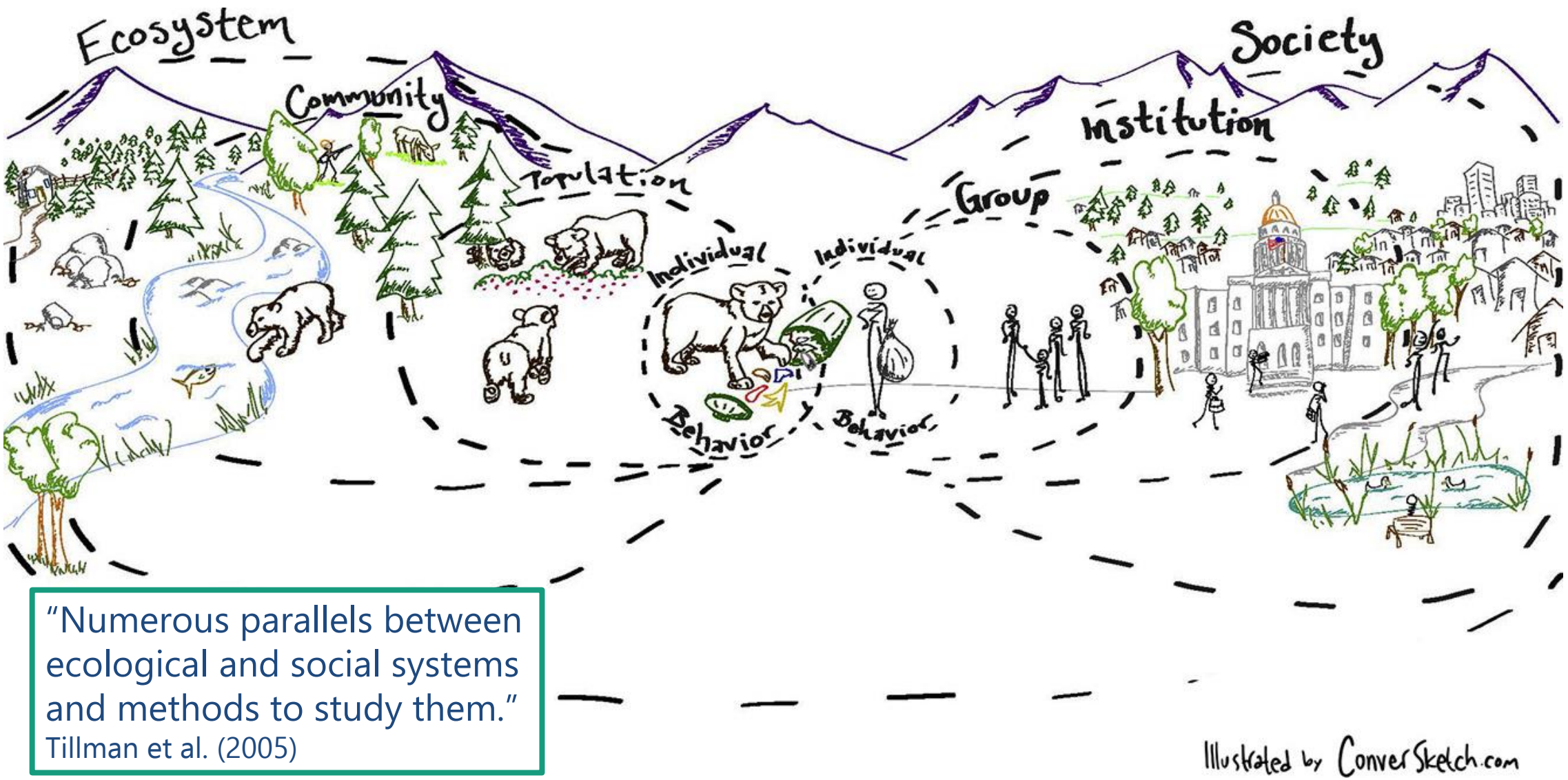
Conservation Social Sciences & Natural Resource Economics

August 11, 2023

David J. Trimbach, PhD, Conservation Social Scientist
Braeden Van Deynze, PhD, Natural Resource Economist

Washington Department of FISH and WILDLIFE



"Numerous parallels between ecological and social systems and methods to study them."
Tillman et al. (2005)

Lischka et al. (2018)

Who are we?

David Trimbach, PhD

Conservation Social Scientist

Undergrad, University of Dayton
- BA, Sociology

Grad, Portland State University
- MUS, Community Development

Grad, University of Kansas (KU)
- PhD, Human Geography

Applied Social Scientist, Center for Public Partnerships and Research, KU

PostDoc(+), Oregon State University, Department of Fisheries, Wildlife, and Conservation Sciences
- Human Dimensions Lab
- Housed with Puget Sound Partnership

Braeden Van Deynze

Natural Resource Economist

Undergrad Gonzaga
- BS Economics, BA Biology
- Varsity cross country

Grad School Michigan State
- Ag, Food, and Resource Econ
- Focus on farmer pest/weed control decisions

Postdoc University of Washington
- Co-op appointment with NOAA Northwest Fisheries Science Center
- Fish passage planning research

Celebrating first anniversary with WDFW!

What have we studied before WDFW?

David Trimbach, PhD
Conservation Social Scientist

peer-reviewed articles

UNDERSTANDING NARVA & IDENTITY
LOCAL REFLECTIONS FROM NARVA'S RUSSIAN-SPEAKERS

Journal of Nonprofit Education and Leadership
http://dx.doi.org/10.18666/JNEL-2016-V6-I2-7346
2016, Vol. 6, No. 2, pp. 115–126

Published in the printed edition of Baltic Worlds Bw 1-2 2016 p4-12
Published on Balticworlds.Com on June 23, 2016

Thank You for Being a Friends Group
An Assessment of Friends Group Characteristics and Best Practices

David J. Trimbach

SOCIETY & NATURAL RESOURCES
https://doi.org/10.1080/08941920.2021.1936318

Routledge
Taylor & Francis Group

OPEN ACCESS Check for updates

Salish Sea Survey: Geographic Literacy Enhancing Natural Resource Management

David J. Trimbach[a], Joseph K. Gaydos[b], and Kelly Biedenweg[a]

ELSEVIER

Contents lists available at ScienceDirect

Applied Geography

journal homepage: www.elsevier.com/locate/apgeog

Shared shorelines, shared meanings?: Examining place meaning in Puget Sound

David J. Trimbach *, Kelly Biedenweg

Braeden Van Deynze
Natural Resource Economist

SOIL AND WATER CONSERVATION SOCIETY

JOURNAL OF SOIL AND WATER CONSERVATION
The science and art of natural resource management for sustainability

What drives voluntary adoption of farming practices that can abate nutrient pollution?

Z.R. Luther, S.M. Swinton and B. Van Deynze

Land Economics

Potential Supply of Midwest Cropland for Conversion to In-Field Prairie Strips

Zachary R. Luther, Scott M. Swinton and Braeden Van Deynze

American Journal of Agricultural Economics

AAEA

Article | Open Access

Are glyphosate-resistant weeds a threat to conservation agriculture? Evidence from tillage practices in soybeans

Braeden Van Deynze, Scott M. Swinton, David A. H

ELSEVIER

Biological Conservation
Volume 274, October 2022, 109710

What influences spatial variability in restoration costs? Econometric cost models for inference and prediction in restoration planning

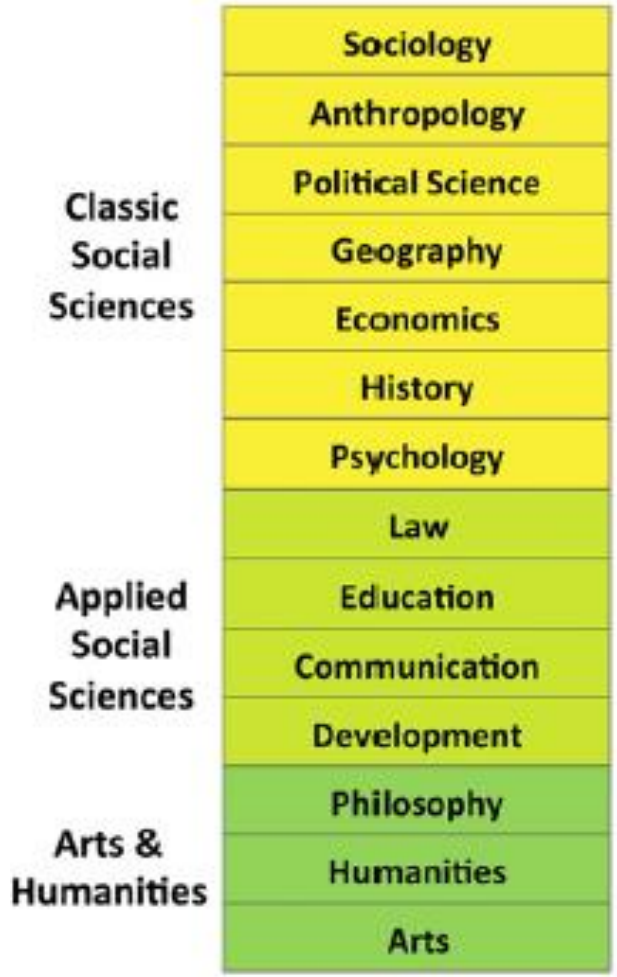
Braeden Van Deynze [a], Robert Fonner [b], Blake E. Feist [b], Sunny L. Jardine [c], Daniel S. Holland [b]

What are the social sciences?

Diverse **academic disciplines** that study **human societies**
- Specialized training, expertise, and knowledge (e.g., graduate degree)

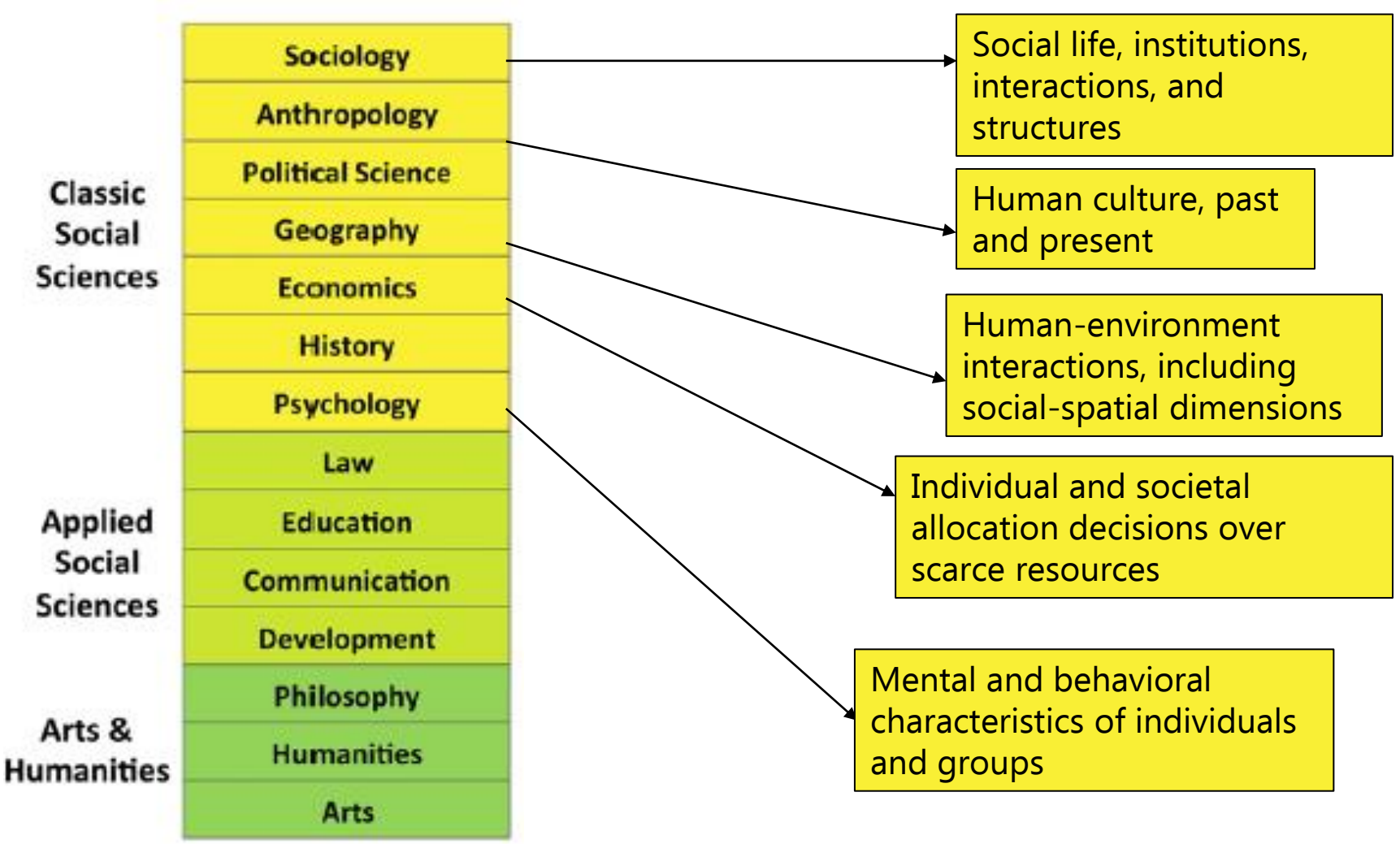
Social sciences are ***sciences***
- *Upstream* of human dimensions, comms and outreach e.g., facilitation, social marketing, or community outreach

Social sciences **contribute to many fields**, but are distinct from them e.g.,
- Educational scholar vs. teacher
- Economist vs. banker
- Law and society researcher vs. lawyer
- Intertidal ecologist vs. nearshore restorationist



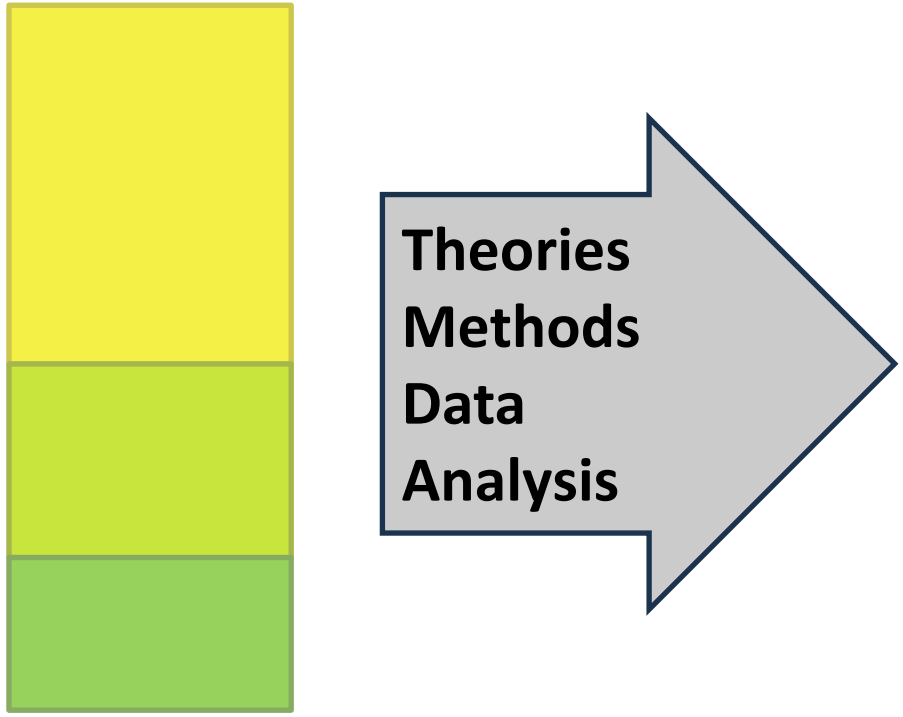
(Bennett et al. 2017; Scales et al. 2023)

What do social scientists study?



(Bennett et al. 2017; Charnley et al. 2017)

What do social scientists study?



Adapted from Bennett et al. (2017)

Social Phenomena

Policy Markets Governance

Narratives Norms

Culture Politics Demographics

Social Processes

Social Organization Decision Making

Communication Educating

Management Development

Individual Attributes

Values Ethics Preferences

Behavior Knowledge Perceptions

How can social science support fish and wildlife conservation?

"Improving **conservation management practices and governance processes**, including understanding how to **better engage different stakeholders**"

– Public Comment, Benefit-Cost Analysis

"Helping to **justify and normalize conservation actions**"

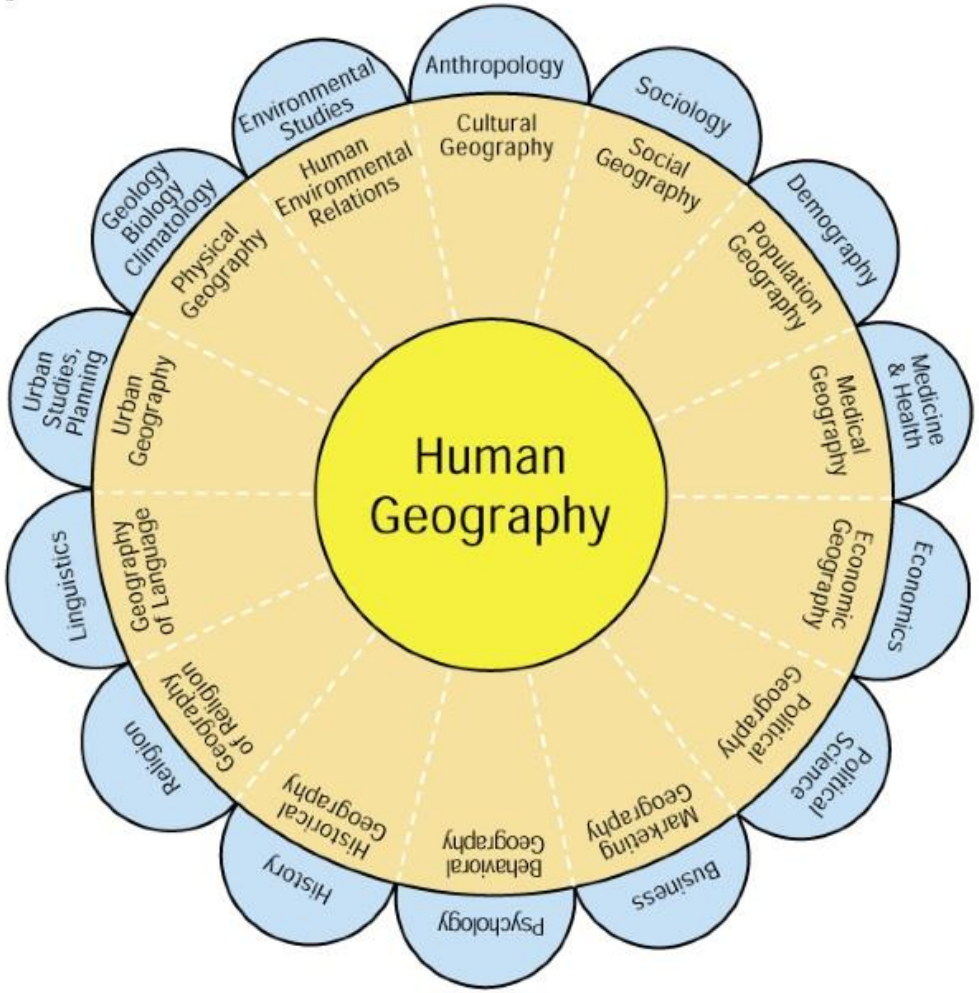
"Facilitating more **socially equitable and just** conservation processes and outcomes"

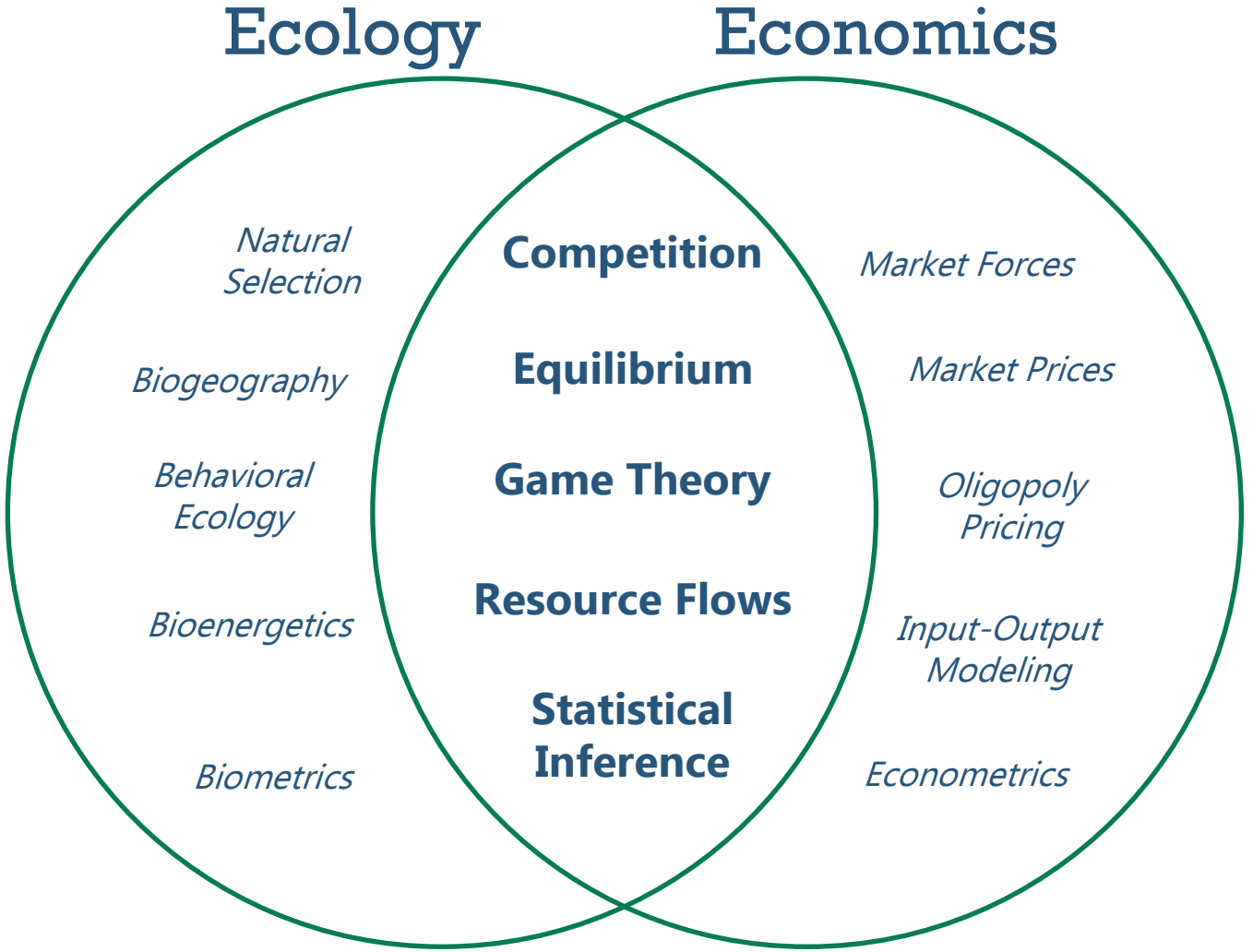
"Understanding why **support or opposition varies** by places"

"Helping to frame communication and outreach strategies designed to **change attitudes or behaviors**"

(Bennett et al. 2015; Bennett et al. 2017; Scales and Adams 2023)

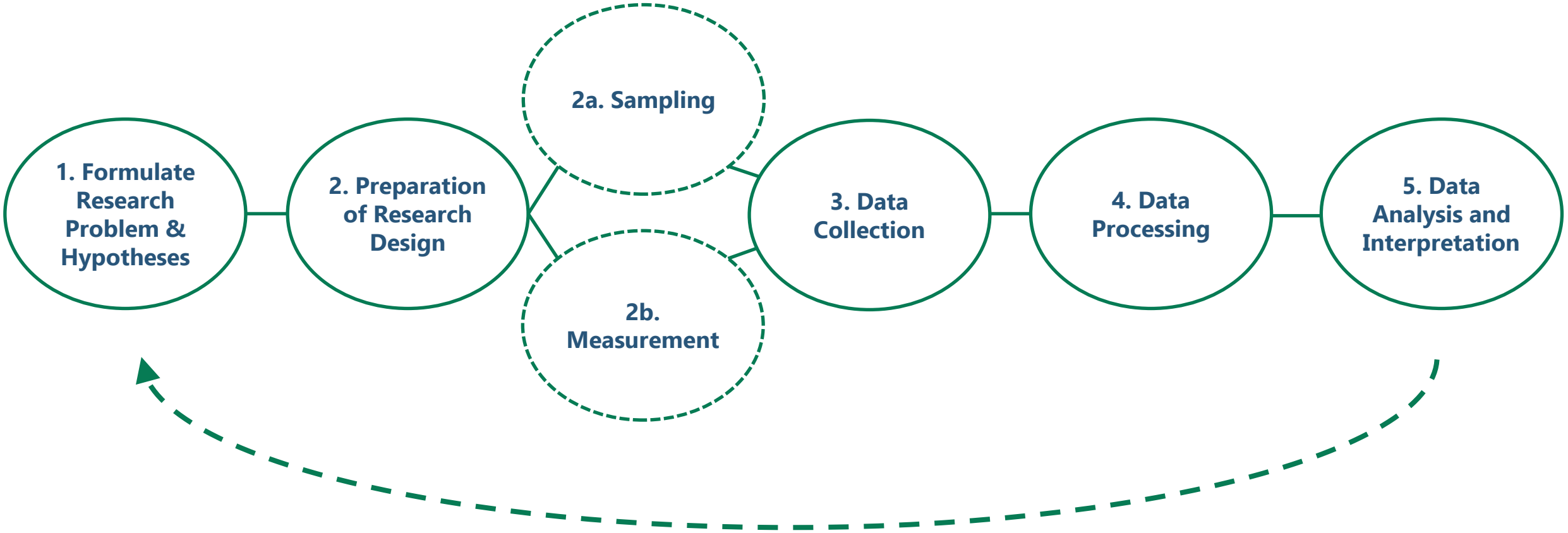
How do social sciences relate to other fields and disciplines?





(Image source: Human Geography Quote | Quote Number 706105 | Picture Quotes)

How do social scientists conduct research?



(Singleton and Straits 2005)

How do social scientists conduct research?

QUALITATIVE	QUANTITATIVE	PARTICIPATORY	EVALUATIVE	SPATIAL
• CASE STUDIES • INTERVIEWS • FOCUS GROUPS • PARTICIPANT OBSERVATION • DISCOURSE/ TEXTUAL ANALYSIS • ETHNOGRAPHY • IMAGE ANALYSIS • COGNITIVE MAPPING	• SURVEYS • COST-BENEFIT ANALYSIS • MODELING • ECONOMIC VALUATION • ECONOMIC IMPACTS • COGNITIVE MAPPING	• COMMUNITY-BASED PARTICIPATORY RESEARCH (CBPR) • ARTS-BASED METHODS • ACTION RESEARCH	• MONITORING AND EVALUATION • POLICY ANALYSIS • CASE ANALYSIS	• GEOGRAPHIC INFORMATION SYSTEMS (GIS) • COMMUNITY-BASED MAPPING • 3-D MAPPING • LIDAR • GLOBAL POSITIONING SYSTEMS (GPS)

Method: a tool for data collection and analysis
Not all tools are the same, nor are they appropriate for all projects

(della Porta and Keating 2008; Bennett et al. 2017; Leavy 2017; Trimbach et al. 2020; Moon and Blackman 2023)

What is best available social science?

Contents lists available at ScienceDirect

Environmental Science and Policy

journal homepage: www.elsevier.com/locate/envsci

Review

Evaluating the best available *social* science for natural resource management decision-making

Susan Charnley[a,*], Courtney Carothers[b], Terre Satterfield[c], Arielle Levine[d], Melissa R. Poe[e,m], Karma Norman[e], Jamie Donatuto[f], Sara Jo Breslow[e], Michael B. Mascia[g], Phillip S. Levin[e], Xavier Basurto[h], Christina C. Hicks[i,j], Carlos García-Quijano[k], Kevin St. Martin[l]

Example: U.S. Forest Service – Integrated BASS in forest management plan revisions (Charnley et al. 2017)

22 scientist team, including 3 social scientists

Builds on same core criteria as BAS: accuracy, reliability, and relevance

- "We argue that the evaluative criteria for BAS should expand to include those associated with diverse social science disciplines"

Example Criteria

- Clear research purpose and questions
- Justification of why chosen methods and research design are appropriate
- Relevant literature reviewed
- Data collection and analysis clearly documented
- Ethical considerations in sharing research results and data
- Findings are published in peer-reviewed outlets

How is social science integrated at natural resource agencies?

State Level

National Level

WDFW

Conservation Social Scientist
Natural Resource Economist
DEI Data Analyst
Environmental Justice Coordinator
& Other Staff w/ Social Science Training

What Can We Learn from Natural Resource Economics about Conservation?

Measurement of Costs and Benefits

Economic Values for Ecosystem Services

Economic concept of value is *much broader* than commercial, or market, value Heal et al. (2005)

Defined by aggregated sum of individual **marginal willingness to exchange** Heal et al. (2005)

Mainstream economics has long recognized & sought to measure a wide range of values fish, wildlife, and habitat provide people
Hotelling (1947), Heal et al. (2005)

- Commercial value
- Recreation value Hotelling (1947)
- Nonuse, cultural, and existence value Arrow et al. (1993)

Quantifying the Value of Ecosystems

Total Economic Value – Aquatic Ecosystems		
Use		Nonuse
Direct	**Indirect**	**Existence & Bequest**
Commercial fishing	Nutrient (carbon) retention and recycling	Cultural heritage
Aquaculture	Flood control	Resources for future generations
Transportation	Storm protection	Existence of charismatic species
Potable water	Habitat function	Existence of wild spaces
Recreation	Shoreline and riverbank stabilization	
Genetic material		
Scientific and educational opportunities		

Adapted from Barbier (1994), Barbier et al. (1997), and Heal et al. (2005)

What is the public's *willingness-to-pay* for recovering Oregon Coast coho?

Non-Market Valuation: Choice Experiments

Estimate theoretically consistent economic value using (carefully designed) survey questions Johnston et al. (2017)

➔ As much as **$518million/year** for an additional 100,000 returning spawners Lewis et al., (2019)

PLOS ONE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

The non-market benefits of early and partial gains in managing threatened salmon

David J. Lewis, Steven J. Dundas, David M. Kling, Daniel K. Lew, Sally D. Hacker

Published: August 14, 2019 • https://doi.org/10.1371/journal.pone.0220260

What is the economic value of species richness to birders?

Non-Market Valuation: Recreation Demand Modeling

Measure the economic value of access to recreation and changes in conditions at sites

Relies on travel cost as *implicit price* for visits to sites, allowing estimation of demand curves Lupi, Phaneuf & von Haefen (2017)

➔ Marginal value of additional bird species as much as **$3.38 per species per trip**

➔ Mean ***willingness-to-pay per trip*** for Puget lowlands bird watching is **$278**

Kolste & Cameron (2017)

Contents lists available at ScienceDirect

Ecological Economics

journal homepage: www.elsevier.com/locate/ecolecon

Analysis

The Non-market Value of Birding Sites and the Marginal Value of Additional Species: Biodiversity in a Random Utility Model of Site Choice by eBird Members

Sonja Kolstoe [a,*], Trudy Ann Cameron [b]

[a] Assistant Professor of Economics, Department of Economics and Finance, Salisbury University, United States
[b] Mikesell Professor of Environmental and Resource Economics, Department of Economics, University of Oregon, United States

What drives variability in barrier culvert correction costs?

Predicting Conservation Costs and their Drivers

Considering relative costs in conservation decisions can dramatically increase efficiency Babcock et al. (1997), Naidoo et al. (2006)

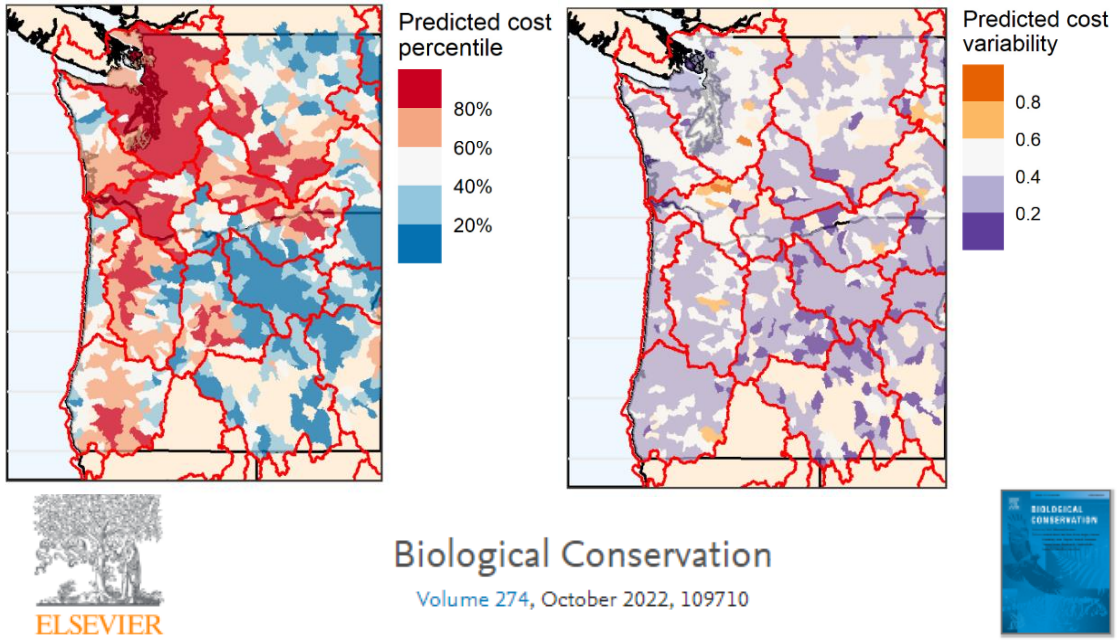
→ Especially when *variability* in benefits btw. alternatives is low or *variability* in costs is high

However, relies on reliable measure of relative costs Armsworth (2014)

➔ Std. dev. increase in **bankfull width** or **channel slope** associated w/ **56% and 35% higher costs**

➔ Predicted costs are highest, and most variable in Puget Sound

Van Deynze et al. (2022)



What influences spatial variability in restoration costs? Econometric cost models for inference and prediction in restoration planning

Braeden Van Deynze [a], Robert Fonner [b], Blake E. Feist [b], Sunny L. Jardine [c], Daniel S. Holland [b]

Bringing it All Together

Benefit-Cost Analysis (*and its cousins)

Often used in federal decision-making (grants, policy analysis)

**Related methods include…*

- *Cost-effectiveness analysis*
- *Return-on-investment (ROI) analysis*

Benefit-Cost Analysis for Elwha Dam Removal

	0% discount rate (in millions of 2012 dollars)	7% discount rate (in millions of 2012 dollars)
Costs		
• Purchase of dams	37.9	37.9
• Physical dam removal and construction of accompanying facilities	70–183.7	50.64–132.89
• Lost electricity value (172 GWh annually) over 100 years	816.4	109.6
Benefits		
• Restoration of anadromous fish species over 100 years	242.02	11.2
• Increased visitation to Clallam County over 100 years	729.68	60.87
• Non-market benefits over 100 years	48,561	36,485
• Ediz Hook maintenance savings over 100 years	3.64	0.37

Bellas & Kosnik (2019), Meyer & Lichtkoppler (1995)

Conservation Social Sciences Supporting Fish and Wildlife Management

How do we consider Washington residents' values or what Washington residents value in our work?

Values are goals and principles that **guide behavior.**

Values are **durable yet change**.

CONCEPTS AND QUESTIONS 355

Bringing social values to wildlife conservation decisions

Michael J Manfredo[1*], Richard EW Berl[1], Tara L Teel[1], and Jeremy T Bruskotter[2]

Landscape and Urban Planning 185 (2019) 24–27

Contents lists available at ScienceDirect

Landscape and Urban Planning

journal homepage: www.elsevier.com/locate/landurbplan

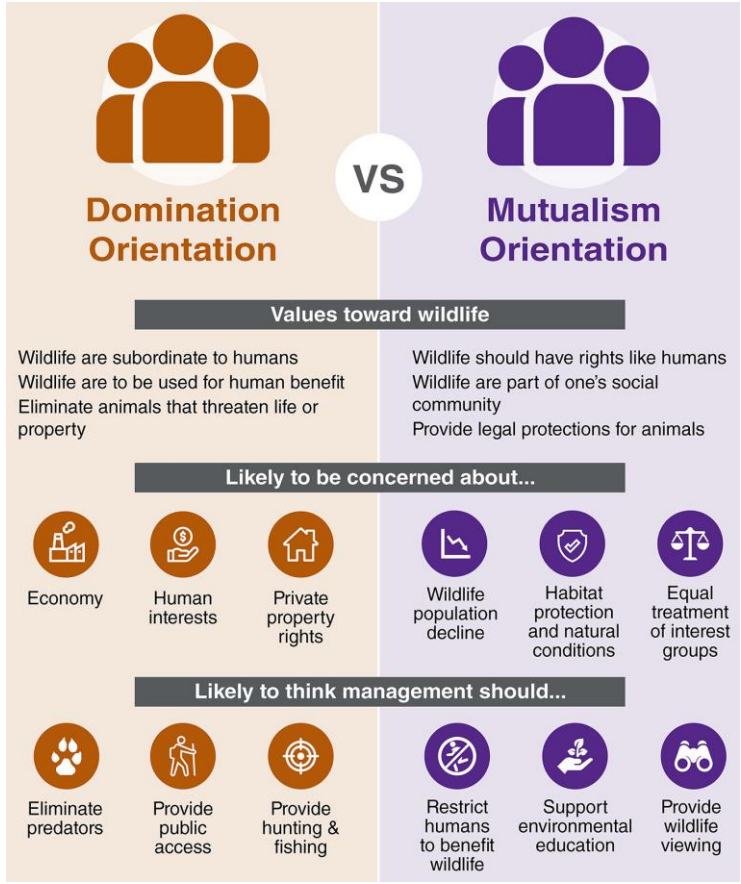
ELSEVIER

Landscape and Urban Planning

Is recreation a landscape value?: Exploring underlying values in landscape values mapping

Kelly Biedenweg[a,*], Katherine Williams[b], Lee Cerveny[c], Diane Styers[d]

Landscapes contribute benefits (values) to humans and can be mapped to inform management.



How do we ensure Washington residents' wellbeing is supported by our work?

Healthy ecosystems contribute to human wellbeing.

Wellbeing is **multidimensional.**

Marine Policy 64 (2016) 31–37

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

A holistic framework for identifying human wellbeing indicators for marine policy

Kelly Biedenweg [a,b,*], Kari Stiles [c], Katharine Wellman [d]

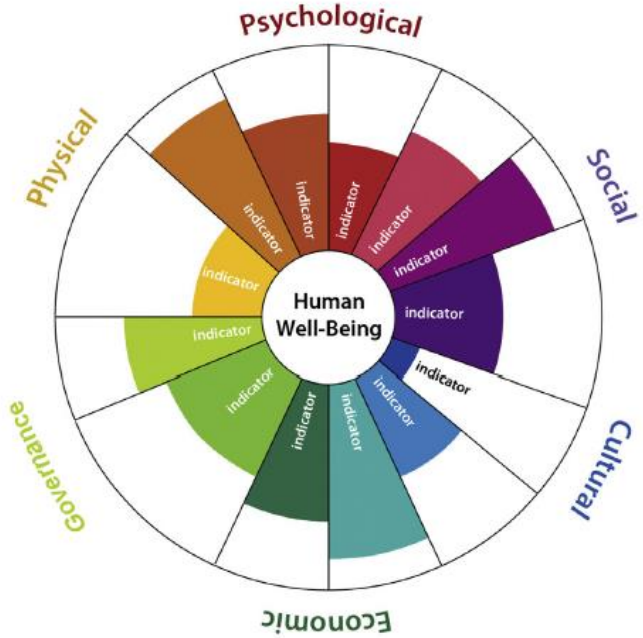
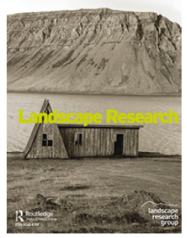


Fig. 1. Visual representation of Human Wellbeing domains for marine policy.

Sense of place is a dimension of wellbeing.

Sense of place includes peoples' **place attachment and identities.**



Landscape Research

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/clar20

Examining coastal sense of place through community geography in Island County, Washington

David J. Trimbach, Lori Clark, Laura Rivas, Barbara Lyon Bennett, Gwendolyn A. G. Hannam, John Lovie, PaulBen McElwain & Jacqueline Delie

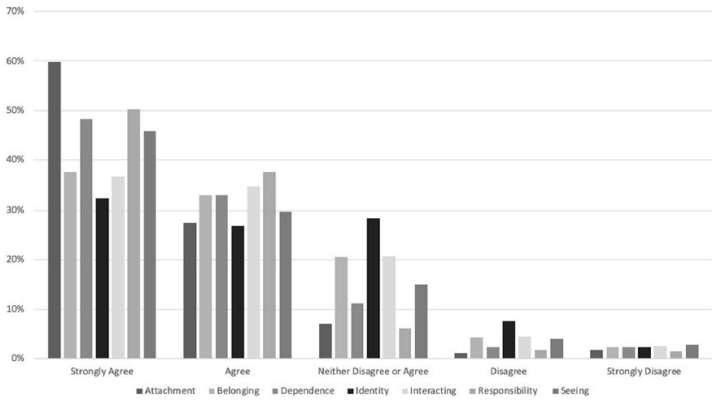


Figure 3. Sense of place survey responses (%) ($n = 327$).

How do we enhance our programs or decisions with diversity, equity, and inclusion (DEI)?

Outdoor programs can **help military veterans**.

Many **outdoor programs struggle** to equitably engage all veterans.

JOURNAL OF LEISURE RESEARCH
https://doi.org/10.1080/00222216.2023.2193189

Routledge
Taylor & Francis Group

Check for updates

Evaluating diversity, equity, and inclusivity in outdoor programs for veterans on public lands

Lee K. Cerveny[a], Monika M. Derrien[a], David G. Havlick[b], and Kerrick Robinson[c]

DEI is not just about representation; DEI is about **diversity of perspectives and values** in management.

CONTRIBUTED PAPER

Conservation Science and Practice
A journal of the Society for Conservation Biology
Open Access

WILEY

Mental models reveal diverse perspectives on marine resources management across racial/ethnic and gender social identities

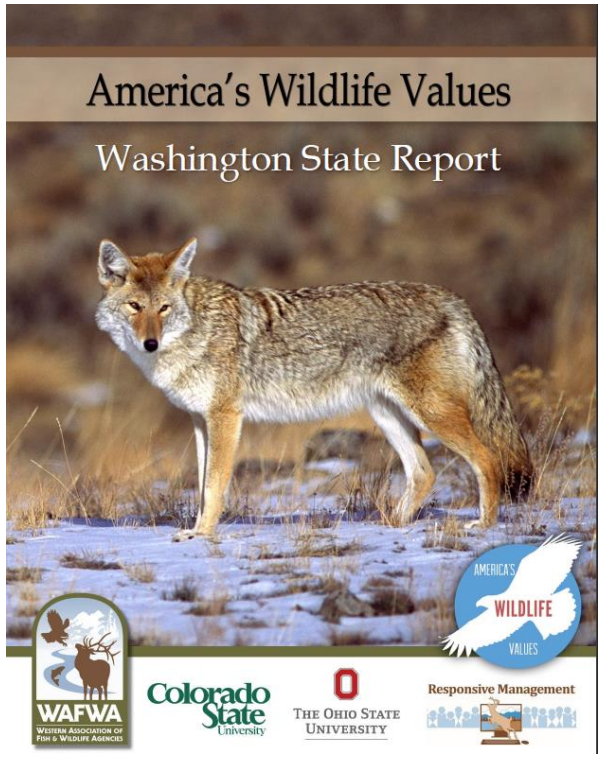
Brittany D. King

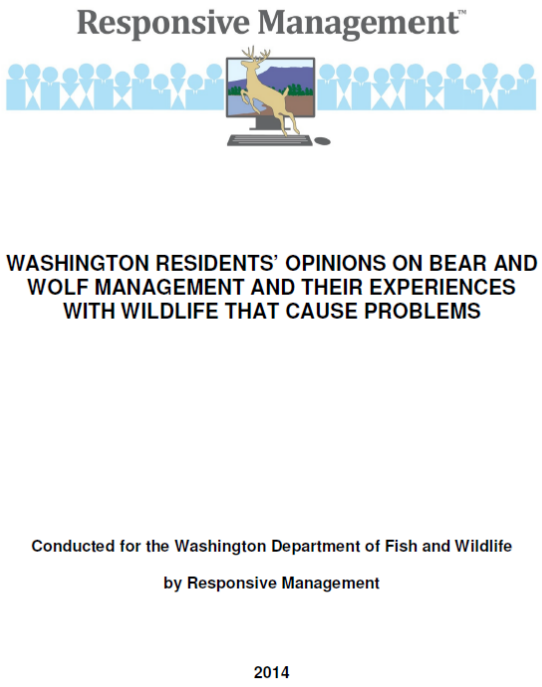
What Do the Conservation Social Sciences Look Like at WDFW?

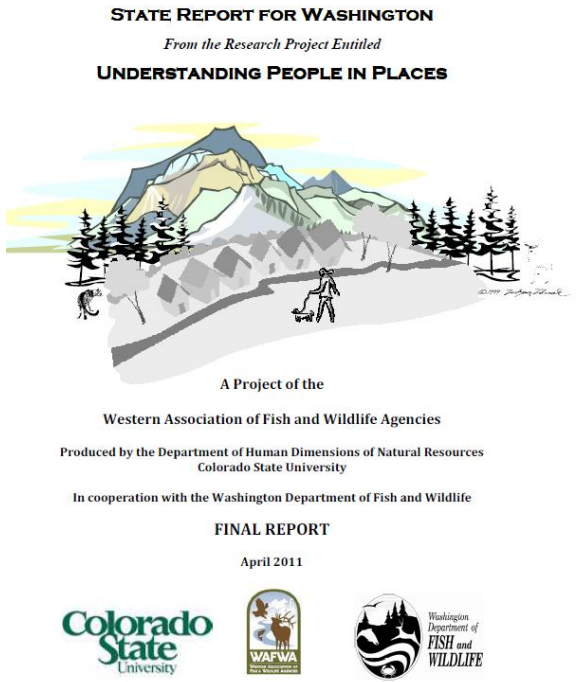
What does this look like at WDFW?

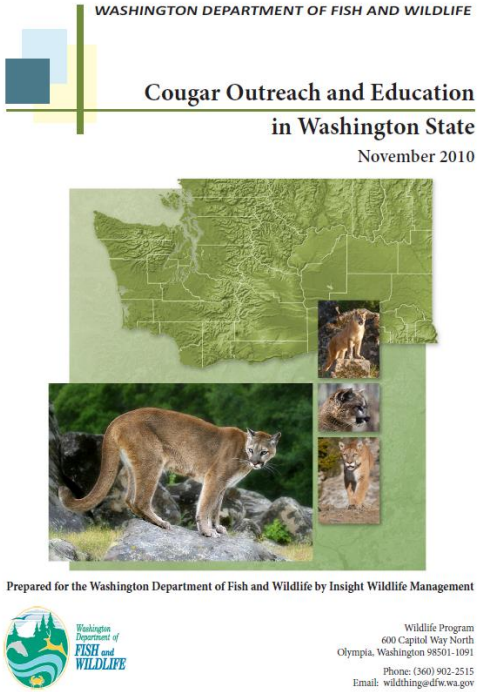
Social Science is <u>not new</u> to WDFW, but internal social science positions are new

Social and economic data has been **collected for decades** in order to inform management and decision making









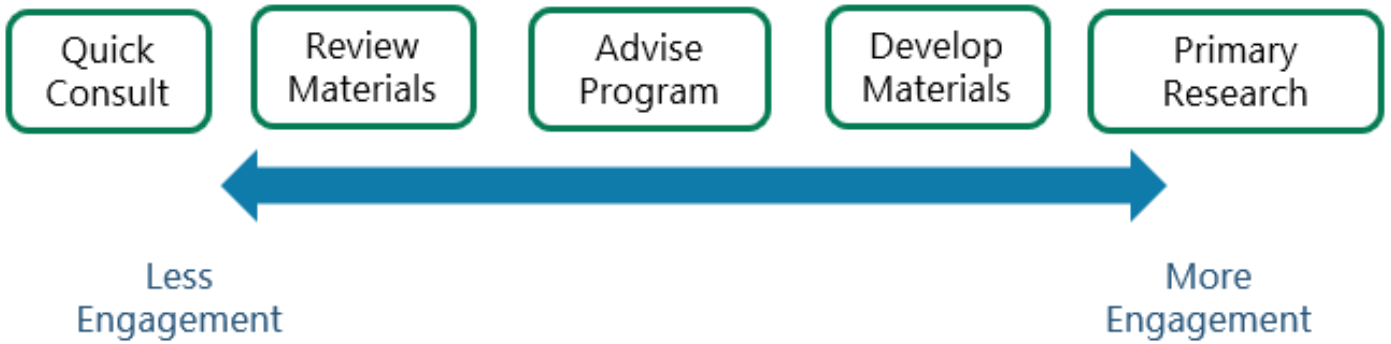
What does this look like at WDFW?

Social Science Team: Dr. Braeden Van Deynze (Natural Resource Economist), Dr. David J. Trimbach (Conservation Social Scientist), Rebecca Niggemann (DEI Analyst), and Environmental Justice Coordinator (TBD)

Supporting Programs: general guidance and advice, minor collaboration, major collaboration, and assistance obtaining external support (engagement guide and service request form)

Building Capacity: Includes creating infrastructure and resources (suite of resources), leading internal community of practice, developing new tools and approaches

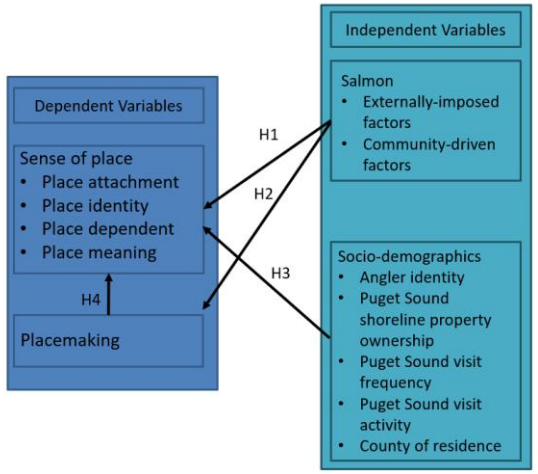
Participate in Agency & Scientific Community: publications, grant writing, conferences, student committees, cross-program teams, and external collaborations



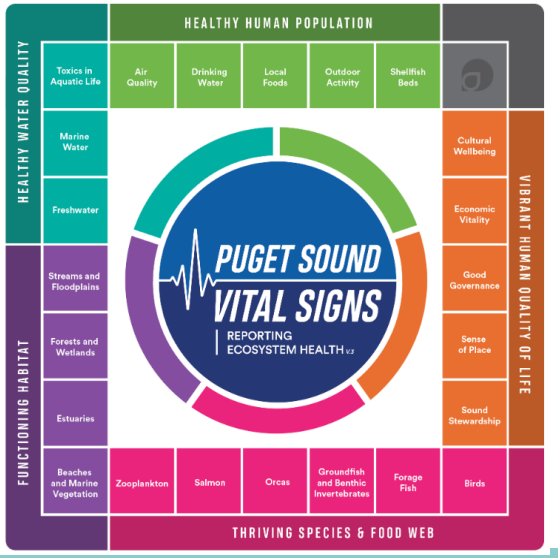
What does this look like at WDFW?

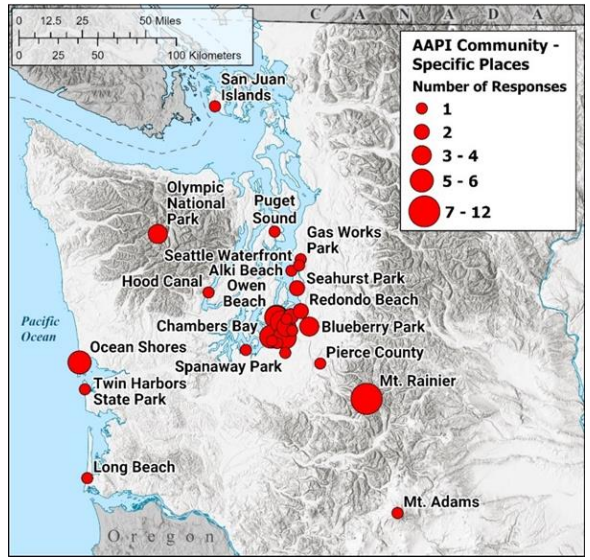
Conservation Social Scientist-Projects (2022-2023)

1. **Puget Sound Estuary Literacy Study**: examined Puget Sound **residents' knowledge** of Puget Sound as an estuary and residents' **connections to salmon**.



2. **Inclusive Human Wellbeing Monitoring Study**: assessed how **Puget Sound's environment contributes to Asian American, Pacific Islander, Black, and African American residents' wellbeing**.





What does this look like at WDFW?

Conservation Social Scientist-Projects (2023-2024)

1. **Lands Division Survey**: gauging **recreators' use** of WDFW lands and **satisfaction** with a pilot **volunteer program**.

2. **Shrubsteppe Values Study**: examining and mapping Region 3 **residents' connections and values** associated with shrubsteppe.

BOISE STATE UNIVERSITY

3. **Public Comment Process Assessment**: **assessing the agency's application of public comment** in rule-making processes across programs.

4. **Lands Advisory Group Study:** assessing **volunteers' capacity to engage and enhance** agency lands advisory groups.

Tracking Best Available Economic Statistics

Recreational Fishing

938k annual participants

$1.14 billion in spending

Hunting

219k annual participants

$356 million in spending

Wildlife Watching

2.17M annual participants

$3.17 billion in spending

Commercial Fishing

62k jobs supported

$358 million in avg landings revenue

2011 Fishing, Hunting, and Wildlife Associated Recreation Survey (USFWS); 2020 Fisheries Economics of the United States (NOAA)

What is the *non-market value* of the ecosystem services provided by the Duckabush restoration?

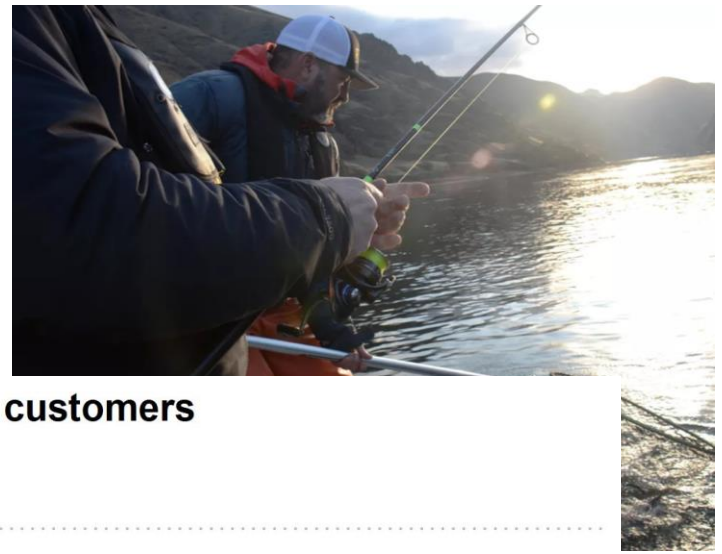
Restoring the ecosystem function of the Duckabush Estuary identified as a key step in recovering listed **Hood Canal summer chum** populations

Requires replacing US 101 causeway with 1,600’ span

Used *benefits transfer* to apply value estimates from the literature

➔ Recovery valued at an estimated **$90.9mill** of future non-use benefits (undiscounted)

What is the role of guide fishing in the recreation economy?



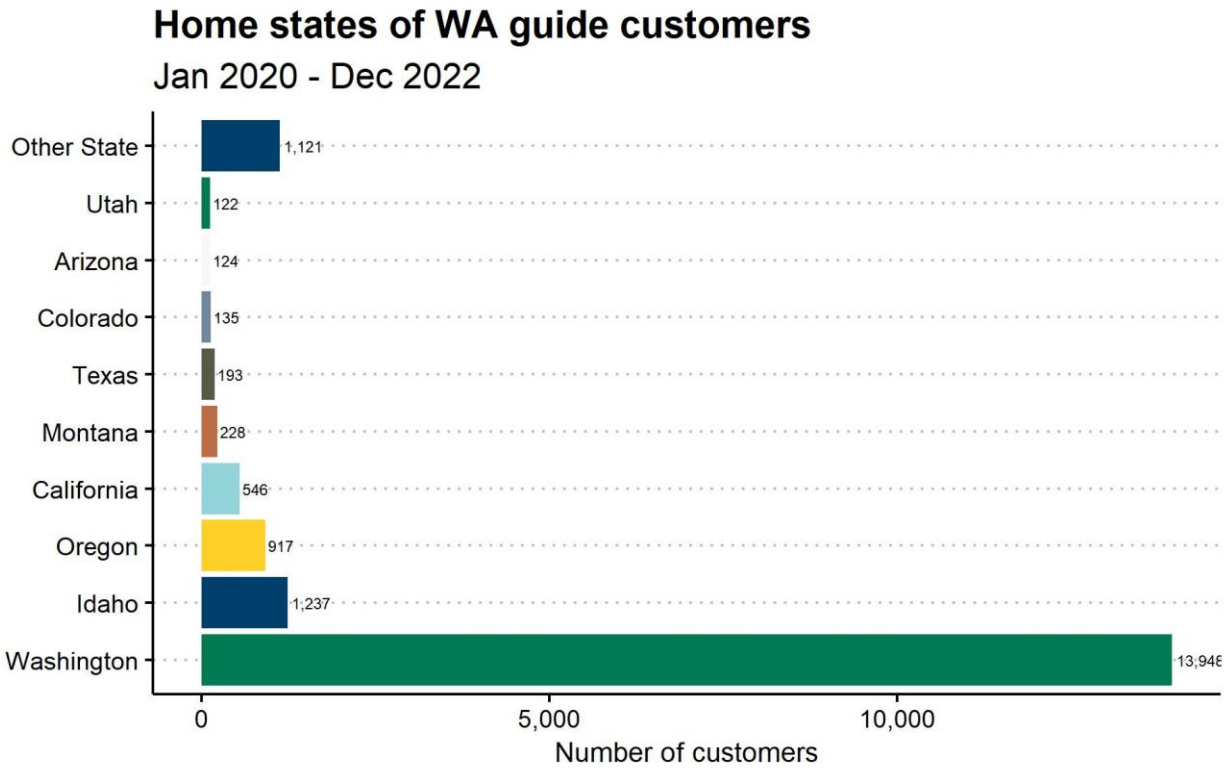
~500 licensed fishing guides* in Washington state

Required to keep **logbooks**

➔8.4k customers took 15.k trips

➔25% of customers from outside WA

Next Steps: Gather price, costs data necessary for IO analysis



How can we best meet demand for water recreation?

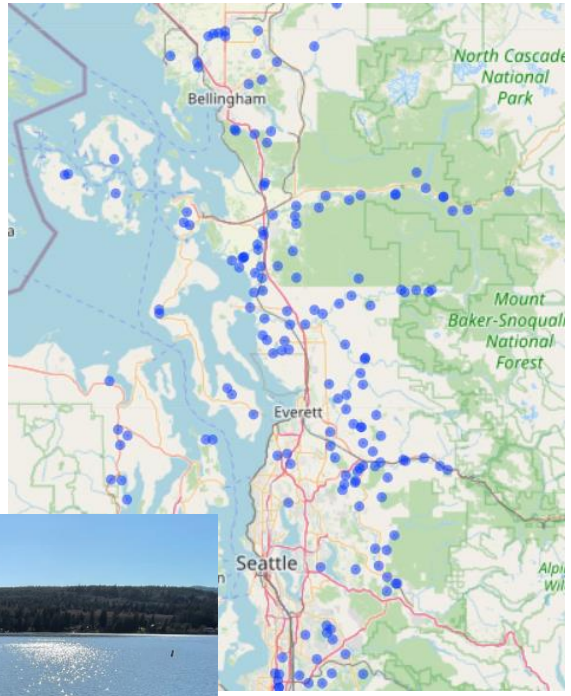
DFW manages **~400 Water Access Sites** across the state

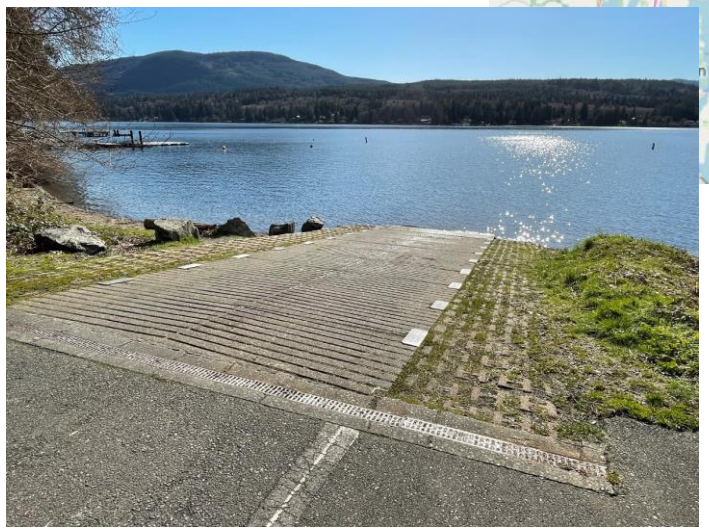
Managing for multiple uses

– Fishing, boating, paddling, wildlife watching, swimming, cookouts, etc.

Revealed Preferences: Survey of random addresses, anglers asking about *most recent trip*

➔ Will recover *willingness-to-pay* estimates for site features





Conclusion

Social sciences are **diverse & rigorous** scientific disciplines

Incorporating social science research findings can improve the **efficiency, efficacy, and equity** of conservation and agency operations

WDFW is leading among peers in social science integration and application

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*"Making available the best social science possible and using it in decision-making is critical for improving the **credibility**, **defensibility**, and **social acceptability** of management decisions, and may **improve compliance** with them, **reducing enforcement costs**."*

(Charnley et al. 2017)

Thank you!

Questions?