon covers approximately 3.3 million acres or 5,126 square miles and is bounded by the Siskiyou Mountains and Cascades Mountains (DEQ, 2012). It is one of the most diverse regions on earth in terms of its geology, biology, botany and hydrology, with elevations ranging from mean sea level to 9485 feet at the peak of Mt McLoughlin (ODEQ, 2011; World Conservation Union). The Basins five major subbasins (Lower Rogue, Middle Rogue, Upper Rogue, Illinois and Applegate) collect water from 26,079 miles (18,961 perennial, 7118 intermittent) of streams (USGS, 2014), that gather to become the 216 mile Rogue river transecting the Coast Range on its way west to the estuary and Pacific Ocean (Map 1: Rogue River Basin). The River has a mean flow of 5703 cfs (years 1961-2014) at Agness (USGS, 2015). The land cover is predominantly forested (approximately 65%) and in public ownership (64%), with approximately 20% in grassland/shrub, and 5% each in agriculture and urban land cover, and 3-5% other (USGS, 2011).

This Action Plan relies heavily on existing data, assessments and analyses from Cascadia scale eco-regional assessments, federal and state conservation plans, regional studies, and locally developed plans and data layers, listed in the Literature Citations and Reference Documents section. Relevant information pertaining to this Action Plan's goals have been summarized; refer to the original works for greater detail on specific topics. The GIS data, maps, and supporting documentation are posted on Databasin.org in a shared workspace for Rogue partners. All relevant plans gathered and organized, are currently in a shared folder on Dropbox. All electronic data generated for this Action Plan will be housed and managed by the Rogue Basin Partnership and made available to all electronically via the web.

Rogue River Basin Ecology

This ecological assessment condenses and simplifies the existing reports and data sets (see Reference Reports and Datasets list in Citations) to four major focal resource/habitat types: Water, Aquatic Habitat, Riparian Habitat and Terrestrial Habitat (dryland forests, grasslands). Each resource/habitat type is described briefly below.

Water: Quantity and Quality

Water quality and quantity are of critical importance to the health of the Rogue Basin, ecologically as well as socially and economically. The Basin is located in a transitional area of four unique climate zones including: California Mediterranean to the south, Oregon High desert to the east, Northern Temperate to the north, and Pacific Maritime to the west along the coast (ODEQ, 2011). With snowpack from the Cascades and Klamath-Siskiyou Mountains, providing much of the critical groundwater recharge and spring runoff, the region is at high risk of decreasing water availability with the shift in climate. The existing water quality challenges, especially temperature, bacteria and nutrients, are exacerbated with the declining flows. Much of the population of the Basin resides in the inland Rogue Valley of Jackson County, where water is expected to become increasingly scarce over time.

Water Quantity

Water quantity management in portions of the upper Rogue (Little Butte and Bear Creek) is well documented in the WISE Preliminary Feasibility Study (HDR, 2009). The complex network of reservoirs, diversions, canals, and water users, makes effective management difficult. Projects and strategies to improve efficiency of delivery and water use under consideration within the WISE project areas, but will take decades to complete. The Basin has 6898 approved surface water rights throughout the Basin with 170 rights pre-dating statehood (ODEQ, 2011) and consuming 4,202cfs (OWRD, 2013). Instream water rights exist for approximately 273 miles of streams and the River. However, having an instream right does not guarantee flows are present, given the low priority dates of instream rights. There are 5 major publicly owned reservoirs in the Rogue Basin that provide regulating flow (William Jess and Applegate Dams), flood control, irrigation, and water supply (not all operate for all purposes noted), and 22 public water systems (ODEQ 2012) drawing upon surface waters, in addition to thousands of smaller impoundments. There are another 251 public systems (ODEQ, 2011) relying on groundwater; which is of increasing concern due to

the rapid decline of the water table and or groundwater quality in many locations. There are limited studies of groundwater and its interaction with surface water in the Rogue Basin (DEQ, 2015 S. Stewart personal communication).

Map 2: Instream Water Rights shows the stream reach extents with in-stream water rights (OWRD, 2011) that may help protect aquatic habitats. However, many of these rights are insufficient and/or are junior to other water rights in the basin. A careful analysis of all water rights will be needed to implement flow restoration strategies. Map 3: Predicted Changes in Mean Summer Flows by 2040 shows the predicted flow changes in the summer mean based on climate change modeling (Wegner, et al. 2010), which shows significant decreases in headwater areas due in part to projected snowpack loss. Streams in the valley show less projected summer flow change, partly because many are already dry under current conditions. Map 4: Predicted Changes in 1.5-yr Return Interval Winter Flows by 2040 shows the predicted change in winter mean based on climate change modeling (Wegner, et al. 2010). As with summer flows, changes are projected to be most significant in the headwaters, while the valley streams will see less change.

Water Quality

Water quality in the Rogue basin is generally considered good (ODEQ, 2012) but varies by watershed, largely from land use and water availability, as well as pollution from point sources. Temperature and fine sediment have been identified as pollutants of concern throughout the basin, while pH, dissolved oxygen, and bacteria (fecal coliform and E. coli) are problematic in specific subbasins (ODEQ, 2012). Oregon Water Quality Index monitoring for the Rogue includes five sites; status for 1999-2009 are shown in Figure 1 and Table 1: DEQ Water Quality Index Monitoring Results (ODEQ, 2011).

Table 1: Pollutant trends in Rogue Basin OWQI Monitoring Sites (1999-2009)*

Site	Site Name	Significant Sub-Index Trend	Quality Score
1	Rogue R. at Lobster Cr. Br.	↓BOD, ↓TS	Good
2	Illinois R downstream of Kerby	↑N, ↓ BOD	Good
3	Rogue R. at Robertson Br.	None	Good
4	Applegate R. at Hwy 199	↓BOD	Good
5	Rogue River at Rocky Point Br.	↓BOD, ↓TS	Good
6	Bear Cr. at Kirtland Rd.	↑DO, ↓P	Fair
7	Little Butte Cr. at Agate Rd.	↑DO, ↓BACT	Fair
8	Rogue R. at Dodge Pk.	None	Excellent

DO=dissolved oxygen, BOD=biochemical oxygen demand, TS=total solids, N =nitrogen, P=phosphorus, BACT=bacteria
Range of Quality scores = excellent, good, fair, very poor

*Adapted from DEQ, 2011

The inland Rogue, specifically Bear creek and Little Butte Creeks, have the most significant water quality challenges with multiple pollutant listings. Bear Creek is the area where a majority of the population in the basin resides and is listed as “Water Quality Limited” for bacteria, including contact advisories, by DEQ. Other watersheds have impacts primarily from agricultural and forestry practices.

Temperature is the greatest limiting factor for surface water quality in the Rogue River and streams and is predicted to be in both acute and lethal ranges for salmonids in the summer months in the coming decades (Isaak, 2014). Harmful algae bloom advisories have been issued for Willow Lake, Lost Creek Lake, Whestone Pond, Lake Selmac and Fish Lake (ODEQ, 2012) and could impact Agate Reservoir, Emigrant Reservoir, Horseshoe Lake, Indian Lake Reservoir as well as the mainstem and tributaries, as management

activities and climate change influence both the temperature and water availability. Changes in runoff patterns have already impacted Emigrant Reservoir water quality; resulting in the discharge of heavily sediment laden water down Bear creek in 2015 (Mail Tribune, May 18, 2015)

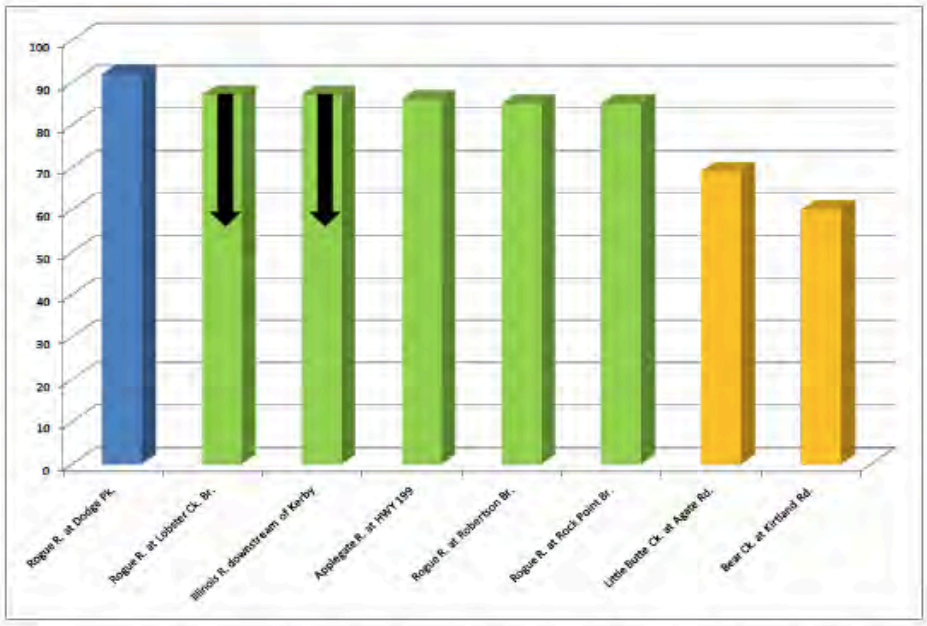


Figure 1. 10-year mean Oregon Water Quality Index (OWQI) scores for Rogue Basin sites. Blue = excellent, Green = Good, Yellow = Fair, Orange = Poor. Downward arrows indicate significantly declining trends in water quality condition

Map 5: Number of Water Quality Listed Parameters by Reach, Excluding Temperature shows the number of water quality parameters each stream reach and waterbody is listed for by DEQ (2012), excluding temperature, which is reflected elsewhere. Waterways with multiple water quality concerns will require concentrated efforts to address sources if impairment; little butte and bear creek are top priorities for addressing water quality. Map 6: Impervious cover by HUC 6 shows the levels of impervious cover, a strong predictor of water quality impact. The rogue valley and Grants Pass area have the highest impervious cover areas (and associated water quality impairment), highlighting the need to focus on stormwater management in the red and orange subwatersheds.

The range of acceptable temperatures for salmonid species found in the Rogue is 12-22°C depending on life history stage and species (Beechie et al, 2012). Map 7: Historic Modeled August Mean Temperature shows the historic modeled temperature of streams in the Rogue based on crowd sourced temperature data, with an increase in warming as water flows downstream. Map 8: Predicted August Mean Temperature by 2040 shows the projected modeled temperature in 2040 taking into account the median climate model A1B emissions scenario (Isaak, 2014); there is a significant increase in projected stream temperatures across the Basin, reducing the availability of thermally optimal aquatic habitat for fish in the system during the summer months. Map 9: Predicted Change in Stream Temperatures Current -2040 shows the difference between the current and future scenario. A 1 to 1.66 degree change in the summer mean water temperature in the next 25 years could alter water quality and aquatic habitat conditions significantly. The Action Plan identifies ways to help build resiliency in select locations to accommodate the likely changes.

In addition to surface water impairment, many areas of the Rogue Basin have significant surface-groundwater interactions that may impact water quality. "Groundwater quality is potentially impaired in many areas of the basin based on results from the Oregon Health Authority (OHA) real estate transaction testing results (ODEQ, 2013). The primary groundwater quality concerns in the basin are: nitrate and bacteria in the valley and lowlands and arsenic, salts, minerals, fluoride, and boron in the hills and mountain areas. ODEQ analysis indicates 98% of the bacteria in Bear Creek and 96% of the bacteria in the Rogue River are due to nonpoint sources of pollution including: runoff from streets, lawns, agricultural lands, septic systems, and others (ODEQ 2012). Arsenic, salts and minerals, fluoride and boron are most likely present in groundwater due to naturally occurring sources in the bedrock"(SOFRC, 2013). Figure 2 shows the nitrate test results from domestic well testing 2001 -2015 complied by OHA (2015). The blue dots represent background levels of nitrate, the yellow are elevated levels, and the red are high nitrate concentrations at 10 parts per million or above, which is the limit of EPA's safe drinking water standard. The elevated and high-level points highlight the need for concentrated outreach and action to reduce nitrate and bacteria loading into groundwater. In general, groundwater quality and quantity in the Rogue Basin are not well understood; this is an area of increasing need for study, according to DEQ and others working in the Rogue Basin on this issue.

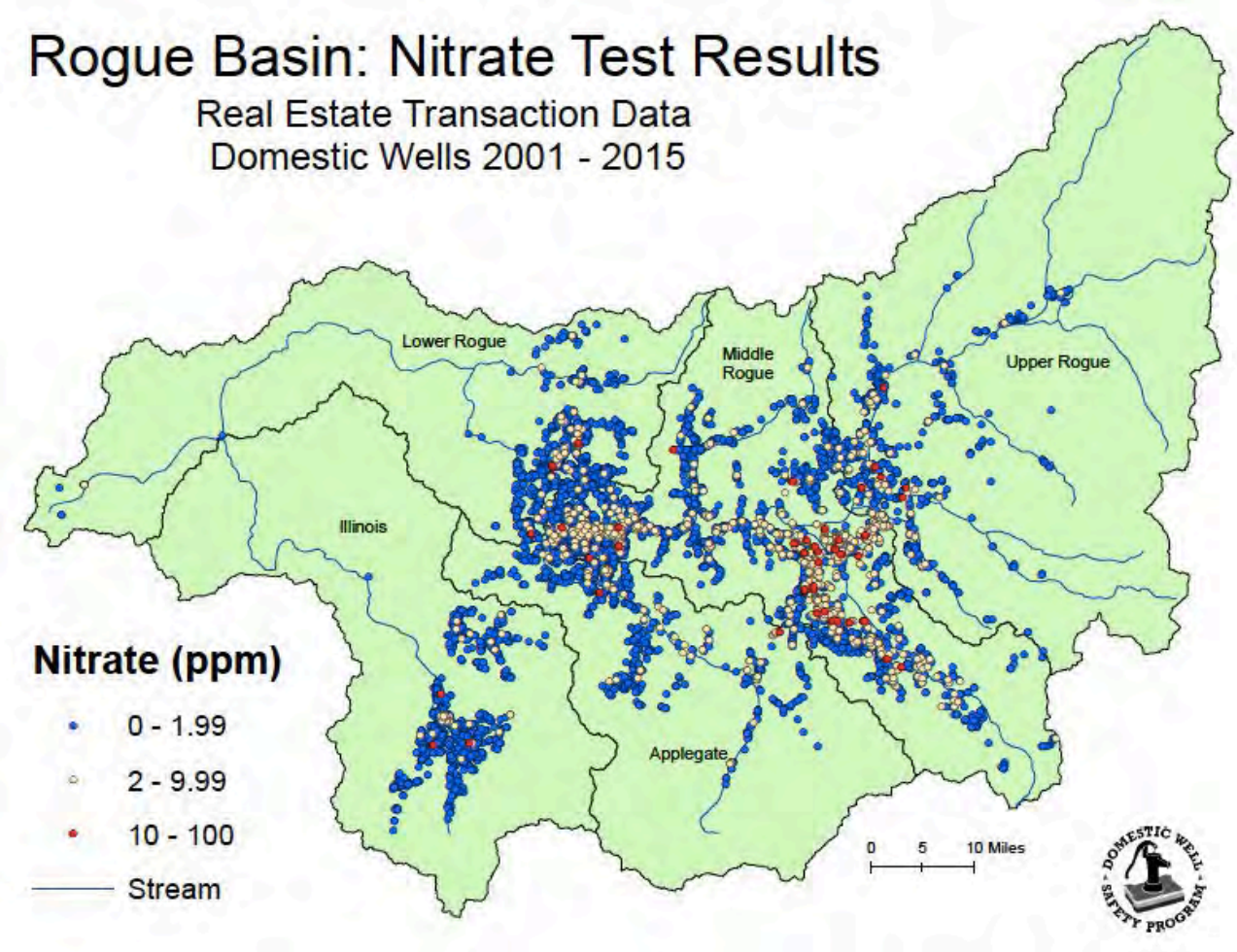


Figure 2: Nitrate Levels in Groundwater in the Rogue Basin

Aquatic Habitat

The River, streams, and the estuary of the Rogue support a diversity of native fish including spring and fall Chinook salmon, Coho salmon (ESA-listed threatened), green sturgeon (ESA -species of concern), white sturgeon, winter and summer steelhead, Pacific lamprey, and cutthroat trout, Klamath small-scale sucker, among others (ODFW, 2006 NOAA, 2014). The anadromous fish belong to evolutionary significant units (ESUs) separate from the bulk of Oregon coastal populations, and the Rogue is the anchor in Oregon for these ESUs. Summer steelhead in the Rogue are particularly unique with their expression of the half-pounder life history. Tens of thousands of young adult steelhead return to the Rogue during the fall (following just several months in the ocean) before migrating back out to the Pacific. This migration pattern only occurs in the southwestern corner of Oregon and northwestern corner of California (primarily in the Rogue, Klamath, and Eel Rivers). Rogue Coho are part of the Southern Oregon Northern California Coho (SONCCC) ESU (NOAA, 2014) and are part of a recovery plan. The Rogue is also believed to be one of only three rivers in the world where green sturgeon spawn (NOAA, 2015). The Rogue is the second largest producer of salmon in Oregon, only behind the Columbia River System (NOAA, 2006).

Aquatic habitat dependent wildlife species found in the Rogue include: beaver, river otter, northern red-legged frog, coastal tailed frog, foothill yellow-legged frog, Pacific tree frog, common king snake, and northwestern pond turtle, among others. Aquatic/ riverine dependent birds found in the Rogue include: common merganser, great blue heron, green heron, bald eagle, osprey, American dipper, belted kingfisher, among others. The Rogue has exceptional biodiversity, and even supports an aquatic gilled mushroom found nowhere else in the world.

Macro-invertebrates, which are the basis of the food chain for the above noted species, were sampled by DEQ from 2000-2008 in 62 wadeable streams throughout the Rogue. Of those, 62% were least disturbed, 8% moderately, and 30% most disturbed (ODEQ, 2011). The findings generally corresponded to levels of current or historic land use practices – with valley bottom streams and those with former mining, logging or forestry operations scoring lowest. Limitations on macroinvertebrate production can have cascading impacts on other species.

Aquatic habitat conditions vary widely throughout the basin based hydrogeomorphic conditions as well as historic impacts of mining, agriculture, forestry and urban land use practices. Map 10: Synthesis of Historic Aquatic Habitat Scores for Pools, Large Wood, and Side Channels shows the quality of the aquatic habitat assessed by ODFW, USFS, and others – with a composite score for pool depth, large wood presence, side channels (ODFW, 2014; CBI, 2003). This reflects historic monitoring data on habitat conditions that were used to target where the best aquatic conditions already exist. Map 11: Extent of Salmonid, Sturgeon, and Lamprey Use and Number of Species Types shows the extent of spawning and rearing salmonid species, sturgeon, and lamprey utilizing the river and streams of the Rogue Basin, and the extent of Coho intrinsic potential (ODFW, 2013, NOAA, 2014). This information helped the partners to consider the protection and restoration locations that offer benefits to the most native fish species.

The Estuary

The estuary of the Rogue provides the critical transition zone for migrating salmon and critical habitat for green and white sturgeon. However, a comparison of 1945 and 1975 adult fish scales from the Rogue River indicate that juvenile spring and fall Chinook spend much less time rearing in the Rogue estuary than they did 20 years ago. These data suggests that physical and hydrologic modifications in the Rogue River estuary may have had significant impacts on Chinook populations in the river (Hicks, 2005). Marine fish such as shiner perch, surf smelt, juvenile sturgeon, and starry flounder also come into the estuary in the summer to feed, with some perch species spawning or bearing their young in the estuary. Lamprey, and adult green and white sturgeon migrate through the estuary and spawn in the river systems. Shad, stickleback, herring, and sharks use the estuary as well (Timchak & Myers, 2015).

The marine subsystem accounts for 80 percent of the area of the estuary and extends from the mouth to the Highway 101 bridge at river mile 1.0. This system has high salinity during the summer and strong currents throughout the year. The area is highly modified and most of the development in the estuary is located in this subsystem. Approximately 13 acres of intertidal and 14 acres of subtidal land was filled between 1960 and 1972. Fills included the dike (separating the boat basin from the main channel), marina, and the development and riprap along the north shore (Hicks, 2005).

There is twice as much subtidal area in the riverine subsystem than in the marine subsystem, with most of the substrate being cobble and gravel. Areas away from strong currents, where silt is deposited during the summer and fall and where bottom salinities are sufficiently high, provide suitable habitat for amphipods (crustacea that are shrimp-like in form, which contains mostly marine and freshwater forms). Benthic sampling by the U.S. Forest Service downstream of river mile 2.2 found productive habitat for *Corophium spp*. and *Anisogammarus spp*. in the channel and lower intertidal areas. The subtidal habitat is important feeding and rearing areas for fish with juvenile Chinook, Coho salmon and cutthroat trout often abundant in this area (Cowardin et al., 1979).

Although the supply of sediment to the Lower Rogue may be greater than the transport capacity of the river, the extent and area of bars have also been influenced by historical and ongoing gravel mining and levee/dike construction. Over the last 40 years, permits for gravel removal have declined from 313,000 cubic yards per year to 40,000 cubic yards per year (Pratt, 2004). Thus, sediment has both increased and decreased within different parts of the Rogue Basin, from a variety of sources, making it difficult to assign a cause to any particular lateral or vertical movement in the channel or river bar location. Taking a long-view, the reduction in peak flows and stabilization of bars upstream, should allow bars in the Tidal Reach to stabilize and provide opportunities for wetland establishment. Further information regarding the condition and restoration opportunities of the Rogue estuary can be found in the *Rogue Estuary Strategic Plan* (Timchak & Meyer, 2015). Map 12: Extent of Rogue Estuary shows the area up to river mile 5 and the areas identified as offering high to low ecological priority (Timchak & Meyers, 2015).

Riparian Habitat (including floodplain forests, wetlands)

Riparian habitats cover a small percentage of land area in the Rogue Basin, yet they provide critical breeding areas, overwintering grounds, migration stopover habitat, and corridors for dispersal for many landbird species (Altman 2000), as well as core habitat for amphibians and reptiles (noted in aquatic above) and water dependent mammals such as beaver, river otter, and muskrat. The soil and vegetation within riparian corridors also support some of the invertebrate species life history, critical to native fisheries. Fish utilize riparian forests as velocity refugia during flood events, and the side channels carved through riparian and floodplain habitats support various life history stages depending on species. Alluvial aquifers within riparian areas, buffer and lag in-stream temperature and flow fluctuations as part of hyporheic exchange (Amerson, 2015). Where geologic conditions and floodplain connectivity are adequate, riparian areas can store cool groundwater that supports stream/river base flows during the summer and fall.

Greater bird species abundance and diversity is often found in riparian zones compared to adjacent habitats, especially at lower elevations (Stauffer and Best 1980, Knopf 1985). However, habitat loss and anthropogenic impacts have resulted in significantly declining population trends for birds breeding in riparian areas, including belted kingfisher, spotted sandpiper, Bullock's oriole, willow flycatcher, song sparrow, and wrentit (Breeding Bird Survey Southern Pacific Rainforest physiographic region; Altman 2000 and Sauer et al 2001). Willow flycatcher and yellow-breasted chat are additionally listed as Strategy Species in the Oregon Conservation Strategy (ODFW 2006), while willow flycatcher and wrentit are identified as species of continental importance in the Pacific Avifaunal Biome in the Partners in Flight

North American Landbird Conservation Plan (Rich et al 2004). Due to their biological importance and relative rarity, loss of riparian habitats may be the most important cause of population decline among Western landbird species (DeSante and George 1994), and thus represent a critical conservation priority. Other riparian focal species laid out in the conservation plan for Oregon lowlands and valleys, including purple martin, tree swallow, and yellow warbler (Altman 2000).

Map 13: Extent of Geomorphically Derived Riparian Areas shows the estimated extent of riparian / wetland/ floodplain corridors in the Rogue as developed by the WGA/ LLC Riparian Mapping Project (Krosby et al., 2014). An estimate of the resilience of these riparian corridors in a climate change scenario for 2040 is presented in Map 14: Predicted Riparian Corridor Resilience by 2040 (Krosby et al., 2014). Map 15: Predicted Riparian Dependent Bird Resilience by 2040 shows the predicted areas resilient bird habitat for riparian forests, given estimated climate change impacts (Veloz, et al., 2013). Map 16: Land Cover Vegetation Designations 2011 shows the land cover designations of the riparian corridors based on the National Land Cover Database (USGS, 2011). The data within maps 13-15 were used collectively to score the range of resilient riparian habitats in the Basin.

Terrestrial Habitat – Conifer and Oak Forests, and Grasslands

The terrestrial habitats and biodiversity of the Rogue are extensively documented, most recently in the Rogue Basin Action Plan for Resilient Forests and Watersheds (SOFRC, 2013) and The Nature Conservancy's Eco-regional Assessments that include the Rogue Basin (Vander et al, 2004 and Popper et al., 2007), and not repeated here. Vegetation zones of the Rogue Basin are driven by fire frequency, precipitation/temperature, volcanism, glacial history, topography (aspect and elevation), and geology. Mixed-evergreen and mixed conifer forests are found throughout the Cascade Range and Siskiyou Mountains; mixed-evergreen forests are more prevalent in the Siskiyou and mixed-conifer forests, in the Cascade Range. Oak woodlands and grasslands dominate the interior Rogue valley. Across the 3.3 million acres of the Rogue Basin the most abundant forest subseries is moist Douglas-fir (26%) followed by White fir intermediate, dry Tan oak-Douglas-fir (19%), dry Douglas-fir (13%), and Oregon white oak (5%)(SOFRC, 2013).

The ESA-listed spotted owl, marbled murrelet, and gray wolf, cougar, deer, elk, black bear, Pacific fisher, and coyote, red tree vole, Northern goshawk, Siskiyou Mountains salamander, and rare plants such as the Siskiyou Mariposa lily, yreka phlox, and Gentner's fritillary occupy the terrestrial habitats of the Rogue Basin. Within the Rogue valley, open woodlands, young forests, grasslands, and shrublands (in addition to open wetland communities) also provide habitat for monarch butterflies, and other rare and declining pollinators (USFS, 2015) and bird species. In February 2015 the U.S. Fish and Wildlife Service launched a new public awareness/habitat creation campaign in an attempt to reduce the decline in monarch butterfly populations, estimated at 90 percent in recent years, due to habitat loss from agricultural practices, development, and cropland conversion (USFW, 2015).

All the terrestrial habitats of the Rogue are fire-adapted and dependent. Increased tree and shrub density (everywhere) and shifts to shade-tolerant species (in most settings and in the understory) are documented across a range of habitats in the Rogue including shrublands, oak savannas, and forests dominated by everything from pines to true firs (SOFRC, 2013). These habitats are at high risk for disease, insect infestations, drought stress, and uncharacteristically large and severe wildfires that can be destructive to native species and local communities. Management that excludes fire, and utilizes unsustainable logging and grazing practices, increases the risk of fire severity, especially in the face of climate change.

A summary of terrestrial habitat conditions is presented in the following maps: Map 17: Ecological Integrity Index of Species Richness and Habitat Quality; it shows the ecological integrity scores for existing conditions in the Rogue, based on species richness and habitat quality (Kagan, et al., 2014). Map 18:

Predicted Areas of High Terrestrial Biodiversity Resiliency shows the predicted areas of high terrestrial biodiversity resiliency produced in the face of climate change (Buttrick et al, 2015). Map 19 a, b, c Predicted Areas of Resilient Bird Habitat for Conifer Forests, Oak Woodlands and Grasslands shows the predicted areas resilient bird habitat for conifer forests, oak woodlands and grasslands, given estimated climate change impacts (Veloz, et al.,2013). Map 20: Intrinsic Potential for the Northern Spotted Owl shows the most likely habitat for the northern spotted owl under current climate conditions (Carroll, 2008). The data from maps 17-20 were used collectively to score the range of upland habitat resiliency in the Basin.

Rogue Community – Assessment of Social Connections

There are strong social connections to the Rogue River and its Basin, and significant social support among conservation organizations, the Cow Creek Band of Umpqua Tribe of Indians, Federal and State agencies, landowners, and recreation enthusiasts (fishing, birding, rafting) to restore the Rogue. There were a total of 20 organizations working to support the health of the Rogue in this planning effort. And there is an extensive list of other federal, state, and local entities and nonprofits working on specific natural resource issues (such as forestry, water supply, fish passage, temperature management, etc.) in the Rogue. A table of the primary entities identified through this planning process and their role in the Basin are provided in the Implementation Framework section, Table 10.

Watershed councils, Soil and Water Conservation Districts, the Southern Oregon Land Conservancy, Applegate Partnership, Southern Oregon Forest Restoration Collaborative, Lomakasi, and Irrigation Districts offer the closest connection to water users, private landowners and on-the-ground implementers. Other nonprofits such as the Nature Conservancy, WaterWatch, and the Rogue Riverkeeper work with the public and engage with Local, State, and Federal entities to address policy, permits, and long term protections. The Freshwater Trust and RVCOG are engaged with local, State, and Federal partners on resource mitigation and permit compliance related activities on behalf of clients and government members. The Rogue Basin Partnership is charged with keeping all the players informed and aligned in their efforts, and in helping them deliver on this Action Plan.

The Cow Creek Band of Umpqua Tribe of Indians' Ancestral Territory includes the Rogue Basin, and the natural and cultural resources within the area are of paramount importance to the Tribe. The Tribe's cultural resources are vital to the continuance of the Tribe's traditional cultural practices, beliefs and identity. The cultural resources of significance to the Tribe include, but are not limited to, traditional use areas, archaeological sites, burial grounds, and spiritual sites, as well as natural resources such as plants, animals, fish, water and minerals. Therefore the mission of the Tribe's natural resources department is to, "Protect and enhance Tribal lands, natural resources on these lands, and the Tribe's aboriginal and cultural heritage, ensuring that all natural and cultural resources are managed in a sustainable, well balanced manner that reflects the ecological, cultural, and economic priorities of the Cow Creek Band of Umpqua Tribe of Indians". Therefore, the Tribe is an active participant in management of natural and cultural resources within the Rogue Basin.

Most of these partner organizations are collaborating in sub-groups working on water quality, riparian restoration practice, fish passage barrier removals, water management via the WISE project, forestry and wildfire hazard risk, biodiversity, and individual watershed actions. While not all efforts can be fully integrated, the Action Plan process attempted to engage as many stakeholders as possible to discuss and share information of common interest. Close coordination with expert organizations in biodiversity and forest health, as well as the US Forest Service and Bureau of Land Management helped to support an "all lands/water approach" in this Action Plan. Since no common vision or platform unites Rogue organizations, and staffing turnover rates are high, both the formation of the Rogue Basin Partnership and

the strategies noted in the Plan Communication and Sustainability section will be important to continually strengthen the social network.

Ownership

A total of 60% of the Basin is under US Forest Service / Bureau of Land Management, 4% is State and local governments, 36% is private (Rogue Riverkeeper, 2015). Map 21: Landownership Patterns highlights land ownership by category, including land in conservation ownership, wilderness / wild and scenic designations.

Population and Stewardship

The Basin supports a human population larger than any other coastal watershed in Oregon, with an estimated 316,212 residents in 2014 (US Census Bureau, 2015). Local SWCD's and Watershed Councils actively engage public and private landowners to voluntarily help restore natural resource conditions and improve land management practices. There have been 1029 reported projects in the Rogue Basin over the last decade, covering 409 miles of stream/river and road related activities, and 2236 acres of instream, riparian, upland and wetlands (OWEB, 2015). A vast majority of the projects were riparian related (642) followed by road repair (158), fish passage (97) and fish screening (70). Map 22: Existing Enhancement or Stewardship Projects highlights the known projects in the Rogue as documented on OWEB's OGMS database. This likely under-represents the number of willing landowners, because not all projects get reported. Map 23: Locally Determined Priority Watershed Areas highlights the areas or watersheds identified as important by local organizations and federal agencies; these represent either ecological and/or as a social strongholds per each organizations' independent local planning efforts. Organizations used various approaches and methodologies to determine their priorities, mostly through subjective evaluations (K Smith, personal communications. 2013). Map 23 represents information distilled from interviews and is only moderately consistent with the OWEB project reporting data, indicating the difference between more recently identified priorities and where work has actually occurred in the past.

Economic Valuation – Assessment of Economic Value of Natural Resources to the Rogue Basin

Fresh water is an economic engine of the Rogue Basin. Without water within healthy functional watersheds, the local communities, and the hundreds of thousands of visitors, would no longer be supported. The Basin delivers vital water resources that support an extensive native fishery. In a study on the economic benefits of Rogue salmon and steelhead, ECONorthwest calculated over $1.5 billion in benefits across the State of Oregon and beyond, with $17.4 million coming to the State specifically for fishing activities (ECONorthwest, 2009). The world-renowned rafting and other river/stream corridor dependent recreation in the Rogue (including its Wild and Scenic corridor) generate $30 million annually in economic output statewide, including 445 jobs (EcoNorthwest, 2009). The Rogue Valley is an important economic region in the state, and is heavily dependent upon its natural resources to fuel its economy. The travel/tourism industry, accounts for a combined 28.4% of the private employment within the Basin while timber represents 4.3%, and agriculture and retail make up less than 3% each, when looking at employment based on land use sectors as of 2012 (SOFRC, 2013).

The restoration economy offers another source for State and local jobs. Over 90 cents of every dollar spent on ecological restoration projects stays in the State, and over 80 cents stays in the county where the project is located, according to a University of Oregon report (Hibbard and Lurie, 2006). Additional research found that every dollar spent on restoration work indirectly generates an average of $2.10-$2.40 in spending within the county (Nielsen-Pincus and Moseley, 2010) according to the SOFRC, 2013 report.

Investment History

Investment in conservation and restoration activities, as well as environmental education were assessed for the Rogue Basin, based on readily available data from local foundation websites, and Oregon Grant

Management System (OWEB, 2014). Funding from federal programs (US Forest Service/ Bureau of Land Management, US Army Corps of Engineers, US Environmental Protection Agency, US Bureau of Reclamation, USDA Conservation Reserve and Enhancement Program (CREP)/ Environmental Quality Improvement Program (EQIP), Oregon Department of Environmental Quality, and local government sources (Medford Water Commission, Soil and Water Conservation Districts, Irrigation Districts, Medford wastewater utility/ temperature management, Rogue Valley Council of Governments, and Cities/Counties) were not assessed for this Action Plan. However, it is recognized these programs offer based funding in natural resource management throughout the Rogue Basin. *(RBP to map funding by entity).*

Figure 3 shows the allocation of the Oregon Watershed Enhancement Board funding in the Rogue from 2000-2013. OWEB has invested over $23 million in the Rogue, or $1.7 million on average annually. Approximately $1 million of the funds support capital restoration projects, while the remaining $700-$750,000 support capacity funding for Councils, SWCD's, and pre/post project implementation activities. The landowner outreach represents the smallest allocation of funds in the Rogue (and are often used for education purposes), while capital restoration represents the largest allocation of resources. (Please note: the allocation of funding to the SWCD's is an estimate, since the capacity funding for SWCD's received prior to 2009, were not recorded in the OGMS system). Figure 4 shows the allocation of funding by year in the Rogue (not when project was actually complete). The two spikes in funding in 2005 and 2010 reflect mainstem dam removal funding allocations.

There are several philanthropic foundations that support organizations based out of or are working in the Rogue. The data available on these investments is inconsistent by year and organization; Table 2 Foundation Investment in Rogue Basin Organizations highlights the funding information readily available. Laird Norton Family Foundation (LNFF) leads the investment portfolio in the Rogue for organizational capacity, planning, and implementation totaling more than $707,500 from 2008 to 2015. Modest funding for capacity, education, and specific projects has been secured from the Carpenter Foundation, Meyer Memorial Trust, Jubitz Foundation, Wilburforce, Bullitt, and Doris Duke Charitable Foundation by a diversity of nonprofit organizations within the Rogue Basin. The average investment from foundations in the Rogue, from the information secured, is estimated at $283,100 annually, with LNFF funding 41% of foundation investment.

Table 2: Foundation Investment in Rogue Basin Organizations

Foundation	Years	Funding Totals	Average
Laird Norton Family Foundation	2008- 2015	$707,500	$117,917
Meyer Memorial Trust	2000-2014	$144,900	$10,350
Carpenter Foundation	2013	$34,000	$34,000
Jubitz Foundation	Over 5 years	$100,000	$20,000
Wilburforce	2011-2014	$177,500	$59,167
Bullitt	2009-2011	$125,000	$41,667
Doris Duke Charitable Foundation*	2014	$214,000	
Totals		**$1,502,900**	**$283,100**

*Single project grant not included in average per year investment calculation

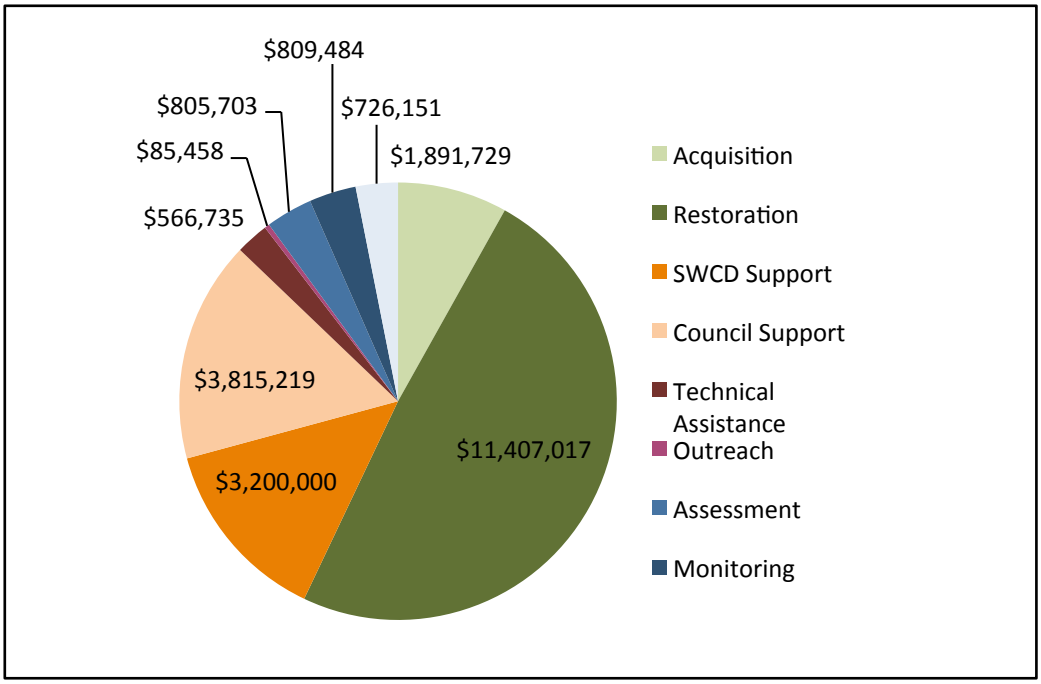


Figure 3: OWEB Investment in the Rogue by Activity Type 2000-2013

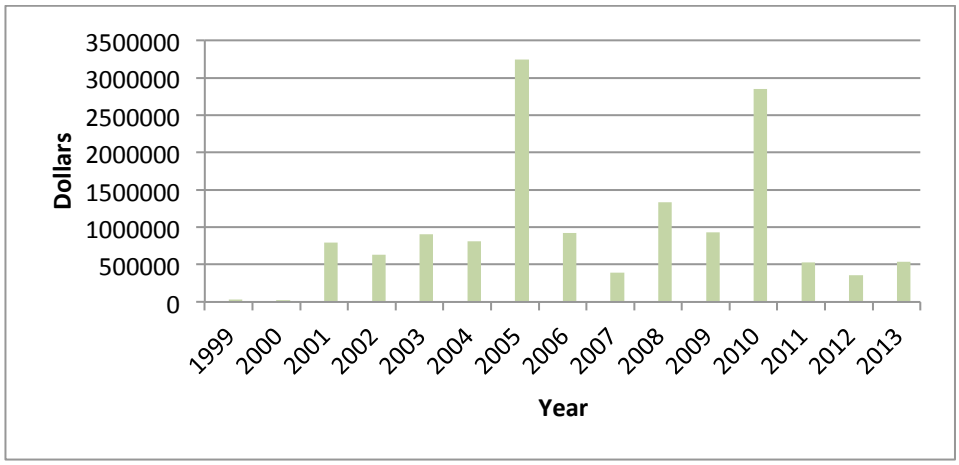


Figure 4: Overall funding in the Rouge Basin by Year 1999-2013 per OGMS. (2005 and 2010 reflect mainstem dam removal funding allocation years)

Though the investment history provided in this Plan is incomplete, it is clear that significant investments have been made in the Basin for conservation purposes. This action plan is designed to help partners secure and coordinate even more funding for the Basin, to achieve the desired outcomes in priority locations in a cost effective and efficient manner.

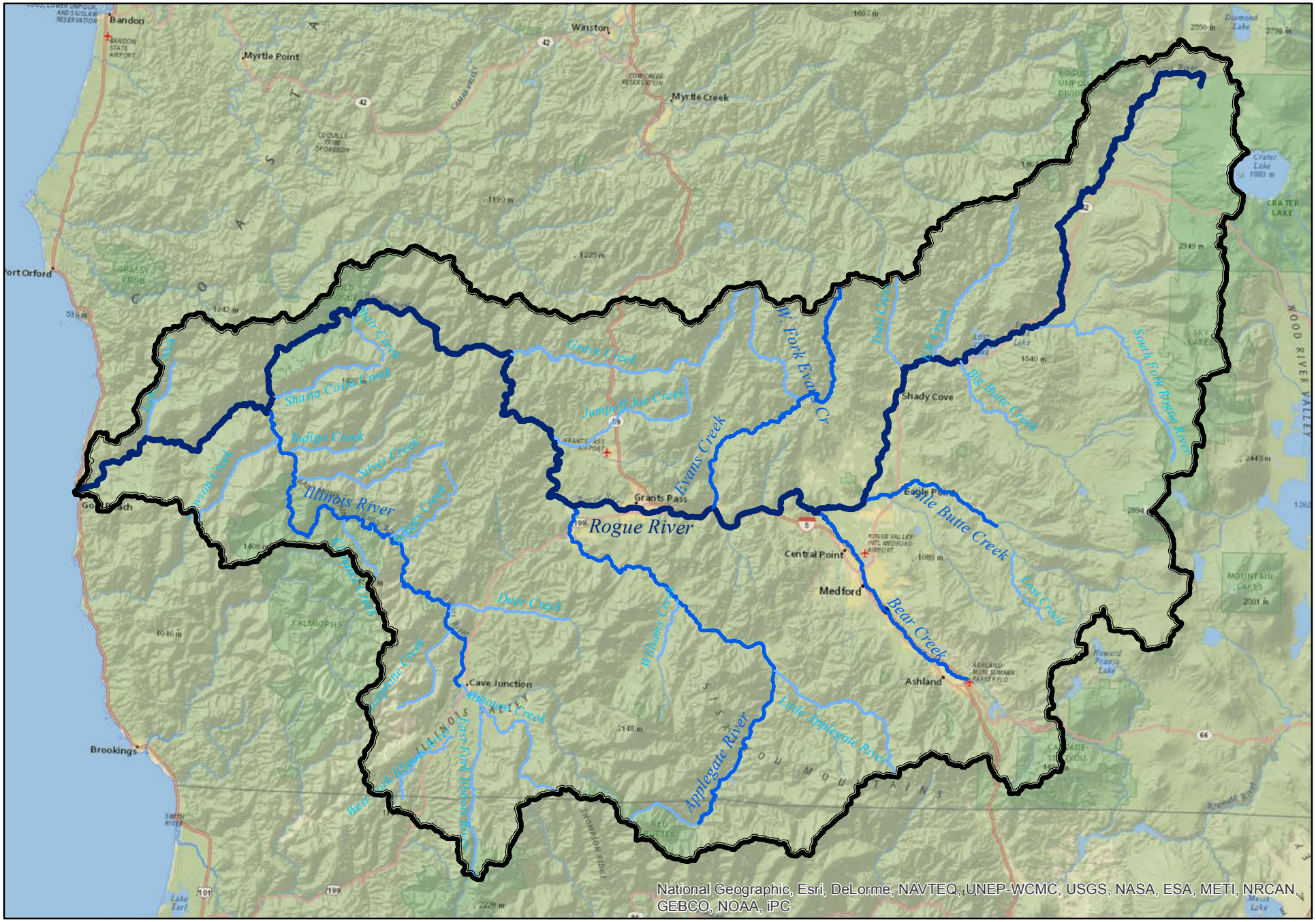
Relationship to Other Planning Efforts

There are numerous water, watershed, agricultural, forestry, and species specific plans that apply to all or part of the Rogue Basin including: Conservation plans for fall and spring Chinook in the Rogue Management Unit (ODFW 2013, 2007), SONCC Coho Salmon Recovery Plan (NOAA 2014), Restoring the Rogue (KS Wild, 2010), Rogue Basin Water Quality Status and Action Plan (DEQ, 2011), the Water for Irrigation, Streams, and Economy (WISE) project (2009), Inland Rogue Agricultural Water Quality Management Plan (IRBLAC -ODA 2010), Rogue Basin Action Plan for Resilient Forests and Watersheds in a Changing Climate (SOFC, 2014), and the Rogue Estuary Strategic Plan (Timchak and Meyers, 2015), among others (please see list in Reference section) and Table 3 below. These plans each offer assessments and identify actions to address critical limiting factors in the Basin. However, they tend to focus on one aspect of the Basin and its management, and only the newer plans consider the implications of climate change. The capital and noncapital actions tables (8 & 9) outlined in the Restoration Approach section lists plans in alignment with specific basin level priority actions.

This Action Plan helps partners integrate the prioritization of conservation and restoration, and assign leadership responsibilities for action, while incorporating actions of previous planning efforts. To facilitate greater information sharing among partners, existing GIS data and plans have been made universally available. The partners will also need to develop restoration data management infrastructure for future activities, to help support and manage an increase in the scale and quality of restoration actions across the Basin (see Implementation Framework section).

Table 3: Recent Plans in the Rogue Basin

Plan Name	Source	Year	Focus Area
Conserving Natures Stage: Identifying Resilient Terrestrial Landscapes in the Pacific Northwest	The Nature Conservancy	2015	Terrestrial biodiversity, climate resiliency
Rogue River Estuary Strategic Plan	Lower Rogue Watershed Council	2015	Estuary conditions and restoration
Ecological Integrity Assessment - Rogue Basin	Oregon State University	2014	Existing terrestrial habitat conditions
Recovery Plan for Southern Oregon/Northern California Coast Coho Salmon	NOAA	2014	Basinwide Coho recovery
Conservation Plan for Fall Chinook in the Rogue Management Unit	Oregon Department of Fish and Wildlife	2013	Fall Chinook conservation
The Rogue Action Plan for Resilient Watersheds and Forests in a Changing Climate	Southern Oregon Forest Restoration Collaborative	2013	Forest health and climate change
Elk Creek Watershed Restoration Action Plan	US Forest Service	2012	Elk Creek watershed
Water Quality Status and Action Plan: Rogue Basin	Oregon DEQ	2011	Water quality
Inland Rogue Agricultural Water Quality Management Plan	Oregon DOA	2010	Agricultural practices
Restoring the Rogue	Klamath-Siskiyou Wildlands Center	2010	Restoration on Federal Lands
Final Preliminary Feasibility Study - Bear Creek and Little Butte Creek Watersheds	WISE Project	2009	Water management
Preparing for Climate Change in the Rogue River Basin	University of Oregon	2008	Climate change adaptation
Rogue Spring Chinook Conservation Plan	Oregon Department of Fish and Wildlife	2007	Spring Chinook conservation
The East Cascades - Modoc Plateau and West Cascades Ecoregional Assessments	The Nature Conservancy	2007	Existing terrestrial biodiversity
Ashland Creek Watershed Assessment and Action Plan	Bear Creek Watershed Council	2007	Ashland Creek watershed conditions
Middle Applegate Assessment Project	Applegate Watershed Council	2007	Middle Applegate
Oregon Conservation Strategy	Oregon Department of Fish and Wildlife	2006	Basinwide threats to habitats and species
Rogue Basin Watershed Health Factors Assessment	Rogue Basin Coordinating Council	2006	Basinwide limiting Factors and Threats
Upper Rogue Watershed Assessment	Upper Rogue Watershed Association	2006	Upper Rogue Subbasin
Lower Rogue Watershed Assessment	Lower Rogue Watershed Council	2005	Lower Rogue
Klamath Mountains Ecoregional Conservation Assessment	The Nature Conservancy	2004	Existing terrestrial biodiversity
Assessment of Aquatic Habitat Monitoring Data in the Rogue River Basin…	Conservation Biology Institute	2003	Existing aquatic habitat conditions
Williams Creek Watershed Assessment	Williams Creek Watershed Council	2000	Williams Creek watershed conditions
Rogue Basin Fish Access Team Strategic Plan	Rogue Basin Fish Access Team	2000	Fish Barrier Passage
Applegate Watershed Assessment	Applegate Watershed Council	1994	Applegate Subbasin conditions



Map 1: Rogue River Basin

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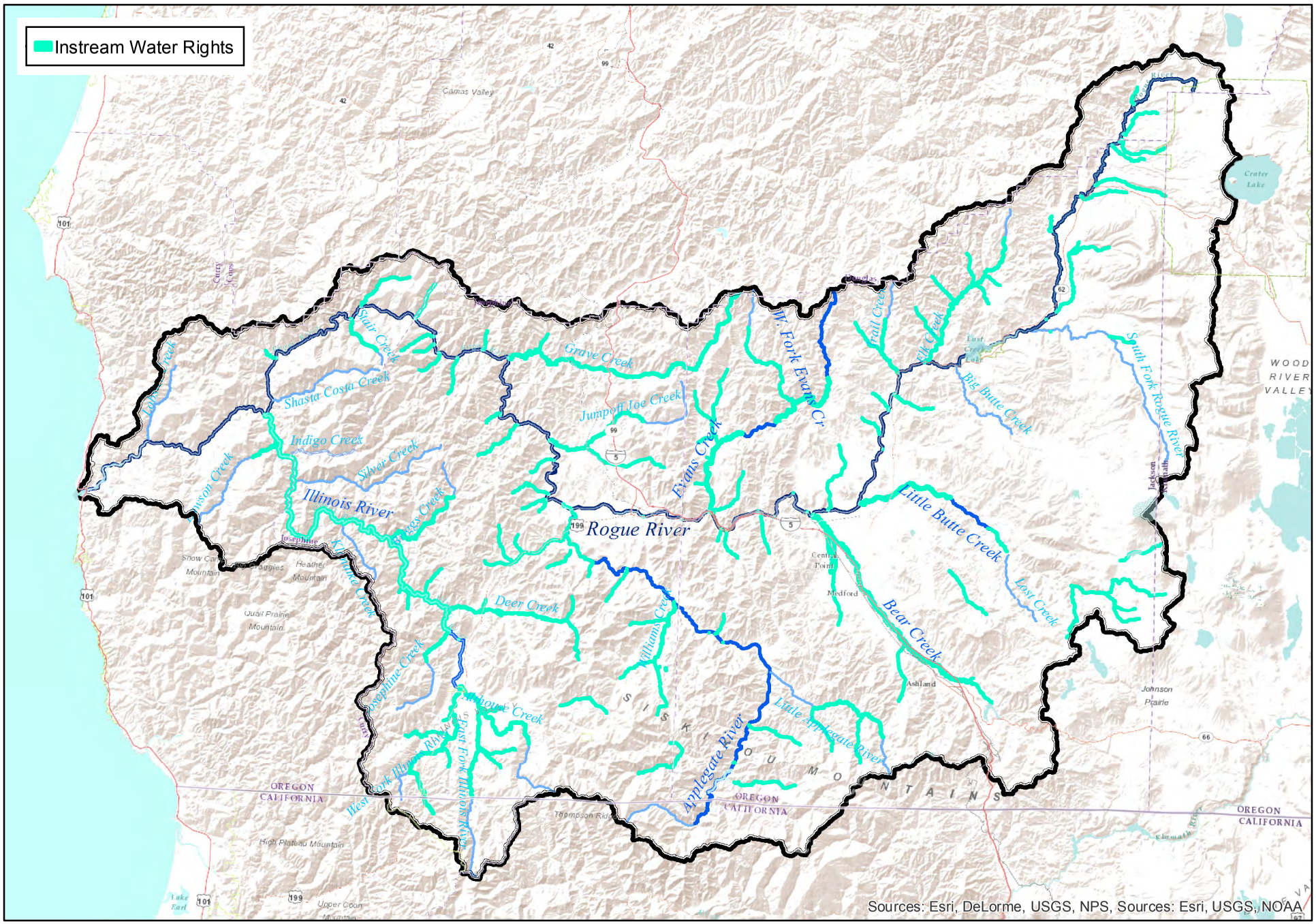

Map 2: Instream Water Rights

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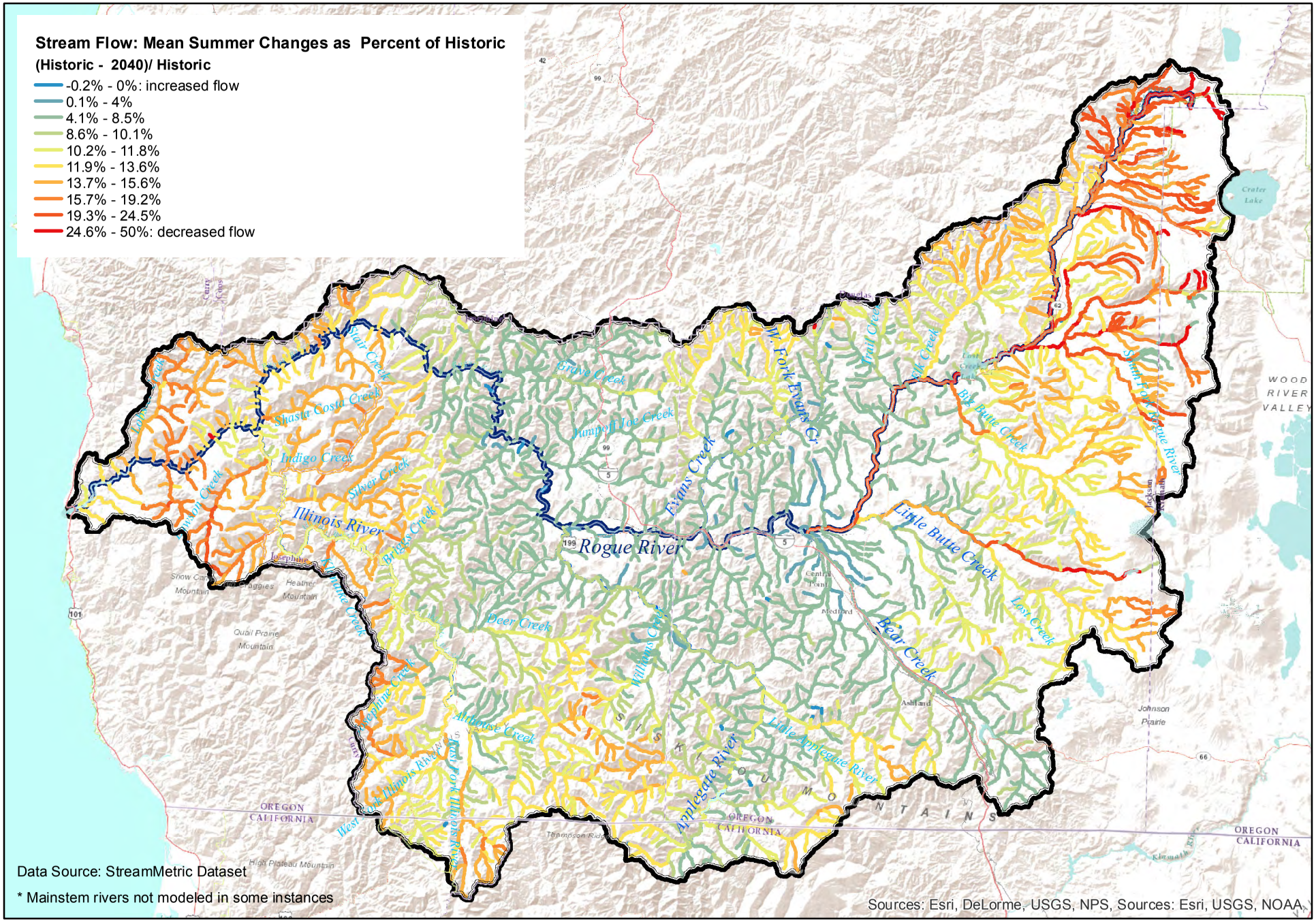
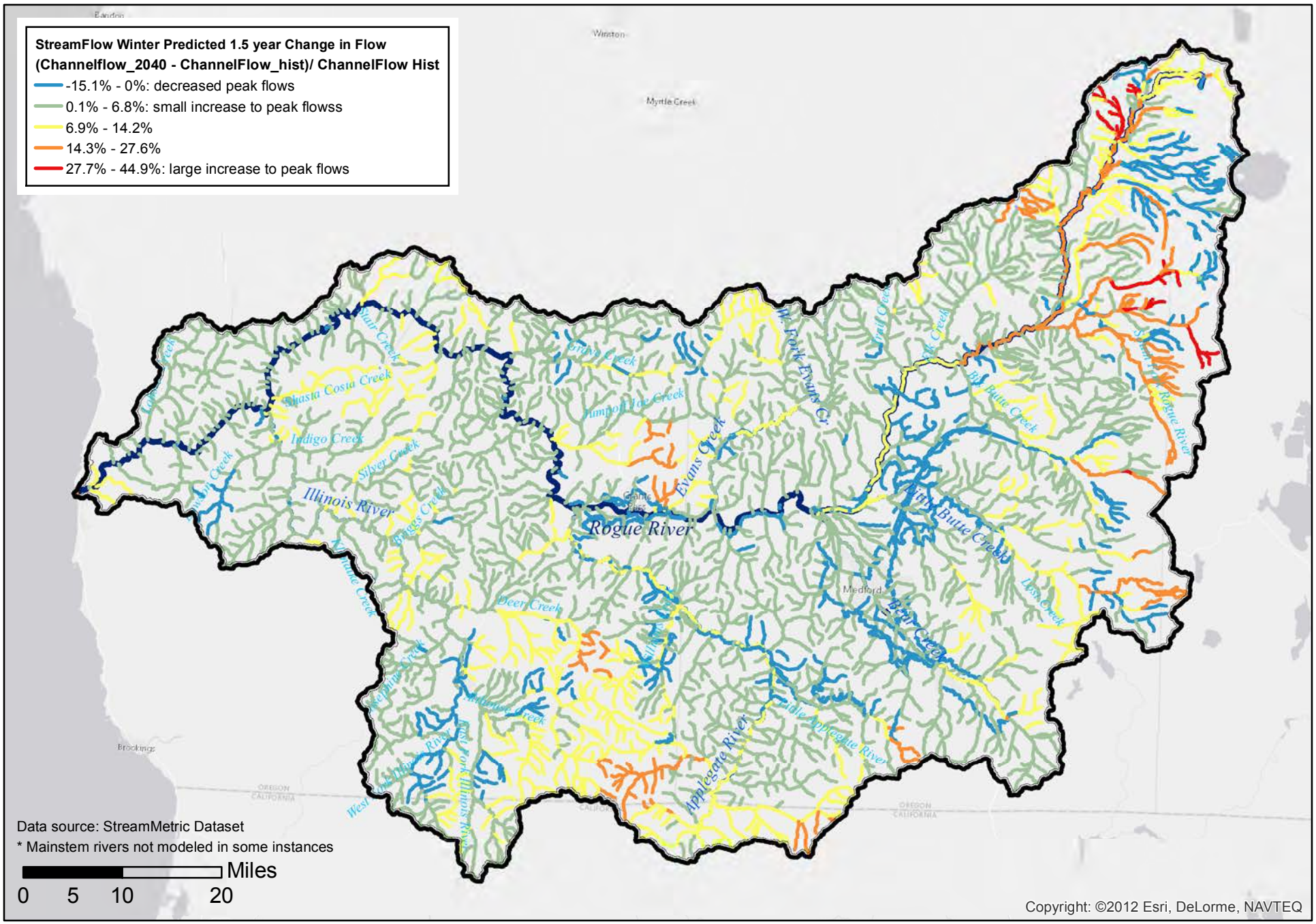
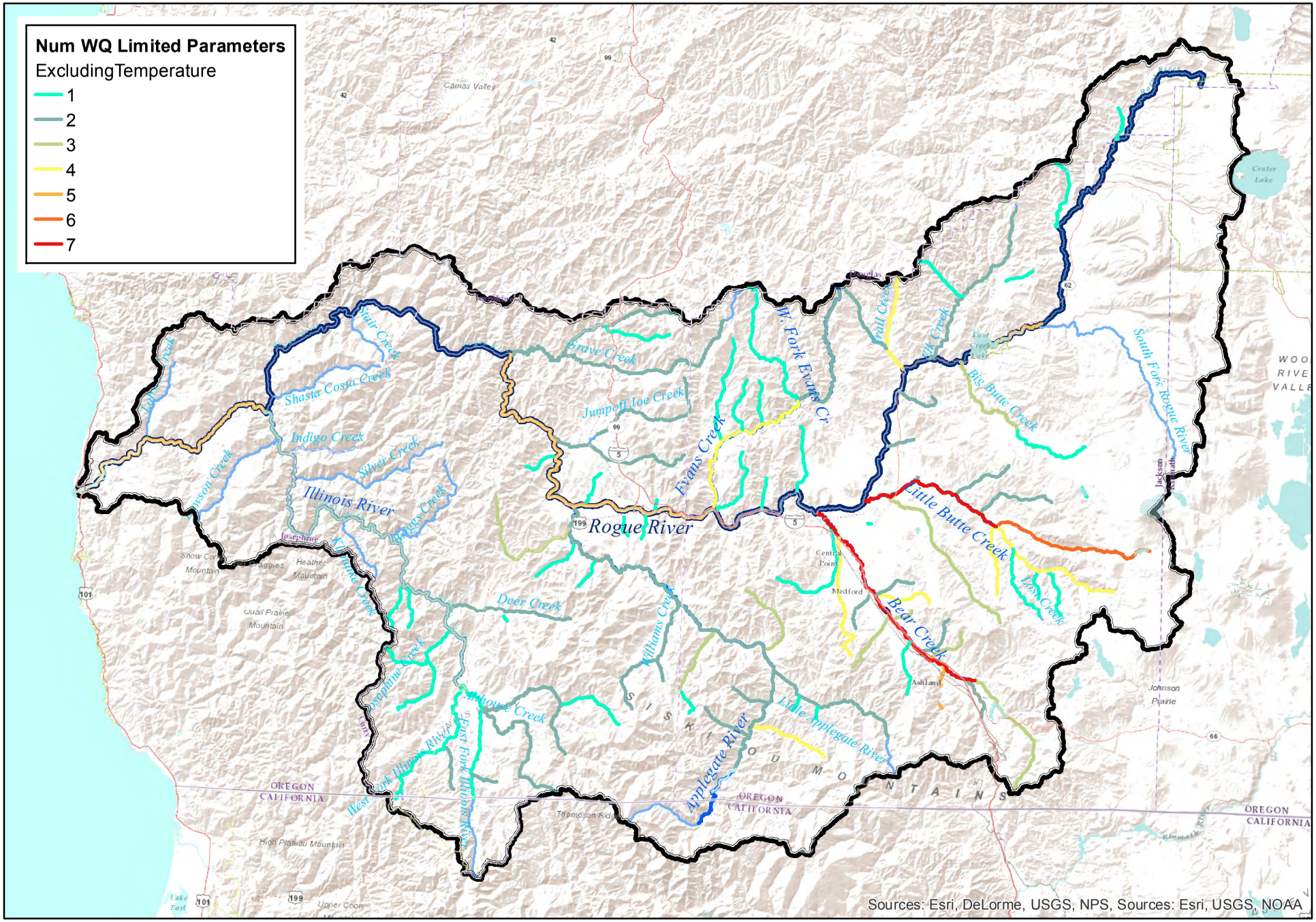


Map 3: Predicted Changes in Mean Summer Flows by 2040



Map 4: Projected Changes in 1.5 yr Return Interval Winter Flows by 2040



Map 5: Number of Water Quality Listed Parameters by Reach (excluding Temperature)

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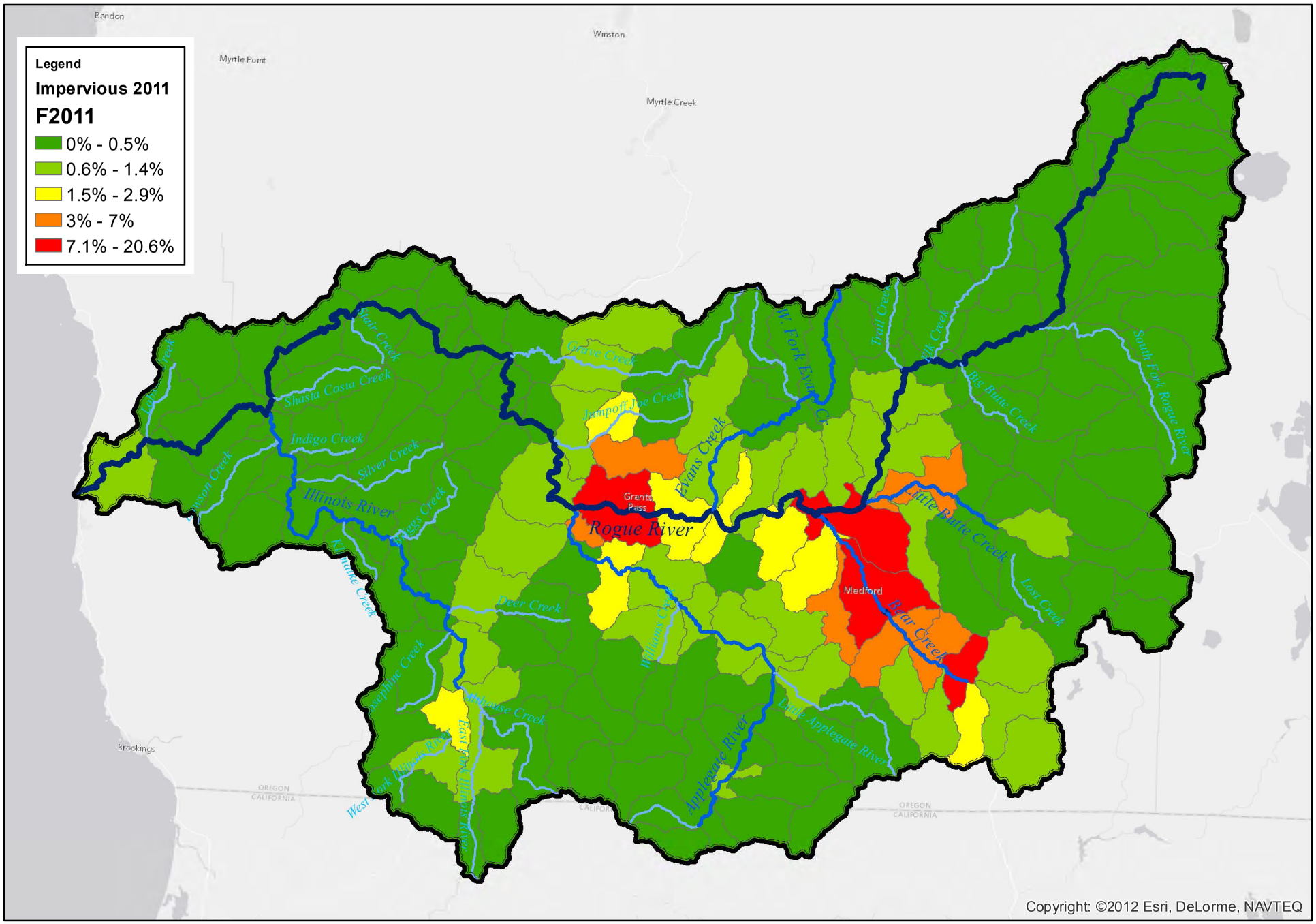
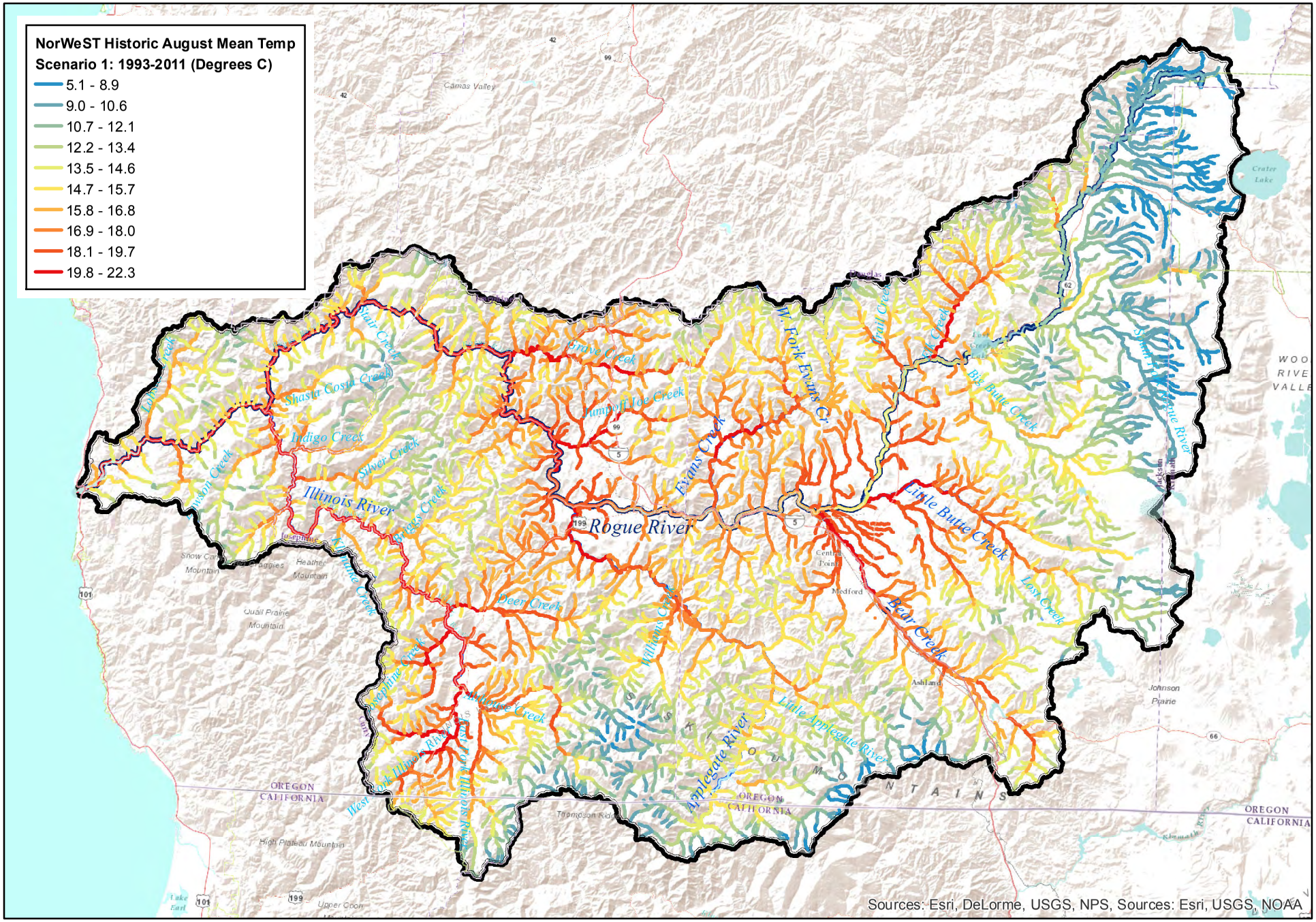
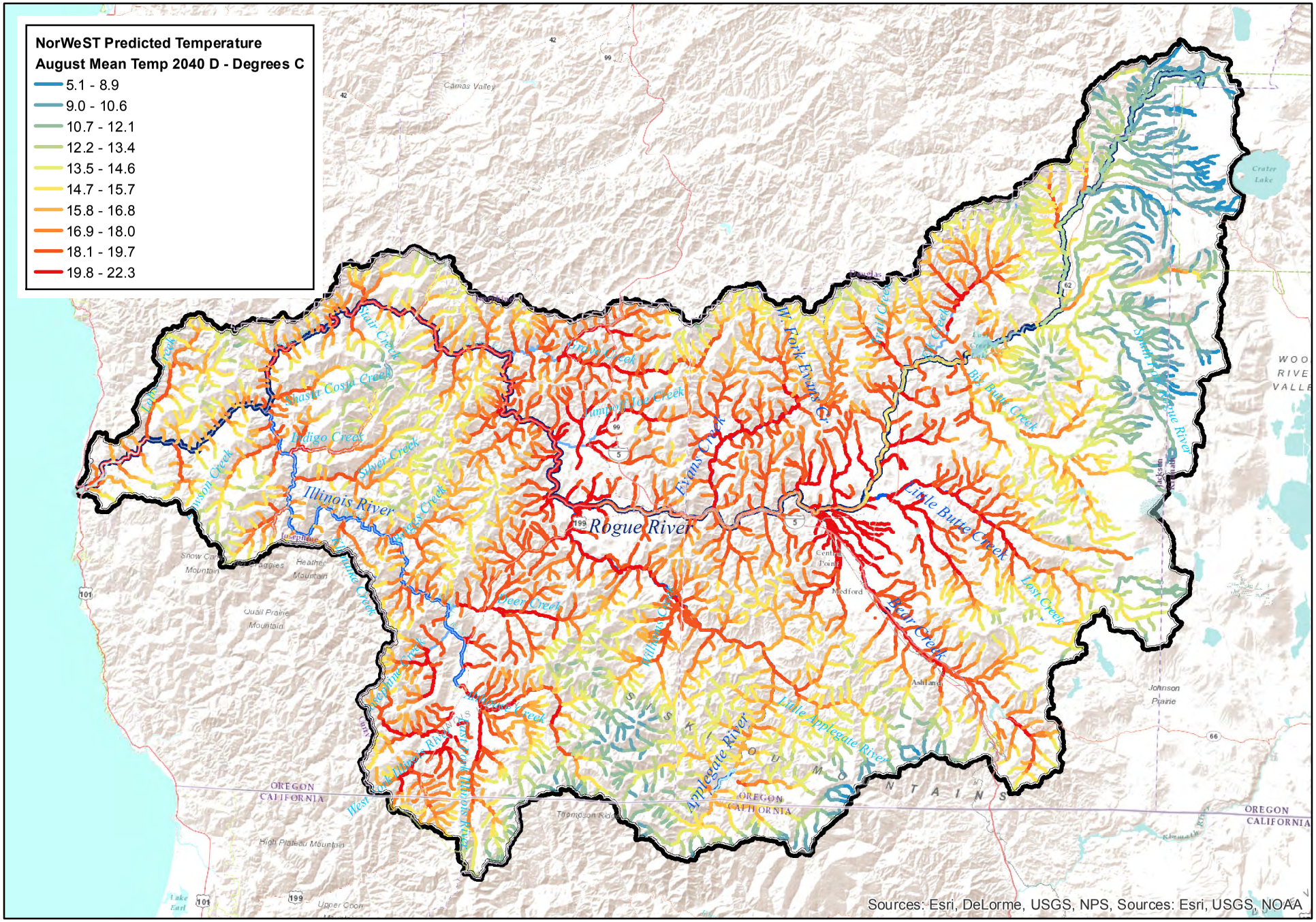
* Reaches Are Oregon DEQ defined LLIDs



Map 6: Impervious Cover by HUC 6



Map 7: Historic Modeled August Mean Temperature



Map 8: Predicted August Mean Temperature 2040

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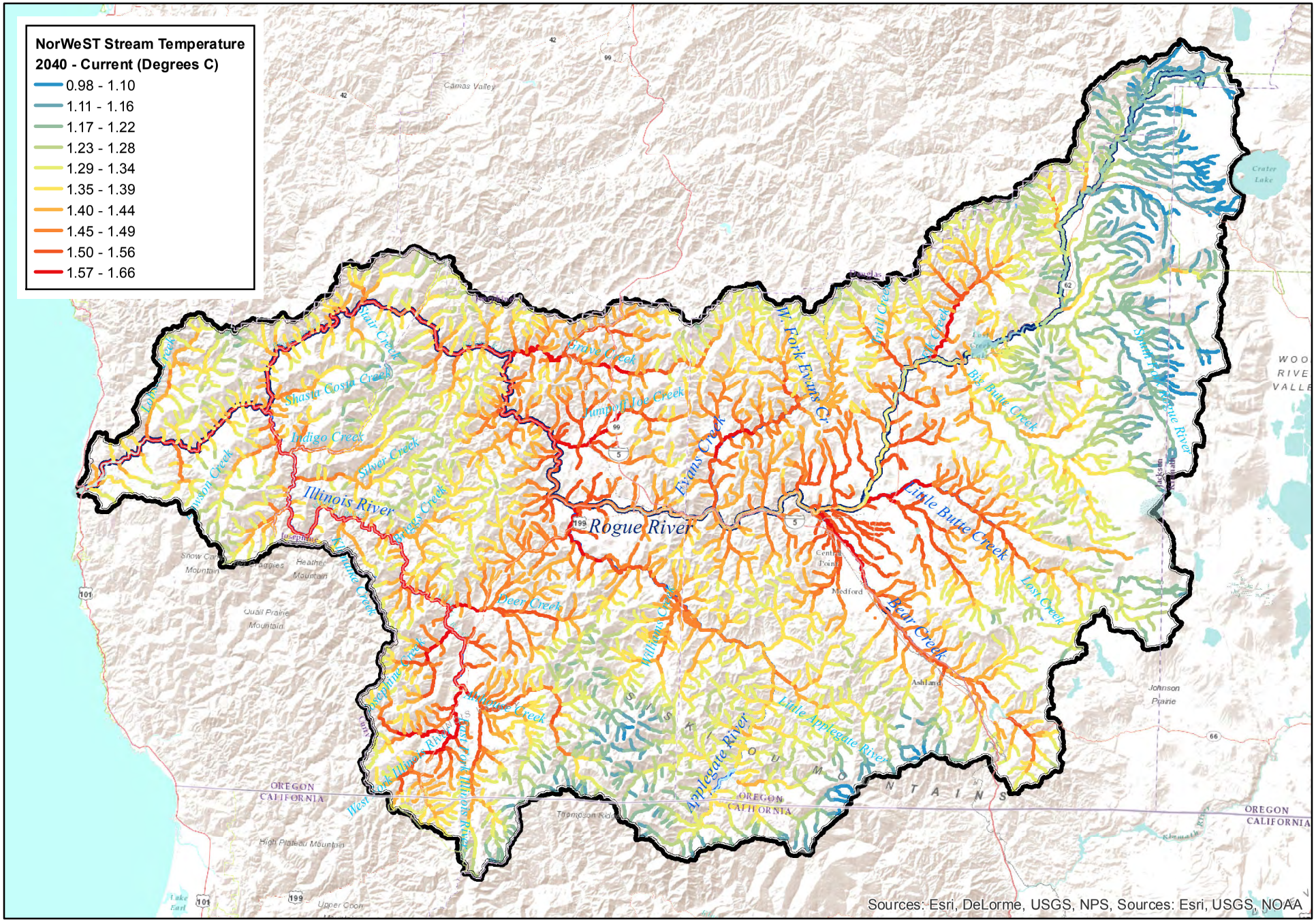

Map 9: Projected Change In Stream Temperatures: Current - 2040

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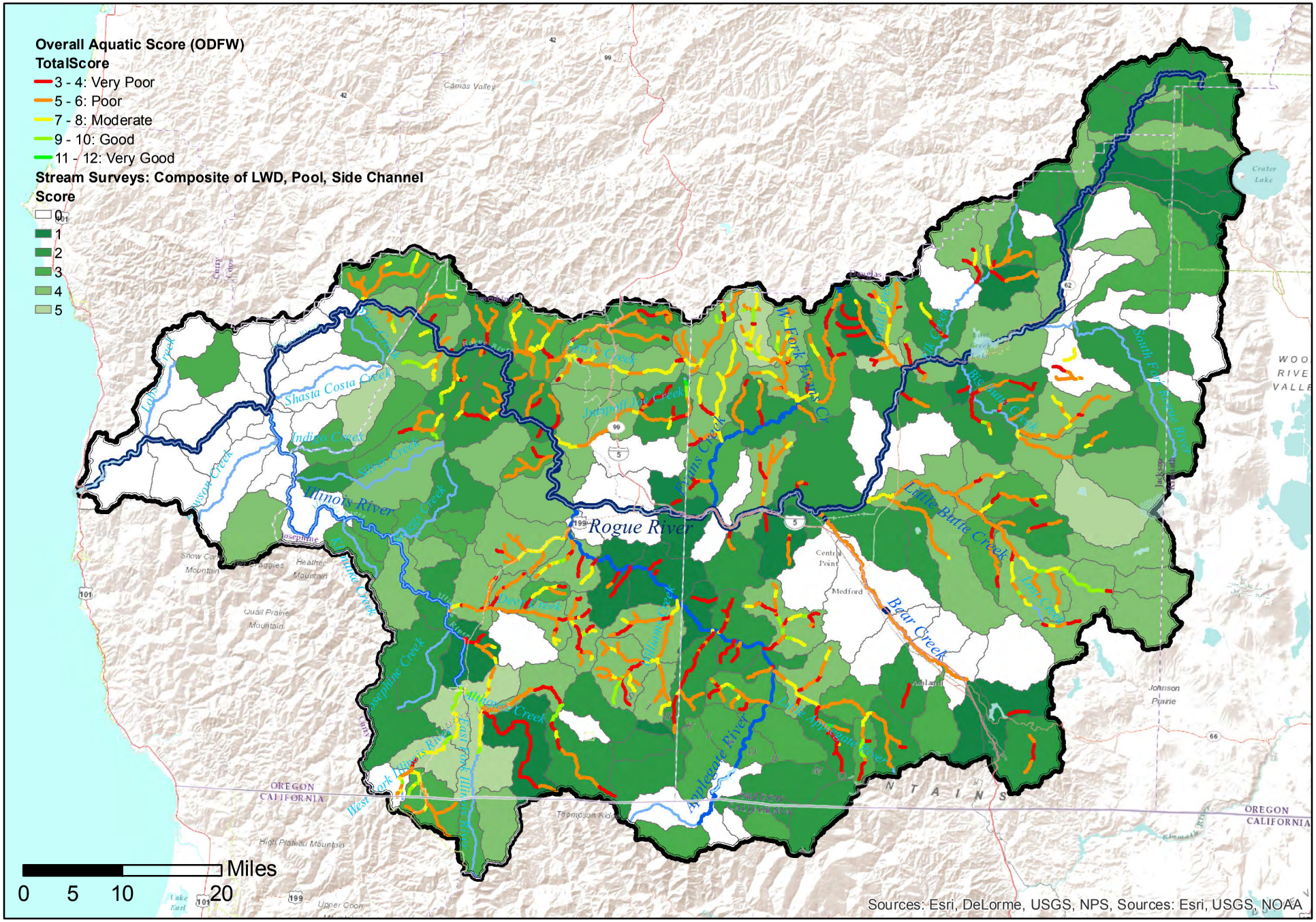
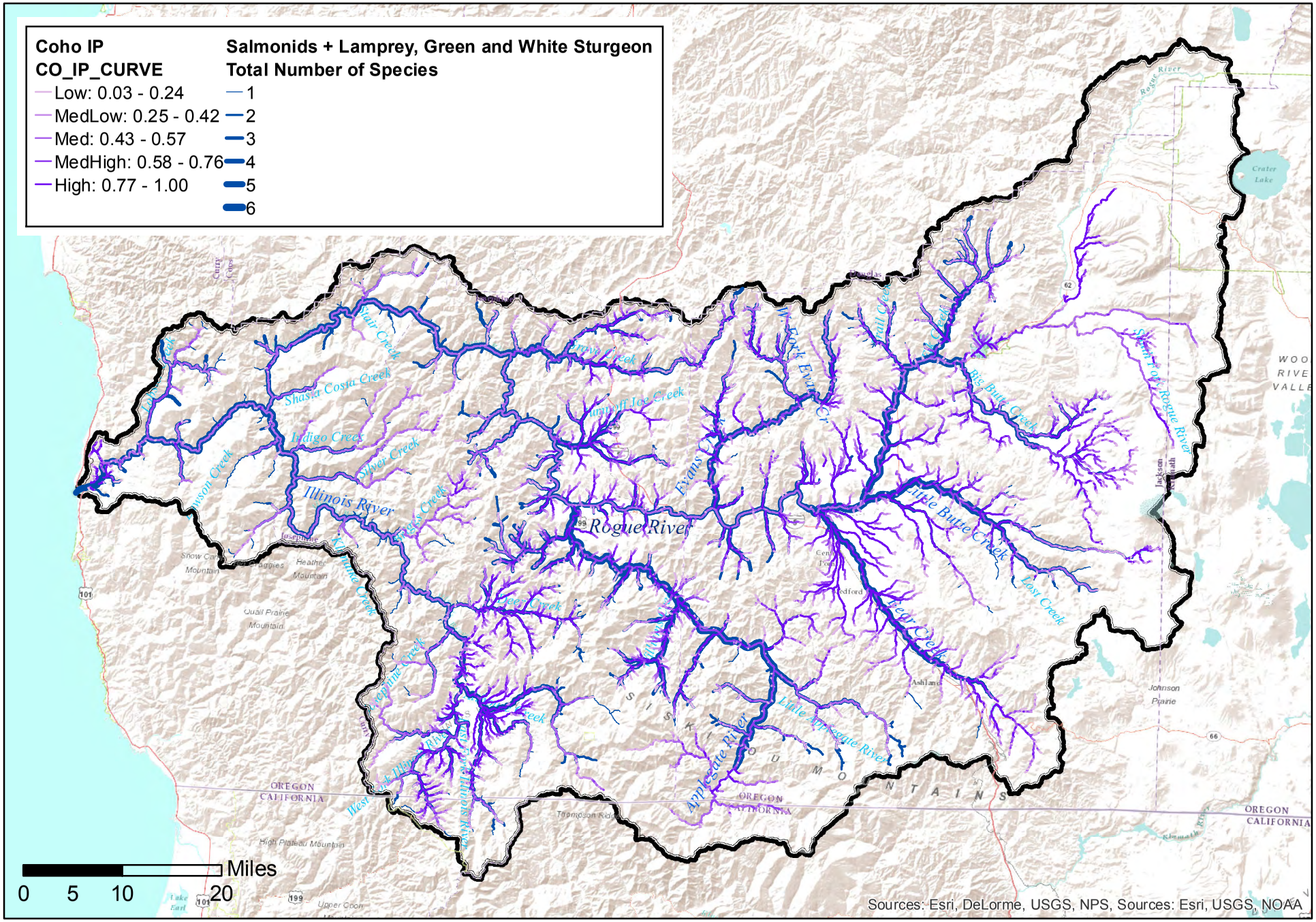


Map 10: Synthesis of Historic Aquatic Habitat Scores for Pools, Large Wood & Side Channels



Map 11: Extent of Salmonid, Sturgeon, and Lamprey Use and Number of Species Types

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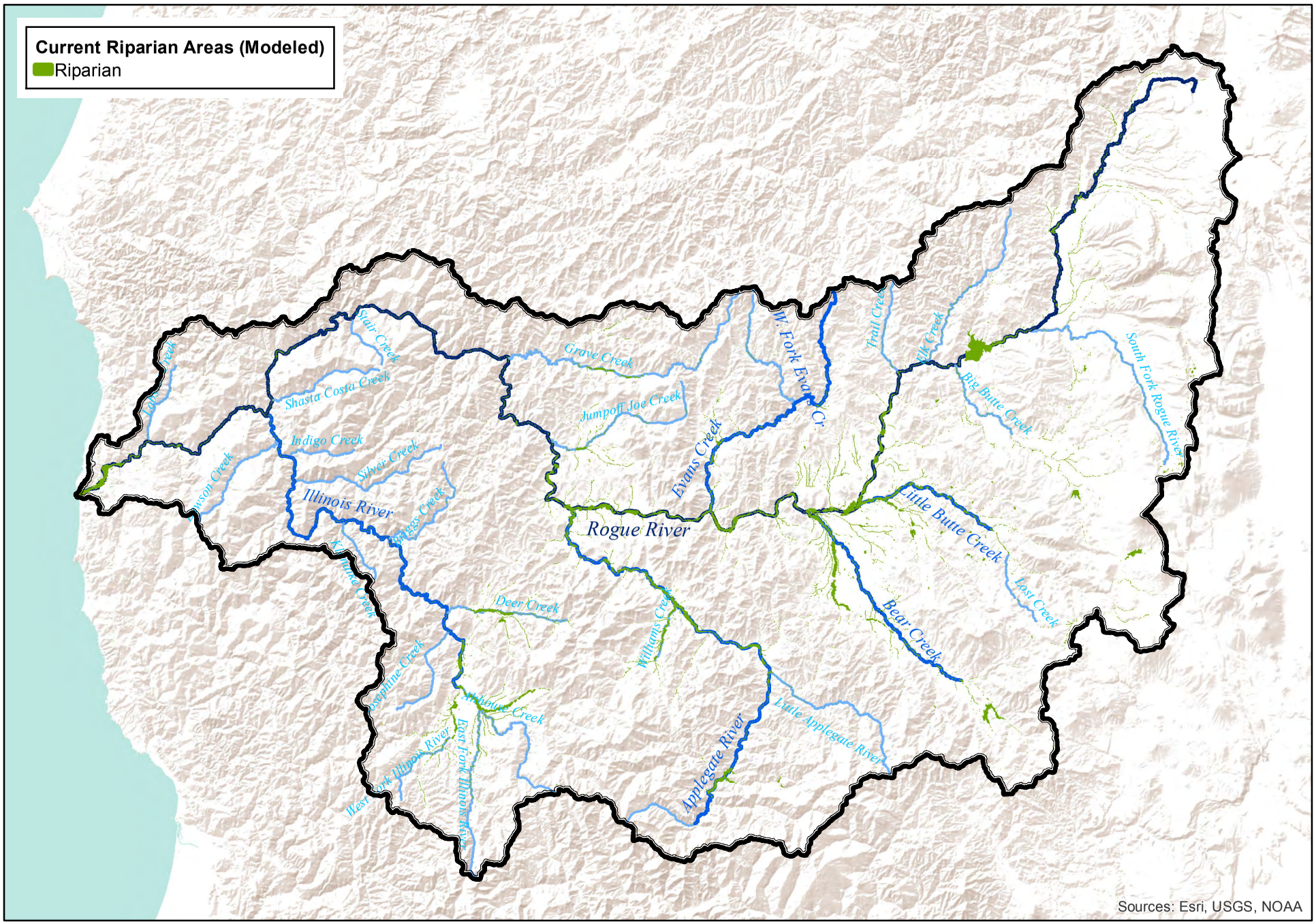
Map 12: Extent of Rogue Estuary

Map from the Rogue Estuary Strategic Plan



Map 13: Extent of Geomorphically Derived Riparian Area

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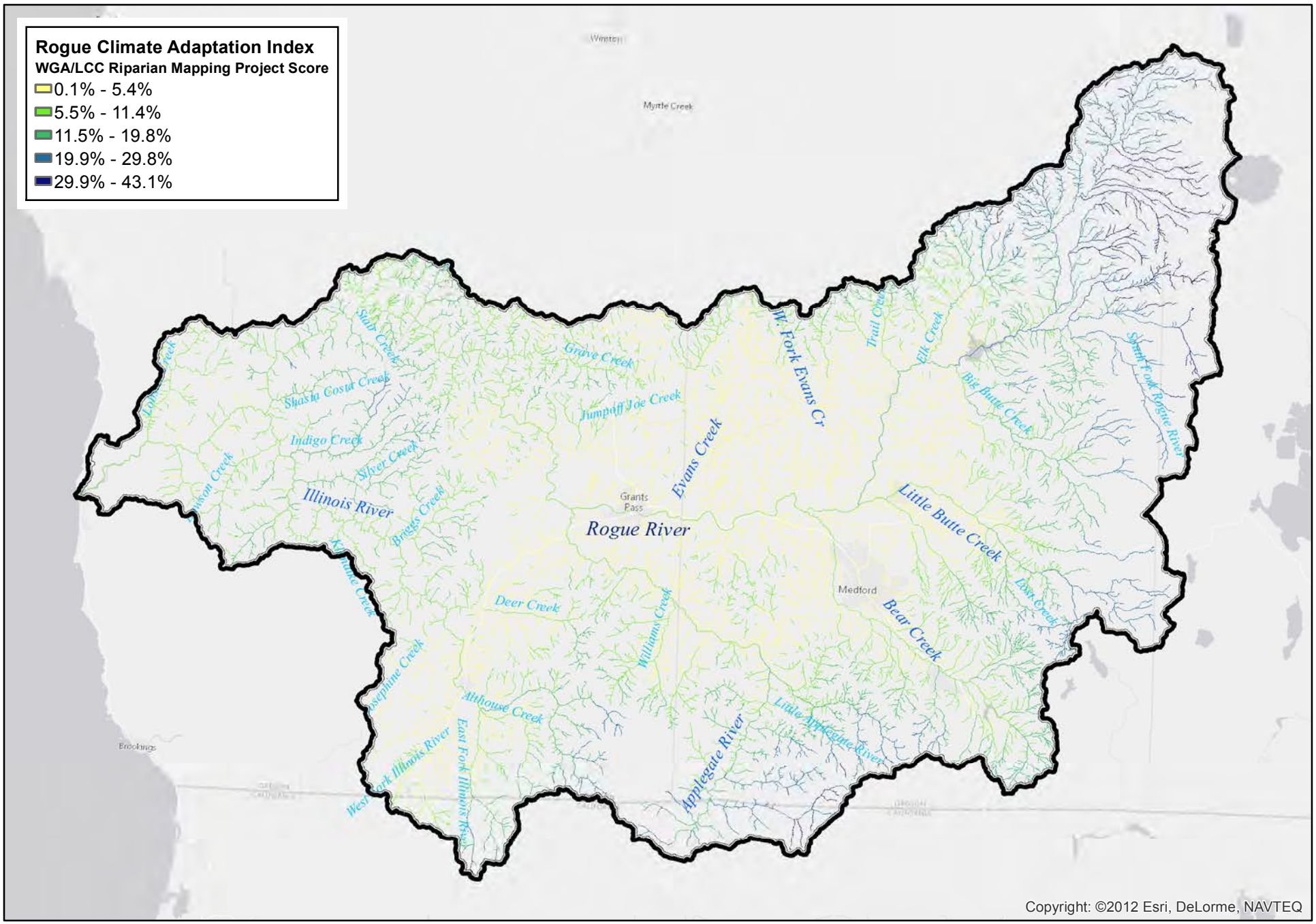

Map 14: Predicted Riparian Corridor Resilience by 2040

Miles
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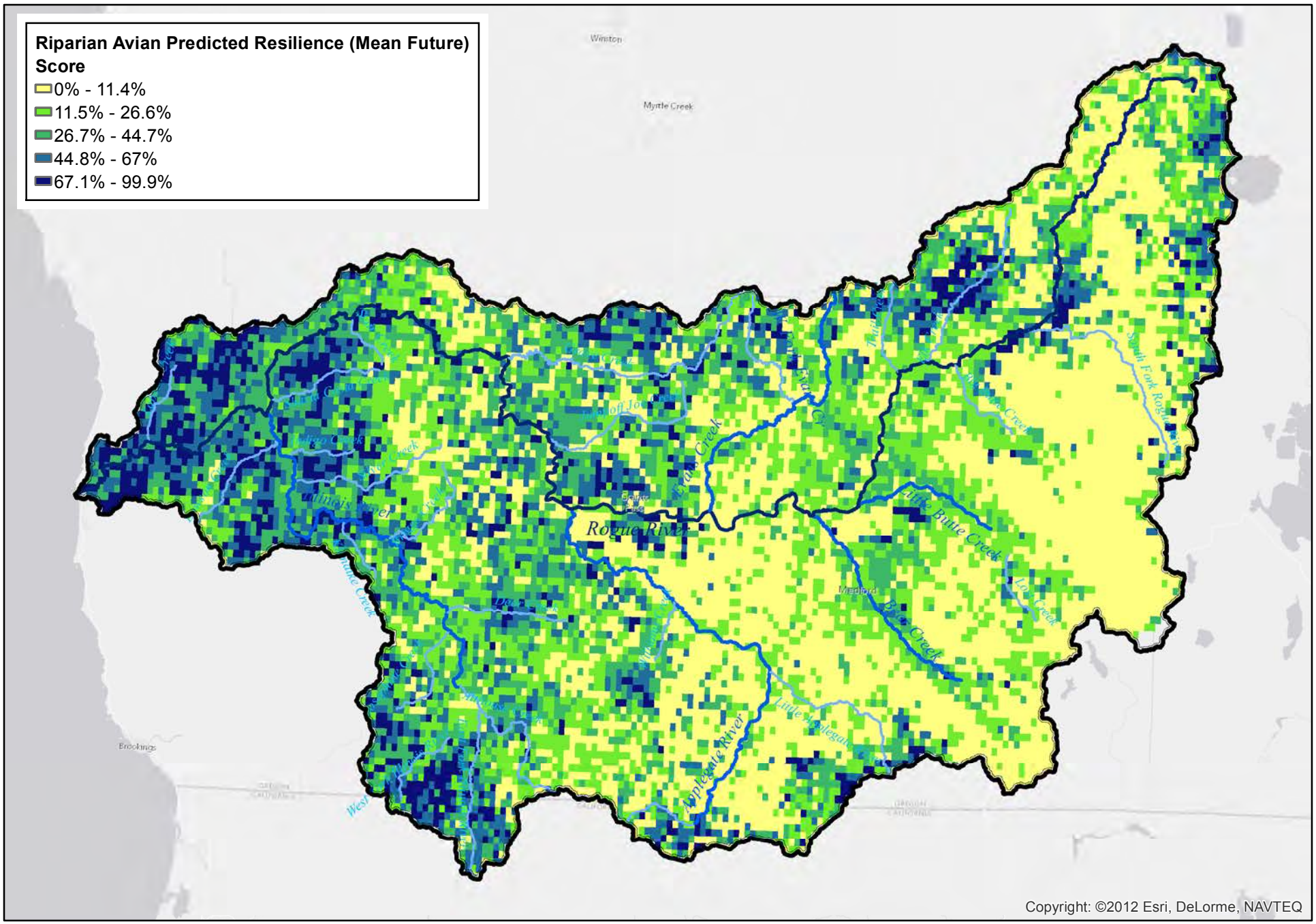

Map 15: Predicted Riparian Dependent Bird Resilience by 2040

Miles
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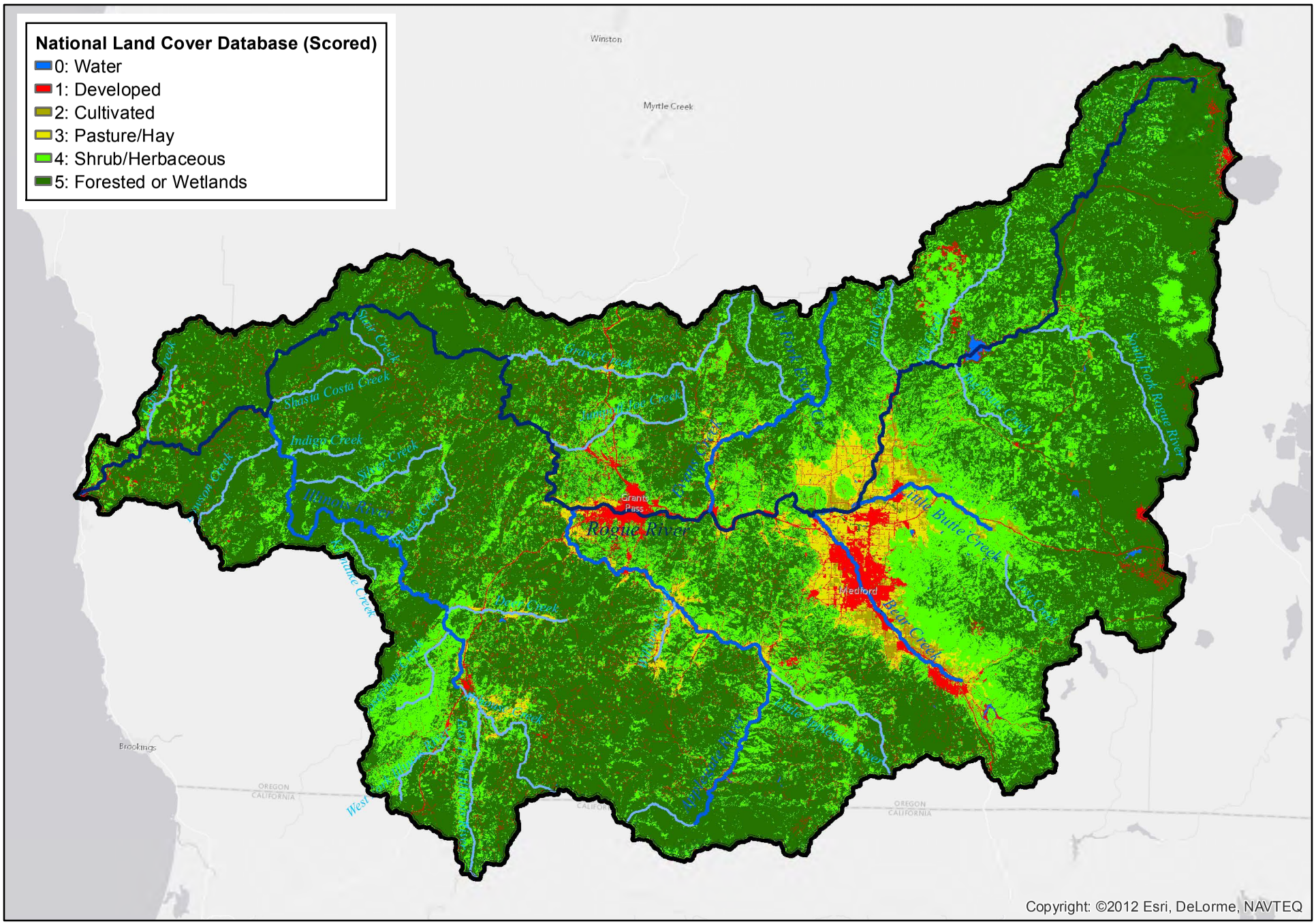

Map 16: Land Cover Vegetation Designations 2011

Miles
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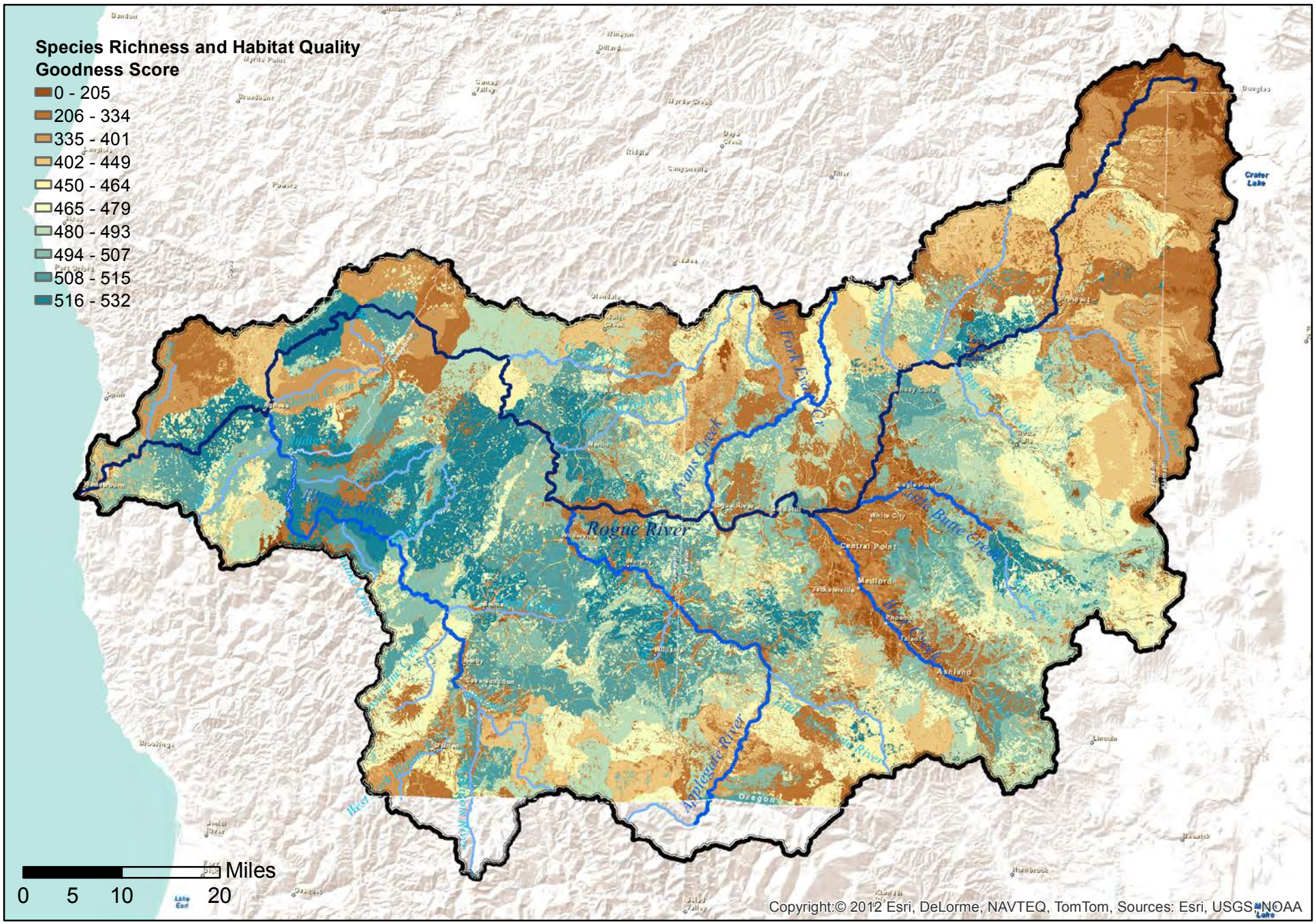

Map 17: Ecological Integrity Index of Species Richness & Habitat Quality

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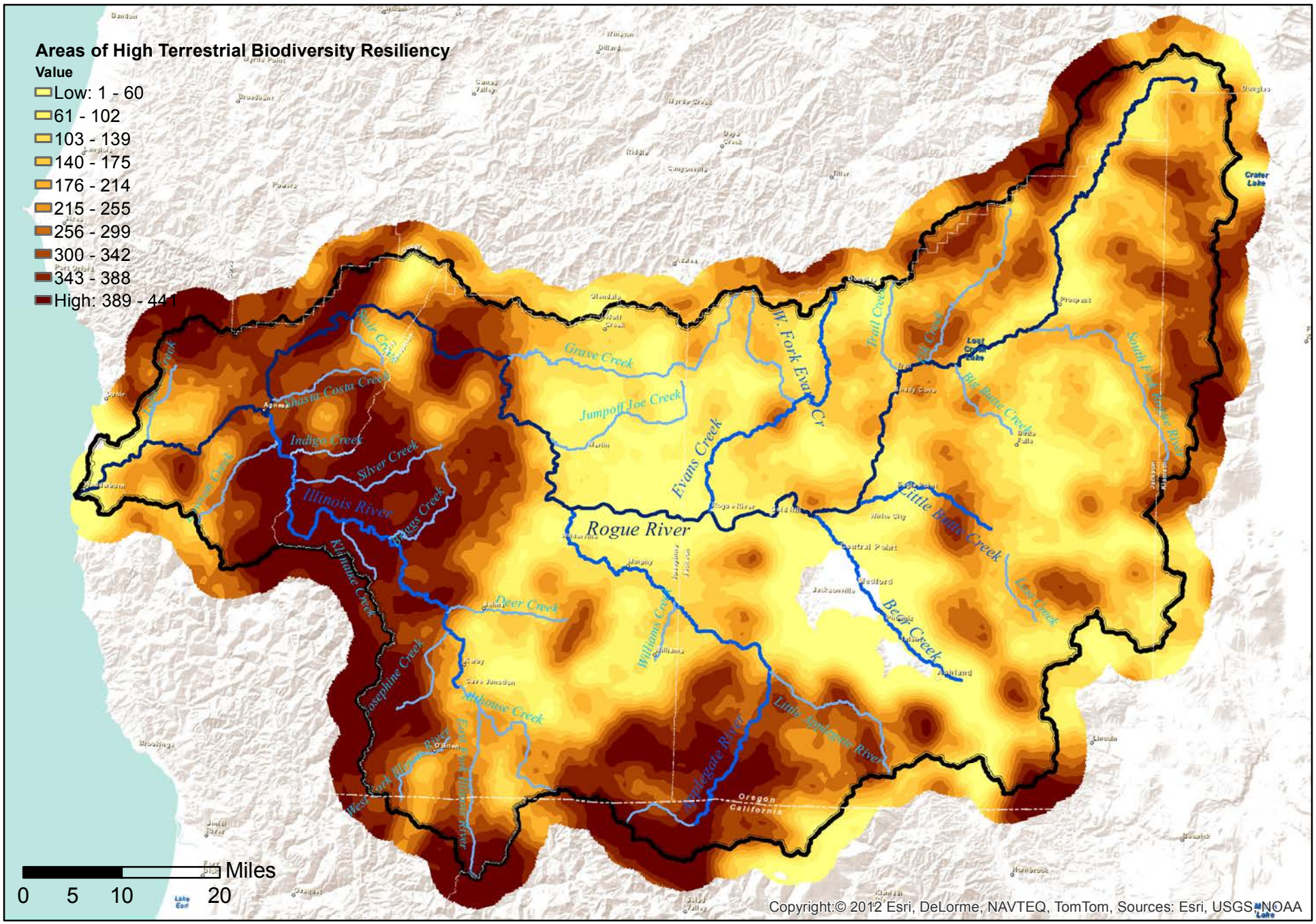
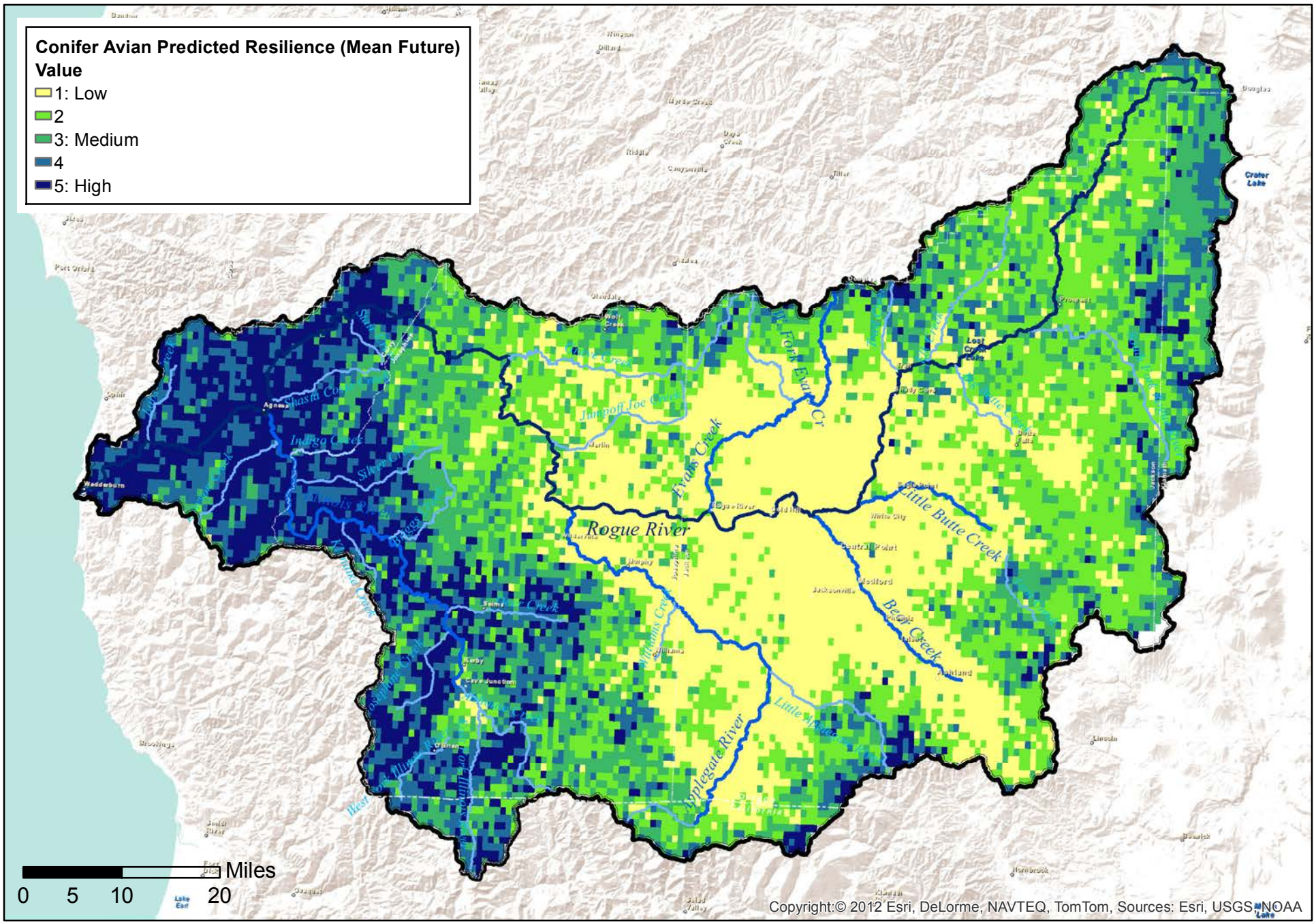


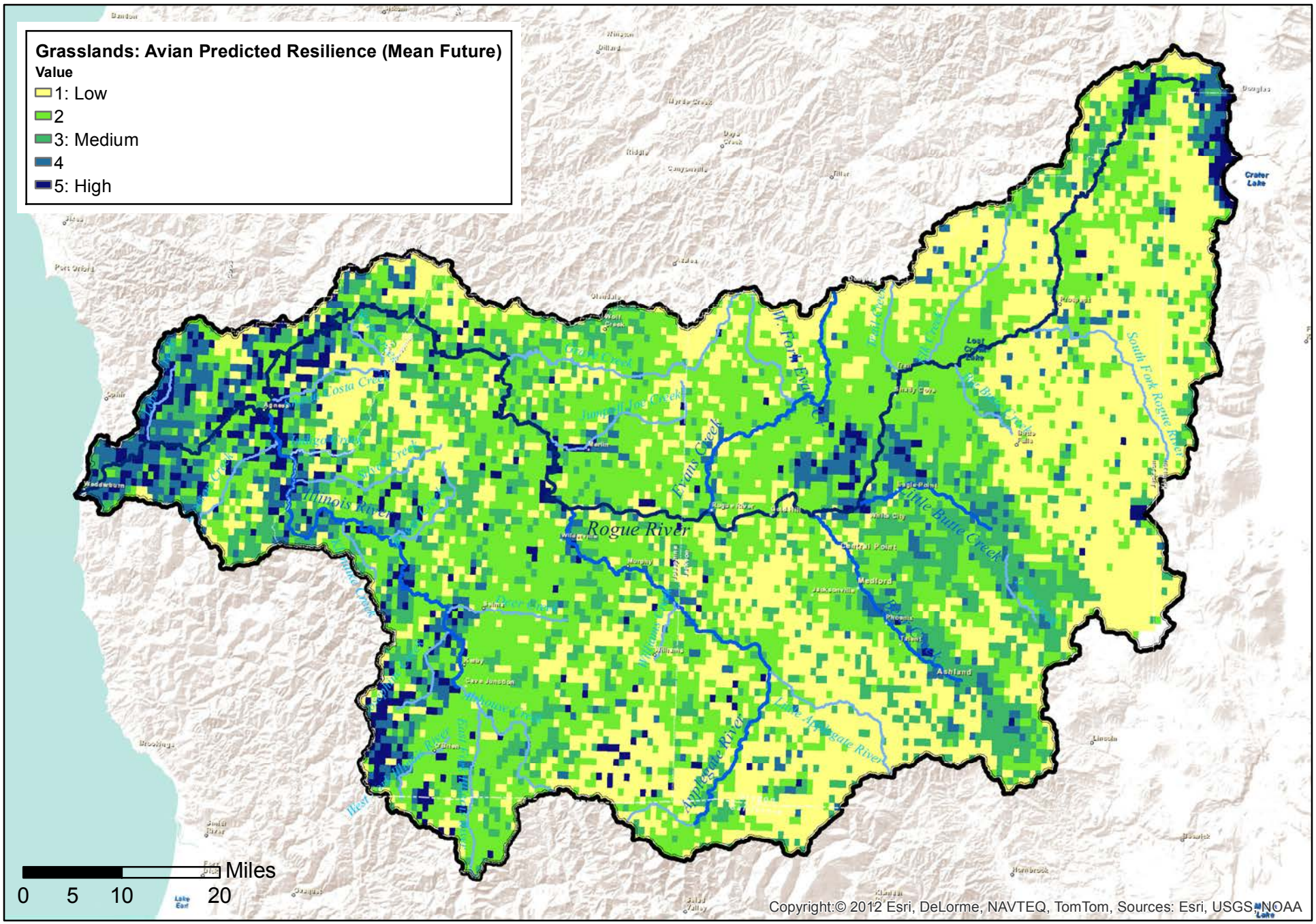
Map 18: Predicted Areas of High Terrestrial Biodiversity Resiliency

N



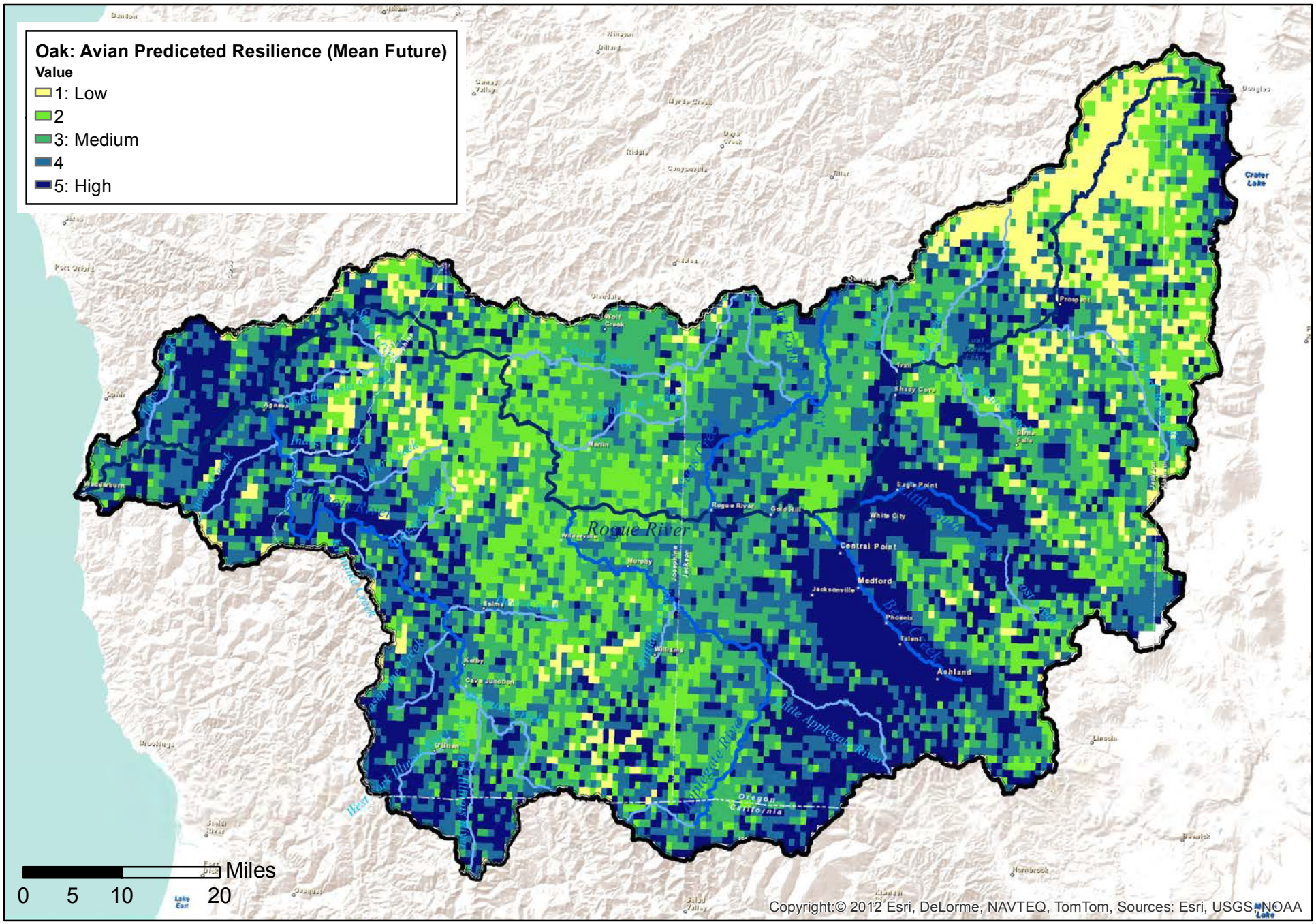
Map 19a: Predicted Areas of Resilient Bird Habitat for Conifer Forests

N



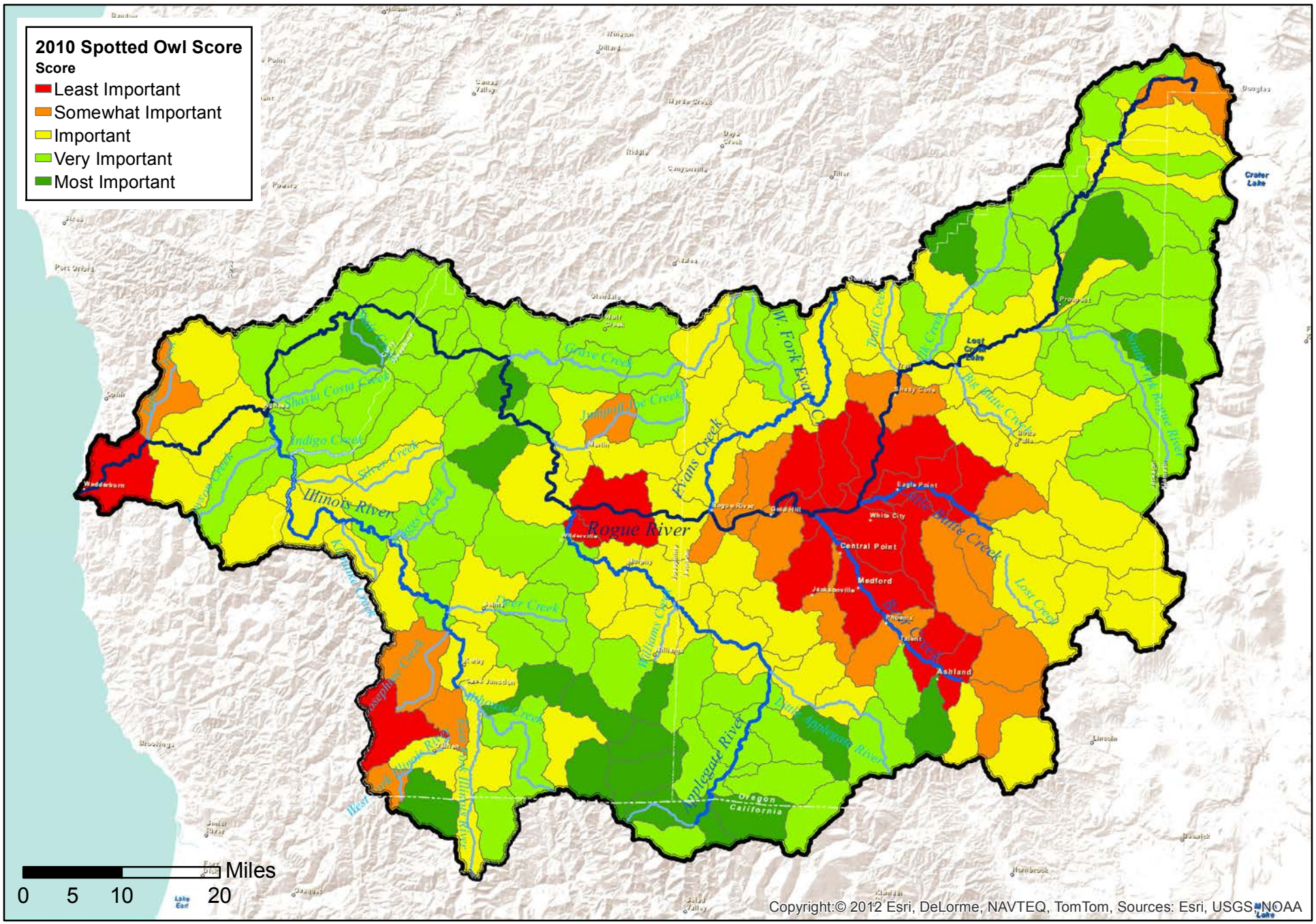
Map 19b: Predicted Areas of Resilient Bird Habitat for Grasslands

N

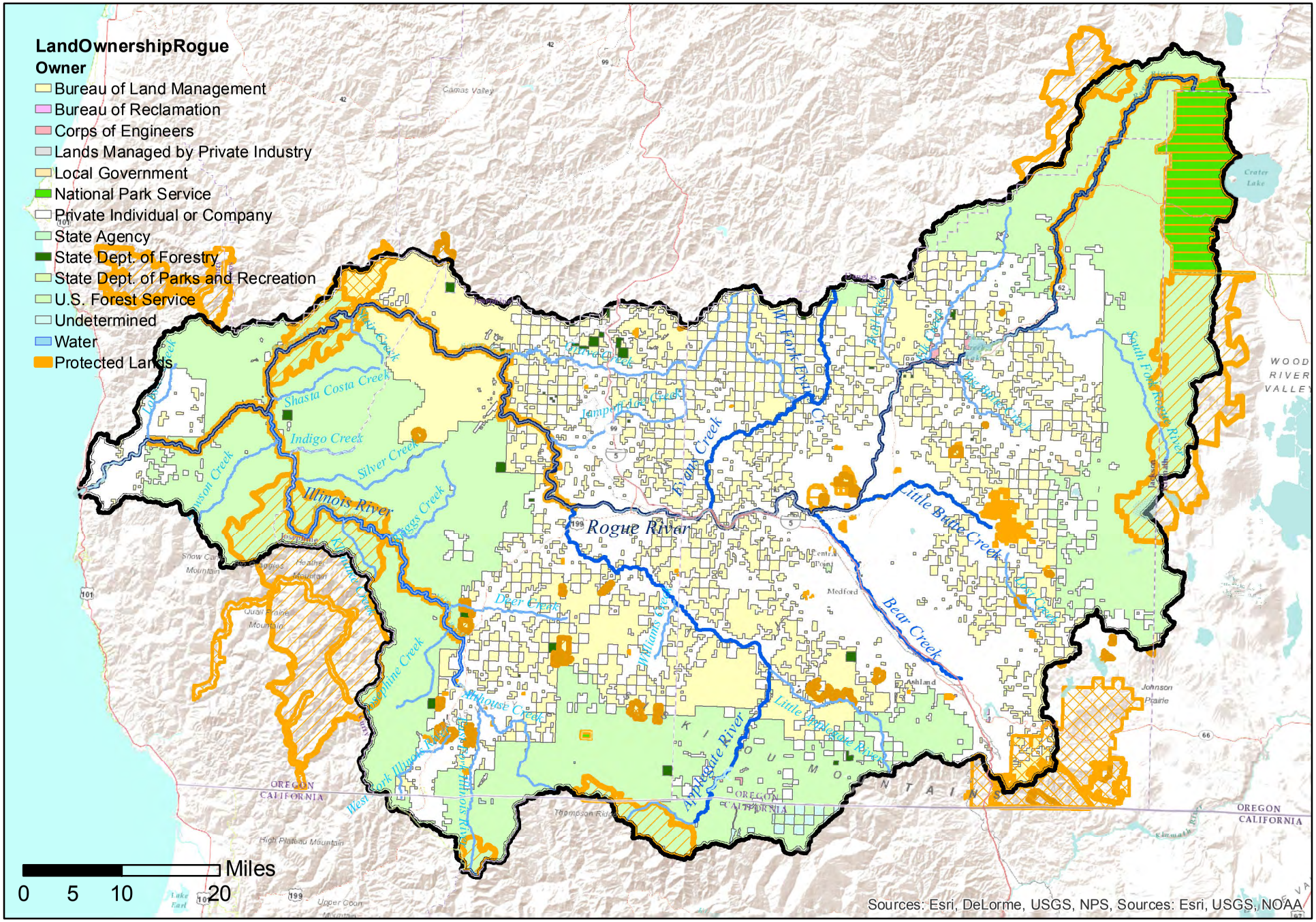


Map 19c: Predicted Areas of Resilient Bird Habitat for Oak Savannahs

N

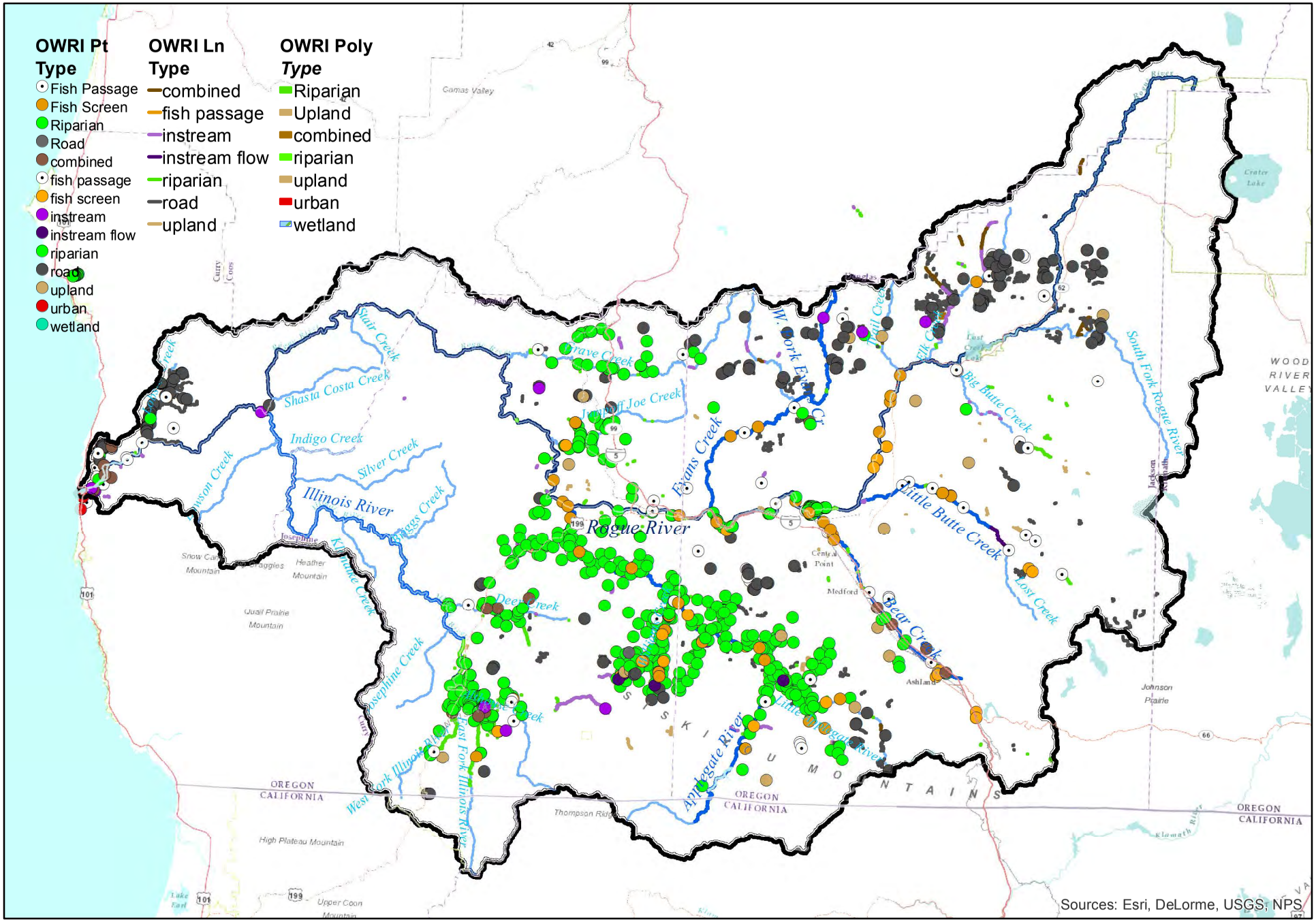


Map 20: Intrinsic Potential for Northern Spotted Owl



Map 21:Landownership Patterns

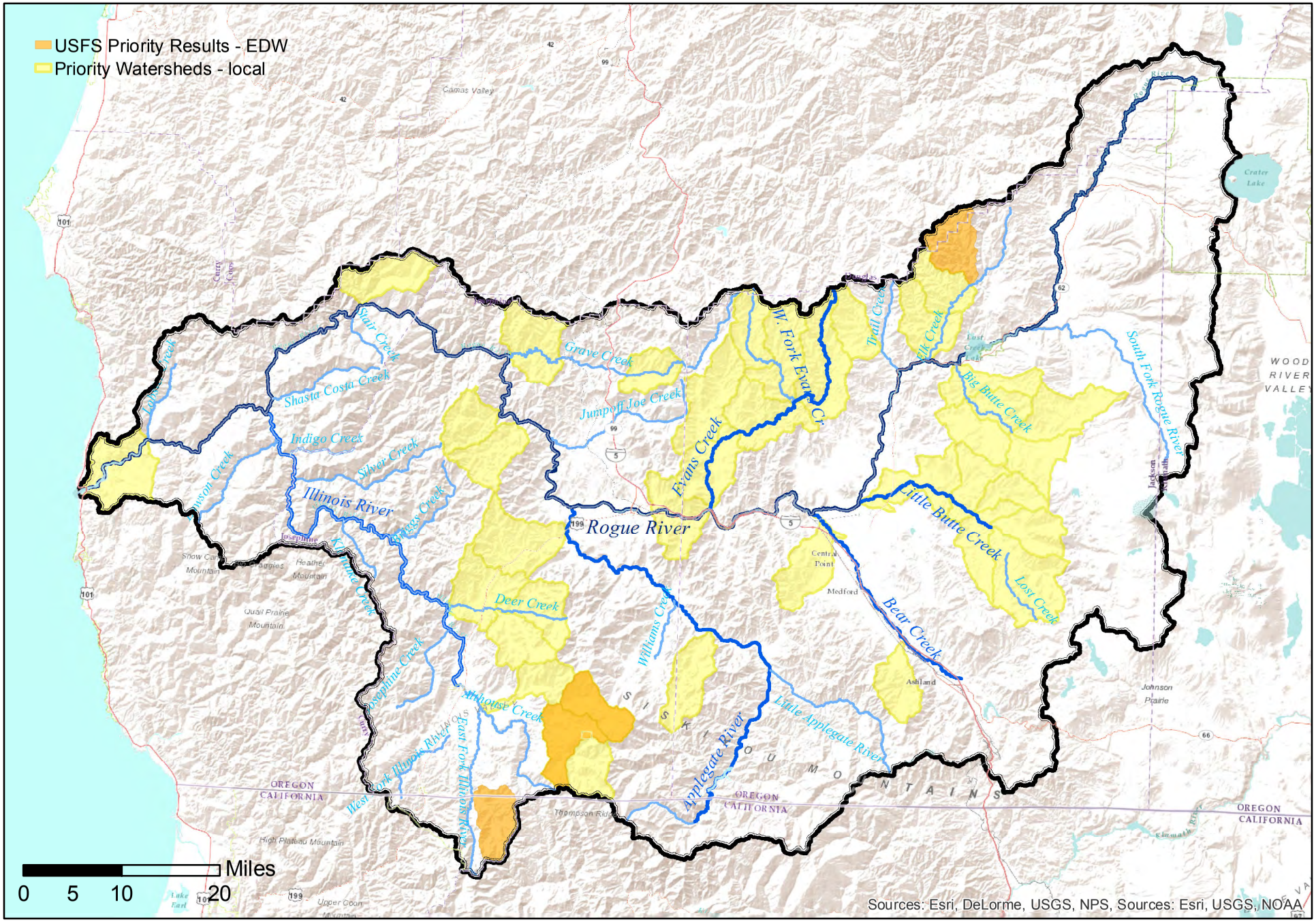
N



Map 22: Existing Enhancement or Stewardship Projects

0 5 10 20 Miles

N



Map 23:Locally Determined Priority Watershed Areas

Limiting Factors Analysis

Limiting factors analyses were completed for the Basin within various assessments, including: Southern Oregon Northern California Coast Coho Recovery Plan (NOAA, 2014), the Rogue Basin Water Quality Status and Action Plan (ODEQ, 2011), the Oregon Conservation Strategy (ODFW, 2006), the Watershed Health Factors Assessment (RBCC, 2006), the East Cascades – Modoc Plateau and West Cascades Ecoregional Assessments (Popper et al., 2007), and the Klamath Mountains Ecoregional Assessment (Vander, 2004). In addition, risk analyses were documented in the Preparing for Climate Change in the Rogue River Basin Southwest Oregon (Doppelt, 2008). Please refer to these reports for detailed information regarding limiting factors, stresses and threats to specific species and habitats in the Basin. A brief summary of some of the limiting factors is outlined below and further depicted in a conceptual model (see Restoration Approach Section) developed as part of the planning process.

Ecological Conditions

Across the Basin there are significant limiting factors including: hydrological modification, water availability, water quality impacts (temperature, sediment, bacteria), invasive species, riparian fragmentation, connectivity, habitat complexity loss, and migration barriers (Oregon Conservation Strategy ODFW 2006). Each are discussed briefly below:

- For water quantity, the over-appropriation of surface water rights, groundwater extraction, loss of beaver due to trapping and habitat conditions, excessive water demand, and the changes in hydrology/ temperatures due to dam operation are direct threats or contribute to resource degradation.
- Limiting factors for water quality, impacting temperature, sediment, bacteria, dissolved oxygen, mercury, pH, nuisance weeds, hazardous algae blooms, and bio-criteria (ODEQ, 2011), are tied to flow over-allocation, loss of channel complexity, loss of riparian habitat, nutrient, toxics, and sediment loading from point sources, upland agricultural, forestry/wildfires gravel and metals mining, and urban land practices.
- For aquatic habitat, flow modification, channel modification, artificial in-stream barriers and structures, beaver removal, invasive species, mining operations, and hatchery operations impact the species and habitat they utilize
- Riparian limiting factors in the Rogue include the removal of native vegetation, loss of fire regime, establishment of invasive plant species, corridor fragmentation, limited regulation, lack of enforcement, and flow conveyance that reduces flood disturbance frequency.
- Terrestrial habitat limiting factors include the loss of fire regime, fragmentation due to roads, development, agriculture and resource extraction practices, and past land management approaches.

The above noted limiting factors are captured in the conceptual model, and strategies to address these limiting factors highlighted in the priorities and implementation strategies of this Action Plan. However, the greatest unknown limiting factor that threatens the Basin is climate change. Through the planning process, the latest climate change projections for the region were gathered and integrated into the scoring and discussion. Climate projection data as it related to the impacts on fish, birds, water temperature, flow, riparian conditions, and terrestrial habitats were utilized.

Social Capital and Capacity

Limiting factors for social capital and organizational capacity in the Basin are well understood by the stakeholders, and articulated early in the planning process. They fell into four categories: organizational capacity / niche management, collaboration, landowner relations, and political will.

An informal organizational capacity / gap analysis (survey, workshop, interviews) was conducted with key conservation organizations in the Basin, to determine what activity niches they filled, and their staff skills and interests. Many of the nonprofit and local government organizations in the Rogue have 1-2 core project/program staff, and no to low levels of administrative support; this limits their capabilities because staff are required to be generalists. Natural alliances and partnerships exist in the Basin to bridge the organizational capacity gaps, and tend to be topic specific (forest health, barrier removal, riparian revegetation, monitoring, education). However, many participants identified the lack of coordination between these working groups as a limiting factor. Or, they identified they couldn't work together because the perception / risk of collaborating with an "environmental group" could put landowner relations at risk. Several participants who serve on multiple organizational boards suggested inefficient use of their time (tending to so many organizations) was limiting. A major concern in advancing flow restoration is the lack of a water trust organization focused on negotiating deals in the Rogue. The limited experience within implementing organizations in negotiating landowner agreements, and systematic strategies for engaging and educating landowners across the Basin, were also identified as limiting factors that could impede larger scale efforts.

Rather than wait until the Action Plan was complete, the participating organizations began to resolve these limiting factors in tandem with the Action Plan, in order to enable more effective implementation once the Plan was complete. The progress to date for these organizational realignments is outlined below and reflected in Table 11 in the Implementation Framework section.

- To address the limiting factor of low restoration project implementation capabilities and inefficient board engagement, four watershed councils in the upper Rogue subbasin (Stream Restoration Alliance of the Middle Rogue, Bear Creek Watershed Council, Little Butte Creek Watershed Council, and Upper Rogue Watershed Association) negotiated a merger in 2014 to consolidate their efforts and become the Rogue River Watershed Council. A new council executive director was hired from another nonprofit in the Basin in January 2015.

- The limiting factor of basinwide coordination and collaboration will be addressed by the formation of the Rogue Basin Partnership. Initiated in 2014, this organization is completing a transformation, from its former role as a watershed council coordinating body. The stakeholders identified the need for a convening entity at the first planning meeting, to help hold center on the Action Plan, and work with partners to communicate and fundraise for activities of basinwide impact. An interim board of stakeholders was formed and funds were raised to secure an organizational development expert to guide them through the logistics of forming a healthy backbone organization to serve the Basin and strengthen their capacity to deliver on the Action Plan.

- Though topic specific partnerships still exist, there is also greater effort among the stakeholders to engage and understand each other's work. For example, Southern Oregon Land Conservancy, the Freshwater Trust, Rogue Valley Council of Governments, are engaged with the Applegate Partnership, The Nature Conservancy, and the Southern Oregon Forest Restoration Collaborative, as they worked closely with the US Forest Service and BLM to redefine forest management in the Rogue. The fish passage barrier team of Rogue Riverkeeper, WaterWatch, Rogue River Watershed Council, and RVCOG are increasing their engagement with watershed councils to assess (in summer 2015) and address at least half of the top barriers in the Rogue Basin identified by Oregon Department of Fish and Wildlife. Bird advocates and tribal interests are also receiving greater recognition and participating in the process.

- To address both limiting factors of no water trust and the need to increase skills in negotiating landowner agreements, stakeholders reached out to a local water rights negotiator and are now working to incorporate their skills, through a relationship with Trout Unlimited, into the Basin.

Social capital and organizational capacity building is ongoing. However, the extended and intensified engagement of the Basin stakeholders over the last 2.5 years and commitment to advancing the Action Plan should help build greater social connections and resiliency over time.

Restoration Economy

The greatest limiting factors to building the restoration economy in the Rogue are limited, inconsistent financial investment in the actions needed to restore the Rogue, and commitment to long-term protection and maintenance of restoration efforts. The factors that limit sources of possible funding and investment are summarized below:

- Private Investment: With an estimated 316,212 citizens living in the Basin as of 2014, a median income of $37-$44,000 across the basin, 15-20% of the population in poverty (US Census Bureau, 2015), and no major philanthropically-inclined industry, there is limited private donor ask capacity at the local level. More than 50% of the total personal income in the Rogue is non-labor income from retirement and investments (SOFRC, 2013), possibly further limiting available liquidity. Most conservation organizations look to funding from foundations and donors, located outside the Basin.
- Foundation Investment: Based on incomplete analysis, there are four private foundations that have offered consistent funding to local partners implementing restoration in the Rogue over the last 5-10 years, and another 6-8 that could be pursued for specific projects. However, with a few exceptions, foundations typically cycle through their funding priorities or themes every 3-5 years (i.e. collective impact, social equity, climate adaptation, etc.), making it difficult for place-based organizations to "stay the course" as foundation funding interests change.
- Transient Investment: The tourism industry is strong in the Rogue, but visitors are not adequately charged for their impact on the resources (water use, roads, lodging, boating entertainment) nor encouraged to contribute to (a vision of) preserving the values that drew them to visit in the first place. An effective mechanism to facilitate securing such resources has not been explored locally due to lack of a regional vision, forum to engage discussion, and a regional plan. However, the Oregon Travel Philanthropy Fund, the first statewide program to promote sustainable tourism development, may help address this issue.
- Public Investment: More than 60% of the land in the Rogue is owned by the government, with various and competing resource management objectives. At the Federal and State level, the funding and program priorities vary annually and require significant lead-time to secure uncertain levels of investment. At the local level, most funding comes from utilities or service providers and can be stable sources of funding for local organizations that offer fee for service contracts. Most local conservation organizations in the Basin have not positioned themselves to provide such services and often do not have sufficient capacity to move into such a position.
- Programmatic Delivery: Without a critical mass of restoration activity, it is difficult to achieve the economies of scale needed to increase capital restoration production and lower per unit costs of efforts over time. Skilled professionals, field crews, contractors and suppliers all exist in the Basin, but their capabilities or priorities may not align with conservation and restoration needs, because the funding for their services is episodic. This creates downward pressure on the Basin's ability to scale up the quality and quantity of restoration efforts with skilled contractors and suppliers.

Compelling greater conservation and restoration investment in the Rogue will take a deliberate engagement and an investment strategy on multiple levels. Investments made to date by the Laird Norton Family Foundation to promote long range strategic planning and organizational alignment, as well as

resources from OWEB and federal funders for large scale fish passage barrier removals, Medford to mitigate their temperature impacts, and US Forest Service and BLM to address forestry related risks and improvements, are examples of what is possible and could be leveraged for the future. Without investment of stable dedicated funding towards restoration, building capacity in the field will be difficult. The technical expertise within organizations can only be strengthened if there is demand for their services. Only through consistent long-term investment in conservation and restoration, can the practitioners elevate the overall quality and quantity of actions across the Basin while supporting local jobs and the social fabric of the community.

Restoration Approach

This Action Plan focuses and connects conservation and restoration activities in select areas, and encourages recovery of the processes that will promote system resiliency over time. Recognizing the limits of funding and human ability to intervene in the trajectory of natural processes, the Plan seeks to incrementally shift (improve) the quality of the landscape conditions by at least a factor of one (based on the scoring discussed later). The Plan integrates approaches and prioritizations proposed for: preserving biodiversity in the face of climate change (Buttrick, et al., 2015), salmonids via cold water refugia (Isaak et al., 2015), restoring salmon habitat in a changing climate, (Beechie et al., 2012), setting restoration priorities (Beechie et al., 2008), selecting restoration techniques and priorities (Roni et al., 2002), riparian restoration in a changing climate (Seavy et al. 2009), and prioritizing watershed protection for salmonids (Bradbury et al., 1995). It incorporates variable landscape management approaches, and considers some areas as novel ecosystems (Mores et al., 2014, Hobbs et al., 2014).

The approach captures some specific actions identified in previously developed plans, such as the *Southern Oregon Northern California Coast Coho Recovery Plan* (NOAA, 2014), *Rogue Basin Action Plan for Resilient Forests and Watersheds in a Changing Climate* (SOFRC, 2013) the *Oregon Conservation Strategy* (ODFW, 2006) and local watershed implementation plans, to emphasize those that are relevant to the goals and objectives identified in this effort.

In addition, this Plan and its approach to restoration looks both back at past activities and forward into the reality of climate change. As noted by Jim Lichatowich (BEF, 2012), it is important to maintain a historical perspective in restoration; to understand what has been done, what worked and didn't and why. Such perspectives were repeatedly shared by participants, which informed the approach moving forward.

Conceptual Model of Strategies and Limiting Factors to Drive Outcomes

The Conceptual Model generally viewed in Figure 5 (see oversized, readable version provided in back) summarizes the key focal targets, limiting factors, and strategies identified throughout the Plan. Ecological (water quality and quantity, aquatic, riparian, and terrestrial habitats), Social and Economic systems key focal targets are highlighted in green, are impacted by limiting factors characterized as both direct threats (pink) and contributing factors (orange). Strategies to address the limiting factors are noted in hexagons (yellow) and relate to the specific actions proposed in this Plan in Tables 8 and 9. The information in this conceptual model was used as a tool to help participants link their desired outcomes to the activities that are likely to influence their success or failure in addressing them.

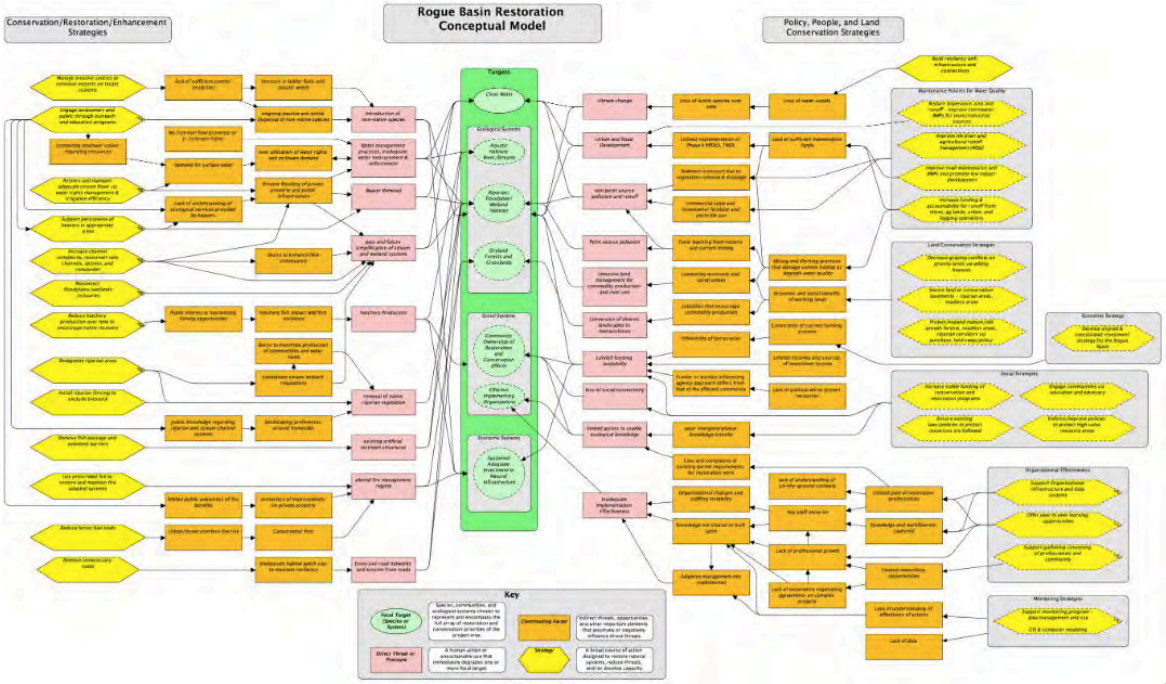


Figure 5: Rogue Basin Conceptual Model (**see Full Scale 11x17 Provided in Appendix**) highlights the interconnection of how strategies and actions in yellow, address limiting factors in orange and pink, to help improve key focal targets in green.

Strategic Prioritization and Geographic Focus

The prioritization and focus process for the Action Plan was iterative, and based on available information and feedback from participants over the course of 2.5 years. The prioritization included defining geographic priorities within resource/habitat types, as well as specific strategies and actions within those priority geographies. The geographic priorities and how they were derived are outlined below.

The four resource/habitats focal targets in the Rogue are: Water (quality and quantity), Aquatic Habitat, Riparian Habitat (Riparian Corridors, Floodplains, Wetlands), and Terrestrial Habitat (Conifer Forest, Oak Woodlands, Grasslands). Data from basin-wide habitat assessments and predictive models on habitat resiliency, completed primarily within the last five years, were utilized to identify the quality of current resource/habitat conditions and the potential of various areas to be resilient in the face of climate change. Table 4 summarizes the data layers utilized in the prioritization analysis and their relevance to the current and projected resources.

Table 4: Prioritization Datasets Relation to Focal Targets

Datasets	Historic/ Existing Condition	Climate Resilience Modeling	Water (Quality and Quantity)	Aquatic Habitat	Riparian Habitat	Terrestrial Habitat	Species Focus
Change in Mean Summer Low Flow 2040		x	x				
Change in 1.5 yr Winter Flows 2040		x	x				
Change in Mean August Temperature		x	x				
Current Water Temperature Refugia (below 19°C)	x		x				x
Water Quality Limiting Parameters	x		x				
In stream Flow Allocation	x		x				
Aquatic Critical Habitat	x			x			
Number of Anadromous fish/lamprey habitats	x			x			x
Coho Intrinsic Potential	x			x			x
Green Sturgeon Habitat	x			x			x
Aquatic Habitat Quality (Pools, Side Channel, LWD)	x			x			
Riparian Area Designations (geomorphically derived)	x				x		
Riparian Area Predicted Climate Resilience		x			x		
Riparian Bird Habitat Mean Distribution 2040		x			x		x
Vegetative Cover in Riparian Corridors	x				x		
Terrestrial Climate Resiliency Modeling		x				x	
Ecological Integrity Index	x					x	x
Terrestrial Crucial Habitat	x					x	
Oak/Conifer/Grassland Bird Habitat Mean Distribution 2040		x				x	x
Totals	**12**	**7**	**6**	**5**	**4**	**4**	**7**

The prioritization analysis scored each dataset parameter on a scale of 1 (low quality) to 5 (high quality) utilizing statistical breaks following natural breaks (Jenks) method built into the GIS analytics, or 1 or 0 for yes/no parameters to determine each focal targets' sub-score. These subscores were then binned into a 1-5 range to represent the relative quality score of each reach or area within the individual resource / habitat focal target (water, aquatic, riparian or upland/terrestrial). In addition, the relative scores of the focal targets for water, aquatic and riparian were added together or stacked, and re-binned on a 1-5 scale, to identify where the highest geographic priorities exist along river/stream corridors. The scored river/stream corridors were overlaid with the terrestrial habitat score (which excludes the stream river corridors), to highlight areas of common high or low quality habitat, and those in-between that should receive restoration to address deficiencies. Table 5 summarizes the sources and scoring of each data layer. A detailed listing for the datasets, metadata, and scoring are provided in the Appendix.

With the accelerated rate of climate change, this Action Plan closely integrates what we know of existing resource conditions, with peer-reviewed regional climate resiliency modeling which attempts to capture potential impacts on various resource elements. While imperfect, it reflects the best available basinwide data sets found.

Map 24 a-d Results of Each Resource/Focal Habitat Priority Scoring shows the results of scoring for each resource/habitat type, using the datasets noted in Table 4. Map 25: Results of River/Stream Corridor and Terrestrial Habitat Scoring Combined shows the overlay of the water, aquatic and riparian as a

river/stream corridor total score, plus the terrestrial habitat overlay that excludes scoring in the corridors to avoid double counting. Map 26: Total Habitat Quality and Resiliency Score by HUC6, reflects the total area weighted score of each HUC for all nineteen datasets used in the regional analysis, binned to a score ranging from 1-5, with 5 being the highest habitat value/resiliency predicted.

Information from previous plans and prioritizations prepared over the last 20 years, and developed at various scales were also reviewed. These data layers listed in Table 6 were stacked upon one another and each area demarcated was given a point for being a previously identified as a priority. Map 27: Previous Plans' Prioritization Results shows the extent of ten data sets that reflect previous efforts to prioritize restoration (without the benefit of climate change projections).

Table 6: Past Priority Analysis By Area or Restoration Action

Focus	Description	Name in Databasin or Other Location	Year	Source
Social	Locally identified priority areas from Councils, SWCD's, others	PriorityWatersheds	2013	Councils, BEF
Agriculture	ODA Strategic Implementation Area Priorities	Data from ODA in Draft, not publically available electronically	2015	ODA
Forestry	USFS Priority Watersheds	http://www.fs.fed.us/publications/watershed/		USFS
Conserve	Protected, Desired Priority Conservation Lands	Conservation Prioritizations in Western Oregon	2012	TNC/WSS Synthesis
Fish	ODFW Barrier Prioritization	Passage Barriers _ ODFW 2013 Priority	2013	ODFW
Fish	Prioritizing Watershed Protection and Restoration to Aid Recovery of Native Salmonids	Excel Table Converted to Line Segments by PSU, BEF	1995	Bradbury Ad Hoc Working group
Flow	OWRD Streamflow Restoration Priority	OWRD_Streamflow_Restoration_Priorities	1998	OWRD
Instream	KS Wild Aquatic Restoration Prioritization	2010_KSWild_RogueBasin_AquaticScore	2010	KS Wild
Conserve	Local Land Conservation Priorities - Adjacency to Protected Lands	SOLC Conservation Plan, Data layers shared with BEF	2011	SOLC
Overall	ODFW Overall Crucial Habitat Scores	Compiled Crucial Habitat Overview	2013	ODFW

The final determination of priorities by the TAC was derived from the total resource/habitat focal targets scores by HUC (Map 26), along with added insight from previous prioritizations (Map 27), other limiting factors data (such as fish passage barriers, mining activities, water withdrawals, etc.) and local input from partners based on their read of the data. The TAC selected a networked distribution of priority watersheds (primary and secondary) incorporating multiple HUC6's within the larger subbasins to serve as core anchors for whole watershed investments (stream/river corridors and terrestrial habitat improvements). Connectivity is provided through primary (restoration) and secondary (enhancement) corridors that connect the priority watersheds. Critical confluences were also identified based on the scoring and known cold water refugia, to create a series of stepping stones along the river/stream corridors. The goal of this prioritization refinement was to create a network of habitats across the basin that would serve the full life histories and migration patterns of most of the species that utilize these habitats. Supporting diversity in target areas, habitats, and species, will promote system resiliency. As a secondary benefit, the network concept offers the opportunity for many of the basin partner organizations to engage in basinwide efforts, even if their specific geography is not a core anchor.

Map 28: Priority Watersheds, Corridors and Confluences shows the final selection of primary priority watersheds *and the desired shift in condition* from lower to higher quality and resiliency over 10 years. For example, a HUC 6 subwatershed currently in dark green condition on map 26 is shown to shift to a desired condition of light blue shown on map 28. The primary priority watersheds were targeted to increase the

overall quality of larger habitat blocks that will serve as habitat refugia. Secondary priority watersheds, demarcated with hashed blue lines, typically reflect conditions already considered in relatively good for the location. However these subwatersheds have specific strategies proposed for them to address resource limitations that could impact the benefits of the larger habitat block (such as habitat access limitations). The Rogue Estuary Strategic Plan (Timchak, 2015) and Watershed Restoration Action Plan for Elk Creek (Rogue River- Siskiyou NF, 2012) will guide localized implementation of restoration actions in those areas and overlap with regional level priority actions. The other priority target areas will need to update and prepare specific implementation actions for the subwatersheds in the context of being a basinwide priority. A framework for completing this work at the local level should be provided by the RBP and implemented through the organizations working in those priority areas.

Priority corridors also have primary and secondary designations on Map 28. Primary corridors will be restored and should support a full suite of habitat improvements along the stream/river corridors (riparian revegetation, barrier removals, instream habitat improvements, flow restoration, etc.), while secondary corridors will have more discrete, targeted actions to address the most significant limiting factors in those corridors. For example, Little Butte creek is marked as a primary corridor because its a critical salmon stream and supports riparian bird habitat but is in medium condition; it needs a host of modest restoration actions to help its recovery. Bear creek is marked as a secondary corridor, even though it is critical to salmon, its current channel and water quality conditions make recovery a more significant and costly endeavor. Consequently, the Bear creek corridor starts lower on the recovery ladder and partners will focus on water quality improvements such as storm water and agricultural water management, and invasive species / native riparian revegetation / shading along the streams, over instream habitat and barrier removals for fish. Improving Bear creeks' water quality will benefit the whole of the Rogue River by reducing the impact of this high pollutant-loaded stream.

Targeted confluences are represented as orange dots and a special confluence concentration area at the Bear/Little Butte/Rogue confluences is a hashed orange area on Map 28. These are dynamic places on the landscape where conservation and restoration efforts will serve multiple benefits. Confluences are where two or more stream/river confluences come together and offer the opportunity to achieve greater instream /riparian/floodplain complexity and cold water refugia. The confluence concentration area at Bear/Little Butte/Rogue was repeatedly identified as an area where important aquatic and terrestrial processes converge on the landscape and require focused efforts to address multiple limiting factors.

General management strategies for each range of scored Subwatershed, Corridor, or Confluence can be assigned when considering the base datasets, focal resource/target habitat scoring, final basinwide prioritization scores, and local limiting factors. Table 7 highlights the type of areas and conditions, and strategies that should be applied based on the ecological and social value scoring. Areas that scored in the higher end of the quality range will have a conservation oriented approach, while areas scoring lower quality will focus on the limiting factors that most impair its condition. The bulk of restoration or enhancement strategies for water and habitat will be applied to the mid-quality areas, where intervention is more likely to bring about the intended response. This graduated approach to restoring ecological processes and function in the selected priority areas, allows for a realistic, pragmatic improvement in resource conditions over time.

Map 29 summarizes all the priority areas (subwatersheds, corridors and confluences) identified through the planning process. This map offers a overview for general consumption; refer to Map 28 for the details of the priorities.

Table 7: Allocation of Conservation / Restoration / Enhancement Strategies Based on Prioritization

General Areas	Strategies
Higher Ecological Quality / Prioritization Score 5-4 = Protection / Conservation Actions	
Old Growth, Mature, and Multi-age class Forests Roadless Areas Priority ESA listed species habitat Priority ODFW Core Habitats Where water quality is good to excellent Where riparian habitat is good to excellent, connected Where instream habitat is good to excellent Where instream flow is good, in-stream water rights exist / are adequate Where species utilize the habitat / critical stage (spawn, nest, rearing) Where there is barrier free / migratory access Where lands are not already protected for conservation values Where confluences of habitat or waterways occur	Land Acquisition / easements/ swap Policy / Regulatory Enforcement of land / water use Buffering of anchor areas and corridors Purchase of water rights, preservation of instream rights Native fish sanctuary designations Policy changes on hatcheries and harvest Protection policies to preserve good conditions Remove fish access limits to these habitats
Medium Ecological Quality / Prioritization Score 3-2 = Restoration Actions	
Adjacent to high value lands / waters Where grazing is occurring Where modest mining could / has occurred Where limited #(3) of barriers, or can be removed to support access Where instream flows are mostly adequate at critical times Where water quality can be quickly improved (1-2 parameters) Where instream habitat is good to fair Where species utilization is moderate but could be improved Where lands aren't sufficiently protected Where riparian habitat is good to fair At perennial confluence areas Where flow restoration is possible	Expand high quality conditions, reconnection Remove unnecessary gravel/dirt roads EDRR treatments, removal on high value lands Willing purchase or easement of land or water rights Removal of barriers to access high value habitats Alternative mgmt of water rights / use, increase instream water Alternative mgmt of flow at dams / mimic natural regime Revegetation and riparian connectivity Reduce / eliminate hatchery operations over time Alternative mgmt of runoff by all sectors Instream habitat improvements, and use of beaver Thinning and restoration of fire cycles for forest health Address grazing and mining conflicts Target removal of limiting factors of trapping and harvest pressure on fish, beaver
Lower Ecological Quality / Prioritization Score 1 = Education / Enhancement Actions / Novel Landscapes	
Not adjacent to high value lands / waters Where high impact/ soil turning agricultural practices are occurring Where heavy mining/ditching has/ is occurring Where more than 3 barriers to migration exist Where water flows are inadequate or non-existent at critical times Where water quality is fair to poor Where instream habitat is fair to poor Where species utilization is low Where lands are degraded, even if protected Where water quality improvements are long term efforts Where fish could utilize stream in future with water improvements Where lands can be stewarded - public or private	Implement actions on lands with high visibility/ educational value Address regulatory mandates to improve water quality Focus on altering management practices over construction Increase connectivity of resource corridors Promote localized stewardship /adoption of enhanced lands Engage public in annual "cleanups" and stenciling to increase overall awareness Focus fish actions on accessible cold water refugia and high channel connectivity

Restoration Strategies and Actions Proposed

The specific restoration strategies and actions proposed through the Action Plan process were built from of the identified Vision, Goals and Objectives. For this Action Plan, strategies are the larger overarching approaches to address a given objective, and actions are place-specific projects. There are both capital (built/construction driven) and non-capital (programmatic, policy oriented) activities to implement over the course of the next decade to improve the conditions in the Rogue Basin. The strategies and actions are tailored to meet the limiting factors in the geographic priorities; not all are assigned to every geographic priority and more refinement will be needed as the priority areas are further evaluated. In addition there are many strategies and actions that are best to address basinwide (such as policy, or fish passage barrier removals that impact the flow of resources along the system) that and are noted as such. The goal is to shift the quality or score of each priority HUC, Corridor and Confluence up by a factor of at least one level (a med-high to a high score, a low to a medium, etc.)

In all cases the specific actions proposed for a given watershed, corridor, or confluence should be driven by the restoration of ecological processes. This Plan supports a hierarchy of conservation and restoration actions that offer the greatest long-term benefit for a reasonable cost and work with the system, rather than against it. As outlined by Beechie, et al. (2008 and 2012), Roni et al. (2002), and others, focusing on actions that support ecological processes such as hydrologic/flood attenuation, sediment transport dynamics, nutrient cycling, temperature moderation, fire/flood disturbance regimes, etc. are considered of higher priority than those that offer short term fixes. For example, placing large wood in a stream that has lost its sediment transport and wood recruitment potential or has significantly degraded water quality, is a high investment with low return even if fish are present. Such an investment may be more appropriate for a stream with higher function and recruitment potential, with the placed wood serving as a catalyst for full system recovery.

Table 8 (oversized in back) outlines the proposed capital strategies (that build the foundation for implementation) and specific actions associated with land conservation, flow restoration, fish passage, riparian restoration, instream enhancements, and uplands management for stormwater, agricultural, and forestry practices. The proposed tasks, lead and supporting entities, timeframe, planning level costs, relation to other planning efforts, and their geographic applicability are identified.

Table 9 (oversized in back) outlines the non-capital strategies and actions that are critical to long-term conservation and restoration in the Basin, including: conservation policy, organizational alignment, stewardship engagement (including education, communications), funding resiliency, accountability and monitoring of progress. These activities are often ongoing, and foundational to addressing many of the social and economic goals and objectives of the Plan. Most of these strategies and actions were identified by the partners early in the process, and have some degree of progress made towards them already. Again, the proposed tasks, lead and supporting entities, timeframe, planning level costs, relation to other planning efforts, and their geographic applicability are identified.

Both the strategies and actions in the above noted tables should be viewed as part of this working document, and subject to change as more information becomes available and the partners engage in active implementation and fundraising on these programs and projects.

Estimated Costs

The costs associated with addressing the conservation and restoration of the basinwide priority watersheds, corridors and confluences are highly dependent on the land ownership, the degree of impairment, and the measures necessary to assist its recovery or protection. As points of reference, the following information on cost estimates for capital project implementation are provided:

- The detailed cost estimate provided by the Elk Creek Watershed Restoration Action Plan (Rogue River-Siskiyou National Forest, 2012), contained a single fifth field (five 6th field) HUC and is a basinwide priority with similar proposed practices to this Action Plan. The restoration was estimated at $8,234,000 (in 2012 dollars) or approximately $900,000 in 2015. Assuming the equivalent of a total of 7 to 10 5th field HUCs with the priority subwatersheds, corridors and confluences on Map 28, the costs for restoration would be in the range of $6,300,000 to $9,000,000.
- The work completed in the Deschutes and Willamette SIP – for recovery of a positive trajectory of a healthy stream/riparian corridor, it has ranged between $250,000 and $1 million per mile for instream/riparian/floodplain work.
- The all-inclusive cost of riparian revegetation has averaged $8-10,000 per acre depending on site conditions to achieve a free to grow state after 5-7 years in the Willamette. The costs are higher in the Rogue given the need for watering and are estimated at $20,000 per acre.
- The mainstem Rogue dam removals, cost in the range of $4-6 million each. The target of future dam and barrier removals will be smaller in scale, but a higher number of barriers will need to be addressed to optimize fish access throughout the Basin. A preliminary estimate of 30 of the ODFW's priority barriers is $5.4 million ($180,000 each average).
- The range in costs per acre for land protections in the Rogue Basin vary widely depending on if they are acquisition or conservation easement, donated or purchased. Recent transactions have ranged from $500-12,000 per acre. Conservation / land trust organizations are estimated to be targeting 20-30,000 acres for protection over the next 10 years.
- The average cost per acre of forest health restoration through selected thinning and burning is (*to be provided by SOFRC in July*).

The estimated costs for the proposed capital projects **identified to date** outlined in Table 8, are $10.3 million (2015 dollars). Additional costs identified in Table 9 for non-capital projects are estimated at $531,000 and associated annual organizational capacity needs at $483,000. All these costs need to be refined and ultimately factored into the Investment Strategy.

Expected Outcomes

The expected outcomes of this restoration approach are linked to the conservation and restoration strategies to be implemented by partners as they focus on achieving the outlined Vision, Goals, and Objectives for the Basin.

The long-term ecological outcome of restoring the Rogue will be clean water at sufficient volumes throughout the year to sustain aquatic and human life and maintain healthy, interconnected, native riparian/floodplain forests and grassland and upland forest habitats dominated by native species. The impacts of uncharacteristically severe wildfires, droughts, floods, and non-native species invasions will be reduced and managed within a changing climate. Conservation and restoration of the full suite of ecological processes (hydrologic/flood attenuation, sediment transport dynamics, nutrient cycling, temperature moderation, etc.) and the functions (food web support, water quality maintenance, flood

Rogue Basin Vision

"The Rogue River basin remains resilient and supports viable populations of native fish and wildlife. Ecological processes, as well as social and economic benefits, are conserved and enhanced through collaborative, coordinated efforts of willing stakeholders."

Goals

- ***Ecological:*** *Address the key limiting factors affecting native fish and wildlife, water quality, and flows in the Basin by conserving and enhancing the ecological processes upon which they rely.*
- ***Social:*** *Promote landowner stewardship, public awareness, technical capacity, and institutional collaboration regarding the Rogue's natural resources.*
- ***Economic:*** *Create sustained funding mechanisms for restoration in the Rogue.*

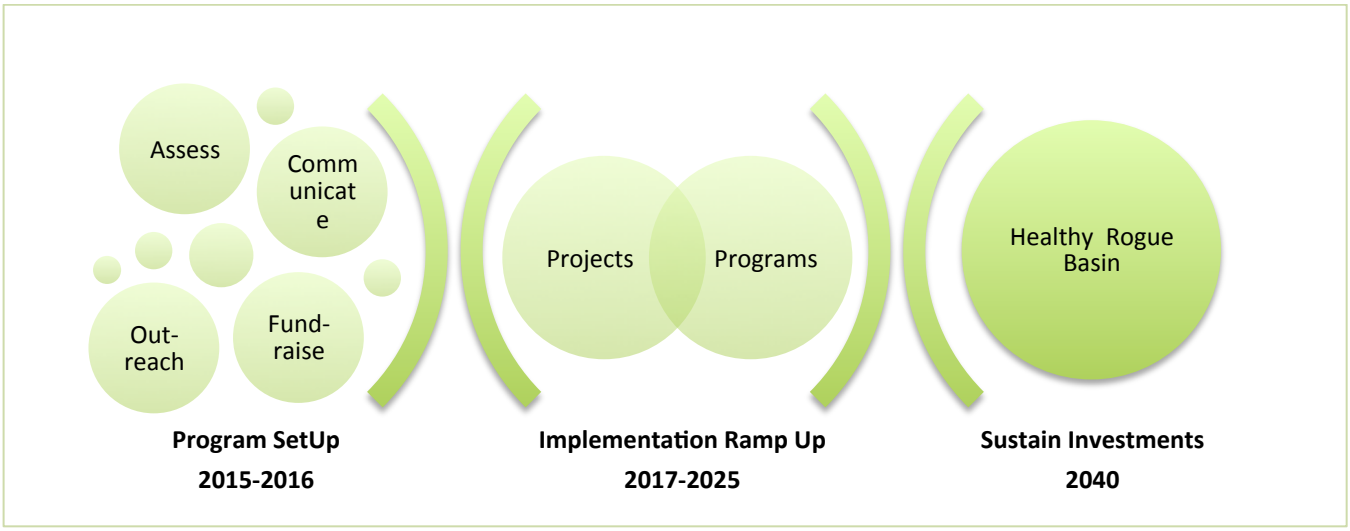
storage, groundwater recharge, wildlife habitat) and values (aesthetics, recreation, foraging, water supply, wild and scenic, etc.) our natural resources provide, is critical to sustaining resilient systems.

Social and economic outcomes are also important to watershed partners, and efforts are already well underway to improve the collaboration and engagement of natural resource oriented organizations. Similar to promoting the connectivity of ecological systems to achieve recovery, there are social and economic networks that must be supported to facilitate our collective impact. The approaches outlined in the Implementation Framework and Funding Strategy, highlight how the network may operate to achieve success. The long-term outcome is to align organizational approaches and leverage funding across Basin to support a more socially and economically resilient Rogue.

Metrics, Milestones, Benchmarks for Achieving Expected Outcomes

The implementation timeframes for the strategies and actions identified in this Action Plan vary greatly, and are driven largely by funding availability, landowner willingness to engage in improvements, and institutional bottlenecks such as permitting for restoration projects, water quality permits, staff capacity and expertise. Recognizing the uncertainties, an estimated timeline of the major plan elements and milestones is represented in Figure 6 and its companion table.

Figure 6: Implementation Timeline of Major Elements



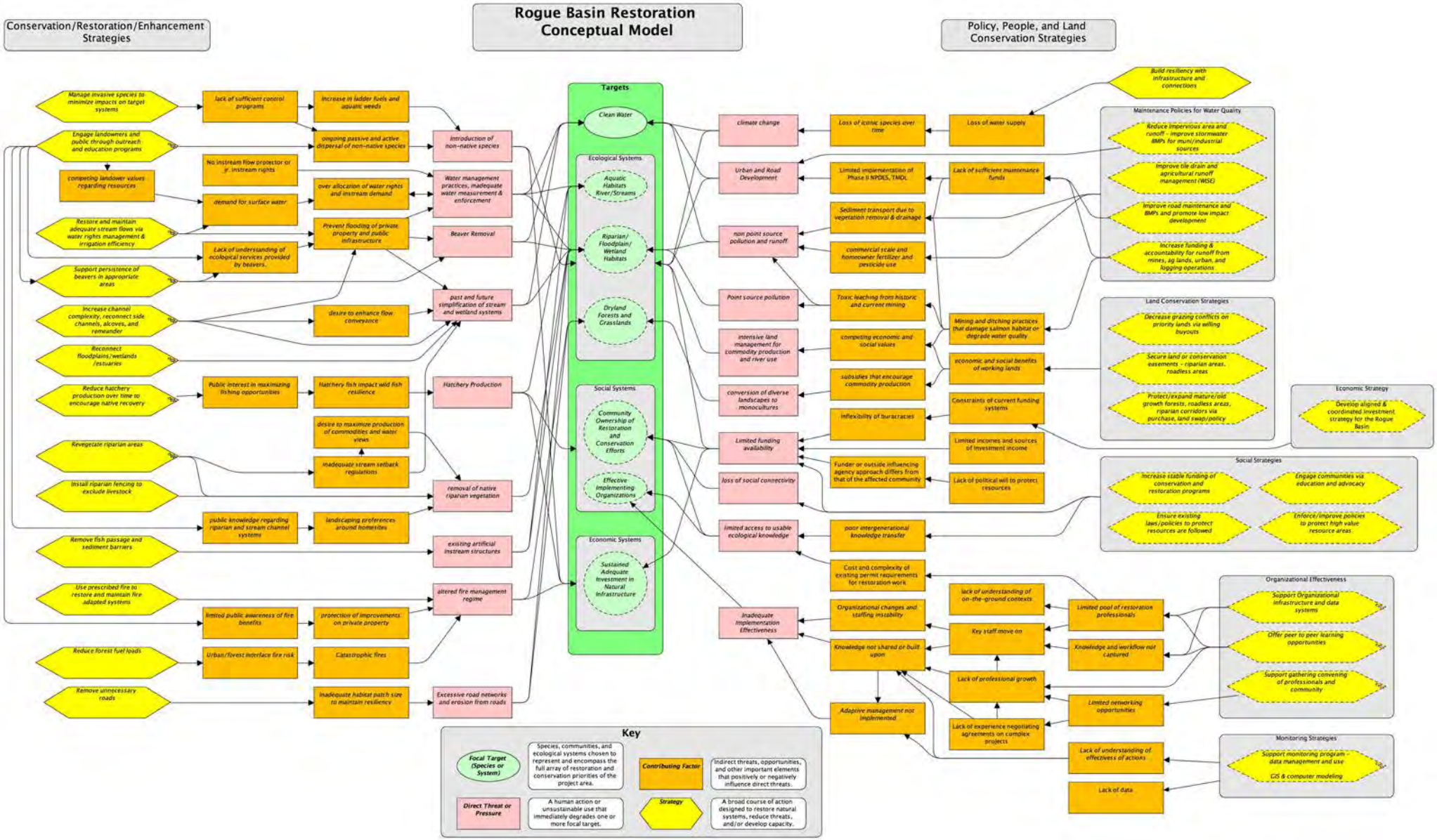
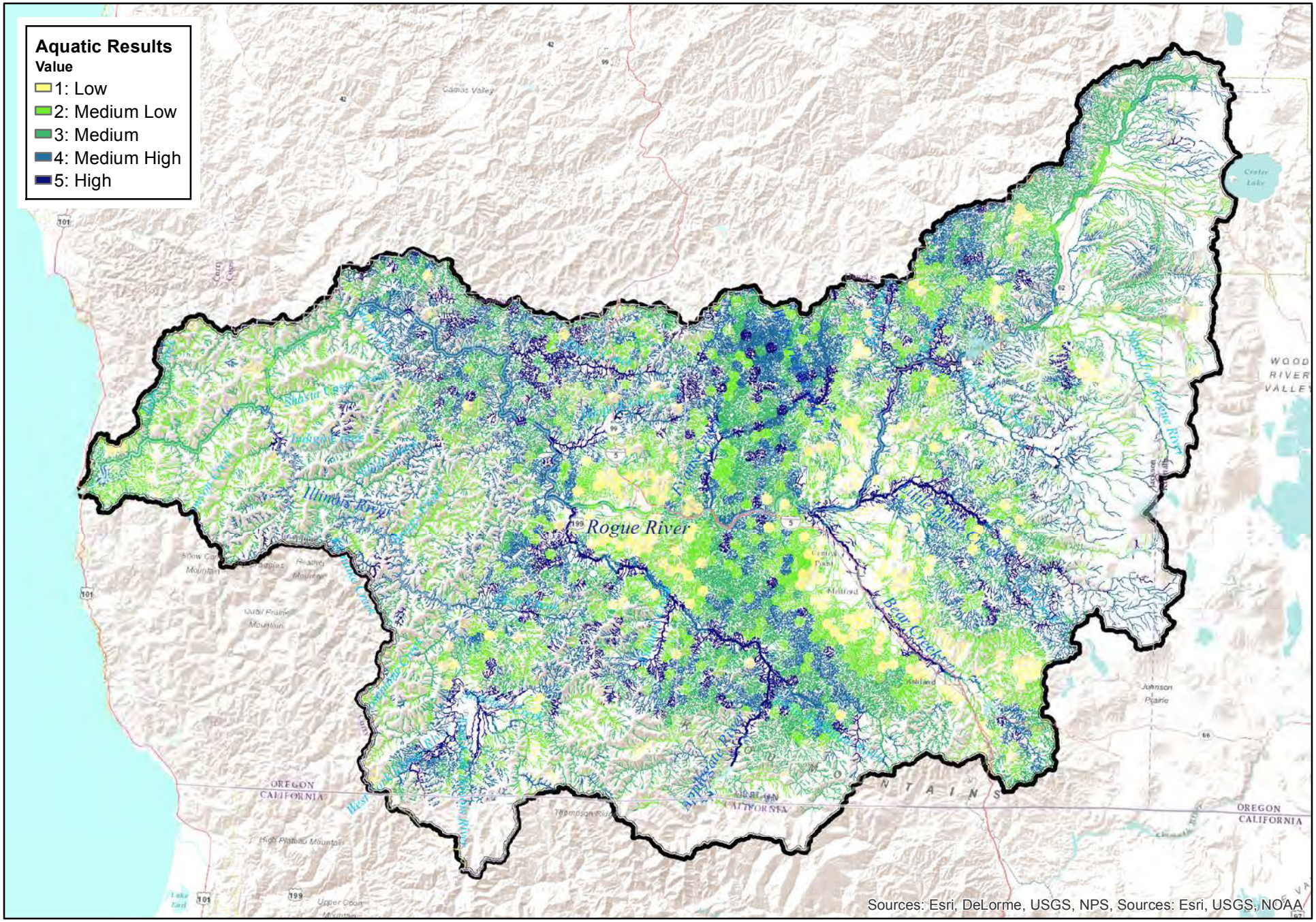
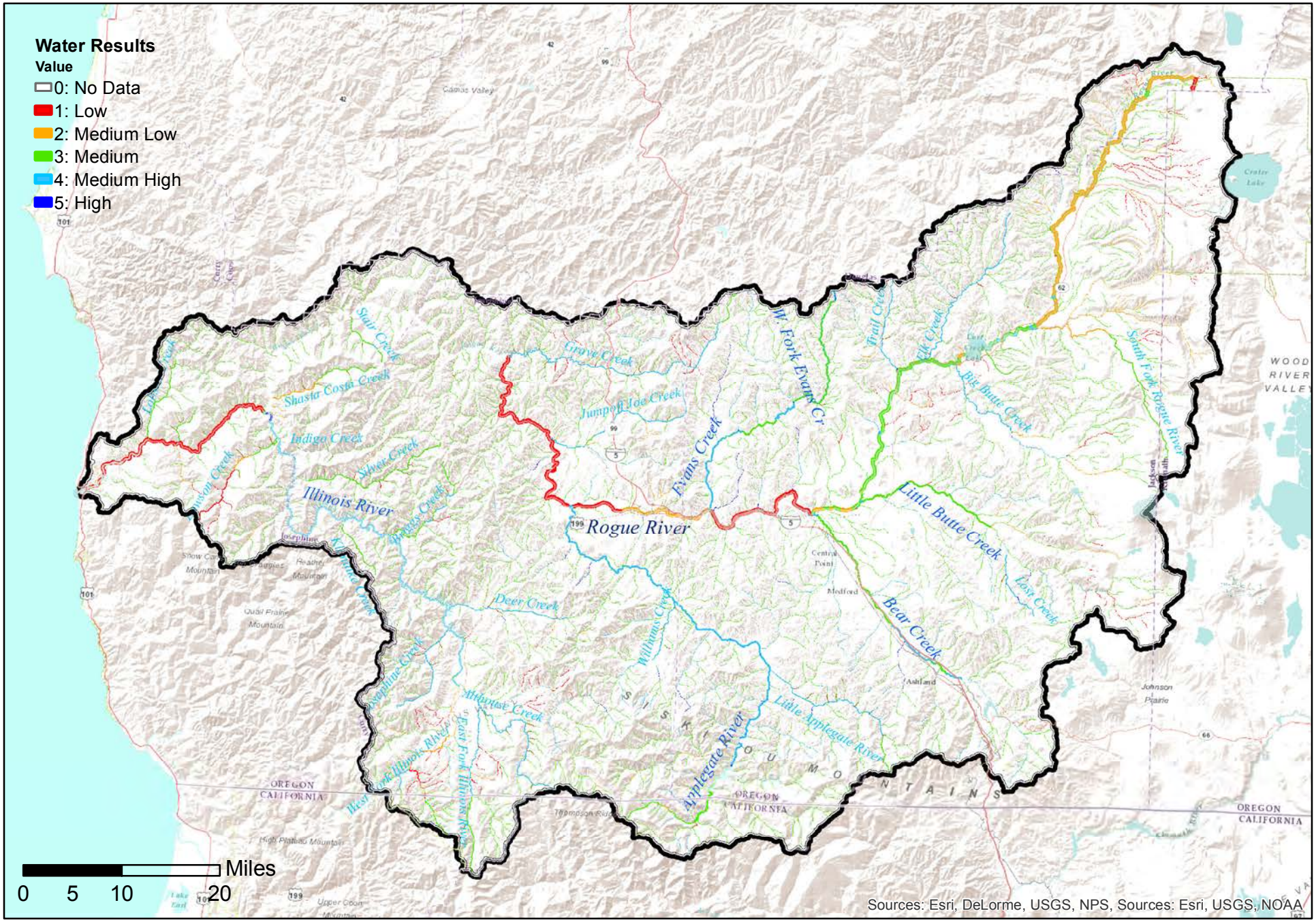

Rogue Basin Restoration Conceptual Model
Conservation/Restoration/Enhancement Strategies
Policy, People, and Land Conservation Strategies
Targets
Clean Water
Ecological Systems
Aquatic Habitats River/Streams
Riparian/ Floodplain/ Wetland Habitats
Dryland Forests and Grasslands
Social Systems
Community Ownership of Restoration and Conservation Efforts
Effective Implementing Organizations
Economic Systems
Sustained Adequate Investment in Natural Infrastructure
Manage invasive species to minimize impacts on target systems
lack of sufficient control programs
Increase in ladder fuels and aquatic weeds
Engage landowners and public through outreach and education programs
ongoing passive and active dispersal of non-native species
Introduction of non-native species
competing landowner values regarding resources
No instream flow protector or jr. instream rights
Water management practices, inadequate water measurement & enforcement
demand for surface water
over allocation of water rights and instream demand
Restore and maintain adequate stream flows via water rights management & irrigation efficiency
Prevent flooding of private property and public infrastructure
Beaver Removal
Lack of understanding of ecological services provided by beavers.
Support persistence of beavers in appropriate areas
past and future simplification of stream and wetland systems
Increase channel complexity, reconnect side channels, alcoves, and remeander
desire to enhance flow conveyance
Reconnect floodplains/wetlands /estuaries
Reduce hatchery production over time to encourage native recovery
Public interest in maximizing fishing opportunities
Hatchery fish impact wild fish resilience
Hatchery Production
desire to maximize production of commodities and water views
Revegetate riparian areas
inadequate stream setback regulations
Install riparian fencing to exclude livestock
removal of native riparian vegetation
public knowledge regarding riparian and stream channel systems
landscaping preferences around homesites
Remove fish passage and sediment barriers
existing artificial instream structures
Use prescribed fire to restore and maintain fire adapted systems
altered fire management regime
limited public awareness of fire benefits
protection of improvements on private property
Reduce forest fuel loads
Urban/forest interface fire risk
Catastrophic fires
Remove unnecessary roads
Inadequate habitat patch size to maintain resiliency
Excessive road networks and erosion from roads
climate change
Loss of iconic species over time
Loss of water supply
Urban and Road Development
Limited implementation of Phase II NPDES, TMDL
Lack of sufficient maintenance funds
Sediment transport due to vegetation removal & drainage
non point source pollution and runoff
commercial scale and homeowner fertilizer and pesticide use
Point source pollution
Toxic leaching from historic and current mining
Mining and ditching practices that damage salmon habitat or degrade water quality
intensive land management for commodity production and river use
competing economic and social values
economic and social benefits of working lands
conversion of diverse landscapes to monocultures
subsidies that encourage commodity production
Constraints of current funding systems
inflexibility of bureaucracies
Limited funding availability
Limited incomes and sources of investment income
Funder or outside influencing agency approach differs from that of the affected community
Lack of political will to protect resources
loss of social connectivity
limited access to usable ecological knowledge
poor intergenerational knowledge transfer
Cost and complexity of existing permit requirements for restoration work
Inadequate Implementation Effectiveness
Organizational changes and staffing instability
lack of understanding of on-the-ground contexts
Limited pool of restoration professionals
Key staff move on
Knowledge and workflow not captured
Knowledge not shared or built upon
Lack of professional growth
Limited networking opportunities
Adaptive management not implemented
Lack of experience negotiating agreements on complex projects
Lack of understanding of effectivess of actions
Lack of data
Build resiliency with infrastructure and connections
Maintenance Policies for Water Quality
Reduce impervious area and runoff - improve stormwater BMPs for muni/industrial sources
Improve tile drain and agricultural runoff management (WISE)
Improve road maintenance and BMPs and promote low impact development
Increase funding & accountability for runoff from mines, ag lands, urban, and logging operations
Land Conservation Strategies
Decrease grazing conflicts on priority lands via willing buyouts
Secure land or conservation easements - riparian areas, roadless areas
Protect/expand mature/old growth forests, roadless areas, riparian corridors via purchase, land swap/policy
Economic Strategy
Develop aligned & coordinated investment strategy for the Rogue Basin
Social Strategies
Increase stable funding of conservation and restoration programs
Engage communities via education and advocacy
Ensure existing laws/policies to protect resources are followed
Enforce/improve policies to protect high value resource areas
Organizational Effectiveness
Support Organizational Infrastructure and data systems
Offer peer to peer learning opportunities
Support gathering convening of professionals and community
Monitoring Strategies
Support monitoring program - data management and use
GIS & computer modeling
Key
Focal Target (Species or System)
Species, communities, and ecological systems chosen to represent and encompass the full array of restoration and conservation priorities of the project area.
Contributing Factor
Indirect threats, opportunities, and other important elements that positively or negatively influence direct threats.
Direct Threat or Pressure
A human action or unsustainable use that immediately degrades one or more focal target.
Strategy
A broad course of action designed to restore natural systems, reduce threats, and/or develop capacity.

Table 5: Scoring Methods For Priority Datasets

Focal Target	GIS Datasets	Name In Databasin Or Other Source Location	Year	Source	High Score 5	4	3	2	Lower Score 1	0
Water**	Predicted Change in Mean Summer Flow 2040	Stream Flow Metric Database, NPLCC	2014	USFS, RMRS	0-4%	4-10	10-13	13-19	19-50%	
	Predicted Change in 1.5yr Flow Events 2040	Stream Flow Metric Database, NPLCC	2014	USFS, RMRS	-9.08-20%	-9--18, 20-50	-18--27,50-100	-27--42, 100-166	-42--57,166-250	
	Predicted Change in Mean August Temperature 2040	NorWeST Project Database	2014	USFS, RMRS	.98-1.16	1.17-1.28	1.29-1.39	1.40-1.49	1.50-1.66	
	Current Cold water refugia - Below 19C August Mean for Coho, Steelhead Rearing	NorWeST Project Database	2014	USFS, RMRS					Yes	No
	Number Water Quality Limited Stream Parameters	Number of WQ Limited Parameters	2013	DEQ	1	2	3-4	5-6	7-8	
	Instream Flow Allocation	OWRD Instream Flow Designation	2011	OWRD					Yes	No
Aquatic Habitat	ODFW Aquatic Crucial Habitat	Aquatic Crucial Habitat Overview	2014	ODFW	Priority 1	2	3-4	5	6	
	Number Anadromous Fish/Lamprey Species Use	Number Of Salmonid Species	2013, 2015	ODFW, NOAA	7	6-5	4-3	2	1	0
	ESA listed species habitat (Coho IP)	WOPR High Intrinsic Potential Coho Salmon Stream Reaches	2014	ODFW, NOAA	77-100%	76-58%	57-43%	42-25%	24-3%	No
	ESA Species of Concern Habitat (Green Sturgeon)	Extent of Sturgeon Use of Rogue River	2012	ODFW (White), Riverkeeper					Yes	No
	Composite Aquatic habitat values (LWD, Side Channels, Pool Depth) see below	Rogue River Basin Stream Survey Score (Composite of LWD, Pool and Side Channel Scores) ODFW, USFS, BLM	2003	ODFW, CBI	9+	7-8	6	5	4-3	
	Survey data percent pools	Percent Pool	2013	ODFW	>43.5	25.3-43.5	17.2-25.2	10.2-17.1	<10.2	
	Survey data percent side channels	Percent Side Channel	2013	ODFW	>7	4.3-7	2.8-4.2	1.3-2.7	<1.3	
	Survey data, LWD per 100M	Large Woody Debris	2013	ODFW	>2.9	1.8-2.9	1.1-1.7	.2-1	<0.2	
Riparian Habitats	PNW Riparian Areas (and floodplain extents) based on geomorh/topo	Potential Riparian Areas in the Pacific Northwest	2013	WGA/LCC					Yes	No
	PNW Riparian Areas Predicted Climate Change Resilience Index	Pacific Northwest Riparian Climate Corridors: scores attributed to ...	2013	WGA/LLC	0.82				0.0003	
	Riparian Bird Predicted Mean Bird Distribution 2040	http://data.prbo.org/apps/nplcc/aknw.php	2014	Avian Knowledge NW	10-9	8-7	6-5	4-3	2-1	
	NLCD Classification of Vegetation Cover	http://www.mrlc.gov/nlcd11_leg.php	2011	NLCD, BEF	Forest, weltand	Shrub, herbaceous	Hay	Cultivated	Urban	
Terrestrial Habitats*	TNC Climate Resiliency Map	https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/oregon/science	2015	TNC	441-342	342-255	255-175	175-102	102-1	No
	Ecological Integrity Scores: Current species richness and habitat quality	Not Posted, not publically available yet	2015	INR/OSU	532-508	507-480	479-450	449-335	334-0	
	ODFW Terrestrial Crucial Habitat	On Compass, not Databasin	2014	ODFW	Priority 1	2	3-4	5	6	
	Oak/ Conifer/ Prairie Predicted Mean Bird Distribution 2040	http://data.prbo.org/apps/nplcc/aknw.php	2014	Avian Knowledge NW	0.9999				0.0086	
*SOFRC/TNC Forest Resiliency / Wildfire Risk Assessment Mapping underway, not avialable for draft plan			2015	SOFRC/TNC						

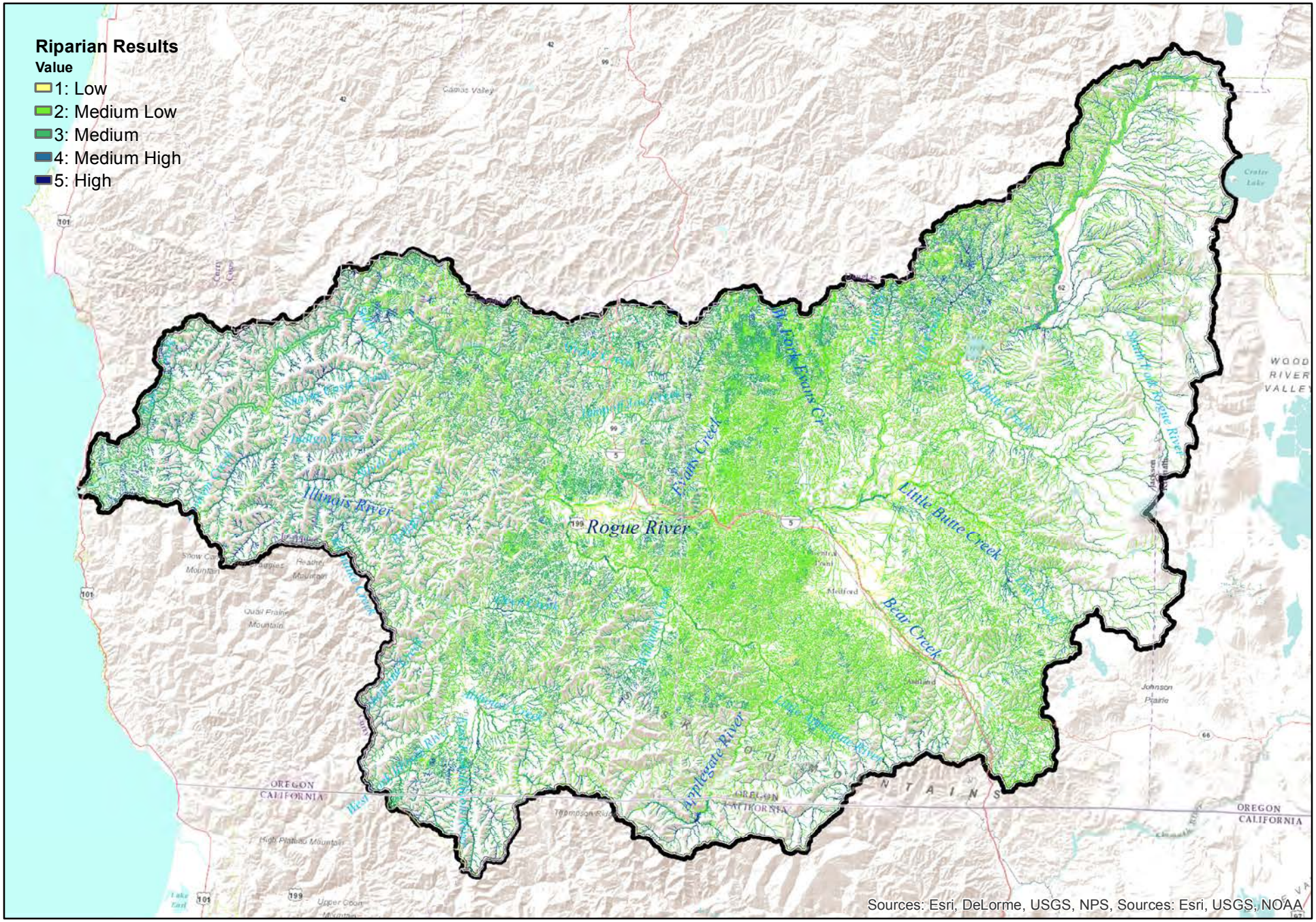


Map 24a: Aquatic Results



Map 24b: Water Results

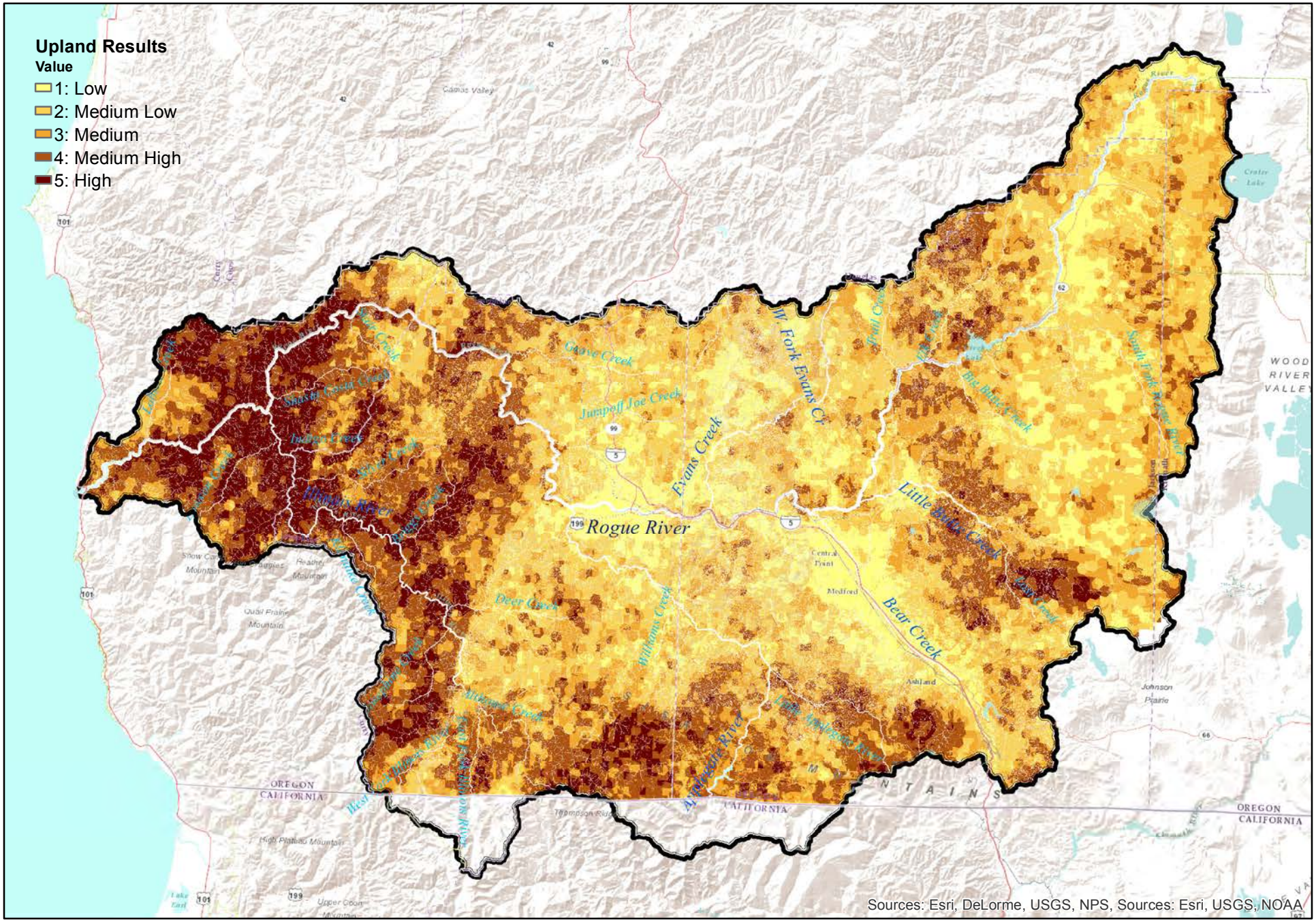
N



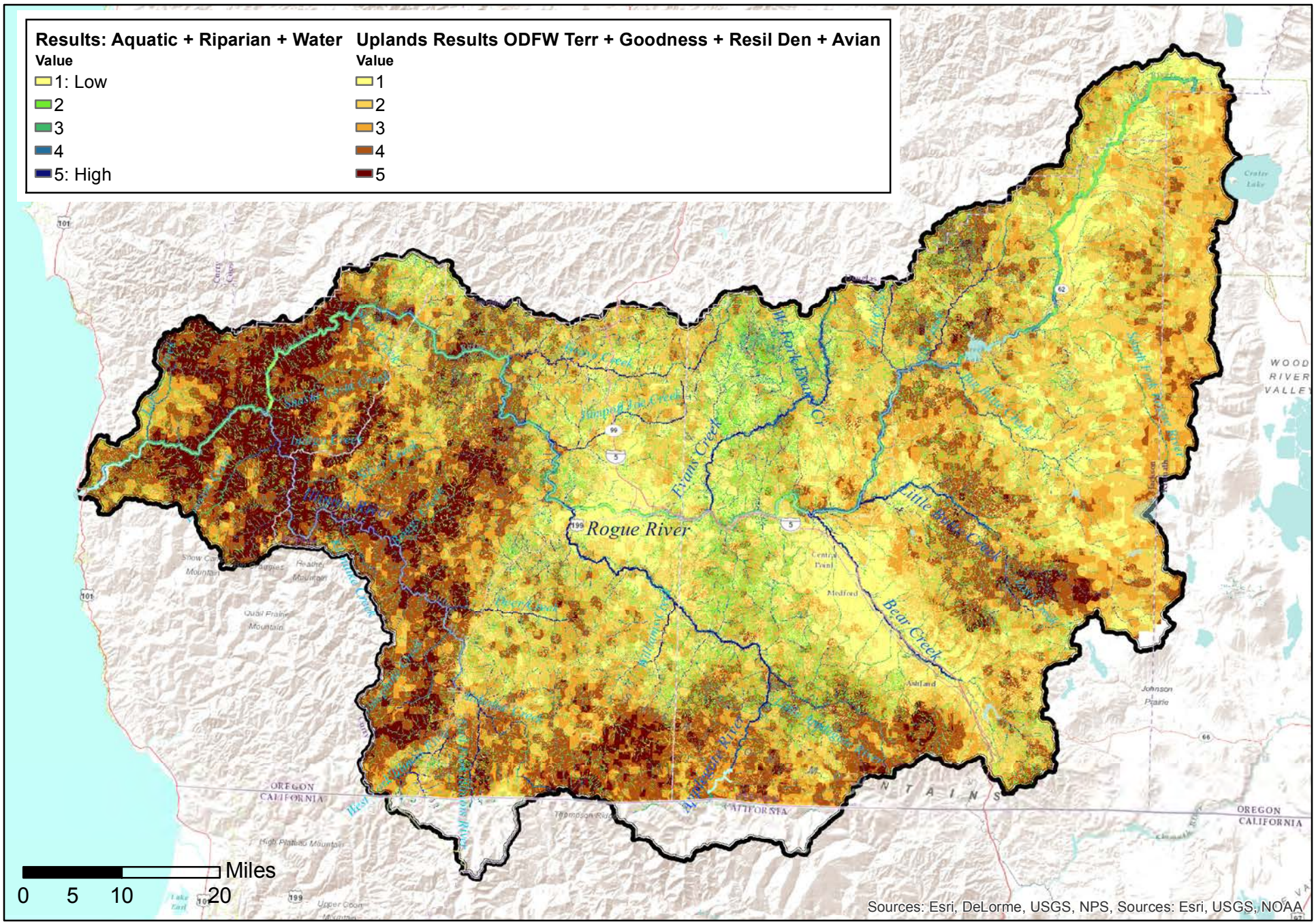
Map 24c: Riparian Results

Miles
0 5 10 20

N

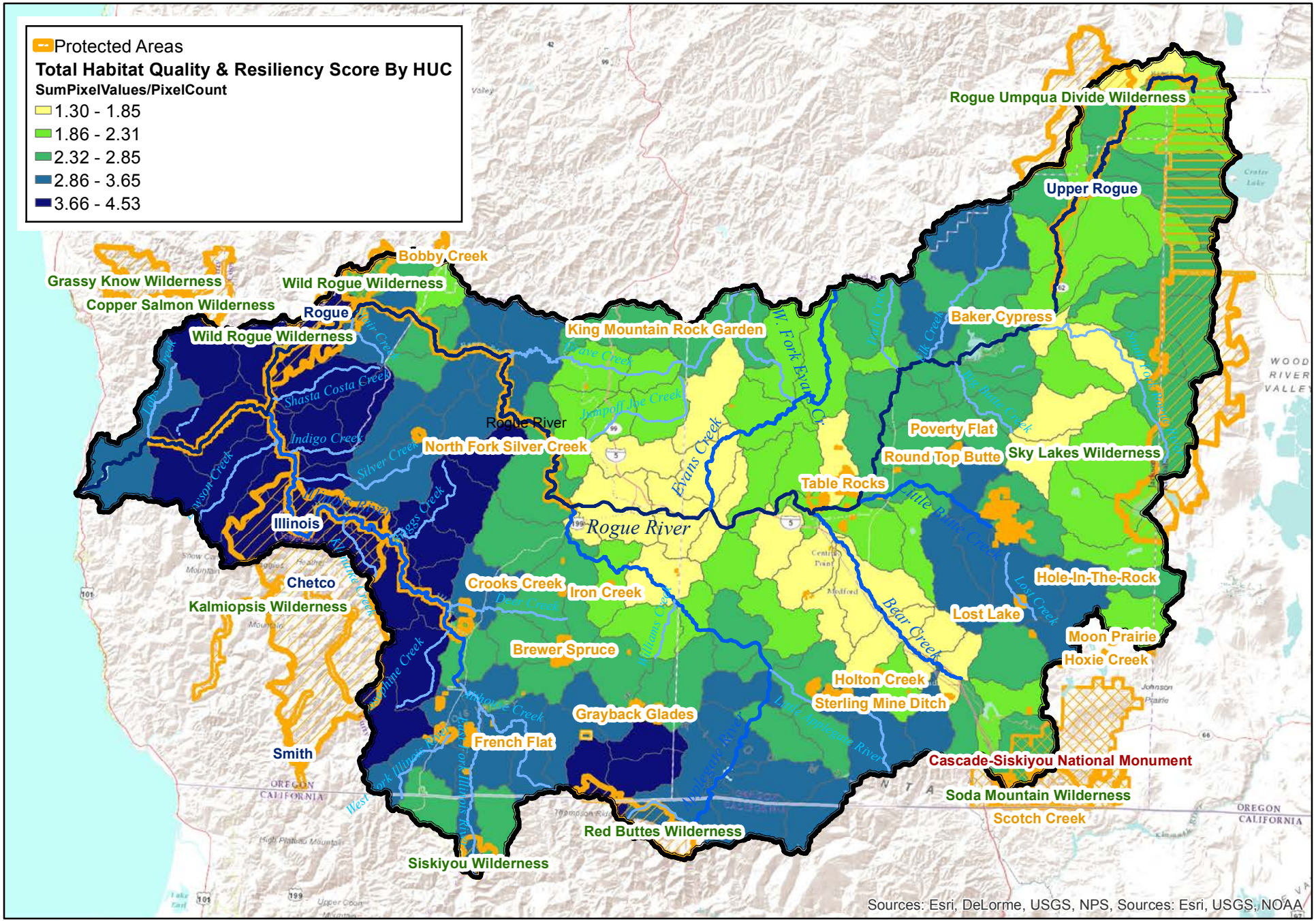


Map 24d: Upland Results



Map 25: Results of River/Stream Corridor and Terrestrial Habitat Scoring Combined

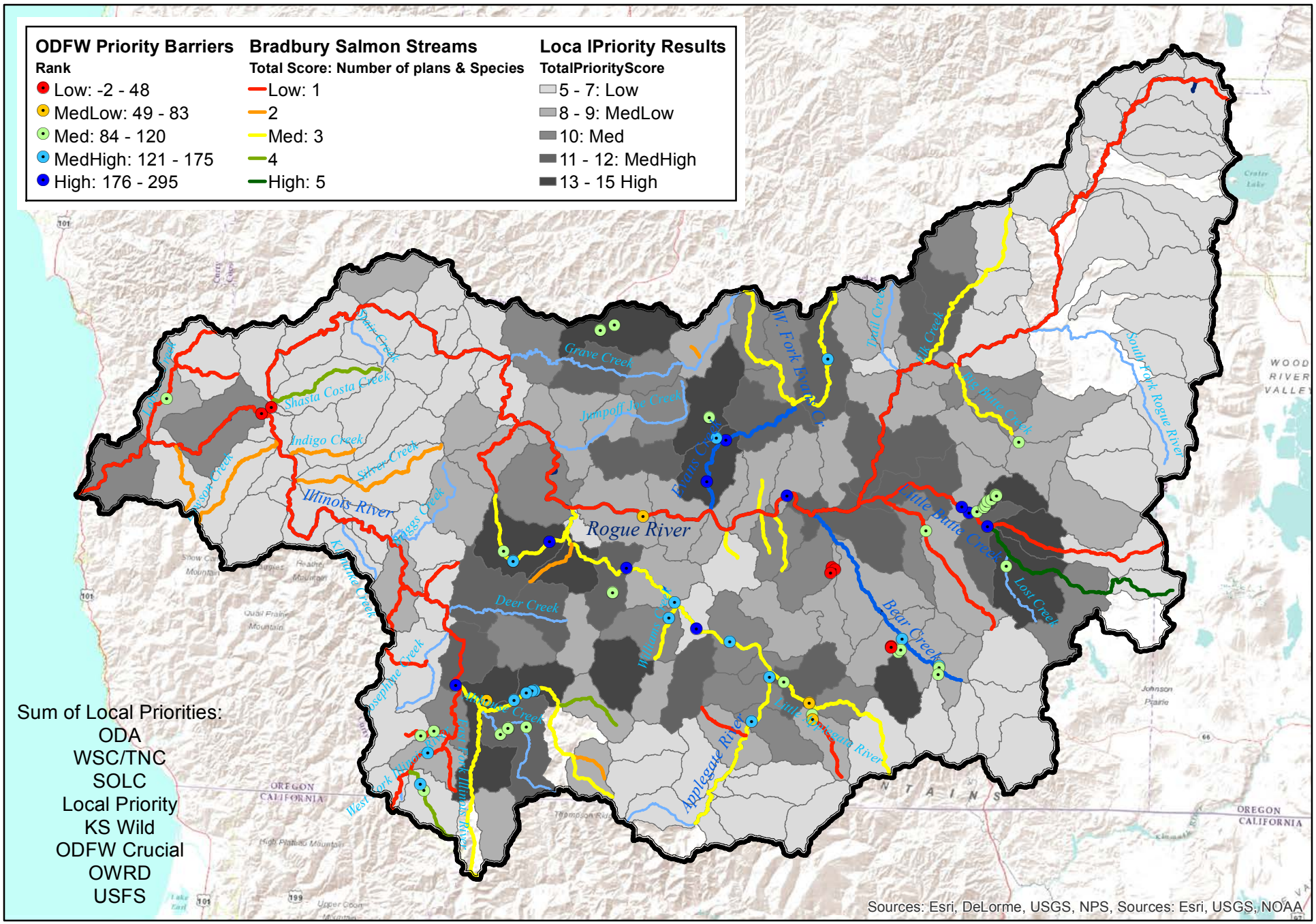
N



Map 26: Total Habitat Quality and Resiliency Score by HUC 6

Miles
0 5 10 20

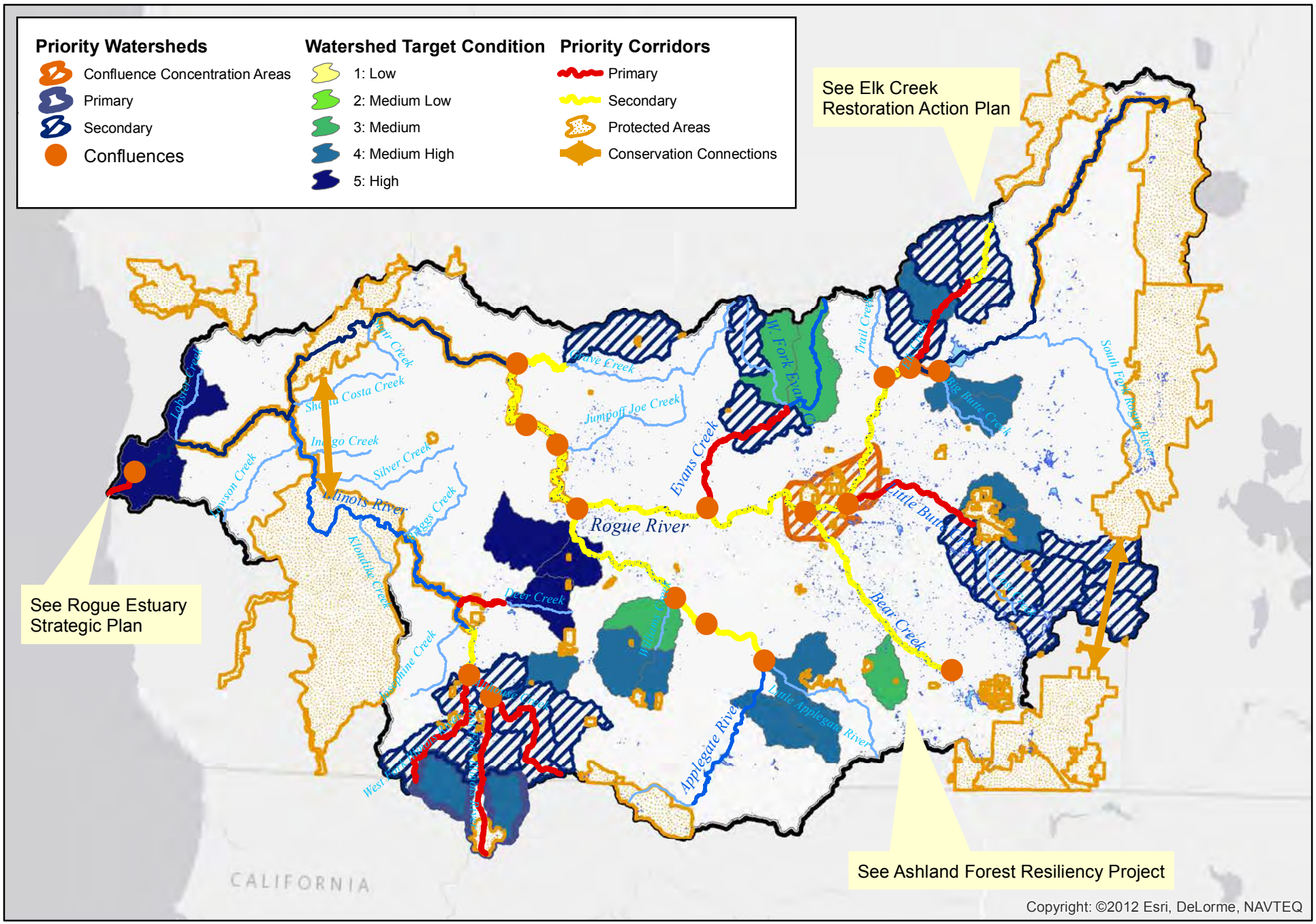
N



Map 27: Previous Plans Prioritization Results

Miles
0 5 10 20

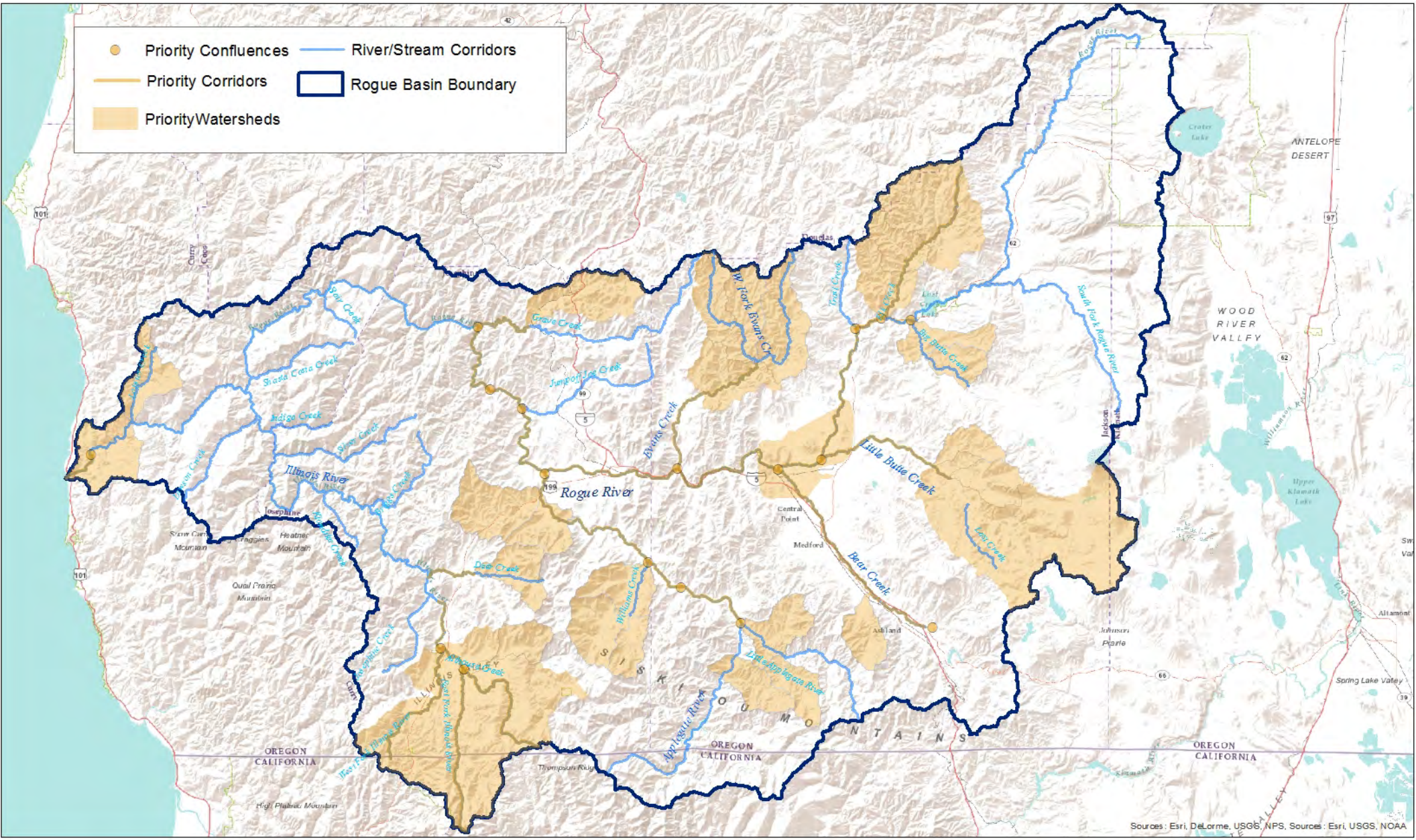
N



Map 28: Priority Watersheds, Corridors, and Confluences

Miles
0 5 10 20

N



Map 29: Rogue Basin Priority Corridors, Confluences, and Watersheds

0 5 10 20 30 40 Miles

ROGUE BASIN PARTNERSHIP

Table 8: Proposed Capital Conservation and Restoration Strategies and Actions

Code	Strategy	Action	Lead Entity	Support Entities	Timeframe	Cost	Relation to Other Plans	Geographic Location	Potential Funders
1.1	Land Conservation	Determine **feasibility of and approach to conservation targets** by: reviewing high priority conservation lands/ waters identified during Action Plan prioritization, using updated taxlot data for all Counties determine private owners with greatest stream lengths and/or water rights, and those adjacent to confluence areas or public or private conservation lands. Determine priority acquisitions and easement sites	SOLC	TNC, TFT, watershed councils	June-December 2015	3,000 to assess	SOLC Conservation Plan	Priority Anchor Watersheds, Connection Corridors and Confluences	Laird Norton Family Foundation
1.2	Land Conservation	Monitor **mining activities and water rights related to mining** that could have adverse impacts and challenge those that have adverse impacts. Work on legislation to protect important salmon and steelhead spawning habitat from mining impacts.	Riverkeeper	WaterWatch	Ongoing	2,000	Riverkeeper Workplan	Priority Anchor Watersheds, Connection Corridors and Confluences	Laird Norton Family Foundation
1.3	Land Conservation	Actively **pursue land and water conservation properties**. Identify inholdings and opportunities for land swaps to create larger blocks of contiguous habitat, especially for listed or sensitive species habitats. Review streamside property listings regularly; work with local entities to secure leads on conservation targets. Purchase high conservation value properties, and buy or accept donated conservation easements.	SOLC	TNC, Western Rivers Conservancy, Trust for Public Land, Pacific Forest Trust, The Conservation Fund, TFT	June 2015-Ongoing	TBD- Project specific	SOLC Conservation Plan, Oregon Conservation Strategy Protection provisions	Priority Anchor Watersheds, Connection Corridors and Confluences	YARG Fund, OWEB
1.4	Land Conservation	Develop an **external land / water conservation funding campaign for the Rogue** to stitch together critical habitats and water needs, not already in public or conservation ownership. Work with public land owners to ensure conservation practices are employed. See Economic resiliency action.	TNC	Western Rivers, American Rivers, Trout Unlimited, Native Fish Society, KBO, SOFRC, TFT, SOLC	Start 2016	TBD- Project specific		Priority Anchor Watersheds, Connection Corridors and Confluences	Doris Duke Charitable Foundation, YARG Fund
2.1	Flow Restoration	Develop **strategies to protect in-stream flows and increase flow in priority area**s identified. Focus on water rights with early priority dates and those most likely to offer needed flow improvements. Identify gaps in instream water right protection in prioirty areas. Work with WISE project to ensure instream rights are restored and protected through public infrastructure upgrades. Assess consumptive use water rights for opportunities to engage holders in in-stream leases, sale of consumptive rights for transfer to instream water rights, land management changes, irrigation delivery and on-farm efficiencies, and other water management practices in priority locations. **Increased local water trust capacity capacity needed to fulfill this action.**	Trout Unlimited	WaterWatch, OWRD, ODFW, TFT	Start October 2015	35,000	OWRD Priorties for Flow Management, NOAA SONCCC Recovery Plan	Priority Anchor Watersheds, Connection Corridors and Confluences	OWEB, OWRD
2.2	Flow Protection	**Identify, map and protect critical cold water refugia** (groundwater upwelling / springs) throughout the system. Propose policies and management strategies to protect these resources from over-extraction. Pursue DEQ/ OWRD to evaluate and put forth measures to **limit groundwater extraction** as it impacts surface flows. **Monitor new water rights applications** (surface and groundwater) and challenge applications that would ahve significant adverse impacts. Protect instream flow releases from Lost Creek reservoir.	WaterWatch	Councils, Medford Water Commission, Irrigation Districts, USFS, BLM, ODFW, TFT, Trout Unlimited	July 2015 - ongoing	5,000	NOAA SONCCC Recovery Plan	Priority Anchor Watersheds, Connection Corridors and Confluences	Laird Norton Family Foundation, OWRD
2.3	Flow Restoration	Work with priority landowners to **address irrigation efficiency** improvement projects to bring water use in line with crop needs, and reduce runoff and groundwater nutrient loading. For sites with significant water savings, use the conservation statute to protect water savings instream.	SWCD's	Trout Unlimited, Rogue River Watershed Council, WISE, NRCS, Councils, Irrigation Districts	Ongoing	TBD- Project specific	Inland Rogue Agricultural Water Quality Plan, ODA high and medium management reporting areas	Priority Anchor Watersheds, Connection Corridors and Confluences	EQIP, CREP, SWCD, WISE project
2.4	Flow Restoration	Work with local forestry and agricultural organizations to identify best management practices to **reduce upland surface runoff and promote groundwater recharge** in locations where contamination of groundwater is not likely. **Pilot study in one priority watershed**, before suggesting BMP's for basinwide implementation.	SWCD's	Watershed councils, US Forest Service, BLM, OWRD, ODEQ, ODA, Siskiyou Permaculture	2016-2020	30,000 initial study		Pilot in West Fork Evans Creek	OWRD Place-based grants, Jacson SWCD, BLM
3.1	Fish Passage	Conduct a **feasibility assessment of the top fish barriers** identified by ODFW, and within priority areas, to determine ripeness for addressing their removal.	RBP	Councils, WaterWatch, Contractor, Riverkeeper	June 2015- Oct 2015	65,000	ODFW Priority Barriers List, Oregon Conservation Strategy, SONCCC Recovery Plan	Basinwide	OWEB (FUNDED)
3.2	Fish Passage	**Implement priority barrier removal** projects. Secure landowner agreements and funding, contract technical support to develop design and engineering and cost estimates, conduct assessments and studies (sediment transport, historical and archeological) for review, and permitting, and manage construction contractor to complete infield removal efforts.	Councils	WaterWatch, SWCD's, American Rivers, Riverkeeper, others	Ongoing	5,600,000	ODFW Priority Barriers List, Oregon Conservation Strategy, SONCCC Recovery Plan	Priority Anchor Watersheds, Connection Corridors and Confluences	OWEB, ODFW R&E, NOAA
3.2.1	*Fish Passage*	*Address barriers on Wagner Creek: Parrish- Rapp Diversion & Beeson - Robinson Diversion*	*Rogue River Watershed Council*	*ODFW, OWRD*	*??*	*??*	*Bear Creek Barriers Analysis*	*Wagner Creek*	*OWEB*
3.2.2	*Fish Passage*	*Address Barriers on Little Butte Creek: Brown, Charley, Walcott*	*Rogue River Watershed Council*	*ODFW, OWRD*	*Fall 2018-2020*	*TBD- Project specific*	*ODFW Priority Barriers List*	*Little Butte Creek*	*OWEB*
3..2.3	*Fish Passage*	*Address barriers on Salt Creek: C-2 #1&2 Meyers,C-2 #3&4 TO, M Peile #1&2*	*Rogue River Watershed Council*	*ODFW, OWRD*	*Summer 2016-Fall 2018*	*TBD- Project specific*	*ODFW Priority Barriers List*	*Salt Creek*	*OWEB*
4.1	Riparian Restoration	Complete **quality and feasibility assessment of riparian corridors** in priority areas to determine levels of invasive species, density within the riparian stand (too high/low), gaps in canopy, livestock access, geomorphic constraints and likely floodplain connectivity.	TFT	Councils, SWCD's	Jan- October 2015	40,000	DEQ Water Quality Status and Action Plan	Priority Anchor Watersheds, Connection Corridors and Confluences	Medford TFT Contract, OWEB
4.2	Riparian Restoration	Identify stream corridors and specific **properties** with livestock, and **livestock exclusion needs**, share with team working on riparian enhancement and develop a shared approach to addressing the issue with landowners.	SWCD's	Watershed Councils, TFT	Fall 2015-Fall 2019	TBD- Project specific	Inland Rogue Agricultural Water Quality Plan	Priority Anchor Watersheds, Connection Corridors and Confluences, especially Little Butte	CREP, EQIP, DEQ 319, SWCD
4.3	Riparian Restoration	Identify **early action riparian corridor projects** in high impact areas, **to engage the public** in the process of understanding the value of riparian corridors and all the conservation and restoration efforts underway in the Rogue. Actively remove and manage **succession supressing invasive species** from the corridors.	Councils	SWCD's, TFT	Fall 2015- 2018	2,000,000	DEQ Rogue Water Quality Status and Action Plan, SONCCC Recovery Plan	Priority Anchor Watersheds, Connection Corridors and Confluences	Medford TFT Contract, CREP, DEQ 319, OWEB, SWCD
4.3.1	*Riparian Restoration*	*Bear Creek Greenway Restoration*	*TFT*	*Jackson SWCD, RV COG, Rogue River Watershed Council*	*Fall 2015-2020*	*1,000,000*	*Greenway Plan*	*Bear Creek*	*Medford TFT Contract*
4.3.2	*Riparian Restoration*	*Little Butte Creek Agricultural Demonstration*	*Jackson SWCD*	*TFT*	*Fall 2015- 2018*	*1,000,000*	*Inland Rogue Agricultural Water Quality Plan*	*Little Butte Creek*	*Medford TFT Contract, CREP, EQIP, DEQ 319, SWCD*
4.3.3	*Riparian Restoration*	*Valley of the Rogue State Park Riparian Restoration*	*Seven Basins Watershed Council*	*Oregon State Parks, OSU Extension*	*Fall 2015-2019*	*30,000*		*Rogue River*	*Oregon State Parks, OWEB, Middle Rogue Steelheaders*
4.4	Riparian Restoration	**Develop a comprehensive riparian regeneration / revegetation program** with local entities. Conduct landowner outreach to enroll landowners in riparian activities. Enroll interested, eligible landowners in CREP or other partial funding programs for riparian management. Work with contractors and nuseries to scale up / adjust practices to increase the efficiency and effectivess of active riparian enhancement efforts	Councils, SWCD's, TFT	NRCS, RVCOG	Fall 2015- 2025	3-5,000,000	DEQ Rogue Water Quality Status and Action Plan, NOAA SONCCC Recovery Plan	Priority Anchor Watersheds, Connection Corridors and Confluences	Medford TFT Contract, CREP, DEQ 319
5.1	Instream Enhancement	Upon completion of LIDAR imagery for the streams, river, floodplains, and wetland in any given subbasin (DOGAMI, Others), **assess locations for floodplain connectivity projects**. Complete predictive **flood inundation maps** for the 50%, 10%, and 1% probabily flood elevations using climate change scenario hydrology to determine areas expected to retain resiliency in connectivity	RVCOG, Councils	County Planning, Contractor, TFT, FEMA	2016-2017	100000	Emergency Management Planning, NFIP	As LIDAR is available in Priority Anchor Watersheds, Connection Corridors, and Confluences	NOAA Climate Resiliency, OWEB, FEMA
5.2	Instream Enhancement	Identify **opportunities for in-stream habitat, channel re-meander or connectivity** for perennial streams first, then intermittent in subbasins with high aquatic habitat rankings from ODFW. Build opportunities out from anchor habitats and tracts of high value public lands. Use LIDAR floodplain reconnection and flood inundation maps to guide decision making.	Councils	SWCD's, TFT	2018 - ongoing	30,000	ODFW Conservation Strategy, NOAA SONCCC Recovery Plan	Priority Anchor Watersheds, Connection Corridors and subanchor confluences	NOAA, OWEB
5.3	Instream Enhancement	Complete a **beaver intrinisc potential analysis** throughout the basin. Select locations to focus restoration of beaver to increase surface and groundwater storage, and manage sediment transport in streams. First priority areas should target high Coho intrinsic potential. The Tribe will provide meeting space and contacts.	Applegate Partnership and Watershed Council (Beaver/Native Species Working group)	Councils, SWCD's,Cow Creek Band of Umpqua Tribe of Indians, BEF	2016	20,000	NOAA SONCCC Recovery Plan, Oregon Conservation Strategy	Priority Anchor Watersheds, Connection Corridors and Confluences - esp such as the upper Illinois valley, Williams Creek and the Little Applegate in the Applegate subbasin, Little Butte Creek, Elk Creek	OWEB, ODFW, NOAA
5.4	In-River Enhancement	Pursue strateigies to increase **floodplain connectivity and wetlands**, for fish resting and rearing along the mainstem Rogue.	Upper and Lower Rogue Watershed Council	TFT, SWCD's	2018-2025	TBD- Project specific	NOAA SONCCC Recovery Plan	Priority Anchor Watersheds, Connection Corridors and Confluences - esp Applegate to Elk Creek confleunces, and Estuary	NOAA, OWEB, FEMA (floodprone parcels)

Table 8: Proposed Capital Conservation and Restoration Strategies and Actions

Code	Strategy / *Action*	Tasks	Lead Entity	Support Entities	Timeframe	Cost	Relation to Other Plans	Geographic Location	Potential Funders
6.1	Upland -Urban/Stormwater	**Consolidate the available surface drainage network data** for the Basin (storm pipes, irrigation ditches/cannels, streams) and sanitary pipes in GIS form. Include City, County, Special Service Districts, and ODOT data	RVCOG	Cities, County , Special districts	June-December 2015	10,000	NPDES Stormwater Permits, DEQ Rogue Water Quality Status and Action Plan	Priority Anchor Watersheds, then remaining areas with higer Impervious cover	SWM Fees
6.2	Upland -Urban/Stormwater	**Prioritize treatment of runoff from the highest EIA areas** (most likely coming from pipes) and the highest overland wash off areas draining into ditches and known to have water quality or scouring excessive quantity issue. Update the impervious cover calculations for all lands within the urban growth boundary to the finest resolution possible. Use LIDAR and the piping data to determine the amount of cover and level of "connectedness" the high levels of imperviousness actually have (called Effective Impervious Area). Determine the area of drainage contribution at the point of discharge to a natural surface system for all the stormwater pipes and irrigation or other ditches.	RVCOG	Cities, County , Special districts, SWCD's	Nov 2015 - Ongoing	2,000	NPDES Stormwater Permits, DEQ Rogue Water Quality Status and Action Plan	Priority Anchor Watersheds, then remaining areas with higer Impervious cover	SWM Fees
6.3	Upland -Urban/Stormwater	Identify **priority locations** (preferrably above the 4% probability flood elevation) **for multi-basin treatment wetlands/ swales to pretreat runoff**. Work with municiple NPDES permit holders to fund implementation of pretreatment.	RVCOG	Cities, County , Special districts, SWCD's	Nov 2015 - Ongoing	TBD- Project specific	NPDES Stormwater Permits, DEQ Rogue Water Quality Status and Action Plan	High EIA areas	SWM Fees
7.1	Upland- Agriculture	**Identify areas with flood irrigation or where irrigation return flows to streams or agricultural ditches are occurring**. Determine the best practices needed to stop return flows that carry sediment and high nutrients back into the irrigation system or directly to the streams/river, and reduce nutrient leaching into groundwater. Work with landowners to resolve. See 2.3 Flow Restoration Strategy as complimentary	SWCD's	Riverkeeper, Irrigation Districts, Medford Water Commission, WISE Project	Oct 2015- Jan 2016	15,000	WISE Project	Little Butte Creek, Bear Creek	SWCD, Medford Water Commission
7.2	Upland- Agriculture	Determine high nutrient load areas (livestock or other heavily fertilized crops) and their proximity to streams, highly hydrologically connected flooplain areas, and contaminated groundwater areas. **Identify land management strategies to reduce nutrient loading on sites** - including adjustment to livestock grazing rotation and timing, irrigation adjustments, and fertilizer application quanities and timing. Consider a lysimeter study in a pilot watershed to **evaluate nutrient load below the root zone** on various crops to help prioritize best practices.	SWCD, OSU Extension	NRCS, Councils, Contraactors	Oct 2015- Jan 2016 Pilot test 2016	10,000	Inland Rogue Agricultural Water Quality Plan, ODA high and medium management reporting areas, DEW Rogue Water Quality Status and Action Plan	Priority Anchor Watersheds, Connection Corridors and Confluences Pilot Lysimeter study in one watershed	SWCD, NRCS, OSU, ODA, ODEQ
7.3	Upland- Agriculture	**Identify property** utilized by livestock but **lacking exclusion fencing or other exclusion mechanisms** from streams and wetlands. Work with landowners to install fencing, nose pumps and other watering strategies to reduce impact to water resources.	SWCD	NRCS, Councils	October 2015-Jan 2016	5,000	Inland Rogue Agricultural Water Quality Plan, ODA high and medium management reporting areas	Priority Anchor Watersheds, Connection Corridors and Confluences	SWCD, NRCS
7.4	Upland- Agriculture	**Identify high value public lands and encourage a retirement of grazing rights** on those lands over time. Work with federal agencies to identify grazing and watering strategies that will minimize impacts to public lands for areas where grazing will continue.	KS Wild	BLM, USFS	Jan 2016 - Ongoing	5000	Restore the Rogue Plan	Priority Anchor Watersheds, Connection Corridors and Confluences	Wilburforce, Jubitz
8.1	Upland- Forestry	Review Restore the Rogue logging road data and high value/ priority habitat corridors to **determine road removal projects and locations for culvert replacements or low water crossings**. Work with FS/BLM to pursue repair or removal of eroding roads/ditches close to streams.	KS Wild	TNC, SOFRC, Forest Collaboratives	July 2015- Ongoing	TBD- Project specific	Restore the Rogue Plan	Priority Anchor Watersheds, Connection Corridors and Confluences	Wilburforce, Jubitz, US Forest Service
8.2	Upland- Forestry	**Identify priority forest tracts and implemement forest health restoration techniques** (burning, mechanical thinning) following analysis conducted by TNC, SOFRC, and USFS. Integrate terrestrial projects with priority areas for instream and riparian corridor activities.	SOFRC	TNC, Forest Collaboratives, Lomakasi, USFS, BLM	Ongoing	TBD- Project specific	SOFRC Rogue Basin Action Plan for Resilient Watersheds and Forests in a Changing Climate, Wildfire Hazard Risk Assessment	Basinwide	Doris Duke Charitable Foundation, US Forest Service, BLM
8.3	Upland - Forestry	**Conserve** (protect and restore) **oak habitats** on public and private lands throughout the Rogue Basin	Klamath-Siskiyou Oak Network (KSON)	KBO, Lomakatsi, TNC, BLM, USFS, USFWS, NRCS	Ongoing	TBD- Project specific	Oregon Conservation Strategy, Other?	Basinwide	Doris Duke Charitable Foundation, US Forest Service, BLM
8.3.1	*Upland- Forestry*	*Specific project sites that are being targeted for forest health, wildfire risk- to be developed with SOFRC after July 2015*	*SOFRC*	*Lomakatsi, US Forest Service, BLM, other Forest Collaboratives*	*Ongoing*	*TBD- Project specific*	*SOFRC Wildfire Hazard Risk Assessment*	*From their prioritization work*	*US Forest Service, BLM*
9.1	Invasive Species	Develop a **basinwide invasive species management strategy** to address specific ecologically damaging plant and animal species, such as: new zealand mudsnail, umpqua pikeminnow, redside chinger, japanese knotweed, salt cedar, himalayn blackberry, reed canarygrass, etc.	SWCD's, CWMA's Jackson/ Josephine Co	Jackson SWCD, Councils, TFT, Native Fish Society, Oregon Invasive Species Council	Ongoing	100,000 annually	Oregon Conservation Strategy, SONCCC Recovery Plan, Rogue Estuary Strategic Plan	Basinwide	OWEB, ODA, US Forest Service / BLM, ODFW

Table 9: Proposed Non Capital Conservation and Restoration Strategies and Actions

Code	Strategy	Action	Lead Entity	Support Entities	Timeframe	Cost	Relation to Other Plans	Potential Funders
A.1	Conservation Policy	Develop a collaborative process to consider **adjusting** and possibly reducing Rogue **hatchery programs,** to protect productivity of native genetic stocks. Consider instream flow and ocean conditions that impact food availablity and survival, and the level of harvest still needed to support local economies and predator species food web demands in the analysis.	Native Fish Society	Riverkeeper	2019-2025	20,000	NOAA SONCC Recovery Plan	NOAA, NFS
A.2	Conservation Policy	Continue pursuing legislation and policies that limit impact or **eliminate degrading practices** such as in-stream **suction dredge mining** and other river/stream/floodplain **mining practices** along the River corridor. Work with agencies to redefine migitation for mining practices in a manner that improves habitat conditions and avoids creating fish stranding pits.	Riverkeeper	WaterWatch, RVCOG	Ongoing	5,000	Rogue Riverkeeper Strategic Plan	Jubitz, LNFF
A.3	Conservation Policy	Continue engaging local, State and Federal entities to **address point and nonpoint source pollution** (policy, rulemaking, implementation, permit compliance and enforcement). Encourage adequate funding for implementation of programs to address stormwater runoff, forest road decommissioning, agricultural nutrient management. Work with the Pesticide Stewardship Partnership program to address testing of pesticide persistence in Rogue.	Riverkeeper	RVCOG	Ongoing	10,000 annually	DEQ Rogue Water Quality Status and Action Plan	DEQ, ?
A.4	Conservation Policy	Develop a **basinwide approach to riparian area management**, to protect the resource and reduce landowner risks of flooding and bank loss. Work with local, state and federal entities to streamline permit processes to allow for restoration that meets thresold standards designed by restoation practitioners (such as: invasive species removal without special permits, use of fire in restoration, etc.)	RVCOG	TFT, Councils, SWCD's	2019-2021	5,000	DEQ Rogue Water Quality Status and Acion Plan, SONCCC Recovery Plan	DLCD
A.5	Conservation Policy	Work with local water interests, USACOE, DEQ, and scientists to develop strategies for **addressing toxic algal blooms and other water quality and quantity impacts** likely to result from climate change. Identify strategies to continue **environmental flow releases** to support river sediment transport and fisheries management.	Riverkeeper (Water Quality), WaterWatch(Water Quantity)	Medford Water Commission, Irrigation Districts, TNC	Ongoing	10,000 annually	DEQ Rogue Water Quality Status and Acion Plan	DEQ, OWRD
A.6	Conservation Policy	Continue engagement in monitoring water allocation by Oregon Department of Water Resources, water policy that affects the Rogue and strategies to **protect and increase in-stream flows and groundwater.** Encourage an investigation into groundwater withdrawals and its impact on surface flows in critical salmonid watersheds.	WaterWatch	Trout Unlimited, Riverkeeper	Ongoing	5,000	WaterWatch Strategic Plan	Jubitz, LNFF
A.7	Conservation Policy	**Protect high value resource lands and waters** by identifying inadequate land designations or instream water protections and campaigning to secure needed protections.	KS Wild	TNC, WaterWatch	Ongoing	5,000	Oregon Conservation Strategy	Jubitz
A.8	Conservation Policy	Work to ensure the public benefits (water conservation, instream flow benefits, improved water quality and removal of key barriers) of the WISE project are achieved. For agricultural areas, focus on **water conservation and improved water quality of irrigation return** flows	Trout Unlimited	Riverkeeper, Waterwatch, Medford Water Commission, Rogue River Watershed Council, Jackson SWCD	ongoing	5,000 annually	Wise Feasibility Study, Little Butte and Bear Creeks	Jubitz, OWRD
A.9	Conservation Policy	Work with ODFW to **reduce trapping pressure on beavers** in critical coho habitat corridors and high priority restoration watersheds. Increase education and awareness of the value of beaver for water suppply, stream function and fish/lamprey.	Applegate Partnership and Watershed Council (Beaver/Native Species Working group)	Riverkeeper, Councils	2016	5,000	NOAA SONCC Recovery Plan	ODFW
A.10	Conservation Policy	Develop and engage in **long term planning integration** for Basinwide watershed health. Integrate efforts in aquatic and terrestrial planning and restoration efforts to address climate change over time.	RBP	All Organizations	Ongoing	5,000 annually		LNFF Climate change Fund, US Forest Service
A 11	Conservation Policy	Review ad **revise floodplain development ordinances** basinwide to align with ESA listed species habitat needs and FEMA, NFIP compliance	RVGOC	Cities, County, Riverkeeper	2016-2018	40,000	NOAA SONCC Recovery Plan	SWM Fees
A.12	Conservation Policy -Riparian Restoration	**Resolve conflicts with Jackson County riparian ordinance** in achieving efficient, effective riparian restoration	TFT	Councils, SWCD's, Rogue Riverkeeper, County/City Planning	June -December 2015	3,000	Jackson Co Planning Ordinances	LNFF
B.1	Organizational Alignment	Develop an inclusive organizational engagement framework and **backbone coordinating organization** to facilitate long-term collaboration efforts and implementation of the Rogue Restoration Action Plan	Rogue Basin Partnership	All	May 2014-October 2015	40,000		LNFF
B.2	Organizational Alignment	**Secure commitment** of key restoration organizations, local, state, and federal land managers to work together and fund common, prioritized projects when it is within their jurisdictional authority to do so by October 2016. Develop working groups to adress key priorities.	Rogue Basin Partnership	All	August 2014- October 2015	NA		LNFF
C.1	Social - Stewardship Engagement	Develop a **consistent strategy of landowner engagement** across the basin through the use of social network mapping, neighborhood gatherings, open houses, etc. to engage riparian and critical habitat landowners. Review and **improve the landowner agreement and negotiation strategies** employed to gain access and permission to implement projects on private lands. (see work in Willamette and Coos Watersheds)	Councils	SWCD's, TFT, Other nonprofits	Start 2016	20,000	Local Watershed Plans	OWEB
C.1.1	*Social - Stewardship Engagement*	*Pursue funding from OWEB and others for a multi-year strategic **engagement campaign for landowners in selected high priority watersheds, corridors and confluences**. Utilize the expertise of landowner outreach specialists. Participate in peer to peer learning with other successful councils with large landowner bases (Willamette)*	*Councils, SWCD's*	*Others?*	*Start 2016*	*75,000 annually*	*Local Watershed Plans*	*OWEB*
C.1.2	*Social - Stewardship Engagement*	*Secure **commitment of 250 landowners along the Rogue River and streams** to support restoration of their riparian areas, and or manage their water rights in part for fish recovery by 2025. Target 50 new landowners across the Basin per year through 2025. (This should be the focus of OUTREACH grants per the OWEB rulemaking)*	*Councils*	*SWCD's, TFT,and others*	*Ongoing*		*Local Watershed Plans, All Capital Project Impelmentation*	*OWEB, Medford TFT Contract*
C.2	Social - Stewardship Engagement	Develop a single, but **nested public awareness and media campaign** to galvanize support for restoring the Rogue (in conjunction with economic objectives). Expect the campaign to run for several years to build up momentum. Review and identify locally relevant strategies for **engaging and communicating the value of the Rogue**, with particular emphasis on clean water (a consistent high value by the public). Gather survey information from others to identify trends in messaging. Conduct a local survey to test messaging, existing awareness, and willingness to support a broader restoration effort int he Rogue.	Rogue Basin Partnership	Medford Water Commission, other local utilities, irrigation districts, WISE, RVCOG, Councils, SWCD, Riverkeeper Consultant contract?	October- Dec 2015 Develop Materials Start Implementation 2016	30,000		LNFF, Jubitz, MMT
C.3	Social - Training and Education / Organizational Alignment	Prepare a **basinwide environmental educational framework** for partner organizations to utilize and align their efforts. Gather existing educational materials found in the Rogue Basin, group like information, and synthesize a mosaic of the efforts currently employed across the basin. Identify educational elements or strategies that have proven most successful or compelling. Link to funding and cirriculum needs.	Rogue Basin Partnership (initial convener)	All Organizations	Start 2017	??	Local Watershed Plans	OCF, Gray Foundation, Murdock Trust
C.3.1	*Social - Training and Education*	*Facilitate **restoration practitioner learning and professional development** by offering a minimum of four learning and collaboration opportunities annually for Rogue basin natural resource organizations. Conduct on-line surveys to guage interest and learning types, venues. Use the data to formulate yearly activities*	*OSU Extension*	*RBP, Councils, SWCD, SOU, PSU, others with technical expertise*	*Ongoing*	*4,000 annually*		*OSU*

C.3.2	*Social - Training and Education*	*Conduct **trainings on riparian enhancement practices**, herbicidee use etc. for landowners, practitioners. Articulate range of practices from natural assisted regeneration via invasives exclusion, to active revegetation strategies based on site conditions. **Research and gather data on the "reference condition"** of riparian areas in the various plant assemblages - specifically species, and their appropriate stock density to support resilient conditions in a changing climate.*	*OSU Extension*	*TFT*	*Quarterly*	*4,000 annually*	*OSU Extension Service Provisioning*	*Medford TFT Contract*

Table 9: Proposed Non Capital Conservation and Restoration Strategies and Actions

Code	Strategy		Lead Entity	Support Entities	Timeframe	Cost	Relation to Other Plans	Potential Funders
C.3.3	*Social - Training and Education*	*Secure funding to support a multi-year **outdoor education strategy** for students and adults (nested with the public awareness campaign) utilizing existing successful program materials to the maximum extent practicable.*	*OSU Extension?*	*All Organizations*	*Start 2018*	*200000 annually*		*Gray Foundation, Bullitt, OCF*
C.3.4	*Social - Training and Education*	*Provide a **coordinated student and adult education curriculum** focused on watershed issues. Based on population and resource concerns in each region of the Basin, partner organizations offer a minimum of one education opportunity per month combined. Key topics for consideration include: **beaver as a restoration tool**, **groundwater** management and protection, **invasive plant and animal species** (aquatic and terrestrial), herbicide use best practices, and monitoring opportunities (OSU /TFT effort underway).*	*Watershed Councils, OSU Extension*	*Councils, SWCD's, TFT, other NGO's that do education?*	*Start 2018*	*50,000 to develop curriculum*		*Gray Foundation, Bullitt, OCF*
C.3.5	*Social - Training and Education*	*Work with local guides and shops and ODFW to **pursue a non-native fish reduction strategy** to help reduce predation on native salmonids. Specifically target Umpqua pikeminnow and warm water fish (large and small mouth bass, etc.) known to feed on native fish or increase competition for food resources.*	*Northwest Steelheaders?*	*Native Fish Society, Trout Unlimited, Invasive Species Council*	*Start 2016*	*40,000*	*Oregon Conservation Strategy, NOAA SONCCC Recovery Plan*	*OWEB*
C.4	Social - Stewardship Engagement	Conduct annual **agricultural and landowner chemical collection events** and create a regional drop off location to remove illegal and unwanted pesticides and other chemicals from the basin, reducing the potential for water quality and soil contamination.	Medford Water Commission	SWCDs, Watershed Councils, RVCOG, ODEQ, ODA, others	January-March 2016, then ongoing	50000 annually	DEQ Rogue Water Quality Status and Acion Plan	Oregon Health Authority, ODEQ
D.1	Economic - Funding Resiliency	**Increase and diversify funding from local entities** (businesses, local governments, recreation groups) for on the ground implementation and program/policy suppot by a minimum of $1,000,000 annually by 2020 through intensive awareness, coordinated askes, and local funding levies such as user fees dedicated to restoration. This effort should be linked to a Restore the Rogue campaign developed by the Partnership members.	Rogue Basin Partnership	All Organizations, Oregon Travel Philanthropy Fund	Ongoing	20,000 annually to staff		Oregon Travel Philanthropy Fund
D.2	Economic - Funding Resiliency	**Increase and diversify funding from outside stakeholders, foundations, and non-local agencies** (excluding OWEB) for on the ground implementation and program/policy support by a minimum of $1,000,000 annually by 2020 through intensive marketing and coordinated challenge-based askes. Work with local / State organizations with ties to such funders to ensure asks are appropriate and add value to Basinwide efforts.	Rogue Basin Partnership	All Organizations	Ongoing	20,000 annually to staff		MMT
D.3	Economic - Funding Resiliency	**Increase awareness of the economic benefits of conservation** and restoration/enhancement actions on the local economy (measure through a baseline economic evaluation, and a professional social attitude and willingness to pay survey) coordinated with public values / awareness campaign	SOU	All Organizations	Start 2016	30,000		Research orgs
D.4	Economic - Funding Resiliency	Pursue **Focused Investment Program funding with OWEB** on a topic of interest and value to the entire Basin. Request graduated funding over the six years of the program to allow for ramp up of implementation.	Rogue Basin Partnership	All Organizations	July 2015, or 2017	3,000		MMT, LNFF
E.1	Accountability and Monitoring Progress	Continue to engage organizations and **provide basinwide leadership** in fundraising, collaboration/convening, and connecting needs to resources.	Rogue Basin Partnership	All Organizations	Ongoing	80,000 annually		Murdock Trust
E.2	Accountability and Monitoring Progress	Utilize a **consistent** web-based multiuser **database to track** and manage landowner contacts, restoration activities, monitoring activities across organizations. Utilize the system to track and show progress over time.	Councils, SWCD's	RBP, Others	Summer 2015- ongoing	10,000		MMT
E.3	Accountability and Monitoring Progress Organizational Alignment	Develop a **basinwide monitoring and project tracking framework** with partners, to increase understanding of what information is being collected, how and where its being stored, and how it will be used to inform resource management decisions.	RVCOG	All Organizations	Jan-June 2016	20,000		DEQ, ODFW
E.4	Accountability and Monitoring Progress	Work with entities conducting monitoring in the Rogue (of all kinds) to **coordinate and consolidate monitoring implementation efforts**. Survey and map locations of current data collection, identify gaps (spatially, temporally, and by parameter), and work with partners to agree to consistent protocols and data management proceedures. Work with DEQ to build needed database systems that support the data. Data should be housed in public datasets to support their use. Conduct periodic analysis of information for use in awareness campaigns, or on specific projects.	RVCOG	Medford Water Commission, DEQ, Councils, Riverkeeper, TFT	Start Jan 2015- ongoing	20000		SWM fees, MMT. LNFF
F.1	Maintenance and Operation Practices	Identify high load traffic corridors and high impervious cover subbasins (see Map 6) with connected drainage for **enhanced street sweeping and catchbasin cleaning**, especially before fall rains. Work with responsible entities to adjust operations to optimize pollutant removal in those designated areas.	RVCOG	Citiies, County , Special districts	Nov 2015 - Ongoing	No Change in Existing Costs	NPDES Stormwater Permits, DEQ Rogue Water Quality Status and Action Plan	SWM Fees
F.2	Maintenance and Operation Practices	**Develop a central basinwide source control/spill response/sanitary cross connection team** to coordinate and remedy any identified sanitary sewer or other cross connections identified within 5 working days of discovery. Water at units with cross connects should be shut off, to avoid further impact to surface waters. Team to work with private NPDES permit holders to ensure their discharges meet water quality standards and permit requirements. (Train team with peer to peer assistance from Phase I jurisdictions in the State).	RVCOG	Citiies, County , Special districts	Jan 2016 - Ongoing		NPDES Stormwater Permits, DEQ Rogue Water Quality Status and Action Plan	SWM Fees

Figure 6: Implementation Timeline of Major Elements

Strategies	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Totals
Communications and Public Awareness / People reached	Develop		Implement			Educate						60,000 reached
Investment Strategy - New funds raised basinwide	250K	500K	750K	1 million	1.5 million	2 million	2.5 million	3 million	2.5 million	2 million	2 million	$17.5 million
Strategic Landowner Outreach	Training and Setup		50	50	50	50	50	50	50	50	50	250 committed
Land Conservation	Assess and Outreach		Pursue Acquistions and Easements			10,000 acres					10,000 acre	20,000 acres
Water Conservation/ Flow Restoration	Assess and Outreach		5%	5%	5%	10%	5%	5%	5%	5%	5%	50% of targeted CFS
Fish Passage Barrier Removal	Assess		4-6	4-6	5-7	5-7	6-8	5-7	5-7	4-6	4-6	51 barriers
Riparian Restoration (Exclusion and Revegetation)	Assess and Outreach		10 miles		10 miles		10 miles		10 miles		10 miles	50 miles
Invasive Species EDRR and Revegetation	Assess and Outreach		150 acres		150 acres		150 acres		150 acres		100 acres	700 acres
Instream Enhancement			Assess and Outreach			10 miles		10 miles		10 miles		30 miles
Upland Stormwater / retrofit for pretreatment	Modify Maintenance Practices			4	4	4	4	4	4	4	4	48 facilities
Upland Agricultural Practices / sites with treatments	Assess and Outreach		5%	5%	5%	5%	10%	5%	5%	5%	5%	50% of sites
Upland Forestry Practices		2000 acres		2000 acres		2000 acres		2000 acres		2000 acres		10,000 acres
Monitoring and Adaptive Management	Regionwide Program Setup					Mid Program Check				Report Outcomes		

Implementation Framework

The implementation framework builds off the experiences of 16 other partnerships throughout the Pacific Northwest, as they have embarked on similar collaborative conservation/restoration efforts. Moving Toward Comprehensive Restoration: Key Learning from the 2012 Model Watershed Partner Gathering (BEF, 2012) captures the successes and challenges conservation organizations face in delivering community-based restoration. The shared stories and wisdom were incorporated into the prioritization process described in the Restoration Approach, as well as the details of partnership and niche management, stewardship engagement, accountability, monitoring and adaptive management discussed below. The investment strategy/fundraising and communications aspects of implementation are addressed in their own sections.

Partnerships and Niche Management

Partnerships come in all shapes and sizes, but a unity of purpose (shared vision, mission and/or values) is critical, to help build trust and support for working together. And while it is important to appreciate the value of organizations with either complimentary or divergent missions, you may not want to formally partner with them (BEF, 2012). The level of "partner" engagement of the participating organizations ranges from:

- Cooperation: instance of working or acting together for a common purpose or benefit, to
- Collaboration: cooperating to produce or create something especially in a joint intellectual effort, to
- Coordination: the organization of different elements of a complex body or activity to enable them to work together effectively.

The level of willingness to engage at any level noted above is dependent upon the organizations, their areas of influence, the type and manner of their core activities, and staffing capabilities. In the Rogue Basin organic cooperative partnerships have been formed to address restoration specific issues such as: fish passage barriers/salmon, forest health/spotted owl, and water management for irrigation and the environment, water quality monitoring, among others. Similar organization types (i.e. watershed councils, SWCD's, irrigation districts, advocacy groups, governments) have built-in cooperative relationships developed out of their common operating structures. These informal partnering arrangements are encouraged to continue and evolve (as working groups of the Rogue Basin Partnership) in support of the strategies and actions identified in this Action Plan.

This Action Plan is the result of collaboration among more than 20 interested stakeholders and organizations. The process supported the formation of a coordinating entity (or backbone organization) to provide ongoing engagement with existing and new organizations, and encouraged the strengthening of implementing organizations such as the watershed councils; four of which merged. The Rogue Basin Partnership will serve as the coordinating entity to facilitate collective impact and Action Plan delivery by: fostering partner member dialogue, convening technical expertise and peer to peer learning, securing and administering basinwide programmatic-level funding, and engaging broad conservation-oriented members in delivering each element of the Action Plan. Table 10 outlines both ongoing and potential partner organizational roles and capacity in the Basin.

Niche clarity is key to sustaining healthy partnerships and ongoing support for coordination at a basin-scale. With limited capacity in the Basin, it is critical to encourage only modest overlap of services, to help maintain delivery efficiencies while strengthening respective technical skills within organizations. Working groups within the Rogue Basin Partnership are suggested as a way to facilitate coordination among the entities engaged in complimentary actions for a common topic. Groups will also continue to convene based on their geographic focal areas. Table 11 outlines the suggested working groups of the Rogue Basin Partnership; these groups should work together on implementation efforts, including developing work plans and a funding strategy for their activities, and provide a quarterly summary to the Partnership membership at their meetings.

The Rogue Basin Partnership will be responsible for delivering this Action Plan, through the coordinated funding and implementation efforts of its members. The organization has four standing committees (Executive, Governance, Internal Affairs and External Affairs) to help guide the organization in its role as convener and facilitator of the Action Plan.

Through ongoing partnership development and working group engagement, members will need to balance the their local priorities with those of basin-wide importance. It is suggested that partners spend an average of at least 50% of their resources on implementing actions proposed in Tables 8 and 9 in the high priority areas identified on Map 28, and report regularly to the whole RBP on their collective progress. Maintaining a team approach to addressing the large-scale issues in the Rogue will be critical to the long-term viability of the restoration program identified in this Action Plan.

Accountability and Tracking of Conservation / Restoration Activities

Accurately tracking and documenting the work implemented in the Rogue, will be critical for sharing the story of the Rogue restoration and help identify the successes and challenges of implementation. To avoid having multiple tracking systems, or a series of grant reports to comb through annually, the Rogue Basin Partnership and its organizational members must come to agreement on how to track basic outputs over time such as: landowners contacted, willingness status (on a scale from project, to interested to refusal), landowner agreements, project acres / miles, number and type of actions undertaken, contractors utilized, events held, meetings attended, grants awarded/ dollars secured, funders reached, etc. For those with overlapping jurisdictions, a mechanism to track landowner outreach and engagement is critical to prevent multiple contacts to a potential landowner. Those with similar niche roles in the Basin, should also be aware of their requests to funders. A consistent, centralized web-based database that houses both written and spatial data is advised. A dashboard of statistics that highlights progress over time by rolling up basinwide information can then be used as a communications and reporting tool.

Two implementing organizations in the Rogue are using the Confluence database system to track their activities and manage their GIS spatial data. Further investigation into this and other data management tools should occur early in the implementation of this Plan, to reduce the administrative burden and challenge of documenting older projects and activities as organizations scale up their efforts. For those with limited project activities in the Basin, there should be a portal for them to provide their information as it occurs, without requiring full engagement and use of the tool. Whatever system is selected, it should have a technology shelf life of at least 5 years, and have prospects of mobile-based in-field application. Organizations should budget and plan on migration of their information as the technology advances. No system is perfect; the Partnership should select an approach that is sufficient to meet its needs without being overly burdensome financially or structurally on its members.

Table 10: Partner Organizational Roles

Organization Type	Area of Influence	Core Activities / Expertise / Anticipated Contribution	Tech Staff Est.
Coordinating Entity Rogue Basin Partnership	Basinwide Membership Based	Ambassador, convener, holder/tracker of the Restoration Plan, basinwide fundraiser, facilitator of technical learning/connecting, fiscal administrator/ support of large basinwide grants	1-2 FTE
Watershed Councils Lower Rogue, Illinois Valley, Applegate, Seven Basins, Rogue River	Designated Subbasins OWEB Supported Capacity	Regional non-government presence, landowner engagement, community outreach and education, negotiate project agreements, ongoing landowner stewardship, technical project implementation in house or contracted to basinwide pool, fundraiser for local projects	8-10 FTE
Soil and Water Conservation Districts Curry, Illinois Valley, Josephine, Jackson	Countywide OWEB Supported Capacity Tax Base (Jackson only)	Countywide quasi-government presence, landowner technical assistance and project implementation, community outreach and education esp in agricultural issues, invasive species management, grazing management, irrigation efficiency, CREP / EQIP funding implementation, financial support for stweardship projects	10-15 FTE
Forest Collaboratives Southern Oregon Forest Restoration Collaborative, Applegate Partnership, Josephine County Stewardship, Ashland Forest Resiliency, Small Diameter Collaborative	Delineated Forest Areas Grant and Contract Supported	Engage in forestry dialogue to further natural resource management goals. Wildfire hazard risk assessments and forest health improvement strategies. Economic development for small diameter and other wood material products.	3-4 FTE
Land Trusts Southern Oregon Land Conservancy, The Nature Conservancy	Targeted Focus Areas / Biodiversity Types YARG Capacity Supported, Membership based	Engage willing landowners in land conservation thru acquisition or conservation easement. Plan and develop target areas for conservation priorities.	4 FTE
Advocacy Organizations	Varies	Pursues anti-degradation legislation, review regulatory permit requests, utilizes legal mechanisms to protect and preserve natural resources (water, river/stream corridors, forests, biodiversity, etc). Specialties:	16 FTE
Geos Institute	National Grant Funded	Climate change research, adaptation	
Waterwatch	Statewide Grant Funded	Water and water rights, river protection, legislation, legal, fish passage barrier removal (technical implementation organization)	
Rogue Riverkeeper	Basinwide Grant Funded	Water quality and fish advocacy, regulatory and legislative advocacy, public oversight of clean water laws	
KS Wild	Regionwide Grant Funded	Forestry, biodiversity conservation, education	
Tribal Government Cow Creek Band of Umpqua Tribe of Indians	Federal Internal and Grant Funded	The Cow Creek tribe's Ancestral territory includes the Rogue basin. The Tribe also owns land within the basin. The mission of the Tribe's natural resources Department is to, "Protect and enhance Tribal lands, natural resources on these lands, and the Tribe's aboriginal and cultural heritage, ensuring that all natural and cultural resources are managed in a sustainable, well balanced manner that reflects the ecological, cultural, and economic priorities of the Cow Creek Band of Umpqua Tribe of Indians".	1 FTE

Table 10: Partner Organizational Roles

Organization Type	Area of Influence	Core Activities / Expertise / Anticipated Contribution	Tech Staff Est.
Technical Restoration Implementing Orgs	Varies	Pursues funding and implementation of restoration projects in areas of expertise. Specialties:	6-8 FTE
The Freshwater Trust	National Grant funded, contract funded (Medford, BLM)	Riparian revegetation, some habitat and flow activities	
Lomakatsi Restoration Project	Regionwide Grant Funded	Forest health and watershed projects	
WISE Project –Water for Irrigation, Streams, Economy	Bear and Little Butte Grant and Contract Funded	Water management, storage and delivery improvements, conservation	
Trout Unlimited	National Grant Funded	Water trust, water rights negotiation with willing parties	
Klamath Bird Observatory	Regionwide Grant Funded	Native bird conservation, research, science planning, monitoring	
Government Orgs / Special Service Districts	Federal, State, Regional, Local	Serve their respective ratepayers or public at large, depending on funding source.	
Rogue Valley Council of Governments	Local Service Charges, Grant Funded	Regional planning, monitoring coordination, data management, education	
Medford Water Commission	Local Service Charges	Regional water provider planning of assets	
Irrigation Districts	Local Service Charges	Securing and delivering water for its customers	
Counties, Cities	Local Taxes, Grant funded	Counties/ Cities – local planning, permitting	
USDA: USFS / BLM / NRCS	Federal Taxes	Federal lands management for forestry and multi-use lands	
USDA: NRCS	Federal Taxes	Technical entity for agricultural practices improvements	
NOAA	Federal Taxes	Funding source and long range planner for ESA listed marine based species	
OWEB	Lottery Funds, Federal & State Grants	Statewide funding source	
ODEQ/ODFW/ OWRD/ODF/ODA	State taxes, Grant funded	State agencies issue regulations and priorities for water, fish and wildlife, forestry and agriculture	
Other Outside NonProfits Interested in the Rogue	Varies	Pursues funding for projects that align with their interests and mission, partner with local organizations, offer technical support as long as funding is available. Not anchored in region per se.	2 FTE
BEF Sustainable NW	Grant Funded Grant Funded	Action Plan Development and Implemenation Facilitation	
Educational Institutions	Varies	Develops projects and programs within their area of expertise.	
OSU Extension	Statewide	Adult education / Technical Assistance	
Southern Oregon University	Regionwide	College Age Education/ Mentorships	

Table 11: Suggested Implementation Working Groups

Suggested Working Groups	Organizations	Focus Areas
Land Conservation	**Southern Oregon Land Conservancy**, TNC, KS Wild	Identifying and pursuing land protections in target areas
Water Conservation	**WaterWatch,** Rogue Riverkeepter Trout Unlimited, Medford Water, WISE	Identifying and pursuing water rights acquisition and/or protections in target areas
Native Species: Fish Passage, Beaver, and Aquatic Habitat	**Watershed Councils (Applegate Lead)**, Cow Creek Band of the Umpqua Tribe, Rogue Riverkeeper WaterWatch?, others?	Coordinate basinwide decisions on fish passage barrier removals and aquatic enhancement projects in target areas (including estuary)
Riparian Restoration and Invasives	**TFT,** Applegate partnership and Watershed Council, other Watershed Councils, SWCD's (invasives), KBO	Coordinate basinwide decisions on riparian revegetation, and invasive species management approaches
Agricultural Management	**SWCD's**, irrigation districts, Trout Unlimited (for water deals), others? ODA, watershed councils	Coordinate agricultural based projects with other implementing orgs
Forestry Management	**SOFRC**, TNC, KBO, Other forest collaboratives, USFS, BLM, watershed councils, Lomakasi, NRCS, SWCD's, Applegate Partnership and Watershed Council	Coordinate forestry based projects with other implementing orgs
Urban Stormwater and Water Quality	**RVCOG**, cities, county, SWCD's, Rogue Riverkeeper	Coordinate and/or influence basinwide decisions on stormwater, point source discharge, and urban impact management planning
Conservation Policy	**Rogue Riverkeeper**, KS Wild, WaterWatch, RVCOG, KBO	Coordinate basinwide / regionwide conservation policy agendas to protect and decrease impacts of human activities on natural resources
Communications (RBP External Affairs Committee)	**Rogue Basin Partnership**	Coordinate basinwide communications, and the nested strategy for partners to connect integrate into their outreach
Environmental Education / Awareness / Outreach	**Rogue Basin Partnership (initial convener)** OSU Extension**,** KBO, Audubon, SWCD's, Watershed Councils, RVCOG, SOLC, Siskiyou Field Institute	Coordinate basinwide activities associated with environmental education (adults, children), awareness, and strategies for landowner outreach (coffee klatches vs. one on one engagement). Work should link to communications group
Monitoring	**RVCOG**, Rogue Riverkeeper, Cities, County, DEQ, KBO, ODFW, USGS, OWRD, Southern Oregon University, Councils, SWCD's	Coordinate a basinwide monitoring strategy that integrates water quality, flow, aquatic and riparian habitat, and species conditions

Bold = Lead Entity to facilitate coordination of working groups

Monitoring and Evaluation of Progress

A fully integrated monitoring plan that takes into account the planned actions within the Basin will need to be developed early in the Action Plan Implementation. The outcomes of ecological improvement can take a decade or more to observe and a well-grounded monitoring strategy will be required to document changes in conditions over time. Status and trends monitoring such as DEQ's water quality, USGS's flow, ODFW's aquatic habitat inventories, and US Forest Service / BLM assessments are examples of programs that can be readily used by partners to gain relevant information without the burden of gathering and maintaining these data systems. Locations, parameters measured, and methods used should be well understood by local partners. Coordination with the State and Federal agencies to supplement or increase to their efforts is possible when presented with a well-vetted monitoring plan that outlines gaps in coverage.

Based on the data currently gathered by multiple organizations throughout the Rogue Basin, the following parameters are recommended:

- Temperature, year round and networked in focal watersheds / corridors
- Flow, year round and networked in focal watersheds / corridors
- Riparian vegetative composition and structure
- Terrestrial vegetative composition and structure
- Photographic monitoring and tracking of sites, rivers (time lapse, video)
- Aquatic habitat inventories (ODFW)
- Water quality and macro-invertebrates (DEQ)
- Fish species presence and abundance (NOAA, ODFW, COE)
- Birds presence and abundance as indicators of ecosystem function (KBO)

Project effectiveness monitoring attempts to capture the impact of a single action or a collective; it can be costly and have limited transferability. However, if done correctly it can yield valuable information about the systems response to collective action. Based on extensive analysis conducted by BPA on programmatic effectiveness monitoring (Roni et al., 2013), most restoration actions identified in this Action Plan can employ a simple pre-condition baseline and an extensive post treatment (EPT) study design that incorporates all like actions within one sampling circuit. To manage costs, the monitoring should be employed on staggered 10-year intervals for at least 30 years, and only one or two specific actions or focal watersheds should be chosen. Table 12 identifies various project effectiveness monitoring strategies based on the types of restoration implemented. Table 13 outlines common measures and metrics gathered and their relevance to specific project types. These are provided as considerations when developing a basin specific monitoring plan. Funding and organizational capacity will dictate which aspects of monitoring are ultimately pursued as part of this Action Plan. At a minimum, tracking outputs should occur even while a monitoring plan is developed for outcome measures.

Careful planning regarding funding, data management, analysis, and reporting should be articulated to ensure the information is not simply gathered and then not used. Some organizations have found photo-point monitoring, video and time-lapse photography, temperature and flow data charted on simple graphs, are more compelling to the general public and landowners than most other measures (BEF, 2015).

A data management system for any information gathered by local entities should be managed centrally to help maintain quality control and consistency in methods over time. Five to ten year monitoring reviews, allow the organizations to assess their outputs relative to the outcomes observed by unbiased observers of status and trends monitoring. This information, combined with some feedback from project effectiveness monitoring, can then be used to inform what the next decade's worth of actions should focused on to improve system health.

Social and Economic Monitoring

Social and economic monitoring are also important factors for consideration, and to tell the story of the Rogue. Such work requires special expertise beyond the capabilities of current partners, but should be part of communications plan development. Basin-wide analysis on community awareness / stewardship, willingness to pay for watershed investments, and specific economic valuation measures that can be repeat surveyed or measured in five to ten years, should be developed by the Partnership.

Adaptive Management

Adaptive management is the ongoing process of learning, and adjusting to new circumstances and information. The Implementation Framework outlined above encourages partners to regularly engage with one another in order to advance understanding and appreciation for each other's work and expertise. It is recommended that the working groups conduct periodic peer-to-peer learning events that engage their organizations as well as those less active in the Partnership. This will allow the flow of current information and new ideas to occur on a regular basis with the practitioners most likely to utilize it. In addition, an annual or biennial gathering or basin conference should be developed to promote broad organizational networking. This has proven an effective adaptive management tool in other regions of the Pacific Northwest, where organizations have limited capacity to collaborate, and engage with local scientists, except at such events. Opening the event to include local officials, businesses, and other leaders in the Basin could serve as a platform for increased awareness and willingness to invest in Restoring the Rogue.

This Action Plan is expected to evolve and be updated over time. It is intended to be a working document that the Rogue Basin Partnership and members will adjust as implementation unfolds.

Table 12: Project Effectiveness Monitoring Strategies

Action	Action Subcategory	Design*	Sample Size-Paired	Frequency	Protocol
Fish Passage	Barrier - Complete	EPT	30	Once; or years 1, 10	BPA - EPT Monitoring Effectiveness of Complete Fish Passage Barriers (ID 1869)
	Barrier - Partial	MBACI	10	-2,-1,0,1,2,5	BPA- MBACI Monitoring Effectivenss of Partial Fish Passage Barriers (ID 1870)
	Diversion screening	NA			
Riparian Improvement	Fencing	MBACI	10	-2,-1,0,1,2,5	BPA - MBACI Monitoring Effectiveness of Riparain Improvements Fencing (ID1877)
	Invasive Plant Removal	EPT	30	Once; or years 1, 10	BPA - EPT Monitoring Effectiveness of Riparian Planting and Invaive Plant Removal (ID 1876)
	Planting	EPT	30	Once; or years 1,10	
Flow Restoration	Water Lease, purchase	Case Study			
	Irrigation Improvement	NA			
	Beaver Enhancement	Case Study			
Floodplain Reconnection	Levee Removal or Side Channel Reconnect	MBACI	30	-2,-1,0,1,2,5	BPA - MBACI Monitoring Effectiveness of Off-Channel Floodplain (ID1880)
	Remeandering	MBACI	30	-2,-1,0,1,2,5	BPA - MBACI Monitoring Effectiveness of Off-Channel Floodplain (ID1880)
	Wetland Restoration	Case Study			
Instream Habitat Enhancement	Large Wood, Boulder Placement	EPT	30		BPA - EPT Monitoring Effectivenss of Instream Habitat Projects ELJ's/LWD/Boulders/Pool& Complexity (ID1871)
	Bank enhancements	MBACI	10	-2,-1,0,1,2,5	BPA - MBACI Monitoring Effectivenss of Instream Habitat Porjects Bank Stabilization (ID 1875)
	Beaver Enhancement	Case Study			
Upland Management / Sediment	Forestry Roads, Forest Mgmt Practices	Case Study			
	Agricutural Mgmt Practices	Case Study			
	Stormwater Runoff	Case Study			
Conservation Management	Acquistion	EPT	10	1,5,10	BPA- MBACI Montoring Effectivenes of Habitat Protection Prjects (ID1868)
	Lease	EPT	10	1,5,10	Also Suggested EPT Option - Protocol not articulated, frequency added to reflect ongoing site management
	Easement	EPT	10	1,5,10	

Table 13: Common Metrics To Evaluate Project Types

Measures	Metrics	Fish Passage	Riparian Fencing	Riparian Revegetation	Floodplain Reconnection	Instream Enhancement	Conservation Management
Juvenile salmon and fish abundance and size	Density by species summer/winter, fish weight, length, growth(?)	x			x	x	
Redds or Spawner #	Spawner or redd density	x				x	
Macroinvertebrate composition	Drift or benthic biomass, composition, IBI			x	x	x	
Vegetation Composition and Structure	Species, diversity / composition, growth(?), survival (?), area of native woody cover		x	x	x		x
Shade / Canopy Cover	% shade/canopy cover		x	x			x
Invasive Cover	% invasive cover		x	x	x		x
Site / Reach Length, Width	Total area, mean width / area	x	x	x	x	x	x
Reach Depth	Mean Depth	x	x		x	x	
Bankfull Width /Depth	Width / Depth ratio, Mean BFW		x	x	x	x	
Thalweg Profile, Depth, Sinuosity	Thalweg variation, sinuosity		x		x	x	
Floodprone Width	Mean floodprone width		x		x		x
Bank Erosion	% or length of eroding bank		x	x	x	x	x
Pool Riffle area and frequency	%pool,%riffle, channel Widths/pool	x	x		x	x	x
Pool depth	Mean pool depth	x	x		x	x	x
Residual pool depth, volume ad area	Mean residual pool depth, volume and area	x	x		x	x	x
Substrate Composition	% fines,% different types, D50, D84, poll tail out fines		x	x	x	x	x
Temperature	Mean, max, range, #days greater than threshold		x	x	x	x	
Surface Flow	Mean, max, range, #days less than threshold		x	x	x	x	
Groundwater	Depth to water, condition			x	x	x	
Species Utilization	Evidence of beaver, deer, bird, other species use			x	x	x	x

Investment Strategy

Watershed investment preserves and restores our natural resources, while supporting local communities and sustainable economic opportunities. To achieve the Action Plan vision, goals and objectives, and promote greater organizational resiliency in the conservation/ restoration economy, investment levels must be steadily elevated over the next decade.

The Rogue Basin Partnership members should strive to support $3-4,000,000 of investment per year on average for restoration by 2020 (excluding federal efforts, and those in place with TFT/Medford contract).
OWEB already offers investment of roughly $1,000,000 annually through their regular grant and capacity programs. Up to $2,000,0000 annually could be secured for this restoration program as part of OWEB's focused investment program. Minimum match for such grants will require members to secure up to $1,000,000 annually from other sources.)

As noted in the economic sections of the Assessment and Limiting Factors Analysis, the commitment of local and regional foundations, OWEB, and federal agencies, in supporting local efforts has been a significant contributing factor to the success of the Rogue conservation and restoration to date. However, the limited local donor base, the number of nonprofit organizations in need, the limited place-based long-term commitment of most foundations, and the uncertainty of competitive state and federal grants, makes it extremely difficult to promote an efficiently delivered basinwide conservation and restoration program. Projecting the funding demands, mapping the funding opportunity landscape, and aligning organizations with the highest potential of securing resources for the Basin, are critical first steps in building out an investment strategy for the Rogue.

Capital Investment

This Action Plan articulates the type, priority locations, and lead entities for projects in the Basin that are of basinwide significance (Table 8). This Capital Improvement Program (CIP) contains planning level cost estimates (+/- 30%) and will require refinement as projects are more thoroughly developed and added to the list over the next six months. The current table (reflecting maybe ½ the number of likely projects) shows expected implementation costs on the order of $10.3 million ($13.8 million when adjusted for inflation out to 2025).

Partnership members regularly pursue funding to advance the conservation and restoration projects in the Basin through grants, fee for service contracts, and unrestricted fundraising. The funding analysis should identify all the sources of funds, project and organizational eligibility, funding consistency (how frequently is it available), the range of funding allocation, the lag time from application to approval, and determination of which organizations are most likely to succeed in securing the needed resources. This exercise should recognize the potential contributions of local SWCD's and NRCS staff in administering the agricultural water quality management plans and programs (such as CREP and EQIP), forestry and fire risk reduction programs of the Forest Service, Bureau of Land Management, and others implemented in the priority areas, water management efforts of the WISE project, and the City of Medford contract for riparian shade credits to meet some of its water quality regulatory obligations (an estimated $9 million dollar investment over 20 years). From this effort, the partners should be able to identify where and how the gaps in funding may be filled for the basinwide priority efforts. Determining who should pursue which funds, is highly dependent upon the collective decision of the partners, the openness of organizations to redirect their energies towards the good of the whole, and the existing relationships that may be in place with certain funders (which often drives funding success). Table 14 provides a preliminary list of potential funding sources for the Rogue Basin.

Table 14: Potential Funding Sources		
Source	**Type**	**Areas of Interest**
Laird Norton Family Foundation	Foundation grants	Organizational convening, collaboration, climate change
Meyer Memorial Trust	Foundation grants	Organizational capacity
Carpenter Foundation	Foundation grants	General Support, local
Jubitz Foundation	Foundation grants	General Support, water
Wilburforce Foundation	Foundation grants	Protection of large intact ecosystems and landscape linkages
Bullitt Foundation	Foundation grants	Ecosystem services, urban ecology, environmental fellowship (leadership)
Doris Duke Charitable Foundation	Foundation grants	Climate resiliency for large landscapes, species
OCF - Gray Family Foundation Environmental Education Program	Foundation grants	Land Ethic, stewardship environmental education
OCF - Oregon Natural Resources Education Fund	Foundation grants	Forestry related natural resources education in Oregon High schools
Oregon Parks Foundation	Foundation grants	Supports acquisition, preservation and improvement of land for public parks and other recreation
Ford Family Foundation	Foundation grants	Leadership building Program
Cow Creek Umpqua Indian Foundation	Foundation grants	Outdoor Education
Gordon Elmwood Foundation	Foundation grants	Social services, general support
Yarg Foundation - Gray Family Foundation	Foundation grants	Land Trust capacity funding
MJ Murdock Charitable Trust	Foundation grants	Education, Health and Human services, Scientific Research
NOAA Coastal Climate Resiliency Grant	Federal grant	Climate change and ESA listed species
NRCS Conservation Innovation Grants	Federal grant	Agriculture related innovation
Oregon Watershed Enhancement Board	State grant	Restoration, Technical Assistance, Council and SWCD capacity
DEQ 319 Grants	State grant	Water Quality
OWRD - Water Resources Management	State grant	Water Quantity management

Organizational Capacity

Nonprofit partners in the Basin have differing abilities to fundraise for unrestricted organizational capacity funds. For watershed councils and soil and water conservation districts that rely on localized private landowner and partnership building, fundraising is typically restricted to the Oregon Watershed Enhancement Board, local tax or levies (Jackson SWCD), ODA, local foundations, and localized giving of board members, businesses and other community members. For land trusts and advocacy organizations, there is often significantly greater passion for a cause (protect the land or charismatic mega-fauna, save the fish, clean the water, stop the impact) that enables them to fundraise at a statewide level for work in the Rogue Basin. These organizations often access larger businesses, regional foundations, and larger grant programs (such as NRCS conservation innovation grants) to support their staff and work in the Rogue and elsewhere. Developing a consistent message for the Rogue Basin restoration and funding that can be integrated with the fundraising strengths of individual organizations, should help generate more resources over time as funders recognize a broader moment to “Restore the Rogue”.

Federal, State and local governments, and special service districts rely primarily on tax or fee-based programs, investments and grants, and highly variable appropriations of budgets to fund specific programs and projects that may or may not align with the basinwide priorities identified in this Action Plan.

Outreach and engagement with government and tribal entities by the nonprofit organizations will be critical to bring about alignment of approach, within the context of existing government and tribal programs. Leveraging the efforts of government organizations at appropriate times will help advance the restoration and will help disperse the fundraising burden across all organizations.

Table 9 lists $531,000 in noncapital program funding needs ($714,000 adjusted for 2025). The capacity funding for staff to implement the noncapital program actions totals $483,000 annually, or $6.2 million over 10 years (over and above existing organizational capacity needs).

Communication Plan and Sustainability

Communication Plan

A communications plan will be necessary to build momentum for "Restoring the Rogue" beyond the conservation organizations participating in this Action Plan process. There are several local partners with expertise in communications who could be utilized to develop a unified message for conservation and restoration efforts in the Basin. The following guidance draws heavily from a recent communications and outreach plan developed for two local watershed efforts in Washington (Pyramid Communications, 2012).

The primary goals of a communications plan in the Rogue Basin should be to:

- Reinforce the collaboration among the partners to deliver consistent, clear, and effective communications
- Increase support for watershed conservation and restoration among landowners, key stakeholders, opinion leaders, and the media
- Increase awareness and understanding of the economic and social benefits of watershed conservation and restoration such as clean water, recreation, tourism, and jobs

To achieve these goals, the communications working group of the RBP is tasked with developing a nested communications strategy (Table 9, Strategies C1 and C2) with a clear timeline, specific tasks and deliverables for each outreach sector. The group should identify what the community values and then bridge the gap between what they care about and the watershed improvements proposed in this Action Plan. It will be important to highlight RBP as the manager of the collaboration, while also recognizing the critical implementation roles of local organizations delivering on the Action Plan. The communications plan should articulate the positive social and economic benefits of watershed restoration in consistent, clear, and simple language for the public and stakeholders.

Local outreach and messaging should focus on building relationships with landowners for the long term. Currently, most landowner interactions are project-by-project. Ongoing relationship building and communications will help foster community champions, and may open new opportunities for future projects or financial support. Proactive outreach and engagement at the community level via summer barbeques and community coffee caches in the priority watersheds will help local and regional organizations to get to know the landowners and build trust in the efforts, well before requesting support for actions on public or private property. Invite landowners and the media on tours of successful project sites with host landowners who are both articulate and interested in encouraging others to consider similar efforts. According to some outreach specialists, hesitant landowners are more likely to engage with a conservation organizations after a peer-to-peer experiences than if approached individually and directly by such an organization. RBP and partner organizations should develop and train staff in outreach methods and messaging to be employed across the Basin.

Form of Messaging and Storytelling

Effective messages are sound bite quality, and incorporate the broader story of the Rogue that is relevant and compelling to audiences. Video shorts offer a depth and genuineness that is often difficult to communicate in written form. In all communications regardless of media, consider voice and tone that is collaborative, trustworthy professional, transparent and inclusive. The plan should articulate the elevator statement that all organizations can use and commit to memory when addressing the public. Boilerplate language should be developed and used in materials by the RBP and partner organizations, as well as talking points that deliver three key messages such as:

- Restoring the Rogue is more than an environmental goal, its an economic and social imperative
- Landowners are our most important partners and we are here to support them

- The work we do is having a positive impact on our water, forests, and quality of life

Audiences
Landowners, business owners, elected officials, chamber of commerce / tourism leaders, funders are the primary audience for the communications plan and should represent 75-80% of time and investment. These individuals are most likely to offer leverage in implementing the Action Plan. Media and general public, interested local residents, recreation affinity groups in boating, hiking, fishing are the secondary audience and should represent 20-25% of time and investment. The communications plan should identify all critical elected officials (County, City, special service district officials), media outlet contacts for newspapers, radio and television.

Branding the Rogue
The conservation and restoration efforts of partners in the Rogue Basin should be branded to facilitate an identity for the movement. A website and Facebook page will be needed to promote quick and easy access to information (likely housed by RBP). Monthly e-newsletters that contain both local and regional storylines for interested parties will help reinforce the awareness and document the progress being made over time.

Measuring Success
The communications plan should identify measures of success in order to support an adaptive management approach. Identifying measures such as: the quality of landowner testimonials, collected quotes, one on one conversations, written feedback from gatherings, opinion leader and media briefs, participation and new recruits, and media hits generated are a few examples of easy to track measures.

Sustainability
Successful collaborations occur when partners agree on a common purpose and acknowledge different roles for different organizations (Pyramid Communications, 2012). Having the RBP charged as a manager or facilitator of the collaboration will increase the overall success of the effort by helping align agendas, creating forums to solve problems and exchange ideas.

The Action Plan will only be effective if adequately communicated to potential funders and priority actions are implemented in the right places, at the right time. It will take several decades to realize the full potential within this Action Plan. Partners have invested in creating a backbone organization to help maintain the level of collaboration needed to keep the conservation and restoration program moving forward at an accelerated pace and scale. It was the intention of this planning effort to have local nonprofit organizations align their work first, and then engage community members and government entities, to help refine and support a path forward in the Restoring the Rogue. Alignment in action and funding commitment at the local, regional, state, and federal levels will be necessary to maintain the momentum that has been built through the creation of this Action Plan, and the ongoing work of the partners who continue to steward the unique landscape of the Rogue River Basin.

Literature Citations and Reference Documents List

Literature Citations

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Other Available Resources

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- Hamlin, Samantha. 2015. Rogue Basin Literature Review June 19, 2015
- Watershed Council Action Plans, various dates 1995-2005
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- Studies and local assessments in Appendix G of Rogue Basin Coordinating Council Limiting factors report 1960's-2005

Plans Underway

- Southern Oregon Forest Restoration Collaborative. 2015. Optimized 5 Year Plan / Priority Forestry Management Areas in the face of Climate Change. First iteration due July 2015.

Action Plan Technical Team Members

Participants	Expertise
Brian Barr, Rogue River Watershed Council	Fisheries, aquatic ecology, instream habitat, fish passage, landowner agreement negotiation, climate change
Darren Borgias, The Nature Conservancy	Biodiversity, forest health, resiliency planning
Bob Hunter, Waterwatch	Water Rights law, fish passage, contract law, landowner agreement negotiation
Bob Jones, Medford Water Com / Steve Mason	Water management, WISE project, geology, hydrology
Forrest English, Rogue Riverkeeper	Water quality basin impact analysis, policy, water quality
Jack Shipley, Applegate Partnership	Forestry, policy, OWEB
Gail Grogan- Perrotti, Seven Basins Watershed Council	Social dynamics, education
Jaime Stephens, Klamath Bird Observatory	Birds, riparian and upland habitats, monitoring
Kelly Coates, Cow Creek Band of the Umpqua Tribe	Fisheries (lamprey), tribal liaison
Craig Harper, Southern Oregon Land Conservancy	Conservation acquisition, watershed based planning
Greg Stabach/Craig Tuss, Rogue Valley Council of Governments	Monitoring , data management, natural resources planning, wildlife
Eugene Wier, The Freshwater Trust	Riparian habitats
Janelle Dunlevy, Applegate Watershed Council	Riparian habitats, landowner engagement
John Gardiner / Kevin O'Brien, Illinois Valley Watershed Council / SWCD	Hydrology, geomorphology, instream habitat city representative, SWCD rep
Lori Tella/ Clint Nichols, Jackson SWCD	Rural / Urban water quality, stormwater management, agriculture land use
Kelly Timchak, Lower Rogue Watershed Council	Fisheries, coastal /estuary, landowner engagement
Gwyn Myer / George McKinley, Southern Oregon Forest Restoration Collaborative	Forest health and restoration
Kendra Smith / Jill Ory Bonneville Environmental Foundation	Facilitator and author / GIS analyst for the Action Plan

Appendix: Scoring Methods for Prioritization Datasets — **Score - Higher the Score, the Higher the Quality of the Resource area and Higher the Value to Protect, Enhance**

Use	GIS Datasets	Name In Databasin	Year	Source, Year	Measure	5	4	3	2	1	0	Criteria & Notes
Base	Basin boundary	RogueBasin	2013	GOES	line							
Base	6th Field HUC delineation	WBD_HUC12	2013	USGS	line							
Base	NHDPlus Flowline gives total drainage area sq km per stream line	NHDPlusFlowline	2013	EPA, USGS	line							
Base	River/ Stream Corridor - Graduated Buffer of NHD as a Riparian Sarrogate	Stream / River Buffered NHD	2015	BEF	reach							Rogue 1000', Tribs 500' Huc 5 at 250, remaining peerenial 100, intermittent at 50'
Water	Predicted Change in Mean Summer Flow 2040	Stream Flow Metric Database, NPLCC	2014	USFS, RMRS	line	0-4%	4-10	10-13	13-19	19-50%		Percent change, missing data for mainstem below Bear Creek Confluence
Water	Predicted Change in 1.5yr Flow Events 2040	Stream Flow Metric Database, NPLCC	2014	USFS, RMRS	line	-9.08-20%	-9--18, 20-50	-18--27,50-100	-27--42, 100-166	-42--57,166-250		Least change noted as highest value, declining range from extreme
Water	Predicted Change in Mean August Temperature 2040	NorWeST Project Database	2014	USFS, RMRS	Point, line	.98-1.16	1.17-1.28	1.29-1.39	1.40-1.49	1.50-1.66		
Water	Current Cold water refugia - Below 19C August Mean for Coho, Steelhead Rea	NorWeST Project Database	2014	USFS, RMRS	Point, line					Yes	No	
Water	Number Water Quality Limited Stream Parameters	Number of WQ Limited Parameters	2013	DEQ	reach	1	2	3-4	5-6	7-8		Limited for Flow, Temp, DO, other parameters
Water	Instream Flow Allocation	OWRD Instream Flow Designation	2011	OWRD	reach					Yes	No	
Aquatic	ODFW Aquatic Crucial Habitat	Aquatic Crucial Habitat Overview	2014	ODFW	pixel hexagon	Priority 1	2	3-4	5	6		ODFW Ranking 1= most crucial, 6- least
Aquatic	Number Anadromous Fish/Lamprey Species Use	Number Of Salmonid Species	2013, 2015	ODFW, NOAA	reach	7	6-5	4-3	2	1	0	rearing and unknown - excludes migration
Aquatic	ESA listed species habitat (Coho IP)	WOPR High Intrinsic Potential Coho Salmon Stream Reaches	2014	ODFW, NOAA	reach	77-100%	76-58%	57-43%	42-25%	24-3%	No	Percent estimate of the likihood of suitable habitat for juveniles
Aquatic	ESA listed species Habitat (Green)	Extent of Sturgeon Use of Rogue River	2012	ODFW (White), Riverkeeper	reach					Yes	No	
Aquatic	Composite Aquatic habitat values (LWD, Side Channels, Pool Depth) see belov	and Side Channel Scores) ODFW, USFS, BLM	2003	ODFW, CBI	6th HUC	9+	7-8	6	5	4-3		Summary points binned with natural breaks
Aquatic	Survey data percent pools	Percent Pool	2013	ODFW	reach	>43.5	25.3-43.5	17.2-25.2	10.2-17.1	<10.2		Values merged with analysis above, latest data used
Aquatic	Survey data percent side channels	Percent Side Channel	2013	ODFW	reach	>7	4.3-7	2.8-4.2	1.3-2.7	<1.3		Values merged with analysis above, latest data used
Aquatic	Survey data, LWD per 100M	Large Woody Debris	2013	ODFW	reach	>2.9	1.8-2.9	1.1-1.7	.2-1	<0.2		Values merged with analysis above, latest data used
Riparian	PNW Riparian Areas (and floodplain extents) based on geomorh/topo	Potential Riparian Areas in the Pacific Northwest	2013	WGA/LCC	poly					Yes	No	
Riparian	PNW Riparian Areas Predicted Climate Change Resilience Index	Pacific Northwest Riparian Climate Corridors: scores attributed to	2013	WGA/LLC	reach	0.82				0.0003		
Riparian	Riparian Bird Predicted Mean Bird Distribution 2040	http://data.prbo.org/apps/nplcc/aknw.php	2014	Avian Knowledge NW	pixel	10-9	8-7	6-5	4-3	2-1		
Riparian	NLCD Classification of Vegetation Cover	http://www.mrlc.gov/nlcd11_leg.php	2011	NLCD, BEF	reach	Forest, weltand	Shrub, herbaceous	Hay	Cultivated	Urban		
Terrestrial	TNC Cimate Resiliency Map	https://www.conservationgateway.org/ConservationByGeograph	2015	TNC	Pixel	441-342	342-255	255-175	175-102	102-1	No	Resiliency scores from TNC Study
Terrestrial	Ecological Integrity Scores: Current species richness and habitat quality	Not Posted, not publically available yet	2015	INR/OSU	Pixel	532-508	507-480	479-450	449-335	334-0		Need more metadata details; Scores species presence and habitat quality
Terrestrial	ODFW Terrestrial Crucial Habitat	On Compass, not Databasin	2014	ODFW	Pixel Hexagon	Priority 1	2	3-4	5	6		
Terrestrial	Oak/ Conifer/ Prairie Predicted Mean Bird Distribution 2040	http://data.prbo.org/apps/nplcc/aknw.php	2014	Avian Knowledge NW	Pixel	0.9999				0.0086		Pecentage ranges. Binned, added together, rebinned to 5 classes
Terrestrial	TNC Forest Resiliency / Wildfire Risk Assessment Mapping	Forthcoming	2015	TNC, SOFRC								
Other Priority Analysis By Area or Restoration Action for Comparison												
Social	Locally Identified priority areas from Councils, SWCD's, others	PriorityWatersheds	2013	Councils, BEF	6th HUC					1	0	
Agriculture	ODA Strategic Implementation Area Priorities	Data from ODA in Draft, not publically available electronically	2015	ODA	6th HUC	3		2		1		High=3, low=1
Forestry	USFS Priority Watesheds	http://www.fs.fed.us/publications/watershed/		USFS	6th HUC					1	0	
Conserve	Protected, Desired Priority Conservation Lands	Conservation Prioritizations in Western Oregon	2012	TNC/WSC Synthesis	pixel	5	4	3	2	1	0	The max number of plans scored identified as a priority is attributed to each huc.
Fish	ODFW Barrier Prioritization	Passage Barriers_ODFW 2013 Priority	2013	ODFW	point	295-176	175-121	120-84	83-49	48--2		score
Fish	Salmonids	Excel Table Converted to Line Segments by PSU, BEF	1995	Bradbury Ad Hoc Working group	Line	5	4	3	2	1	0	score
Flow	OWRD Streamflow Restoration Priority	OWRD_Streamflow_Restoration_Priorities	1998	OWRD	6th HUC					1	0	Apply a point if listed as a summer priority.
Instream	KS Wild Aquatic Restoration Prioritization	2010_KSWild_RogueBasin_AquaticScore	2010	KS Wild	6th HUC	1-1.7	1.8-2.4	2.5-3.3	3.4-4.1	4.2-5.0		Orignal scores of 1-1.7 =high value 5 points
Conserve	Local Land Conservation Priorities -Adjacency to Protected Lands	SOLC Conservation Plan, Data layers shared with BEF	2011	SOLC	Reach					1	0	
Overall	ODFW Overall Crucial Habitat (Total Aquatic, Terrestrial Scores)	Compiled Crucial Habitat Overview	2013	ODFW, Western Govenors	pixel	1	2	3-4	5	6		Orignal score of 1 =5 points

Prioritization / Scoring Approach

1. Score each focal target: water (rows 8-13), aquatic (rows15-22), riparian (rows 24-27) and terrestrial habitats (rows 29-32) individually to get a total score for each river/stream reach or area by target
2. Sum water, aquatic and riparian habitat scores, and rebin them on a 1-5 scale for a total stream/river corridor score
3. Review corridor scoring and its association with the terrestrial habitat scores (the corridors were removed from the upland scoring, to eliminate overlap)
4. Discussed with the TAC if weighting of or removal of any of the individual datasets, or summed focal targets should occur (no)
5. Discuss with the TAC how specific Conservation and Restoration Actions should be assigned across the landscape relative to the scoring
6. Discussed with TAC how other Priority Analysis (rows 35-45), using a variety of factors, might be integrated into the prioritization (consider as historic reference in selection of areas)
7. TAC participants used information to select areas of highest and secondary priority, and connection corridors and confluence zones.

Appendix: Dataset Metadata Documentation

Dataset	Source	Parameters	Description
Water			
Number of water quality limited parameters	Oregon DEQ	Sum of Water Quality Limited Parameters	This feature contains a spatial representation of streams and stream segments with water quality information from Oregon's 2010 Integrated Report Assessment Database and **303(d) List** as approved by EPA on March 15, 2012. A water body may have assessment information for multiple pollutants or conditions, and may have multiple data records associated with the spatial representation of the water body or segment of the water body. **BEF took each LLID stream segment and totaled the number of pollutants per segment** (not including temperature). Parameters were summed and counted by reach.
Current cold water refugia based on Historic August Mean Temperature Data and the temperature threshold of 19C for Coho and Steelhead rearing	NorWeST Project Data set	Historic August Stream Flow with 19 year average	NorWest Predicted Stream Temperature Line. These data were originally intended to be used for managing biological resources and predicting species distributions that are affected by August mean stream temperature. Derived from NHD Plus. Represent data along 1 K segments of stream lines. Modeled stream temperatures generated as part of Forest Service project. August mean stream was the metric selected to be modeled. Reconditioned NHD, no longer the same. Points correspond to mid point on 1 km stream lines. **Stream temps modeled from covariate predicators** using spatial statistical software including **1. Air temp august. 2. Stream discharge August** (based on USGS flow gages). **3. Elevation** (from NHD plus DEM). **4. Latitude 5. Canopy** (from NLDC 2001). 6. **Cumulative drainage** (NHD plus) 7. **Stream slope** (from NHD plus). **8. Mean annual precip**. (NHD Plus). **9. Base flow index** (USGS). **10. Glacier %**. see web site in larger metadata **11. Lake %** from NHD plus **12. Tailwater** - derived. Using these 12 predictors various scenarios modeled, including a 19 year avg (1993-2011), 10 year avg 2001-2011, and single years from 1993 - 2011.
Predicted change in Mean August Temperature	NorWeST	S29_2040 S31_2080	See above for base meta-data. Scenario 29, Future scenario based on global climate model ensemble averages that represent the A1B warming trajectory for 2040s (2030-2059). Future stream deltas within a processing unit were similar and based on projected changes in August air temperature and stream discharge. Scenario 31, Future scenario based on global climate model ensemble averages that represent the A1B warming trajectory for 2080s (2070-2099). Future stream deltas within a processing unit were similar and based on projected changes in August air temperature and stream discharge.
Predicted change in Mean Summer and 1.5 yr flow events for 2040	North Pacific LCC, Stream Metric Dataset	Mean Summer Winter 1.5 yr (days) 2040 and 2080 scenarios for summer and winter mean events	A database of **flow metrics for streams** in the western US under historical conditions and climate change scenarios. These are **based on daily simulations of the Variable Infiltration Capacity (VIC)** macroscale hydrologic model produced by the University of Washington Climate Impacts Group. Trout Unlimited and the US Forest Service Rocky Mountain Research Station used these model outputs to **calculate a set of summary flow metrics to describe key attributes of the flow regime** for each stream segment in the 1:100,000 scale National Hydrography Dataset (NHD) in the western US, excluding larger rivers. Datasets are available for the historical period 1978-1997 and future scenarios associated with the A1B emissions scenario for the 2040s and 2080s, including (1) the ensemble mean of 10 global climate models (GCMs), (2) MIROC3.2, a GCM that projects a warmer and drier summers than the ensemble mean, and (3) PCM1, a model that projects cooler and wetter summers than the ensemble mean. Summer Mean = Mean flow during summer (cfs) predicted 2040 or 2080 Winter1.5yr = The probability of a 1.5-year flow event occurring in the winter. Units: probability (0-1). predicted 2040 or 2080 Daily Mean = The mean daily flow, averaged over a year. Also sometimes called mean annual flow. Units: cubic feet per second (cfs). predicted 2040 or 2080 Many other modeled hydrologic scenarios are available in this dataset. *note - BEF infers that the same metadata applies to future scenarios - this info was missing from actual metadata.
Instream Flow Allocation	OWRD	InStream Water Rights	Obtained from Riverkeeper via OWRD. Locations of instream rights by reach. Additional excel tables identify timing and extent of instream right.
Aquatic Habitat and Native Fish			
Aquatic Crucial Habitat	ODFW, 2014	Statewide assessment of critical habitat	Prioritization of areas documented as containing priority species and/or important natural resources for the survival and reproduction of aquatic fish species. See http://www.dfw.state.or.us/maps/compass/md_aquatic_crucial_habitat.asp for detailed documentaion of this layer. Six levels of priority, 1= highest value 6= lowest, based on aggrefation of aquatic species of concern and freshwater integrity data input layers.
Aquatic physical habitat values	CBI/ODFW	Percent Pool Side Channel LWD/100 meters	Stream survey scores were calculated using the CBI method. CBI's method uses **LWD, Percent Pools and percent side channels** as an indicator of stream health. According to CBI's method, LWD ranks were defined based on ODFW statistics from their reference stream habitat surveys for LWD. It is generally accepted that **more pools and side channels are better** than less, and based on this these variables were **ranked using natural breaks**. Once these ranks were established for each variable, a **combined rank** was also calculated by adding the ranks of each habitat variable within each stream reach.
Anadromous fish species habitat for spawning/rearing, also includes lamprey, sturgeon	ODFW, NOAA	Number of Species	These data describe areas of suitable habitat believed to be used currently by wild, natural, and/or hatchery fish populations. The term "currently" is defined as within the past five reproductive cycles. This information is based on sampling, the best professional opinion of Oregon Dept. of Fish and Wildlife or other natural resources agency staff biologists or modeling (see the fhdBasis field). Historical habitat distribution data are outside the scope of the standard and are now maintained in separate datasets. Key features of the Oregon Fish Habitat Distribution Data include: species, run, life history, habitat use, origin, production, the basis for each record, originator name, originator entity and reference. BEF took this data and filtered by spawning and rearing habitat. Then for each stream reach, BEF summed the number of species using each reach for either spawning or rearing.
Coho intrinsic potential	NOAA, WORP - Rogue	IP Score for Coho, includes slope, flow and substrate thresholds no temperature masks	Adapted methods of the Coastal Landscape Analysis and Modeling Study (CLAMS) to implement a GIS approach in modeling the intrinsic potential (IP) of stream reaches to support juvenile steelhead, coho, and chinook salmon. The IP model uses geomorphic and hydrological attributes (expressed as the weighted geometric mean of indices for **mean annual discharge, channel gradient, and channel constraint**) to estimate the **latent potential of stream reaches to provide favorable habitat** characteristics **for spawning and rearing**. Indices for the model are **derived from a 10 m DEM and PRISM precipitation data**. Thus, the model predicts patterns of relative productive potential expected in the absence of human disturbances, as related through the input data. The model does not predict the actual distribution of "good" habitat, but rather the **potential for that habitat** to occur, nor does the model predict abundance or productivity. Additionally, the model does not predict current conditions, but rather those **patterns expected under pristine conditions** as related through the input data. Thus, IP provides a tool for examining the historical distribution of habitat among and within watersheds, a proxy for population size and structure, and a useful template for examining the consequences of recent anthropogenic activity at landscape scales. (note: This layer just shows Coho. Not sure whether there are other layers with the other species. Also has a number of physical and geomorphic fields in this dataset.)
Extent of green sturgeon habitat	NOAA	Extent of Utilization	Line data up to a natural barrier they can not pass
Riparian Habitat and Native Birds			
Current Riparian Conditions	WGA/LLC	Riparian Area Extents (floodplain dominated)	This layer was produced as part of the WGA/LCC Riparian Mapping Project, which identified riparian location, condition, and climate adaptation potential, for the Pacific Northwest, USA. This layer shows potential riparian areas based on **wetted width**, **stream channel** (or active channel), **potential riparian zone**, and **valley bottom** at the edge of or **interface to the upland** area. "More info can be found at: Theobald, D. M., Mueller, D., and J. Norman. 2013. Detailed datasets on riparian and valley-bottom attributes and condition for the Great Northern and Northern Pacific LCC (WRR17)"
Predicted climate resilient riparian areas	WGA/LLC	Expressed as line data	These layers were produced as part of the WGA/LCC Riparian Mapping Project, which identified riparian location, condition, and climate adaptation potential, for the Pacific Northwest, USA. These layers identify **potential riparian areas** (i.e., near-stream valley bottoms; Theobald et al. 2013) **that span large temperature gradients**, **have high canopy cover**, **low solar insolation**, and **low levels of human modification –** characteristics expected to facilitate climate-induced species range shifts and provide micro-climatic refugia from warming. Analysis used **Mean Annual Temperature (PRISM data)**, **Canopy Cover (NLCD 2006)**, **Riparian Area (See above)**, **Potential Relative Radiation (NED and Pierce et. al. (2005) study methods)**, **Landscape Condition (WGA Crucial Habitat Assessment Tool).** Riparian Climate-Corridor Index was created for each outlet-to-headwater stretch of potential riparian area. The Index has a point at each headwater of a potential riparian area. Highest index values indicated those potential riparian areas with the greatest change in temperature from outlet to headwater, greatest width, highest percent canopy cover, lowest exposure to solar radiation, lowest level of human modification. See "Krosby, M., Norheim, R., Theobald, D. M., and B. H. McRae. 2014. Riparian Climate-Corridors: Identifying priority areas for conservation in a changing climate.

Dataset	Source	Parameters	Description
Predicted climate resilient habitat for riparian dependent native birds	KBO, NPLCC, Avian Knowledge Network	High to low score for native bird use distribution and abundance in context of climate change	Data set includes current (last 20 years) and future (2070, based on five regional climate models) species distribution and density maps for 26 terrestrial breeding bird species of the Pacific Northwest, selected as indicators of four habitat types. These maps were produced using models based on climate and vegetation data, along with 3 million bird observation records made available through the Avian Knowledge Network. The gallery also includes conservation priority maps for all 26 species and their associated habitat types: conifer forest, oak woodlands, grasslands and riparian forest. All maps in this gallery were downloaded from the web-based North Pacific Climate Change Avian Vulnerability decision support tool, available at Avian Knowledge Northwest (www.AvianKnowledgeNorthwest.net).
NLCD Classification of Riparian Area Cover 2011	NLCD, 2011	Cover classification	Dataset contains general cover classes as pixel data. Coverage was clipped to the River/stream-riparian corridor basemap developed by BEF. Scoring was based on cover type ranging fro
Terrestrial Habitats (Forests and Grasslands) and Native Birds			
Terrestrial biodiversity resiliency predictions under climate change scenarios	TNC, 2015	Topoclimate diversity and permeability modeling	The study area in the 2015 report covers 92 million hectares (227 million acres) over portions or all of six states, and includes all of the East Cascades/Modoc Plateau, Columbia Plateau, Middle Rockies/Blue Mtns., West Cascades, Klamath Mtns., CA N Coast, Sierra Nevada Ecoregions and the U.S. portions of the Canadian Rockies, North Cascades, PNW Coast, and Willamette Valley/Puget Trough ecoregions. As part of this project, TNC: Created a comprehensive map of Geophysical Settings or Land Facets (the "Stage") using Soils, Elevation, and Slope; Created a comprehensive map of landscape characteristics essential to assessing the resilience of a site by combining local permeability with topoclimate diversity; Assessed Conservancy conservation portfolio sites across the study area to evaluate the adequacy of representation of Land Facets, and also ranked the sites based on the area of terrestrial climate change resilient landscapes (cells) within them; Ranked each land facet within an ecoregion based on levels of protection and conversion, and present these data as a Conservation Risk Index; Using landscape resiliency data, we informed the selection of a new set of conservation sites in the SE Oregon portion of the Columbia Plateau and set the stage for adoption of these methods elsewhere. More information at http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/oregon/science/Pages/Resilient-Landscapes.aspx#sthash.0jfA7rpa.dpuf
Crucial terrestrial habitat designations	ODFW, 2014	Priority terrestiral species and important natural areas	A weighted-sum, additive aggregation method was used to aggregate six data input layers: Terrestrial Species of Concern, Large Natural Areas, Natural Vegetation Communities, Landscape Connectivity, Wetland and Riparian Areas, and Terrestrial Species of Economic and Recreational Importance. As displayed in the table below, each priority rank within each crucial habitat data input layer was assigned a weight, which were distributed exponentially from 0 through 20. Weights were assigned by ODFW based on the importance of the natural resource prioritized in each layer, as well as the type of data used and confidence in said data. The weight of each data input layer priority rank were summed within a given area, and the total scores resulted in a range of 2-75. These scores were classified into the six priority ranks using a quantile classification method, which aims to divide each class into an equal number of hexagons.
Predicted climate resilient conifer, oak and prairie habitat for native birds	O, NPLCC, Avian Knowledge Netwo	High to low score for native bird use distribution and abundance in context of climate change	Data set includes current (last 20 years) and future (2070, based on five regional climate models) species distribution and density maps for 26 terrestrial breeding bird species of the Pacific Northwest, selected as indicators of four habitat types. These maps were produced using models based on climate and vegetation data, along with 3 million bird observation records made available through the Avian Knowledge Network. The gallery also includes conservation priority maps for all 26 species and their associated habitat types: conifer forest, oak woodlands, grasslands and riparian forest. All maps in this gallery were downloaded from the web-based North Pacific Climate Change Avian Vulnerability decision support tool, available at Avian Knowledge Northwest (www.AvianKnowledgeNorthwest.net).
Ecological Integrity scores: Current species richness and habitat quality	OSU /INR, 2015	Count of Habitat Count of High Quality Habitat Goodness	Count of Habitat is a count of any habitat in HUC/WHR (Gap) where species has a quality of 1,2 or 3 Count of high quality habitat is a count of number of species where habitat is 3 Goodness is the sum of the habitat qualities Count of habitat: A simple richness count, showing how many species each pixel supports (good, fair and poor habitat count equally). Count of Habitat Quality: A simple richness count of "good" habitat only, where only pixels with good habitat are counted, so it shows the number of species with good habitat present (where they occur) within each pixel. Goodness: A sum of the quality of habitat and species, which I've named goodness, for lack of better name.
Local Limiting Factors / Opportunities Data Sets			
Number of passage barriers by rank	ODFW	Rank and type of barriers	The Oregon Fish Passage Barrier Data Standard (OFPBDS) dataset contains barriers to fish passage in Oregon watercourses. Barriers include the following types of natural or artificial structures: bridges, cascades, culverts, dams, debris jams, fords, natural falls, tide gates, and weirs. The OFPBDS dataset does not include structures which are not associated with in-stream features (such as dikes, levees or berms). Barriers are structures which do, or potentially may, impede fish movement and migration. Barriers can be known to cause complete or partial blockage to fish passage, or they can be completely passable, or they may have an unknown passage status.
Impervious cover determinations by HUC 6	Rogue Riverkeeper	Range of Impervious cover by HUC6	Information provided by Rogue Riverkeeper, developed from the National Land Cover Database for 2011
Artificial ditching relative to stream length	CBI/WISE		
Number of mining claims/activity status	DOGAMI, Riverkeeper		
Location of cold water refugia / springs	To be developed		
Land ownership analysis of riparian corridors	To be developed		