Chapter 12
Human-Nature Relationships for the Flathead Wild and Scenic River System: Analyzing Diversity, Synergies, and Tensions in a Mountainous Region of Montana, USA

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Significance Statement Natural resource planners face the challenging task of sustaining the diverse range of human-nature relationships supported by mountain systems. Planners of the Flathead Wild and Scenic River system cannot reasonably consider and communicate each individual human-nature relationship in the planning process. We present a social science approach that facilitates public engagement by having members of the interested public prioritize human and ecological meanings and services. Statistical analysis distills the diverse range of human-nature relationships into a limited number to be considered by river planners. Six typified human-nature relationships are explored, and through an understanding of synergies and tensions, planners gain knowledge to support both decision-making and communication for sustaining the integrated mountain system.

Keywords River planning · Q-methodology · Public engagement · Protected areas

1 Introduction

The Flathead Wild and Scenic River (WSR) system, in northwest Montana, USA, supports the well-being of a diverse range of people, communities, and ecosystems – in other words, it fosters a broad spectrum of human-nature relationships. The headwaters flow out of the mountains, passing through and along the Bob Marshall Wilderness Complex and Glacier National Park, two of the earliest and most iconic

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protected area designations in the United States. The Flathead River eventually emerges into the Flathead Valley and Flathead Lake. The mountain system surrounding this watercourse is home to ecological and biological diversity, small residential populations, an agricultural landscape, dams and hydropower production, an aluminum plant (closed in 2015 and now designated as a superfund site), and a vibrant tourism industry. Additionally, the aboriginal territories of several Native American tribes encompass the area, and the economic and cultural importance of the Flathead River is clearly represented in a decade long negotiation and recently ratified 'water compact' between local tribes, and state and federal government entities (Aadland & Dietrich, 2020).

The residents within the mountain system have long struggled to preserve the environment for recreational and tourism opportunities while also maintaining a traditional connection to resource utilization (e.g., timber, hydropower) (Drummond et al., 1975). For instance, the impacts of a proposed hydropower dam (Craighead, 1957) and a proposed coal mining operation (Espeseth, 1979) received early attention, though such threats have, in large part, subsided with legal protections such as Wild and Scenic River designation (WSRA, 1968). Today there is an increasing tension between protecting the environment, maintaining multiple recreation experiences, and growing tourism. This tension is underpinned by factors that are typical of mountain systems, including a remote location far from major markets, and cultural characteristics such as an independent spirit leery of government regulation, and strong backcountry hunting and fishing traditions. The mountainous region of interest in this chapter is constituted, in large part, of public land and waters administered by the United States federal government. As such, there are formal planning processes that require public engagement to better understand stakeholder interests and, additionally, provide the opportunity for decision-makers to communicate the direction of public land management to, in part, foster public support and understanding (USDA Forest Service, 2012).

For the Flathead WSR system, a nested social-ecological system that directly affects the social, economic, and ecological conditions of the broader mountain system, an ongoing planning effort will establish the direction of management for the next several decades. With 349 km of its upper reaches protected under the Wild and Scenic Rivers Act (WSRA, 1968), the Flathead WSR system includes three forks of the Flathead River; to be designated as Wild and Scenic, a river must "possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values". The three Flathead rivers, individually and combined, provide outstanding opportunities for untrammeled conditions, solitude, primitive and unconfined forms of recreation, challenge, remoteness, as well as for camping, angling, hunting, wildlife viewing, horse-packing, and other forms of shore-based recreation (Fig. 12.1). Whitewater, as well as wide river valley locations feature rafting, kayaking, and canoeing experiences, as well as a range of popular fishing, swimming and picnicking opportunities. It is this diverse combination of recreation that creates a unique and outstandingly remarkable value. Other outstandingly remarkable values include historic uses such as trapping, homesteading, and artifacts of early conservation management, ethnographic values reflecting

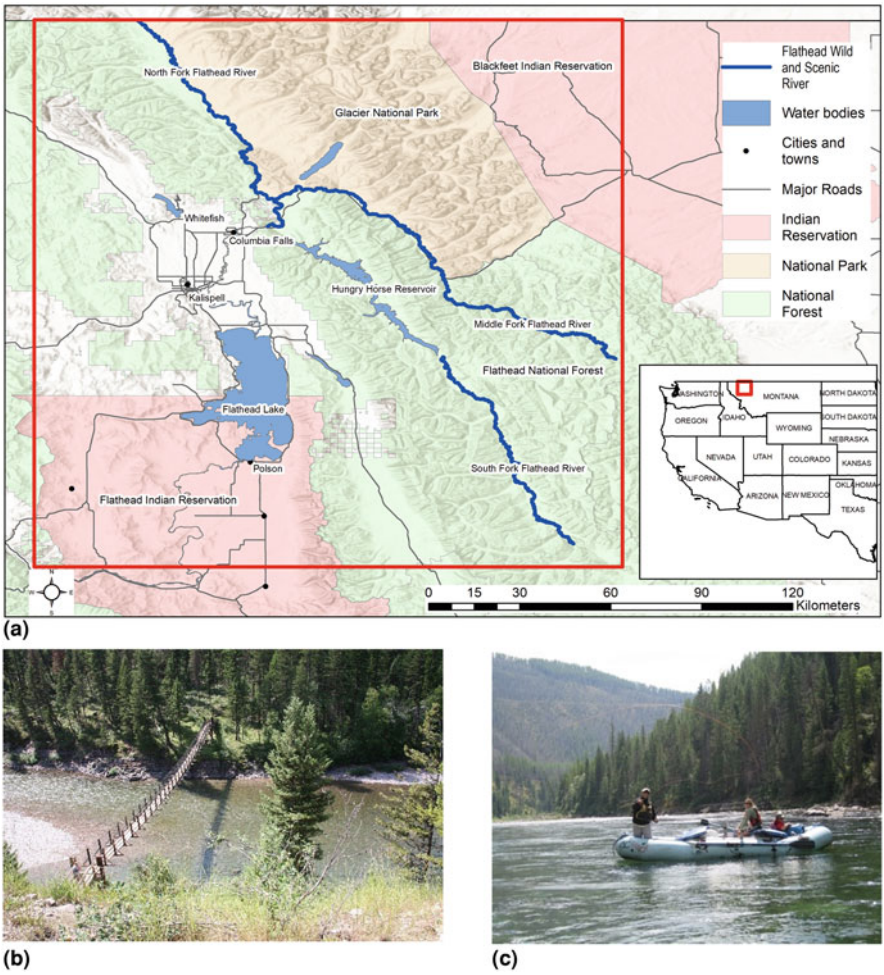

Fig. 12.1 Map (**a**) and images (**b** and **c**) of the Flathead Wild and Scenic River system. (Photo credits: C. Armatas)

continuous human presence going back to at least middle Paleolithic times with all three forks used as travel routes, spiritual practices and subsistence purposes.

Given the diversity of human-nature relationships related to the Flathead WSR, planners and managers face the challenge of understanding, communicating and, to the greatest extent practicable, supporting and accommodating these relationships. This study demonstrates the role that social science can play in both recognizing and understanding these important human-nature relationships, as well as a process that allows land managers and policy makers to demonstrate their engagement with a plurality of relations to nature that cannot necessarily be traded off against one another. This study explores a diverse range of human-nature relationships for the

Flathead WSR system; we then discuss the complexities of maintaining socio-cultural, ecological, and economic sustainability within an integrated mountain system.

2 Methods

We conceptualize human-nature relationships broadly (Armatas, 2019), in a manner consistent with Flint et al. (2013), which moves beyond worldviews or attitudes related to the appropriate role, or positionality, of humans with regard to nature (e.g., humans as 'master' or 'steward') (van den Born et al., 2001; Bauer et al., 2009). That is, we agree with Dvorak, Borrie, and Watson (2013:1519) that the term human-nature relationship is "quite nebulous", and suggest that the broad concept can be defined and partially captured with notions such benefits and uses, meanings and values, and place attachment and identity, to name a few. However, when empirically investigating human-nature relationships, we suggest that, inevitably, the idea is reduced to being comprised of component parts, or *elements* (Armatas, 2019). For this study, we chose human and ecological meanings and services (HEMS) (Williams & Watson, 2007) as the framing elements of the human-nature relationship. Ecosystem services (de Groot et al., 2002) is another way to think of human-nature relationship elements, though it is a concept that has been largely framed through an economic and anthropocentric lens. The use of 'meanings' within the HEMS framing provides language that explicitly highlights the importance of, for instance, wildlife beyond human uses (e.g., intrinsic value). That is, we believe the use of HEMS as a framing facilitates communication within the context of the Flathead WSR system in a way that underscores the various ways people relate to the resource (e.g., economic, cultural, spiritual, intrinsic). HEMS, as a broad framing, is more akin to 'nature's contribution to people' (Díaz et al., 2018), which aims to be inclusive of different worldviews without assuming that all elements of the human-nature relationship are perceived as positive contributors.

To explore the various human-nature relationships for the Flathead WSR system, we applied Q-methodology (Brown, 1980; Watts & Stenner, 2012) which, foundationally, uses a 'Q-sort' where participants prioritize HEMS related to the Flathead River system in a structured way (i.e., HEMS are prioritized in relation to one another, thus requiring tradeoffs). The method facilitates an understanding of differential perspectives, thus resisting a central tendency of opinion, by exploring a limited number of Q-sort groupings (i.e., factors defined by people sorting similarly). The HEMS for this study were primarily derived from a governmental report outlining values of the Flathead River system (Flathead National Forest and Glacier National Park, 2013) and through discussions with natural resource managers and planners. An initial, expansive list of potential HEMS, known as the 'concourse' in Q-methodology (Brown, 1980), was created. The concourse was then distilled into the list of HEMS to be sorted by participants (Table 12.1); a process that included

Table 12.1 Human and ecological meanings and services (HEMS) to be sorted by participants

Ecological meanings and services	
1. Water quality 2. Wildlife habitat and connectivity 3. Aquatic habitat 4. Biodiversity and abundance of wildlife (including threatened and endangered species) 5. Pure fisheries where no non-native fish are present (for example—Westslope cutthroat and bull trout populations in south fork)	6. Diverse and abundant fisheries (full complement of native fish) 7. Rare plant life (often found in wetlands) 8. Diverse and abundant plant life (including seed collection from intact native plant communities)
Human services	
9. Non-motorized river recreation and going with the pace of the river (for example—Rafting, canoeing, fishing from a boat) 10. Motorized river recreation 11. Shore-based recreation and activities (for example—Mountain biking, snow-shoeing, stock use, watching the river flow by) 12. Large-scale exploration in a short amount of time (for example—Driving for pleasure) 13. Wildlife viewing, including photography 14. Viewing geologic features or exploring caves 15. Guided recreation 16. Catch and release fishing 17. Dispersed camping without services 18. Developed camping with services 19. Staying in rustic forest service cabins 20. Economic support to local communities (for example—Jobs and visitor spending) 21. Comfort, safety, and convenience	22. Subsistence activities (for example—Hunting, fishing, foraging for food) 23. Native American use of the river system (for example—Exercising treaty rights, religious/spiritual practices) 24. Easy access to river (for example—Paved vehicular river access sites, or easily accessible trailheads for river-side hikes) 25. Challenging, adventurous, and/or unique river access (e.g., south fork hike or pack, or air delivery to Schafer meadows) 26. Experiences with limited planning, or ability to go on short notice (for example—Day hikes, day floats) 27. Extended, independent, and self-sustained experiences (for example—Multi-day floats or backpacking) 28. Personal achievement from testing and developing skills and abilities
Human meanings	
29. A place for wildness 30. Solitude 31. Quiet soundscapes 32. Clear night sky 33. Scenic beauty, aesthetics, and inspiration (for example—Views of dramatic and rugged peaks) 34. Finding remote and vast places where people rarely visit 35. Being free from society and its regulations 36. Learning how to function and cooperate as a group 37. Social time with friends and/or family—Social bonding 38. Sharing an experience with others outside ones group (camaraderie with strangers) 39. Connecting to the past, and passing stories and knowledge to younger generations 40. A symbol of America's identity, and national heritage and pride	41. Opportunities to reflect and learn about social history and past inhabitants (e.g., tribal groups, homesteaders, early rangers) 42. Educational and research resource (for example—Botany, geology, wildlife) 43. Native American history and knowledge (for example—Culturally scarred trees) 44. History of land management and conservation (for example—The network of historic Forest Service cabins) 45. Homesteading and trapping history and culture (for example—Numerous homesteads and the Polebridge mercantile) 46. Transportation history (for example—The great northern railway through John Stevens canyon) 47. History of mineral use and extraction (for example—The inside north fork road, built by the Butte oil company in 1901)

Note: The numbering of the HEMS is for presentation purposes only. Participants did not sort HEMS with associated numbers, and they do not convey any prioritization herein (i.e., water quality is not to be viewed as the most important HEMS)

iterative discussions with managers and planners, as well as pilot tests with people from both within and outside the federal land management agencies.

During late summer and early fall of 2019, participants who attended either a public planning meeting or were contacted at the river, nearby campground, outdoor business or office completed a Q-sort of HEMS. For the Q-sort, each of the HEMS in Table 12.1 was listed on a separate card, and participants were asked to place the importance of each HEMS from "most important" to "most unimportant" along a quasi-normal distribution. Figure 12.2 presented in the results section shows the forced distribution participants were asked to sort along. Q-methodology focuses on the expression of a plurality of perspectives, without concern about the prevalence or distribution of perspectives across a population. Therefore, sampling is purposeful.

For analysis of the Q-sorts, factor analysis is applied to a correlation matrix of all Q-sorts, which yields a limited number of typified perspectives, or archetypes. Generally, the goal of analysis is to distill the perspectives of many people (157 in the case of this study) down to a tractable number of archetypical Q-sorts, or the weighted average of several Q-sorts done similarly (6 archetypes in this study). One benefit of such a distillation is that, in practice, decision-makers can understand, communicate, and consider *six* perspectives (as opposed to 157 perspectives).

For the reader more interested in this analysis, we recommend: (1) general information about the method and associated statistical analysis (Brown, 1980; Stephenson, 1954; Watts & Stenner, 2012) and; (2) information about the method and associated statistical analysis that is specific to Federal land management and planning (Armatas et al., 2017; Steelman & Maguire, 1999).

3 Results

In total, 157 people completed Q-sorts, with 100 of them participating in one of two public meetings held by the Federal land management agencies in relation to planning of the Flathead WSR system. The remaining 57 people were contacted in several public locations and included people at campgrounds, floaters and anglers, landowners adjacent to the Flathead River, and Native American tribal members with traditional lands within the integrated social-ecological system. Analysis yielded a six-factor solution based upon statistical criteria including consideration of factor loadings and the Scree test of eigenvalues. These six typified relationships, or archetypes, represent six empirically distinct viewpoints of what is important in the Flathead WSR system and how each reflects different priorities and relationships in the system. We selectively highlight examples of the results for the purpose of underscoring both the diverse human-nature relationships and the complexity of planning for the Flathead WSR system; additionally, we highlight how this approach can aid understanding of tensions and synergies across the different human-nature relationships. For the reader interested in the full details related to this study, an archive with an unpublished report prepared for decision-makers and associated (and anonymous) raw data is freely available (Armatas et al., 2021).

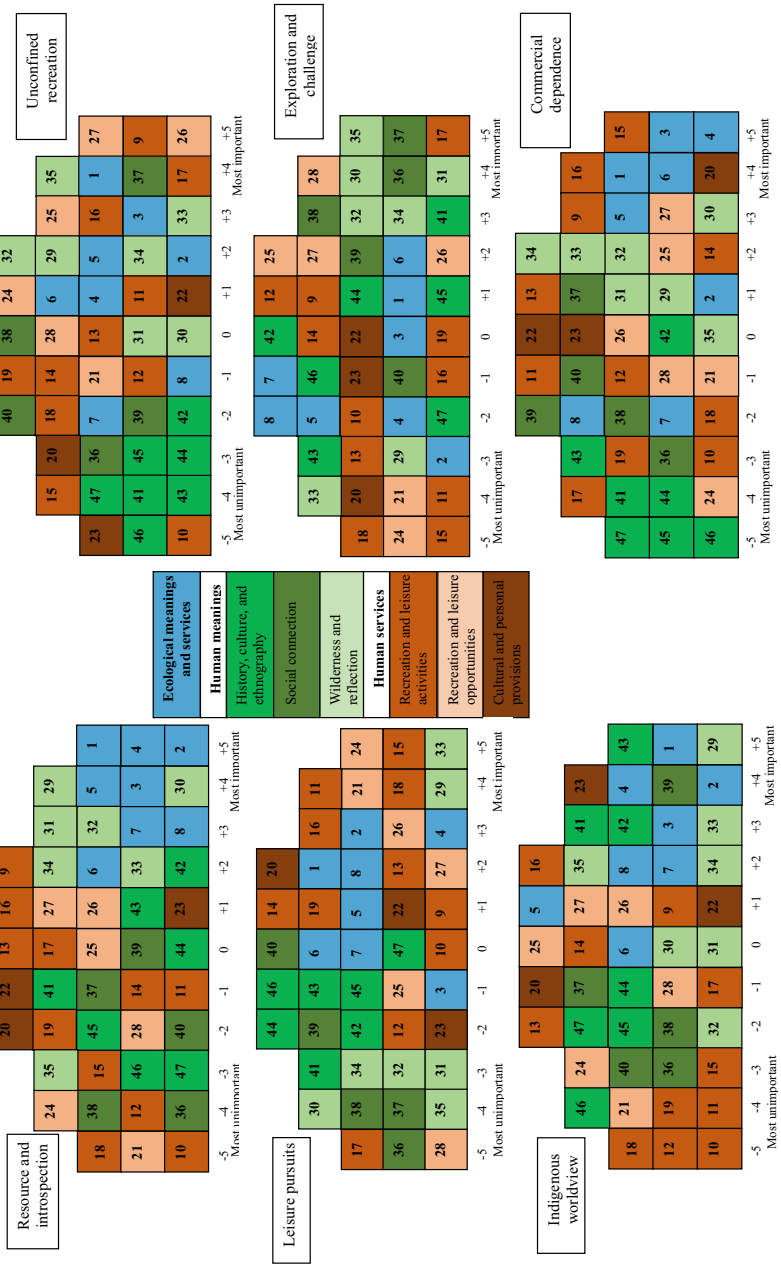

Fig. 12.2 Six archetypical human-nature relationships fostered by the Flathead WSR system

3.1 Human-Nature Relationships for the Flathead WSR System

Figure 12.2 provides a detailed representation of the diverse ways people relate to the Flathead River system. The numbers in Fig. 12.2 correspond with the human and ecological meanings and services (HEMS) listed in Table 12.1 (e.g., "1" inside a cell represents the placement of Water quality in each of the different archetypes), and the color scheme highlights the types of different HEMS (i.e., ecological meanings and services, human meanings, and human services) that are prioritized in the different archetypes. For the purposes of communication, based on examination of their factor structure, the six archetypes explored in this research were dubbed: Resource and introspection, Unconfined recreation, Leisure pursuits, Exploration and challenge, Indigenous worldview, and Commercial dependence.

Figure 12.2 highlights and illustrates the composition of each archetype. For example, human-nature relationships that aligned with the Resource and introspection archetype prioritized, in general, ecological meanings and services, and those human meanings related to wilderness and reflection. The Indigenous worldview archetype also prioritized several ecological meanings and services, but they differed from all other archetypes in their prioritization of Native American history, knowledge, and use of the river system. In general, the Leisure pursuits, Unconfined recreation, and Exploration and challenge archetypes prioritize recreation; albeit different importance for different elements of the recreation experience. For instance, the Leisure pursuits archetype highlights a human-nature relationship that may not even pertain to floating the river, and the Unconfined recreation archetype, true to its name, was heavily focused on a recreation experience that was free from regulations. Lastly, those human-nature relationships that align with the Commercial dependence archetype underscore desire to balance ecological meanings and services and deriving livelihoods.

Figure 12.2 can also highlight common ground and tensions among all human-nature relationships. There is consensus about the importance of water quality, biodiversity and abundance of wildlife, and access. Whether for community health, the recreation experience, the tourism industry, downstream agricultural operations, or cultural and spiritual benefits, maintaining particular ecological meanings and services and access to the resource are foundational to the human-nature relationships sustained by this mountain system. As an example of tensions, or areas where a change in the provision and/or protection of particular HEMS may disparately impact human-nature relationships, we highlight the general tension between a growing tourism industry and recreational use on perceived naturalness and abundant solitude. Generally, the mixed view of tourism in the Flathead River system is evident in the disagreement around the importance of economic support to local communities stemming from river use. That is, guided recreation and economic support to local communities are generally unimportant to the Resource and introspection archetype, the Unconfined recreation archetype, the Exploration and challenge archetype, and the Indigenous worldview archetype.

Another, related tension is the different recreational experiences represented by the Leisure pursuits archetype, the Unconfined recreation archetype, and the Exploration and challenge archetype, which highlights that 'recreation', as an important component to human-nature relationships, is not monolithic. Finally, we highlight the tension related to the history, culture, and ethnography HEMS, which were generally seen as a low priority to all archetypes except the Indigenous worldview archetype.

4 Discussion: Sustaining Social-Ecological Systems Through a Focus on Human-Nature Relationships

While there is no single correct 'solution' for planning for complex systems such as the Flathead WSR system, as it constitutes a wicked problem (Norton, 2012; Rittel & Webber, 1973; Davies et al., 2015), we suggest that knowledge about diverse human-nature relationships is important for two broad reasons: (1) understanding the complexities and nuance of how different human-nature relationships will be influenced by a change in HEMS and; (2) clear communication with the interested public about the diverse human-nature relationships for the purpose of facilitating mutual awareness and respect.

For the purpose of on-the-ground planning and management (e.g., weighing choices such as restricting access for recreation, investing in invasive species prevention), understanding both the commonalities across different human-nature relationships (e.g., the importance of water quality) and the areas of disagreement (e.g., the preferred direction for the tourist industry) is critical. Such knowledge will highlight which human-nature relationships are likely to be positively or negatively influenced under different planning scenarios and, while no scenario is likely to fully satisfy all, it may be possible to minimize the negative effects. Currently, planners of the Flathead WSR system are perhaps most explicitly concerned about addressing recreation related issues, including the tension between maintaining an unregulated recreation experience and an experience that provides ample opportunities for solitude, and the mixed view related to commercial use and guided recreation. While the findings from this study highlight the need to address these recreation related issues, the findings can also serve as a reminder to planners of the Flathead WSR system about the diverse range of human-nature relationships that exist, some of which have concerns extending beyond recreation. For instance, the Indigenous worldview and the Resource and Introspection archetypes generally prioritized ecological meanings and services, which underscores the potential need of planners to clearly demonstrate how future management of the system will ensure the protection of the ecosystem; in doing so, Fig. 12.2 can guide planners to focus on those ecological meanings and services that may be of high priority to most or all human-nature relationships (e.g., water quality, biodiversity and abundance of wildlife).

The wicked nature of sustaining complex systems implies a task that is, in large part, about communicating with a diverse range of people and their equally diverse human-nature relationships. We argue that clear, transparent, and consistent communication and an increasing awareness and validation of differing human-nature relationships is beneficial, based on the assumption that greater knowledge in this area may lead to increased empathy (Armatas et al., 2019) and, perhaps, social learning (Armatas, 2019). For example, this research highlights the importance of different recreation experiences for three different archetypical human-nature relationships, but in some instances these different recreation experiences may be in tension. It is possible that knowledge of these tensions with the explicit acknowledgement and validation of different human-nature relationships could influence acceptability of a management action that, for instance, limits use for the protection of solitude, even if such an action constitutes a negative influence on experiences with limited planning.

Finally, we stress a broader point, which is that by focusing on HEMS and human-nature relationships (and the corresponding deeply personal elements such as cultural connections and identity), there is less emphasis on specific people, and interest/user groups. This research stresses that human-nature relationships are not unidimensional and, given that the archetypes feature numerous HEMS, decision-makers are pushed to engage with the plurality and nuance of such relationships. Further, decision-makers are pushed to confront the challenge of communicating that the Flathead WSR does not only support jobs and incomes, but also meanings, values, identities, and attachments that, in aggregate, represent complex and intertwined human-nature relationships. Documenting what people with differing human-nature relationships may prioritize or not can guide decision-makers focus away from user- or interest-groups based on socio-demographics. If we assume that building more resilient mountain systems will require, at least in a part, a shift in behavior and worldviews that is representative of diverse connections to nature (Turner & Clifton, 2009; Mayer & Frantz, 2004), then understanding both the breadth (e.g., commercial dependence to introspection) and depth (e.g., personal bonds to the river, connecting to the past) of human-nature relationships is needed.

5 Conclusion and Future Research

The Flathead WSR system in Montana, USA supports a diverse range of people and communities, and planning processes related to the long-term direction of the social-ecological systems in the region require understanding of different human-nature relationships. This study presented social science research related to six different human-nature relationships relevant to planning for the future sustainability of the Flathead River system. Using an established practical approach for implementation into natural resource planning processes, we identified areas of agreement and disagreement. The potential benefits of this approach include support for both decision-making and communication with the interested public. A limitation that

may be worth noting is that this approach does not provide any knowledge about how different archetypes are distributed across the population; without such knowledge, planners cannot know if particular decisions will be broadly popular or unpopular.

As we look towards future research, there is a need to understand how different framings and a broad approach to articulating the connection of people to nature changes peoples' perspective, if at all. In other words, empirical investigations that focus on the social learning and empathy effects of enhanced understanding of diverse and complex human-nature relationships will be critical to building more resilient integrated mountain systems.

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References

Aadland, C., & Dietrich, E.. (2020). *CSKT water compact clears congress*. Montana Free Press, December 22. https://montanafreepress.org/2020/12/22/cskt-water-compact-clears-congress/

Armatas, C. A. (2019). Pragmatist ecological economics: Focusing on human-nature relationships and social-ecological systems (dissertation). In *Department of Society and Conservation*. The University of Montana. http://scholarworks.umt.edu/etd/1025/

Armatas, C. A., Borrie, W. T., & Watson, A. E. (2019). *Protocol for social vulnerability assessment to support National Forest Planning and management: A technical manual for engaging the public to understand ecosystem service tradeoffs and drivers of change*. Gen. Tech. Rep. RMRS-GTR-396. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 52 p. Available at URL: https://www.fs.usda.gov/treesearch/pubs/59038

Armatas, C. A., Venn, T. J., & Watson, A. E. (2017). Understanding social–ecological vulnerability with Q-methodology: A case study of water-based ecosystem services in Wyoming, USA. *Sustainability Science, 12*(1), 105–121. https://doi.org/10.1007/s11625-016-0369-1

Armatas, C. A., Watson, A. E., & Borrie, W. T. (2021). *Flathead wild and Scenic River planning: 2019 Q-methodology data on public perspectives of human and ecological meanings and services and drivers of change*. Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2021-0025

Bauer, N., Wallner, A., & Hunziker, M. (2009). The change of European landscapes: Human-nature relationships, public attitudes towards rewilding, and the implications for landscape Management in Switzerland. *Journal of Environmental Management, 90*(9), 2910–2920. https://doi.org/10.1016/j.jenvman.2008.01.021

Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. Yale University Press.

Craighead, J. (1957). Wild River. In *Montana Wildlife*. Montana Fish and Game Department. Available at URL: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd570453.pdf

Davies, K. K., Fisher, K. T., Dickson, M. E., Thrush, S. F., & Le Heron, R. (2015). Improving ecosystem service frameworks to address wicked problems. *Ecology and Society, 20*(2). The Resilience Alliance. https://doi.org/10.5751/ES-07581-200237

de Groot, R. S., Wilson, M. A., & Boumans, R. M. J. (2002). A typology for the classification, description and valuation of ecosystem functions, goods and services. *Ecological Economics, 41*(3), 393–408. https://doi.org/10.1016/S0921-8009(02)00089-7

Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R. T., Molnár, Z., Hill, R., et al. (2018). Assessing nature's contributions to people. *Science, 359*(6373), 270 LP–272 LP. https://doi.org/10.1126/science.aap8826

Drummond, L., Boyd, S., Dakin, W., & McGlynn, K. (1975). *Lifestyles of Western Montana: A comparative study. Report submitted to the Western Montana planning area guide team*. United States Forest Service, Department of Anthropology and the Institute for Social Research, University of Montana.

Dvorak, R. G., Borrie, W. T., & Watson, A. E. (2013). Personal wilderness relationships: Building on a transactional approach. *Environmental Management, 52*(6), 1518–1532. https://doi.org/10.1007/s00267-013-0185-7

Espeseth, K. J. (1979). The proposed Cabin Creek coal development: The social impact for the north fork of the Flathead River. In *Environmental Studies*. The University of Montana.

Flathead National Forest and Glacier National Park. (2013). *Outstandingly remarkable values assessment of the Flathead River system*. Flathead National Forest and Glacier National Park.

Flint, C. G., Kunze, I., Muhar, A., Yoshida, Y., & Penker, M. (2013). Exploring empirical typologies of human–nature relationships and linkages to the ecosystem services concept. *Landscape and Urban Planning, 120*, 208–217. https://doi.org/10.1016/j.landurbplan.2013.09.002

Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology, 24*(4), 503–515. https://doi.org/10.1016/j.jenvp.2004.10.001

Norton, B. G. (2012). The ways of wickedness: Analyzing messiness with messy tools. *Journal of Agricultural and Environmental Ethics, 25*(4), 447–465. https://doi.org/10.1007/s10806-011-9333-3

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences, 4*, 155–169.

Steelman, T. A., & Maguire, L. A. (1999). Understanding participant perspectives: Q-methodology in national forest management. *Journal of Policy Analysis and Management, 18*(3), 361–388. John Wiley & Sons, Inc. https://doi.org/10.1002/(SICI)1520-6688(199922)18:3<361::AID-PAM3>3.0.CO;2-K

Stephenson, W. (1954). *The study of behavior: Q-technique and its methodology* (Vol. 29). The University of Chicago Press. https://doi.org/10.2307/2281274

Turner, N. J., & Clifton, H. (2009). 'It's so different today': Climate change and indigenous lifeways in British Columbia, Canada. *Global Environmental Change, 19*(2), 180–190. https://doi.org/10.1016/j.gloenvcha.2009.01.005

USDA Forest Service. (2012). *National Forest System Land Management. Federal Register 77(68):21162–21276*. U.S. Government Printing Office.

van den Born, R. J., Lenders, R., De Groot, W. T., & Huijsman, E.. (2001). The new biophilia: An exploration of visions of nature in Western countries. *Environmental Conservation, 28* (1). Cambridge University Press, pp. 65–75. http://www.jstor.org/stable/44521679

Watts, S., & Stenner, P. (2012). *Doing Q methodological research: Theory, method and interpretation*. SAGE Publications Ltd.

Williams, D. R., & Watson, A. E. (2007). Wilderness values: Perspectives from non-economic social science. In A. Watson, J. Sproull, & L. Dean (Eds.), *Science and stewardship to protect and sustain wilderness values: Eighth world wilderness congress symposium; September 30–October 6, 2005; Proceedings RMRS-P-49* (pp. 123–133). U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

WSRA. 1968. Wild & Scenic Rivers Act. *16 U.S.C. 1271–1287*. United States.