Adaptive governance of riparian lands in Washington State: coordinating policy and practice to leverage river and floodplain protection benefits

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Abstract

Wildlife corridors are designed to mitigate habitat fragmentation, yet their success is often limited by political and economic barriers to building and maintaining them at the landscape scale. Although jurisdictional boundaries are considered in conservation planning, ecological connectivity models do not quantify spatially-explicit patterns in legal authority for corridor conservation. We formulated a method to map conservation authority across a county in Washington State (northwestern United States) and formalized an integrative legal-ecological corridor analysis to assess the potential contributions of the existing legal landscape to broader scale connectivity conservation strategies. The results show that incorporating the legal landscape into a connectivity model identifies different priority areas for rebuilding habitat connectivity than a model based on ecological conditions alone. Integrating legal authority with ecological corridor value across the landscape revealed social-ecological spatial patterns that enabled us to highlight areas of opportunity for promoting cross-boundary coordination, targeting areas for restoration, or effecting policy change to build and maintain habitat connectivity. This social-ecological categorization scheme is a step toward strategic corridor planning to address both social and ecological barriers to landscape connectivity.

Significance Statement

Demand is increasing for integrative social-ecological approaches to inform environmental management and conservation in the context of climate change and future uncertainty. Despite significant political and economic barriers to building and maintaining habitat corridors for wildlife conservation, habitat connectivity models do not yet explicitly, quantitatively incorporate crucial social aspects of landscape fragmentation. We formulated a method to evaluate the spatial arrangement of legal authority over a local landscape within the larger-scale ecological context of building habitat connectivity. The combined legal-ecological landscape revealed different priority areas for building habitat connectivity than those identified by ecological

conditions alone. These results demonstrate one way in which social-ecological spatial analysis may offer new insights into persistent environmental problems.

Keywords

habitat corridors, jurisdictional mapping, legal authority, riparian, species conservation

Introduction

The overlay of climate change on landscapes fragmented by human activity threatens species' survival by limiting the ability to move to new habitats in response to environmental change (1). Accordingly, conservation efforts aim to promote species' survival by preserving or restoring habitat connectivity across landscapes (2). Nevertheless, corridor initiatives that require coordinated conservation efforts among stakeholders across large landscapes have been plagued with challenges (3). Current approaches to systematic, landscape-scale corridor conservation aim for species' persistence by mapping landscape condition and/or protected status (e.g., (4)). They generally lack an integrated legal-ecological framework for effective implementation. Progress toward such integration is hindered by the misalignment between jurisdiction and the spatial or temporal scales of ecosystem processes (e.g., species migration or flood buffering) (5).

Habitat corridors are designed to build connectivity for species conservation, focusing on a specified ecological level (individuals to populations) and scale (local to national) with goals relating to movement, dispersal, or long-term species persistence (2). Habitat connectivity models typically rely upon available spatial ecological data such as vegetative cover to inform corridor planning (6). They almost never codify and map the legal authority underpinning conservation planning (e.g., (7). Yet, pure ecological metrics may be neither timely nor sufficient for securing the long-term support of politicians and governmental officials that would be necessary to design, implement, and maintain habitat corridors (3). Moreover, species' movement in response to climate change raises complex issues that call for integrated ecological, conservation, and social research as well as engagement of the public and decision-makers (8).

Riverine corridors: leveraging ecosystem services for habitat connectivity

Given the degree of scientific uncertainty in models predicting future climate change and species' distributions, systematic conservation measures that aim for multiple positive outcomes may increase the likelihood of corridor success (9, 10). Corridor conservation would benefit from systematically building upon spatial overlaps between priority areas for ecosystem services and landscape-scale habitat connectivity. Incorporating multiple priorities into decision-making can be difficult, however, because it requires spatially-explicit consideration of the local setting within the context of broader-scale conservation issues (11). Information tools are needed to tailor and streamline this process.

We approach this problem by concentrating upon riparian ecosystems, the transition zones between rivers and adjacent uplands, as a potential nexus of ecosystem services and landscape-scale habitat connectivity (9). Riparian ecosystem services depend upon processes (e.g., nutrient filtration and flood attenuation) that are strongly linked to hydrology, climate, and adjacent ecosystems. To translate riparian ecosystem processes into policy, we define *riverine corridor systems* as networks of river channels, floodplains, and riparian areas that require lateral, vertical, and longitudinal connectivity from headwaters to mouth. Because riverine corridor systems are embedded within a human-impacted landscape, we treat them as social-ecological systems that are dynamic, nested, hierarchical, and flow across social boundaries (12). Within these systems of interdependent lands and waters, there is a clear, multi-dimensional misfit between ecological and social structures and processes.

Legal bridges to connectivity

Landscape connectivity depends upon the spatial arrangement of biophysical characteristics, so how can we map the capacity to move toward effective governance and management of riverine corridor systems? *Governance* refers to both formal government and informal "structures and processes by which societies share power" (13); it establishes the social framework within which management must operate. Although adaptive management involves experimentation and feedback, it alone is not capable of coordinating piecemeal efforts, promoting social learning, or bridging discontinuities across boundaries. *Networked governance* can provide a framework for experimentation and dissemination of knowledge as well as the capacity of a social-ecological system to adapt or transform in response to disturbance (14, 15).

The first step in navigating governance for conservation is to identify the actors (16). Social values can be mapped to inform conservation planning (17) and land use and ownership maps reveal areas where corridors might be more politically feasible to establish and maintain (3). These maps display existing categorical information (e.g., public versus private lands), but do not quantify that information to make it compatible with other quantitative spatial datasets. Thus, habitat connectivity models do not formally incorporate spatially-explicit patterns in governmental authority through regulations, land use, and management or ownership across jurisdictional and property boundaries (Panel 1). To address this gap, we asked: *what sources of authority affect actions upon riverine lands? How is this authority configured spatially across a given landscape, and how might spatial patterns in legal authority inform landscape-scale conservation efforts?*

Our objective is to analyze the spatial arrangement of legal authority over lands within a riverine corridor system, highlighting opportunities to build capacity for cross-boundary coordination of governance for multiple conservation goals. We formulate a method to map multiple levels of government authority over the landscape at the local scale where the checkerboard nature of private land ownership imposes significant barriers to connectivity of land and water resource management. We present a reproducible method for assigning relative cost values to an authority landscape to represent the emergent role of accumulated layers of authority in promoting coordination across property boundaries. Finally, by integrating authority values with habitat corridor values in cost maps to generate a resistance surface for corridor analysis, we show how spatial relationships between landscape-scale conservation priorities and local patterns of authority over public and private lands can be used to inform conservation actions.

Methods

In a single, large county in Washington State (northwestern United States (U.S.)) that spans a habitat connectivity gap (Figure 1a), we mapped sources of authority over riverine lands. We focused on formal government and tribal nations as a subset of a governance system that also includes the public, private interest groups, and bridging organizations (e.g., The Nature Conservancy) (18). We assigned a conservation authority index (CAI) value to each source of legal authority based on its scope and propensity to support conservation actions continuously across riverine lands (Panel 1) and summed the CAI by pixel (98x98 meters). Second, to spatially examine the multi-level legal landscape within the context of building habitat connectivity, we intersected a national-scale map of ecological corridor value with the sum of CAI values from our countywide authority map. We ranked, inverted, and combined these two sets of conservation values to quantify the combined legal and ecological frictional costs of movement (resistance) across the county. We envision the map products as resistance surfaces to quantify spatial patterns of legal-ecological bridges and barriers to rebuilding habitat connectivity.

Defining the social-ecological problem

Wildlife connectivity is a conservation target for multiple species across the Northwest (19). Core habitat in this region consists of protected areas (e.g., National Park, Wilderness Areas) enclosed by multiple-use public lands. These government-owned lands are subject to a patchwork of federal and state jurisdiction and management, while the surrounding lands are divided into private parcels under local or tribal land use regulations. This fragmented authority landscape inhibits the geographic continuity of riverine land conservation, limiting the provision of ecosystem services and co-benefits related to water resources, aquatic habitat, and species persistence. We selected Okanogan County to delineate our geographic information system (GIS) because it contains core habitat, public multiple-use lands, tribal lands, and a checkerboard of private parcels presenting barriers to landscape connectivity (Figure 1b).

Mapping conservation authority

To restrict GIS analysis to riverine corridors, we created a buffer proportional to stream size by multiplying the Strahler stream order (20) by 200 feet (~60 meters). We compiled the federal and state sources of authority over lands within this buffer under the federal Endangered Species Act and Clean Water Act as well as other applicable state laws, tribal code, and local government zoning. We reviewed the pertinent statutes, regulations, rules, and plans, collated available GIS data, and mapped the spatial extent of each source of authority (Table 1). For each source, we attributed polygons with the statutory and regulatory bases of authority, levels of government, agencies and other entities involved in implementation. We generated a raster map for each source of authority at sufficient resolution (98x98 meters) to capture the patterns of fragmentation and align with available ecological datasets without being unnecessarily computationally intensive.

Mapping the legal-ecological landscape

Connectivity modeling through least-cost analysis calculates the accumulative cost of movement across a resistance surface based upon the best available ecologically relevant spatial datasets (6). To generate a legal-ecological resistance surface, we needed a conservation authority value raster compatible with ecological measures of corridor value. We assigned a conservation authority index (CAI) value to each source of authority based on its role in providing geographically continuous governance for riverine land conservation (Panel 1; Table 1) and then summed the CAI values for all sources of authority by pixel (Figures 1c, 2). We then ranked the summed CAI values (1-10), such that the highest conservation authority had a value of 10.

To represent ecological corridor value, we utilized a map of national-scale high-value corridors (4), which was a composite of least-cost corridor outputs based on landscape naturalness as a proxy for accessibility by multiple species. We resampled and ranked the corridor model values (1-10) for the range of variability across the county, such that areas of higher ecological corridor value had higher rankings. We then inverted the conservation authority and ecological corridor rankings to transform them into cost maps, summed the two cost maps, and set all values outside riverine corridors to 1000 (very high cost) to create an integrated resistance surface (Figure 1d). Using core quality habitat (4) at opposite ends of the county as source areas, we calculated the least-cost corridor across the integrated resistance surface (Figure 3). To allow comparison between the national-scale ecological and local-scale authority corridor maps, we calculated zonal statistics by Reach Code (21). We then used nested conditional statements to categorize pairs of conservation authority and ecological corridor values by stream reach into four conservation categories across the county (Figure 4). All GIS analyses were completed in ArcGIS 10.5.

Results

Mapping conservation authority

The riverine conservation authority map (sum of CAI values, shown in Figures 1c, 2) illustrates spatial heterogeneity with areas of high value (sum of CAI >24) distributed across the county, crossing boundaries of land ownership and jurisdiction. Private riverine lands across Okanogan County displayed substantial variability in conservation authority over short distances, reflecting fragmentation by property boundaries (Figure 2). Within a given corridor, the conservation authority values were greatest and most continuous near stream banks. There was a break at the lateral extent of areas under stream-centered sources of authority (e.g., designated fish critical habitat or shoreline development restrictions); areas within the wider outer band of riverine corridors had lower conservation authority values and more complex spatial patterns.

Mapping the legal-ecological landscape

The integrated resistance surface (Figure 1d) showed low to moderate cost within riverine corridors where one or both input cost maps had low cost (i.e., high conservation value), as expected. A different cost pattern emerged when connectivity was incorporated by calculating least-cost conservation authority corridors across this resistance surface (Figure 3). Accumulative cost values ranged from < 6 million to 29 million for riverine corridor lands across the county. Low-cost conservation authority corridors generally covaried with areas of low to moderate authority cost and ecological corridor cost (i.e., moderate–high conservation values in both). However, two areas of high accumulative cost (potential barriers; circled in Figure 3) overlapped with areas of low to moderate cost in the integrated resistance surface that also had the highest national ecological corridor values. These riverine areas were characterized by fragmented jurisdiction, lack of designated critical habitat, and limited state-level shoreline jurisdiction.

We used conditional statements to group riverine conservation values into four categories (Figure 4). Areas where authority and ecological cost were both low were categorized as bridges (areas of conservation congruence); areas with both high authority and ecological costs were categorized as barriers. The intermediate areas, where authority and ecological costs diverged, distinguished places where either coordinated riparian restoration to improve habitat or changes in governance to address fragmentation of authority could present bridging opportunities for riverine corridor conservation.

Discussion

Mapping authority at the resolution of local government jurisdiction allows us to view spatially-explicit details of the legal-ecological landscape within the context of existing broader-scale maps for species conservation. This multi-scale, applicable approach may inform (1) landscape-scale conservation efforts and (2) local land use decision making within a broader spatial context by incorporating multiple conservation goals and aiming for system resilience through unpredictable change. Identifying conservation authority corridors is a first step toward mapping governance and emergent social capacity to coordinate conservation efforts across boundaries. Future steps may involve mapping the roles of bridging organizations, community-based social networks, or economic factors associated with land use. This type of spatially-explicit mapping to represent integrated, cross-scale social-ecological conservation landscapes can be readily adapted to other places and contexts in which a spatial misfit between ecological and social systems needs to be addressed.

Connectivity of governance: building capacity to manage for resilience

Riverine corridor network conservation in the U.S. exemplifies the need to build coordination capacity because existing governance systems struggle to support management befitting the multi-dimensional connectivity of riverine corridor systems, despite broad agreement that riverside lands should be conserved. U.S. riverine land governance is divided among multiple agencies and organizations ranging in scope from local to national. Each entity acts upon its own mission, goals, processes and timeframes within a scope delineated by property boundaries. As a result, the governance landscape in riverine corridor systems, as well as other terrestrial systems, is highly fragmented (22) (Figure 2).

Valuing and mapping legal authority in formats compatible with ecological connectivity analyses may help to counteract this fragmentation by revealing opportunities to build connectivity through further coordination, restoration, and/or policy change. For instance, low-cost ($<10x10^6$) conservation authority corridors linked rivers and streams across drainage divides (Figure 3). In those locations, conserving riverine corridor connectivity beyond the extent of designated fish habitat could provide corridors for wildlife movement with co-benefits for water quality. Furthermore, different routes might be prioritized for building habitat connectivity when legal authority is included than when models rely upon ecological conditions alone, e.g., where conservation authority corridors diverged from areas of highest ecological corridor value. The legal-ecological maps in this study (Figures 1d, 3; 4) present one of many possible formulations to assess the relative costs of building connectivity along different corridors. Here, we limited our analyses to riverine corridors and emphasized conservation authority and habitat corridor values, but integrative resistance surfaces could be tailored to address many other conservation scenarios.

Building upon emergent seeds of adaptive governance could contribute to the long-term success of corridor conservation initiatives. In the case of riverine lands, strategic conservation for multi-dimensional connectivity has many co-benefits, which may incentivize coordination among government agencies and opportunities to leverage funding from multiple sources (7, 9). Place-based representation of conservation authority in a familiar map format that is compatible with other spatial datasets may help to foster new collaborations or prioritize local actions. The process of coordination itself builds social capacity for governance and may lay the groundwork for future adaptation or transformation in response to change.

Acknowledgements

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Figures with Legends

Figure 1. (a) Vegetation classification used in the Washington State Wildlife Action Plan (23). (b) Land ownership and management in Okanogan County, Washington. Hatched areas are managed for biodiversity; gray area is privately owned. Map layers were generated from existing data sources (24, 25). (c) Sum of conservation authority index (CAI) values (see Table 1) by pixel, displayed as maximum sum of CAI values per reach. See Figure 2 for pixel-level detail for inset area (gray box). (d) Integrated resistance surface. The conservation authority and ecological corridor value (4) maps were normalized, ranked and inverted to convert from value to cost before they were summed. (High values equate to low cost for both authority and naturalness.)

Figure 1(a)

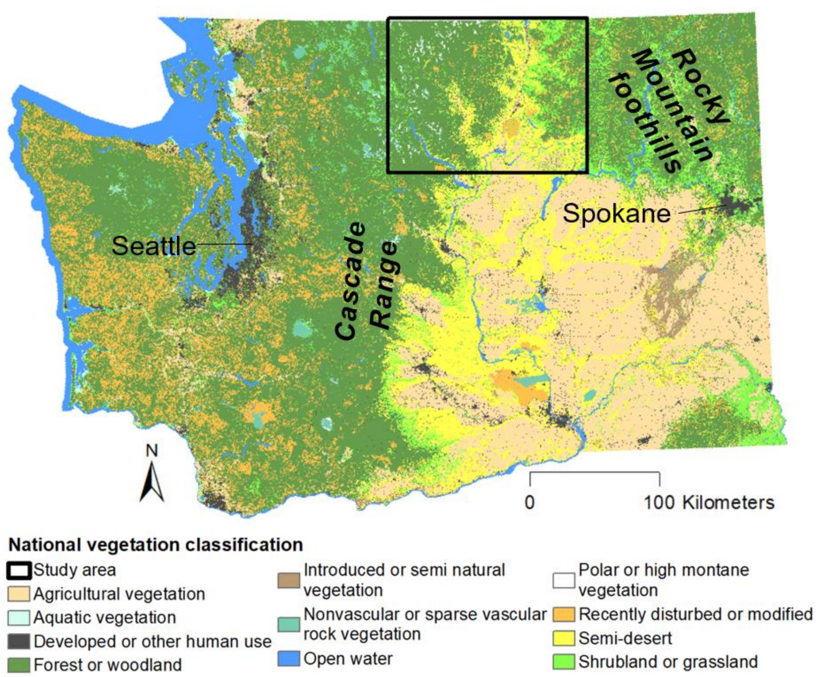


Figure 1(b)

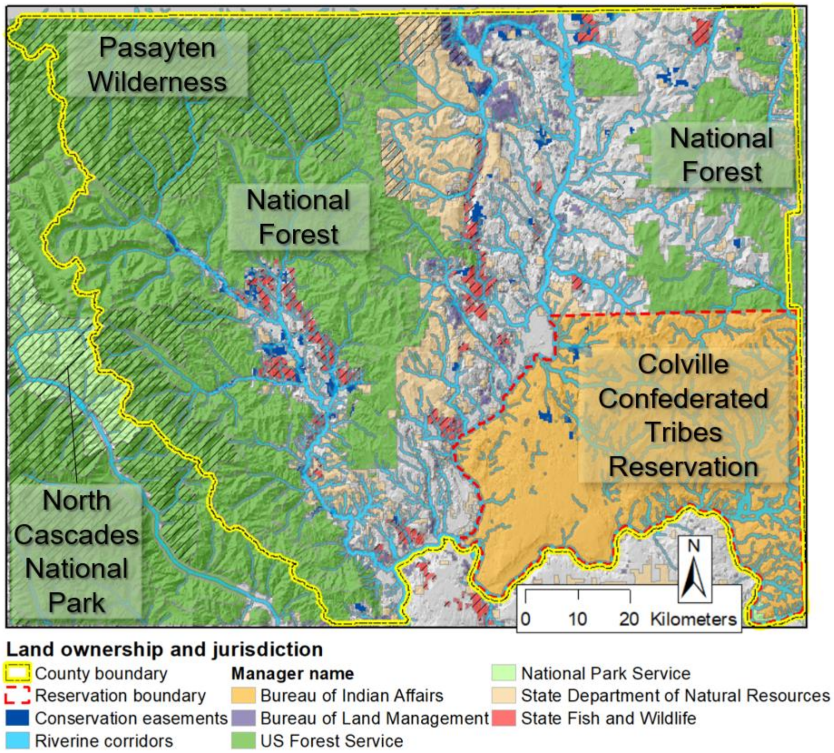


Figure 1(c)

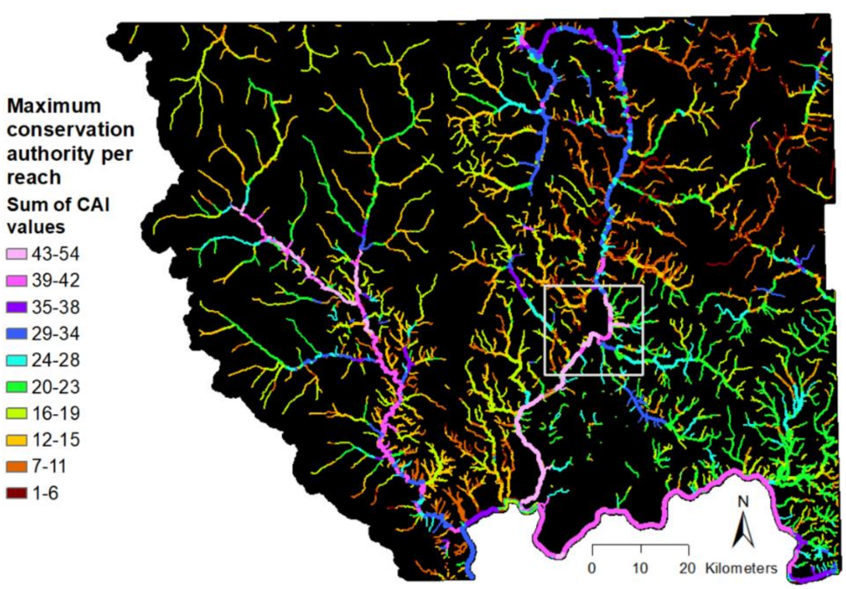


Figure 1(d)

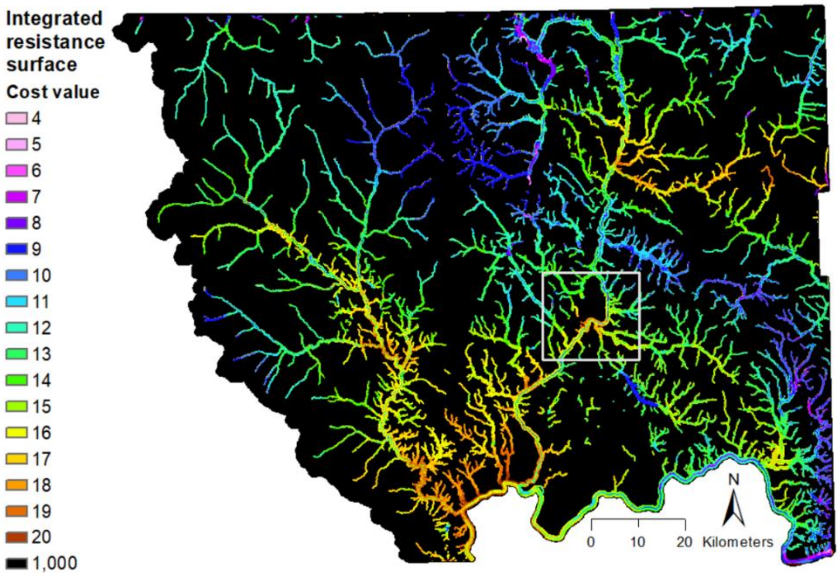


Figure 2. Finer-scale depiction of the spatial arrangement of conservation authority (sum of CAI values by pixel). Patterns in conservation authority reflect the fragmentation of the jurisdictional landscape by property boundaries.

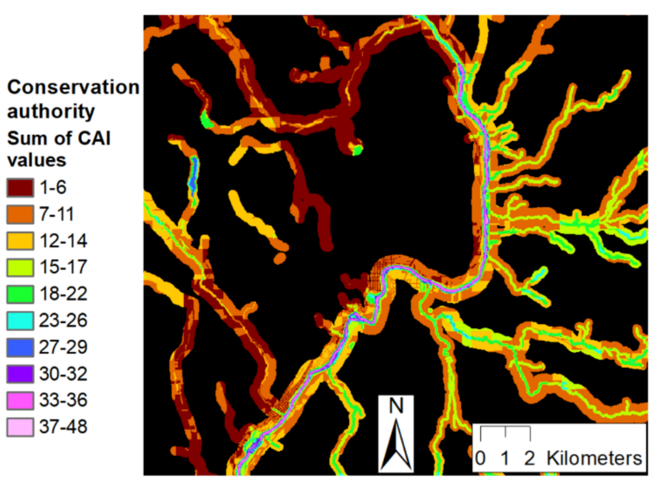


Figure 3. Least-cost conservation authority corridor output. Riverine corridor network boundaries are outlined in white. Transparent white overlay shows areas of highest habitat corridor value based on naturalness (4). Circles indicate areas where the habitat corridor value is highest, but the local riverine conservation authority corridor shows high cost due to fragmented jurisdiction, lack of designated critical habitat, and limited state-level shoreline jurisdiction. Alternatively, the legal-ecological analysis illustrates that other paths might be more efficiently connected by linking areas with overlapping layers of legal authority (see also Figure 4).

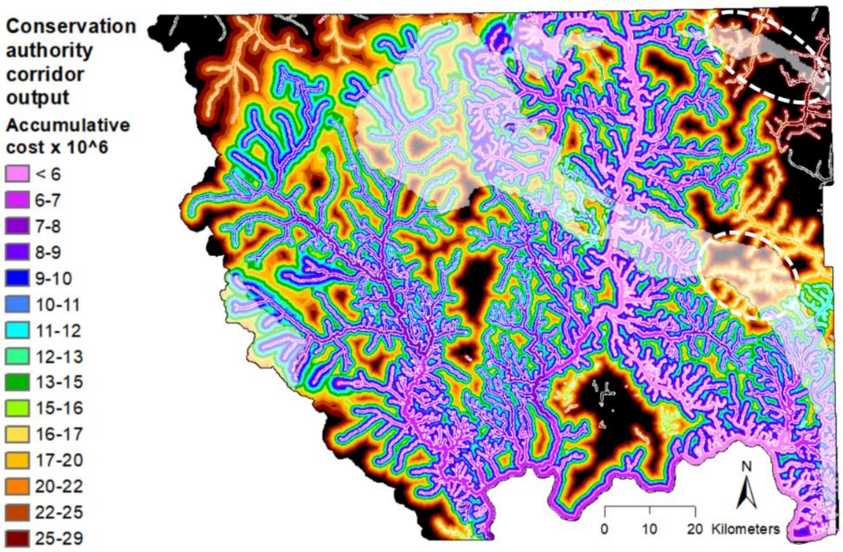


Figure 4. (a) Integrated legal-ecological assessment yields categories to inform conservation actions. (b) Same area as shown in Figure 2 for detail. Black and yellow riverine areas reflect moderate–poor landscape condition associated with cities, highways, privately-owned agricultural lands or semi-desert. In black riverine areas conservation authority values are also low; these are mainly private or tribal riverine lands fragmented by property boundaries. Yellow riverine areas indicate high conservation authority values and potential opportunities to build connectivity by improving riverine landscape condition. White and blue riverine areas have high corridor value, but blue areas may require additional coordination to build legal-ecological connectivity.

Figure 4(a).

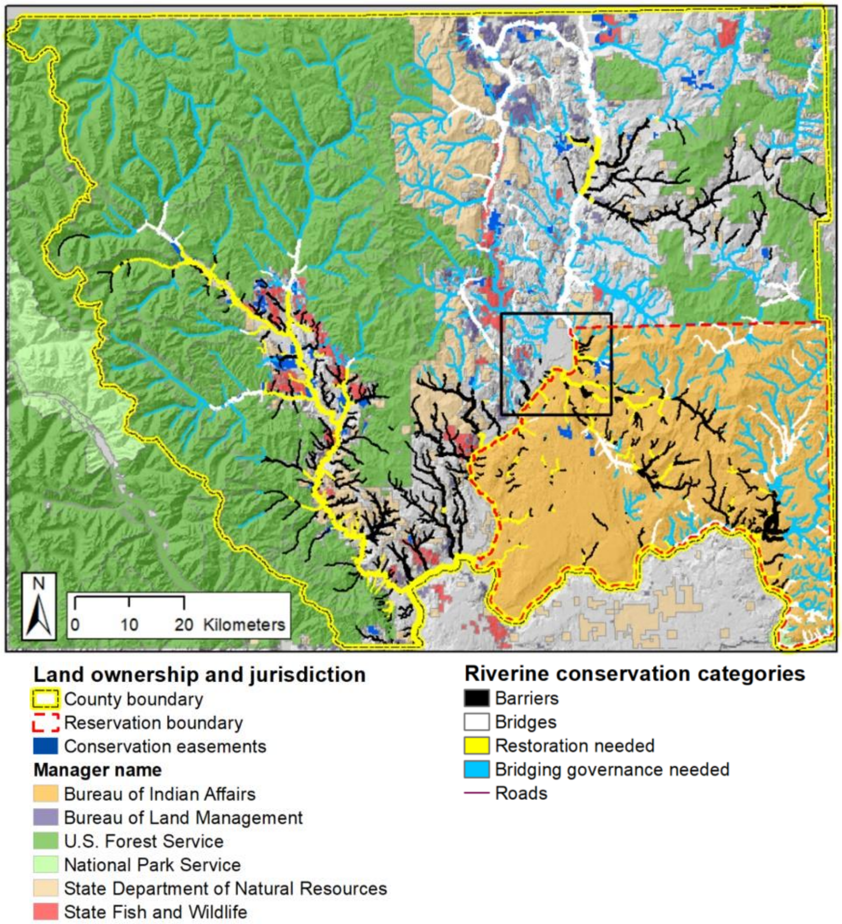
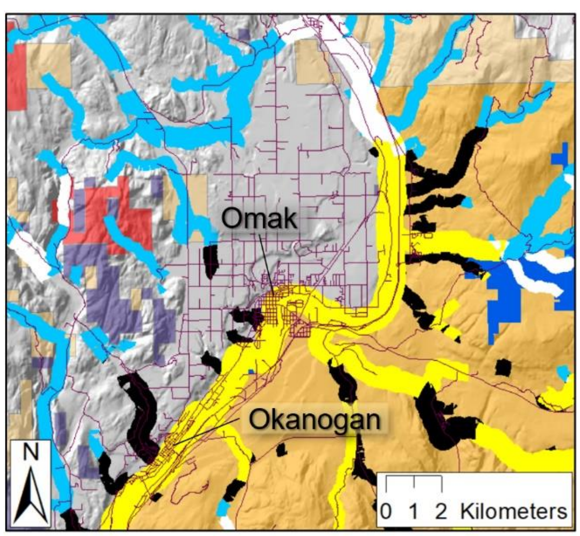


Figure 4(b).



Panel 1. Definitions of terms related to authority mapping.

Sources of authority: legal avenues of authority including (1) formal governmental authority through regulations, land use, or management and (2) ownership authority, which can be public or private. We attributed each mapped source of authority with its legal basis, agencies and organizations involved in implementation of associated actions on riverine lands.

Conservation authority index (CAI): value assigned to each source of authority that represents its relative influence on spatial connectivity of riverine land conservation actions. A higher CAI value indicates greater relative tendency to promote legal-ecological connectivity.

Conservation authority corridors: low-cost corridors revealed in a least-cost corridor output generated from an integrated legal-ecological resistance surface.

Table 1. Sources of authority mapped to riverine corridors for pilot study in Okanogan County, Washington (WA).

Source of authority	**Primary agency**	**GIS data sources[1]**	**GIS input**	**CAI value[2]**	**Justification**	**Potential co-benefits of legal-ecological connectivity**
CWA[3] Best Management Practices address **nonpoint source pollution** through TMDLs[4] or watershed (WRIA[5]) management plans	WA State Department of Ecology (Ecology)	Ecology GIS data (26, 27)	Clipped to riverine corridors	1	Coordinates voluntary riparian practices within a watershed	Increased effectiveness of pollutant removal
Conservation easements protect riverine lands by parcel	various	USGS[6] (24); Okanogan County GIS data (28)	Collated data and clipped to riverine corridors	2	May protect riverine lands across parcel boundaries	May provide opportunity for bridging organizations to implement ecological corridors, potentially increasing CAI value
ESA[7] protects **critical habitat** for *Oncorhynchus tshawytscha* (Spring Chinook salmon)	National Marine Fisheries Service (NOAA[8] Fisheries)	NOAA Fisheries ESA Critical Habitat GIS data (29)	Linear extent (polyline) extended laterally to ordinary high water mark	2	Protects riverine habitat longitudinally where adjacent uplands have fragmented jurisdiction	Promotes fish survival throughout life cycle
ESA protects **critical habitat** for *Salvelinus confluentus* (Bull trout)	U.S. Fish and Wildlife Service (FWS)	FWS Threatened and Endangered Species Active Critical Habitat Report (30)	Linear extent (polyline) extended laterally to ordinary high water mark	2		
ESA protects **critical habitat** for *Oncorhynchus mykiss* (Steelhead/rainbow trout)	National Marine Fisheries Service (NOAA Fisheries)	NOAA Fisheries ESA Critical Habitat GIS data (29)	Linear extent (polyline) extended laterally to ordinary high water mark	3	Protects riverine habitat longitudinally where adjacent uplands have fragmented jurisdiction, critical habitat bridges	

Source of authority	Primary agency	GIS data sources[1]	GIS input	CAI value[2]	Justification	Potential co-benefits of legal-ecological connectivity
					watershed boundaries	
CWA protects **wetlands** through reporting and permitting requirements	EPA[9], Ecology, USACE[10]	FWS, Ecology, DNR[11] GIS data (31–33)	Collated and merged available datasets. Clipped to riverine corridors for least-cost analysis.	3	Wetlands-based regulatory authority may be leveraged for multi-target corridor building	Increased likelihood of positive conservation outcomes if wetlands are linked to protected riverine corridors
Forest Practices' Riparian Management Rules protect water quality and fish habitat (balanced with timber extraction)	DNR	DNR GIS data (34)	Clipped to riverine corridors	3	May provide geographic continuity of riparian practices on state-owned forest lands, but there are a variety of approaches and corridor-scale connectivity is not necessarily intended	Increased likelihood of positive conservation outcomes if consistent riparian practices are extended beyond jurisdictional boundaries
ESA protects **critical habitat** for Canada lynx (*Lynx canadensis*) and Northern spotted owl (Strix occidentalis caurina)	FWS	FWS Threatened and Endangered Species Active Critical Habitat Report (30)	Clipped to riverine corridors	4	Protects habitat overlapping riverine lands, could be leveraged for multiple-goal corridors	Increased habitat connectivity may promote species persistence
Local or Tribal zoning authority may require set-backs on private lands	Local or Tribal government	Okanogan County GIS data (35)	Clipped to riverine corridors	4	Set-back zoning mandates protection on private lands	Increased likelihood of positive conservation outcomes with consistent set-backs across private lands
WA State Growth Management Act	WA State Department of Fish and Wildlife	WDFW Priority	Clipped to riverine corridors	5 for Riparian habitat; 4	Protects riparian habitat consistently statewide through	Framework for coordination among local governments

Source of authority	Primary agency	GIS data sources[1]	GIS input	CAI value[2]	Justification	Potential co-benefits of legal-ecological connectivity
mandates riparian habitat protection	(WDFW)	Habitats and Species (36)		for other habitats/ species	management or local policy guidance	receiving state-level policy guidance
Protected lands (GAP Status 1-3; see (24)) are managed by governmental agencies under applicable mandates	U.S. Forest Service, National Park Service, WDFW, DNR	USGS (24)	Queried and clipped to riverine corridors	5	Administrative practices can be consistent across large areas, but these vary among agencies, are limited to public land boundaries, and are subject to trade-offs, particularly on working lands	Increased likelihood of coordinated riparian habitat protection for water quality, biodiversity, and habitat connectivity, promoting ecological resilience
Local government shoreline master programs restrict privately owned shoreline development and use	County (local) government	Okanogan County GIS data (37)	Clipped to riverine corridors	5	Provides framework for continuity of legal protection along designated streams across a checkboard of privately owned parcels within a local government's jurisdictional area	Increased likelihood of positive conservation outcomes with consistent shoreline protection across property boundaries
WA State Shoreline Management Act (SMA) requires restrictions on shoreline development and land use for designated streams	Ecology	Ecology GIS data (38, 39)	Applied buffer to SMA-designated streams	6	Provides framework for continuity of legal protection along designated streams across the state	Increased likelihood of positive conservation outcomes with consistent shoreline protection statewide

Source of authority	Primary agency	GIS data sources[1]	GIS input	CAI value[2]	Justification	Potential co-benefits of legal-ecological connectivity
CCT[12] Shoreline Code restricts shoreline development and use	CCT Comprehensive Planning Department	USGS (21); Ecology GIS data (40)	Buffered streams and waterbodies within Reservation boundaries	6	Provides framework for protection of riverine lands throughout the Reservation	Increased likelihood of positive conservation outcomes with consistent riparian habitat protection across property boundaries
Government-owned aquatic parcels are managed by governmental agencies under applicable mandates	DNR	DNR GIS data (41)	Clipped to riverine corridors	6	Provides potential longitudinal continuity of practices for riverbanks where adjacent uplands have fragmented jurisdiction	Increased likelihood of coordinated riverbank management practices that could improve water quality and biodiversity

[1] All GIS data were publicly available online from government sources. These datasets were intended for agency use and public information. Disclaimers apply to any other uses of the data.
[2] CAI—Conservation authority index: value assigned to each source of authority that represents its relative influence on spatial connectivity of riverine land conservation actions. A higher CAI value indicates greater relative tendency to promote legal-ecological connectivity. Note that these values are specific to Washington and will vary by state and country, but the procedure is reproducible across scales and could incorporate data from surveys, social network modeling, or other sources.
[3] CWA—Clean Water Act
[4] TMDL—Total Maximum Daily Load (Clean Water Act)
[5] WRIA—Water Resource Inventory Area (specific to the State of Washington)
[6] USGS—U.S. Geological Survey
[7] ESA—Endangered Species Act
[8] NOAA—National Oceanic and Atmospheric Administration
[9] EPA—U.S. Environmental Protection Agency
[10] USACE—U.S. Army Corps of Engineers
[11] DNR—Washington State Department of Natural Resources
[12] CCT—Colville Confederated Tribes