Klamath Dam Removal and Karuk Tribal Community Well-Being: Baseline Social Impact Assessment

Sibyl Diver, John R. Oberholzer Dent, Daniel Sarna-Wojcicki, Ron Reed, Nathaniel Ramos, Cole Dill-De Sa

Stanford University, University of California - Berkeley, and Karuk Department of Natural Resources Pikyav Field Institute

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Sibyl Diver[1], John R. Oberholzer Dent[2], Daniel Sarna-Wojcicki[3], Ron Reed[2], Nathaniel Ramos[1], Cole Dill-De Sa[1]

[1]Stanford University, [2]Karuk Tribe, [3]University of California - Berkeley

We are Karuk-arara… the Up-River people… when the river is strong, the people are strong.
– Anonymous survey respondent

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We wish to first thank the Klamath River, the Karuk Tribe, and the Karuk Department of Natural Resources, especially its Water Quality Program. In addition, we are deeply grateful for each survey respondent and focus group participant who shared their experiences and expertise. We are honored to work in this place, with this community. This study would not be possible without our colleague Dr. Carolyn Smith, whose work was instrumental in study design and data collection. Many Tribal staff made key contributions to study design, and others helped organize the survey and focus groups. This project benefitted from valuable assistance with the project website, focus groups, and report editing contributed by Crystal Liu, Maria Ridgeway-Elsner, and Ireland Sherrill. For editing, we thank Michelle Ng, and for enhancing helpful discussion points we thank Holly Doremus, Angeles Mendoza Sammat, and Larry Alameda. For copy editing and formatting, we thank Jennifer Dent. Focus groups would not have been possible without generous hosts: Scott Aseltine and the Karuk Youth Leadership Council, Florrine Super, Blythe Reis and Mark DuPont, and the Karuk Department of Natural Resources. We appreciate the scholarship and that comes before us and contributed towards the Klamath dam removal decision, especially John Salter's context statement on dam removal with the Karuk Tribe, Thomas King's cultural riverscape report, Mike Belchik's report with Dave Hillemeier and Ronnie Piece on the 2002 Klamath fish kill, and Kari Norgaard's altered diet report with Ron Reed. Finally, we wish to acknowledge generations of Indigenous and allied leadership on eco-cultural restoration and revitalization, including Dennis Martinez, Leaf Hillman, Susan Fricke, Bill Tripp, Frank Lake, Ron Reed, Kari Norgaard, Jennifer Sowerwine, Tom Carlson, Herb Hammond, Art Adolph, Herman Alec, Melissa K. Nelson, and others.

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COVER PHOTO

The largest dam removal project in history is currently underway on the Klamath River (California and Oregon, US), following two decades of Indigenous-led advocacy. This image depicts the Klamath River recliaming its original channel in the reservoir footprint above Copco 1 in February 2024, approximately two weeks after the dam was breached. (Photo: John R. Oberholzer Dent)

Executive Summary

Figure 0-1: The mural, "#WaterWrites Orleans, California," painted by local artists, elders, youth, the Water Writes team, and community organizers in Orleans, CA (Photo: Ireland Sherrill)

This collaborative research initiative engages the Karuk Tribe, the Karuk Department of Natural Resources (Karuk DNR), and the Karuk Tribal community to co-develop an assessment evaluating the social, cultural, and economic impacts of Klamath dam removal on Karuk Tribal community well-being. By engaging with the Karuk Tribe and Karuk knowledge systems, this study extends primary understandings of dam removal as an infrastructure removal or salmon restoration project to recast Klamath dam removal as an eco-cultural revitalization initiative.

In this case, biophysical changes from dam removal are expected to revitalize cultural practices predicated on a healthy environment that are tied to Karuk ceremonial practices and cultural identity. Thus, dam removal is viewed as a transformational moment for improving river health and re-enabling cultural practices, in part by facilitating intergenerational knowledge transfer and repairing healthy relationships held among community members and with the river. As a key contribution to cultural continuity, dam removal provides an impetus for Karuk youth to learn about the place where their ancestors and families come from, a source of inspiration for younger generations to reconnect to the Klamath River, and a reason to celebrate Karuk self-determination and resilience in the face of change.

Primary data collection occurred in the six months prior to the start of dam decommissioning in June 2023, and followed twenty years of Tribal leadership culminating in current Klamath dam removal. By conducting this research with Tribal partners, we have produced a baseline assessment to better understand how domains of social well-being change with dam removal, and also consider the impact of the movement for dam removal thus far. Importantly, this research is being carried out after the decision to remove four dams in the mid-Klamath has taken place, in compliance with required environmental impact reviews, as well as permitting and management planning (https://klamathrenewal.org/regulatory/). Separate from the established regulatory process, our social assessment provides greater understanding of the meaning of Klamath dam removal from a Karuk Tribal perspective and also a community-driven definition for what dam removal success looks like for the Karuk Tribe.

Klamath Dam Removal Context

Removal of four large dams on the Klamath River (J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate dams) is ongoing from 2023-2024. These dams are located directly upstream of the Karuk Tribe's Aboriginal Territory and Tribal lands. They have provided relatively low levels of hydroelectric power, minimal flood protection benefits, and no irrigation waters (see https://klamathrenewal.org/the-project/), yet they have blocked fish passage for endangered salmon runs, caused significant water quality problems, and negatively impacted multiple Tribal communities.

Klamath dams have generated disproportionate levels of harm for Karuk people, who are salmon people: intimate relationships between the Tribe and salmon shape Karuk culture, identity, spiritual beliefs, law and governance. One important catalyst for this dam removal project was the 2002 fish kill in the lower Klamath mainstem, when upstream water diversions contributed to poor water quality conditions in the lower river that resulted in a disease outbreak killing tens of thousands of migrating salmon prior to spawning. Following this tragic loss, the Karuk Tribe and other Klamath River tribes began advocating for dam removal through Federal Energy Regulatory Commission (FERC) dam relicensing processes, and also strengthened Tribal science and policy initiatives for Klamath water protection.

Karuk leadership on Klamath dam removal is part of a broader struggle for Indigenous self-determination that resists ongoing legacies of state sanctioned violence and dispossession of Karuk lands and resources. The Karuk Tribe is a federally recognized tribe with a 1.048 million acre Aboriginal Territory. However, the majority of Karuk Territory overlaps with lands administered by the US Forest Service, posing challenges for self-governance and eco-cultural revitalization. In addition, the Klamath Basin extends over a large area, covering two states as well as multiple counties and Tribal territories, so that water management is typically negotiated across multiple governments and interest groups. Given the challenges of governing such a complex system, the implementation of Tribally-led dam removal on the Klamath after decades of advocacy is an important success for Karuk self-determination.

Study Team and Methods

Our team is composed of Karuk cultural practitioners, Karuk DNR staff, and researchers based at Stanford University and the University of California, Berkeley. Academic and Tribal research partners co-leading this project have been working together since 2009. Our assessment includes a community-wide survey, focus groups, and interviews.

Academic researchers were invited to conduct this study to fill a research gap on the social impacts of dam removal. The initial suggestion was made in February 2020 at a Klamath Dam Removal Science and Monitoring Technical Coordination Workshop organized by Klamath, Karuk, and Yurok Tribal representatives and scientists in Medford, Oregon. The resulting study is rooted in Indigenous research methodologies and was developed with the Karuk Tribe over a one-year scoping process held in three Tribal Council Districts (Orleans, Happy Camp, and Yreka, CA). Research is motivated by the following:

- Historical exclusion of Indigenous peoples in social impact assessment,
- Requests from scientists and the Karuk Tribe for social assessment as a gap in dam removal studies, and
- Decades of Tribal leadership on Klamath dam removal and river restoration and concerns about whether dam removal benefits will fully reach Karuk Tribal community members.

Drawing on community guidance and previous research on Indigenous assessment science that has focused on well-being (Norgaard, 2019; Donkersloot et al., 2020), this baseline assessment examines Karuk Tribal community perceptions of dam removal and aspects of Tribal community well-being that are expected to change with dam removal. We selected relevant domains of well-being for assessment with Karuk partners to reflect multiple dimensions of the Karuk community's long-standing relationship with the Klamath River watershed as an eco-cultural landscape. The five components of Tribal community well-being considered in this assessment are:

- Access to cultural resources
- Holistic health
- Education
- Livelihoods
- Self-governance

In spring 2023, our team conducted an online survey that was distributed via mail and social media to all 7,785 enrolled adult Karuk Tribal members and descendants, based on February 2023 enrollment records. We also conducted focus groups and interviews with 55 individuals. This included eight focus groups ranging from 4 to 11 members in Orleans, Happy Camp, and Yreka Council Districts, where we spoke with cultural practitioners, basketweavers, fisherpeople, Tribal Council members, ceremonial leaders, Karuk Tribe and Karuk Department of Natural Resources staff, and Tribal youth leaders, as well as four key informant interviews.

Focus group and interview transcriptions were analyzed through inductive and deductive coding using NVivo software. We also applied Indigenous storytelling methodologies to analyze selected focus groups. We analyzed survey responses using Qualtrics and R data analysis programs. Selecting high quality surveys for individuals indicating a Tribal affiliation resulted in 238 survey responses used in this analysis, which represent 3.1% of the enrolled Karuk Tribal community. This group was well-mixed with respect to geography, political environment, age, education, gender, and household income.

Community attitudes, goals, and expectations and goals for dam removal and river restoration

Nearly all survey participants indicated that the river was important to them. In general, the Karuk community was strongly supportive of dam removal (68% overall, N = 238). Although support for dam removal was more mixed by political environment, results showed majority support for dam removal for almost all demographic groups. The Yreka Council District was the one exception to this rule, yet even in this more conservative area, over 50% of respondents stated they were either supportive or unsure of dam removal (N = 31). The continued engagement of the Karuk diaspora with the Klamath River is an important finding, with significant numbers of nonlocal community members returning to the river regularly to access cultural resources. These results clearly demonstrate that the Klamath River continues to be centrally important to Karuk people, regardless of their location or background. Following dam removal, a majority of respondents expected to see improvement in cultural resource access and Tribal representation in decision-making, and to a lesser extent, personal health and well-being.

Focus group participants expressed hope that ecological recovery would occur together with associated eco-cultural practices and social activities. In particular, participants felt the return of salmon, as a center point of Karuk society, has the potential to address some of the deepest harms and challenges faced by the community. Improvements may be felt more strongly for the Karuk community in Yreka, who will now have more functional river ecosystems closely available to them, and the Shasta community, whose land

was inundated under the reservoirs. Participants were hopeful that the Karuk Tribe would have a continuing role in stewarding these resources through river restoration activities.

However, research participants also expressed trepidation and uncertainty around river recovery following dam removal given the multiple critical stressors to the watershed. As one participant asked, "Will it be enough?" Due to persistent misinformation, especially in Siskiyou County, many were unsure what to expect from dam removal or restoration. Yreka community members reported experiencing direct racism related to dam removal politics, with some afraid to speak publicly about dam removal due to retaliation (e.g., getting fired from a job). Dam removal opponents in the community frequently cited the following concerns: sediment release, toxicity, loss of recreation, impacts to fisheries, loss of power supply, flooding, and dewatering of the river. Dam removal entities have debunked or taken steps to mitigate each of these concerns (see https://klamathrenewal.org/faq/, and also https://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/docs/2024/klamath-faq.pdf). We noted that expressions of community opposition to dam removal were most often rooted in concern for the river and also potentially tied to lack of access to reliable information about Klamath dam removal processes and expected impacts.

Many focus group participants were keenly aware of potential tradeoffs associated with dam removal, including expected loss of some recreation revenue and impaired water quality conditions during drawdown, but were willing to accept them on balance, given anticipated improvements in the future, as "short-term pains for long-term gains." They were also aware that dam removal is not a cure-all, and expressed concern regarding remaining sources of river impairment from agricultural diversions, groundwater pumping, remaining dams, cannabis cultivation, disconnected floodplains, fire suppression, and catastrophic wildfire. Karuk DNR professionals discussed how some ecological benefits may be distributed on a gradient, attenuating with distance downriver from the reservoir reach.

Deeper significance of dam removal: 1) Eco-cultural revitalization

Research identified three interconnected priorities for the Karuk Tribal community around dam removal: 1) advancing eco-cultural revitalization, 2) the continuation of ceremony, spiritual practices, and Karuk identity, and 3) supporting Karuk Tribal youth. First, as a core goal for dam removal, Karuk community members in our study emphasized the interconnections between ecological and cultural elements of dam removal, and what this means to them. Given the intimate dependencies between healthy ecosystems and Karuk culture, conversations around restoring salmon quickly flowed into discussions of restoring cultural practices and identity through dam removal. Some respondents discussed their cultural identity as being rooted in an embodied relationship to the river, in a physical, spiritual, and metaphorical sense (e.g., as the "life blood of the people"); therefore, reconnecting the river revitalizes the people. This is not restricted to proximity; in addition to survey responses from as far away as Alaska, Hawai'i, and Maine, write-in responses and focus groups revealed the persistence of place in the Karuk diaspora, where nonlocal respondents expressed feelings of belonging and care towards the Klamath River.

Many Karuk cultural resources and stewardship practices rely on natural river processes, many of which are impaired by dams. Synthesizing knowledge shared both by Karuk cultural practitioners and natural resource professionals among the focus groups, we built a conceptual model of some of the linkages connecting biophysical changes from dam removal to cultural resource health. Significant ecosystem processes discussed included: connectivity to spawning grounds for salmon and lamprey eel; flushing flows for fish disease control, riparian vegetation quality, and delivery of large wood for building; sediment

transport for spawning gravels, juvenile lamprey eel habitat, and willow sandbars; and free flow of water to improve temperature and water quality.

Participants discussed changes to cultural resources and eco-cultural practices as being interconnected with improvements to ecosystem functions possible with a free-flowing river. They also discussed linkages between river restoration from dam removal and upslope management beyond riparian corridors. We note that a strictly biophysical approach, often emphasized in Western environmental science, risks overlooking the mutually beneficial caretaking between people and land that Karuk eco-cultural practices sustain, which becomes visible through an analysis of interconnected social and biophysical processes.

Deeper significance of dam removal: 2) Grounding in ceremony and spiritual identity

Second, focus group discussions of dam removal centered on Karuk eco-cultural revitalization concepts included a strong connection to Karuk ceremony. Many respondents emphasized the importance of maintaining and restoring place-based ceremonial and spiritual practices through dam removal as a means of maintaining metaphysical connections between Karuk people and the watershed they come from. When the river is too unhealthy for Karuk people to properly perform ceremonies and observe spiritual practices, this has negative impacts for all. Participants expressed deep loss and pain around current impairment, and high hopes for restoring ceremonial and other spiritual practices following dam removal.

Crucially, participants saw dams as part of a larger colonial legacy of extraction and violence that has compromised elements of Karuk lifestyle and spirituality and contributed to intergenerational trauma. Dam removal was discussed and understood as part of a broader set of efforts to heal resulting intergenerational trauma by repairing reciprocal relationships between the land and the people. Discussions indicated how dam removal provides a transformative moment of spiritual alignment, enabling the revitalization of spiritual practices that guide caretaking on the land. Such caretaking is required for Karuk people to fulfill their inherent responsibilities vis-à-vis World Renewal belief systems to maintain balance in the world.

When discussing the broader context of dam removal, Karuk community members shared their vision for a life of abundance that nurtures a rich ceremonial life and spiritual traditions, especially for the next generation. In Karuk culture, revitalization of ceremony is connected to traditional Karuk foodways and caretaking practices, many of which are carried out along the river through active land stewardship. While dam removal is only one action needed for the revitalization of Karuk Indigenous lifestyles, this event is clearly understood as contributing to a larger set of eco-cultural revitalization outcomes desired by Karuk ceremonial and government leaders.

Deeper significance of dam removal: 3) Centering Karuk youth experiences

Third, research findings emphasized the importance of dam removal for youth and generations to come. We heard that the Karuk community prioritizes its younger generations. Fostering initiatives that facilitate youth connecting to the Klamath River and Karuk place-based identities were also a high priority for many. Speaking for themselves, youth in focus groups expressed their strong connection to the Klamath River, a commitment to river protection, and a desire to grow these place-based connections and commitments. Participants emphasized that Tribal youth must be included in eco-cultural revitalization opportunities that arise through dam removal and river restoration.

Participants observed that youth today face obstacles preventing their ability to access the river and engage in place-based cultural practices that previously infused the community's daily life. Although youth shared happy memories of the river, they were painfully aware of the current health risks of swimming in the mainstem Klamath. With the river impaired, young people have fewer opportunities to experience their culture, participate in Karuk community events, and learn important skills ranging from subsistence to prayer that can help them in their lives. This is the situation that Karuk dam removal advocates seek to rectify, but it is also important to note that the positive impacts of the Undam the Klamath campaign are already felt by youth. Focus group participants reflected on what it has meant for young people to witness the successful collective organizing of Karuk people and their allies that achieved dam removal – not simply as a political win, but as a moment of reconnection that enhances the ability of Karuk to care for the river and the fish as part of their inherent responsibilities.

Despite some of the uncertainties expressed around intergenerational knowledge transfer, focus groups demonstrated that many Karuk youth have maintained a strong relationship with the river. Correspondingly, Karuk youth are motivated to support eco-cultural revitalization, and some have channeled their energy into dam removal advocacy, including the annual Salmon Run. These sentiments reflect a high level of cultural consciousness among Karuk youth that we spoke to, and an active interest in the well-being of their community in connection with the Klamath River. Much like their adult counterparts, youth have observed cultural and environmental decline within their lifetimes and feel compelled to change this. They, too, are concerned for future generations. Youth themselves understand intergenerational knowledge transfer as something that occurs through place-based, eco-cultural practices occurring on the river and connect this to potential for revitalization associated with dam removal.

Baseline assessment: 1) Access to cultural resources

Our social impact assessment documents baseline conditions across selected areas of Karuk Tribal community well-being in the six-month time period leading up to dam infrastructure removal, which started in June 2023. We evaluated five domains of Tribal community well-being for our baseline assessment, described below.

Surveying Karuk members and descendants revealed extensive cultural use of the Klamath River corridor, taking place in all areas from the lower river to reservoir reach, at all times of year. Despite barriers to cultural resource use, results portray a community that is engaged with subsistence use and related river practices. A broad majority of the community members surveyed reported accessing cultural resources, with 47% of local participants and 16% of nonlocal residents accessing at least monthly or regularly within relevant seasons (N = 106 and N = 115, respectively). The four most popular activities among local survey respondents were family outings (66%), fishing (53%), swimming (48%), and ceremony (36%). Other cultural use categories reported were hunting (30%), gathering medicine (30%), gathering basket materials (26%), gathering food (26%), recreational boating trips (23%), education and field trips (22%), eeling (12%), and other cultural uses (13%) (N = 107). Responses of frequent cultural use from nonlocal participants conveyed the continued importance of subsistence and ceremony in the lives of Karuk people everywhere, not only those who live near the river or near ceremonial grounds. The spread of cultural activities among different demographics groups in the Karuk community reflects the distribution of knowledge, priorities, and available resources along the river.

The survey revealed many barriers to cultural resource use. Many of these barriers stem from colonial legacies including genocide, displacement, boarding schools, structural racism, environmental

mismanagement, and ongoing denial of Tribal sovereignty. Despite widespread use of cultural resources, only 22% of participants reported feeling they had "enough access to meet [their] needs" (N = 232). Importantly, we noted that dams were highlighted as the third-largest obstacle to accessing cultural resources: the most common barriers reported were lack of family or cultural connections (47%), distance or travel time to the river (42%), impairment due to dams (37%), and time limitations (37%) (N = 234). These results indicate the high degree of difficulty many Karuk community members face in accessing cultural resources, but also their determination in continuing to practice their place-based culture. The Karuk community is tenacious in perpetuating its relationships with the river and its nonhuman communities. Community members still prioritize place-based connections by investing their time, money, and energy to visit with family and spend time on the river. Access to cultural resources is threatened by environmental decline as well as sociopolitical barriers including permit restrictions, private property, structural racism, and federal land ownership; in addition, distance and economic barriers in a remote, rural region are significant. Similar to focus groups and interviews, survey responses expressed the Tribal community's persistence in engaging with cultural resources despite these challenges, with many investing significant time and personal resources.

Interviews and focus groups highlighted how cultural resources, especially salmon, sit at the heart of Karuk life. Many study participants discussed the interconnected fates of salmon and Karuk people. Expanding beyond utilitarian uses of providing a meal or material for a basket, cultural resources are part of mutually beneficial, life-sustaining relationships held between Karuk people and the landscape, which are a key part of what defines Karuk people. However, social and environmental stressors have resulted in the loss of cultural resources, as well as the loss of human capacity to care for these resources. Such stressors threaten Karuk cultural memory, healthy lifestyles, and place-based connections with the land. Regarding access to cultural resources (e.g., salmon, lamprey eel, roots and sticks for weaving, food, medicine, and other resources), participants reported that historical abundance has declined, yet many community members maintain a vision for eco-cultural revitalization. Among older generations, these visions are based on a reference condition expressed through memories or stories about past experiences. Participants reported the deep significance of ceremony, swimming, and family outings as cultural activities that extend beyond subsistence use, and expressed specific grief at their impairment. Young people, in particular, form fundamental relationships with the river through swimming, fishing, and family outings which lay the foundation for other eco-cultural practices.

Participants emphasized that cultural resources come to flourish under environmental conditions that are beneficial to all human and nonhuman communities. Focus group members discussed how dam removal's impact on the most basic processes of water quality and flow pattern stand to affect the entire ecosystem, from the river bottom to upslope areas. Drawing on traditional ecological knowledge, Karuk responses emphasized and described how dam removal impacts would be felt throughout the watershed. Interconnectivity extends to Tribal stewardship practices such as application of cultural fire or the practice of World Renewal ceremonies that ensure coordinated abundance for human and nonhuman communities on the Klamath. As some participants see it, returning to a place where eco-cultural relationships become viable – through human stewardship and land care practices that include dam removal – can help create enabling conditions for renewed abundance.

Considering the interconnectivity between the ecosystem and people reflected in Karuk traditional ecological knowledge (TEK), participants often viewed Karuk access to cultural resources, including traditional foods, as an indicator of whole system health. In Karuk traditions, interdependence of human and nonhuman systems is established through place-based knowledge, culture, and foodways, which are embedded in the landscape and place-based cultural practices. As the river recovers, it should enable

Karuk cultural practices, which in turn sustain the health and well-being of Karuk people and the river. Therefore, changes in Karuk well-being can be used to evaluate biophysical changes alongside measures focused on the biophysical system.

Baseline assessment: 2) Holistic health

Findings on holistic health demonstrated how strongly Karuk people are experiencing river health impairment as a source of stress in their daily lives. The vast majority of respondents (83%) shared that the river is "very important" to them, and write-in responses conveyed deep concern for the state of the river (N = 238). In addition, 59% of respondents believed the river was "not very healthy" or "not healthy at all" (N = 236). Questions about holistic health focused on the relationship between river, personal, and community health: 72% of respondents believed river conditions contribute to mental or physical health problems in the community (N = 235), and 86% of respondents reported that their health and well-being are affected by their feelings about the river (N = 238).

Numerous participants discussed how Klamath dams have contributed to negative physical, emotional and mental health impacts for Karuk people. Findings highlighted a metaphysical component of dam removal, where the physical manifestation of river health is co-constituted with both the physical and spiritual health of the people. Participants described the negative emotional impacts they experienced from being unable to practice ceremony, including ceremonial practices such as bathing in the Klamath mainstem and ingesting river water that have been disrupted by Klamath dams. A holistic approach recognizes how ecological health and human health are interdependent.

Focus group members and survey participants conveyed feeling sadness, hurt, worry, and stress about the current state of the river due to Klamath dams, especially those who have known the river in a healthier state. Some expressed a loss of self-worth, depression, and feeling a lack of agency to aid the impaired river. Grief was expressed specifically around the decline of cultural resources that are integral to the social systems sustaining the Karuk community, as well as the personal relationships that individual community members maintain with the environment.

The need to bring back traditional foods for their health provisioning value was a strong message. Focus groups discussed the importance of traditional foods like salmon and lamprey eel for their nutritional benefits, as well as the benefits provided from living a healthier lifestyle that supports the harvest and tending of resources. Leveraging dam removal to help restore access to traditional foods and place-based Karuk connections to food is one important pathway for revitalizing a healthy community and instilling hope for a better future.

Dam construction was viewed as a specific harm to community health that is viewed within the broader historical context of colonial dispossession and resource extraction impacting the health of the Klamath River and Karuk people. A number of focus group participants noted the historical trauma that they associate with the dams and other extractive projects impacting the river. They viewed dam removal as an opportunity to heal from historical trauma, in part through Karuk people reasserting their leadership in watershed stewardship. Research participants discussed positive psychological impacts of dam removal that were occurring before ground was broken for the demolition project. In this same vein, numerous participants spoke to the power and potential of dam removal to shift community health trajectories and to heal both the health of the river and the social, physical, mental, and spiritual health of the Karuk community.

Baseline assessment: 3) Education

Regarding education, we found a gap in the amount of educational opportunities available to Tribal community participants. Despite the Karuk Tribe's leadership role in the original Undam the Klamath campaign and the high level of community interest in learning about dam removal (91% of respondents), only 51% of respondents reported receiving new information about dam removal in the year before demolition (N = 238). This disparity indicates that dam removal information and education did not consistently reach the Karuk community during the study period. In focus groups, cultural practitioners expressed that a lack of information on dam operations has affected their eco-cultural practices (for example, high flows that disrupt setting eel baskets). In the time period leading up to dam removal, Tribal managers were also looking for additional information on what to expect from the demolition and restoration process. These findings suggest that dam removal project leaders may have underestimated the centrality of the river to Karuk community life and could have engaged much more with Karuk community members leading up to demolition. Overall, Karuk youth focus group participants were informed about Klamath River ecosystems and expressed strong interest in learning more about dam removal. Focus groups shared that education in local schools was affected by regional politics, and that schools in Siskiyou County can present a hostile environment to teaching about environmental issues like dam removal or Tribal sovereignty. In this context, Tribally-led education initiatives are especially important, and dam removal provides an opportunity for teaching Karuk youth about Karuk knowledge systems that are intertwined with the Klamath River.

As an eco-cultural revitalization initiative, dam removal has far-reaching implications for the continuation of Karuk knowledge and community, as salmon and the Klamath River are integral elements of Karuk education for the next generation. Focus groups discussed dam removal as a stimulus for additional Tribal education programs directly serving the needs of Karuk youth, as well as enhancing social functions that are gained through traditional education on the river.

The impact of the Undam the Klamath campaign can be seen on youth educational trajectories through the Tribe's development of scientific methodologies bridging traditional ecological knowledge and Western science, or "two-eyed seeing" (http://www.integrativescience.ca/Principles/TwoEyedSeeing/). Growing up alongside dam removal and the expansion of Tribal science programs through the Karuk Tribe's Department of Natural Resources that are implementing Karuk eco-cultural revitalization, Karuk youth today are positioned to be leaders in two-eyed seeing efforts throughout the basin. Participants emphasized the importance of Karuk youth receiving both traditional education as well as Western education so that they might approach Western science from a Karuk perspective. One way this can be accomplished is through hands-on and place-based cultural education for youth, including field trips connected to the dam removal project.

Baseline assessment: 4) Livelihoods

In respect to livelihoods, about one-third of all respondents (35%) and half of local respondents (50%) expressed interest in jobs related to dam removal. Despite this, only 10% of all respondents and 14% of local respondents had received any information on jobs related to dam removal during the study period (total N = 238 and local N = 107). These findings suggest that despite need and interest, dam removal has thus far failed to support a meaningful trajectory for the Karuk Tribal community to access jobs related to dam removal. We noted that the level of job information available to Yreka District respondents was especially low, even though this area is closest to the dam removal sites. When participants were asked about preferred job types, interested respondents indicated the following top four choices: Indigenous

stewardship/cultural revitalization (65%), native plants restoration (61%), natural resource management and policy (58%), and fisheries (57%) (N = 83).

We noted that cultural and natural resources work were the most popular interests shared by survey respondents. Focus groups and interviews also demonstrated the opportunity and need for dam removal and restoration jobs that are a cultural fit for Tribal community members and that align with the broader Karuk vision for eco-cultural revitalization. Comments emphasized the importance of building Tribal restoration programs rooted in cultural practices, despite current institutional constraints and economic models that often do not value cultural practitioners or Indigenous knowledge systems.

Research findings identified numerous challenges preventing the meaningful participation of Karuk Tribal community members in dam removal and restoration jobs. Common themes discussed in focus groups included limited access to information about job opportunities, structural challenges associated with living in a rural community, and a need for workforce housing. Participants raised the need for additional capacity building going forward, especially education and workforce training, so that Karuk community members can participate in research and monitoring opportunities that may arise from dam removal funding. A critical challenge included the need for additional workforce housing and basic infrastructure (especially in Orleans and Somes Bar) to support the day-to-day needs of Karuk Tribal community members. This was particularly important to community members who may want to work in Tribal watershed restoration jobs, but cannot find housing. This concern was expressed by Karuk community members in diaspora who wish to relocate to the river and young people returning to the river after completing educational opportunities.

From a Tribal perspective, dam removal is understood as an opportunity for repairing historical injustices. Focus group participants further discussed the importance of distributing economic benefits from dam removal and restoration projects to Tribal community members as a form of reparations and an economic and environmental justice intervention. This is especially relevant for governments and industries that have benefited from the dams at the expense of Tribal livelihoods and well-being. Focus group discussions centered on the idea of increased resources and support for eco-cultural revitalization or specific initiatives that can contribute towards the revitalization of Karuk lifeways. Importantly, participants spoke to the history of the dam removal negotiations, and how early efforts to provide economic benefits to Tribal communities through dam removal have not been directly carried forward into current agreements.

Baseline assessment: 5) Self-governance

In terms of self-governance and community involvement in the dam removal process, we found that 8% of respondents had participated in planning, consultation, or decision-making related to dam removal (e.g., public comment, protest, workshop). Of those who participated, 85% felt their work had an impact on dam removal outcomes (N = 20). Speaking to the future, 69% of respondents felt at least “somewhat confident” that Karuk people would have a voice in dam removal processes moving forward (N = 238). Finally, 71% of respondents reported interest in engaging in opportunities for cultural resources revitalization alongside or after dam removal (N = 235).

Viewed through the lens of self-determination, dam removal is a landmark moment reaffirming Tribal rights and responsibilities. Along with bringing hope to the Karuk community, dam removal instilled a sense of self-efficacy, self-value, and unity in many participants that counters colonial legacies of dispossession and trauma. At the same time, the Tribe has faced challenging power dynamics surrounding dam removal negotiations. Participants were divided on whether Tribal views and needs have been

consistently represented in a meaningful way through dam removal negotiations. Some spoke to funding deficiencies that continue to prevent meaningful Tribal participation in decision-making and restoration. While many felt hope for the future, others remained skeptical of the Tribe playing a meaningful role in decision-making processes. In particular, focus group participants expressed disappointment with the years of delay on the project, despite ever-worsening river conditions that have continued to harm Tribal communities.

Participants reflected on the collective pressure exerted by the Tribal community as an essential driver behind the success of the Klamath dam removal campaign and noted the grassroots nature of the campaign. Participants were aware of the decades of persistence and negotiation of power sharing arrangements required for tribes to maintain a leading voice and reach the point of dam removal implementation. They recalled particular moments of Tribal leaders asserting their interests with environmental NGOs and building new relationships across cultural difference, despite moments of strong conflict. Many reflected on key elements of their success with self-determination coming from the unique strengths of the Karuk community leaders, especially cultural leaders, who played an important role in negotiations. Recognizing ongoing colonial legacies foregrounds the importance of tribes reasserting their self-governance authority, in part through dam removal and river restoration initiatives.

In line with these sentiments, participants also expressed hope for transcending structural racism experienced in relations with non-Native people. Alliance building through dam removal negotiations has forged new partnerships and produced impressive results. However, Yreka participants emphasized that persistent racism against Native people is exacerbated by discussions of dam removal in their area. Despite the violence inflicted upon the Tribal community and the environment, some participants expressed a desire for coexistence.

Focus group participants further discussed Karuk self-determination in relation to dam removal, with an emphasis on reestablishing and maintaining community connections. They considered how dam removal campaigns have helped facilitate positive community dynamics encouraging social well-being and unity for the Karuk Tribe. In addition to remedying biophysical conditions on the river, participants expressed a shared interest in leveraging current dam removal actions to reestablish community connections and build unity among Karuk people as a desired project outcome. Alongside the celebration of dam removal, participants expressed confidence in Karuk self-determination moving into the future. This reflects Karuk aspirations for building a strong Tribal community and improving community well-being for future generations.

Dam removal has the potential to renew Karuk self-governance traditions of natural resource management and environmental protection, including ceremony and place-based family management. Improved environmental conditions from dam removal can contribute to revitalization of Karuk ceremonial practices and law. As cultural resources and ceremonial practice benefit from river restoration, additional opportunities will arise for Karuk people to steward these resources. Viewing Tribal community well-being in this way demonstrates the deeper transformative potential of dam removal for Karuk self-governance and collective continuance capacities.

Main Contributions and Findings

What is clear from our assessment is that most Karuk Tribal community members have high expectations for dam removal bringing positive benefits to community members. This includes hopes for improved social well-being in the community. Alongside an overarching sense of hope, our findings also identified

community concerns about whether opportunities being presented for restoration and repair can be realized in practice: will Tribal community members truly be able to access the benefits from dam removal?

This assessment emphasizes the importance of

- Including Indigenous peoples and their knowledge systems in assessment,
- Understanding the power of dam removal for supporting Karuk cultural continuance and inspiring hope, and
- Advancing Karuk self-determination, restoration, and repair.

By conducting this assessment with Tribal partners, we are contributing methodologies for including Indigenous knowledge in assessment and identifying a very different understanding of Klamath dam removal than is typically emphasized in standard approaches to environmental impact assessment. Dam removal is so much more than an infrastructure removal project or engineering problem. This reorientation of the project assessment around Tribal community well-being helps demonstrate the deeply held reciprocal relationships between Karuk people and the place that they come from, which have been a primary driver for Karuk dam removal advocacy for decades. The main study contributions include:

- Implementing a social impact assessment based on Tribal community well-being that is co-designed and implemented with the Karuk Tribal community, and that accounts for a diversity of Karuk experiences, values, practices, and knowledges;
- Gaining a deeper understanding of Karuk Tribal perspectives on dam removal and river restoration by recasting dam removal as eco-cultural revitalization, and offering a more holistic understanding of dam removal that reflects the longstanding reciprocal relations held between the Karuk Tribal community and the Klamath River;
- Providing a forum for the Karuk Tribal community to express their hopes and priorities for dam removal impacts, as well as their recommendations for harnessing the momentum of dam removal for furthering eco-cultural revitalization and enhancing community well-being;
- Evaluating baseline conditions of Karuk cultural uses in the Klamath river corridor that are predicted to change with dam removal prior to demolition, thereby providing a reference point for evaluating dam removal benefits for eco-cultural revitalization;
- Documenting the importance of dam removal for Karuk cultural continuance, in part through identifying Tribal priorities for youth learning opportunities and engagement in river restoration; and
- Considering how environmental politics around dam removal may be shifting Native and non-Native relations and possibilities for reparations and racial repair in the Klamath Basin, especially in regions that have historically expressed hostility towards Tribal assertions of self-determination.

Recommendations

In focus groups, Karuk Tribal community members shared practical strategies and recommendations that could advance the Karuk Tribe's goals for dam removal. A number of specific community recommendations were made regarding:

1. Increasing youth engagement, community education, and information access. Many participants were excited about the potential for increasing Karuk youth engagement in Klamath River restoration, additional opportunities for youth to learn about cultural practices tied to a healthy river, and more youth internships and culturally relevant job opportunities.
2. Strengthening connections among Tribal programs and enhancing community engagement across all Tribal Council Districts. Community members emphasized overcoming structural barriers to cross-program coordination within the Tribe, creating more regular communication channels for information exchange between cultural practitioners and Tribal staff, and expanding educational and workforce opportunities related to dam removal across all service areas.
3. Supporting more culturally relevant jobs alongside improved community infrastructure and workforce development. Participants were interested in more culturally aligned jobs and community engagement opportunities. This could include additional youth programs leading to specialized Tribal eco-cultural revitalization jobs and expanding environmental and cultural monitoring.
4. Revisiting commitments to land back, reparations, and repair that support Karuk self-determination. Karuk community members highlighted advancing Indigenous environmental justice through additional funding and policies that support greater inclusion of Tribal community members in river restoration, as well as land back opportunities.

Additional recommendations were provided from the research team, as a mixed academic, Karuk DNR, and community partnership:

1. Dam removal processes should facilitate education opportunities and intergenerational knowledge transfer related to river health and restoration for youth, especially through collaborations with the Karuk Youth Leadership Council, Karuk Education Department, and Pikyav Institute initiatives related to K-12 dam removal education including curriculum development, field trips, and monitoring pilots. This work needs continual support and funding, including staff positions (Karuk DNR, Education Department, and schools) and inter-departmental coordination.
2. To increase the potential for Tribal community participation in jobs, grants, and contracting opportunities related to dam removal, workforce development should facilitate capacity building, support Tribal community housing needs, and increase youth training and education in natural and cultural resources.
3. Karuk people and place-based knowledge, practices, and belief systems should inform restoration planning, dam removal jobs, and grant opportunities, as well as research and monitoring, given the disproportionate impacts of the Klamath dams on Karuk people and their key role in achieving dam removal.
4. Dam removal entities should create additional education opportunities for agency staff, contracting and consulting firms, and others to learn more about Tribal relations, including the history of settler colonialism in the Klamath Basin, and self-determination initiatives responding to colonial legacies.
5. Tribal access to culturally important sites and other significant places along the river corridor and in riparian areas, including important fishing and gathering areas, must be protected and enhanced, in part through financial, institutional, and workforce support for Karuk eco-cultural revitalization along the river corridor.

6. Dam removal and river restoration entities that wish to conduct their work in allyship with the Karuk Tribe should partner more closely with a range of Karuk community programs operating in multiple Tribal Council Districts (Yreka, Happy Camp, Orleans), including: TANF (Tribal Assistance for Needy Families), Katishraam Wellness Center, the Karuk Education Department, Karuk Youth Leadership Council, the Karuk basketweaving community, the Karuk Tribal Council, and the Karuk Tribal Enrollment Department, and also increase connections to the broader Karuk community.
7. Dam removal entities, policy makers, funders, as well as those leading research and monitoring initiatives, should consider more holistic goal-setting and evaluation criteria including Tribally-defined goals for community well-being and include social and cultural impacts affecting health, education, livelihoods, Tribal self-governance, and cultural resource access, among other factors.
8. Dam removal entities and state entities should continue to support land back opportunities for Shasta people that arise through the dam removal process in the reservoir reach, and promote land back for the traditional lands of the Karuk Tribe and Native peoples elsewhere.
9. Reflecting on the initial scale of restoration envisioned in the 2010 Klamath Basin Restoration Act (~$750 million, plus adjustment for inflation), state and federal government agencies and legislatures should consider providing more significant levels of economic support for developing a river-based regenerative economy, with specific funds identified to support Tribal community participation in river restoration job and workforce opportunities.

Conclusions

Karuk goals for dam removal reflect high expectations that are built upon the immediate needs of Tribal community members and community investment in dam removal and river restoration initiatives. As dam removal progresses, the Tribe will continue advancing Karuk self-determination and self-governance. Importantly, dam removal has spurred new forms of basin-wide collaboration, offering the possibility of, for example, future restoration efforts in the Upper Basin. A number of community members also viewed dam removal as a pivotal opportunity for racial repair between Indigenous and non-Indigenous peoples in the Klamath watershed, where dam removal offered a potential pathway towards overcoming a deep history of hostility towards Native peoples in the region. At the same time, there is also the possibility of reactionary action against the project. Participants discussed taking precautionary measures to prevent the creation of a hostile environment towards Tribal community members.

Surprisingly, we noted only 10% of survey respondents had received information about jobs or other benefits leading up to the project launch. This is also surprising given that early settlement agreements envisioned dam removal as means for building a local restoration economy, in partnership with local tribes and non-tribal rural communities. Findings suggested a mismatch between the level of community interest prior to project launch and the number of opportunities made available for Karuk Tribal community members to learn about and participate in dam removal restoration initiatives during the study period.

Overall, findings reflected a strong sense of hope extending beyond the Karuk Tribe into other tribal communities, who viewed dam removal as a victory for tribal people. While this is not the only watershed restoration initiative that the Karuk Tribe is engaging with, our social assessment clearly identifies dam removal as an important step towards Tribal community well-being. At the same time, the effectiveness of dam removal in advancing Karuk eco-cultural restoration goals largely depends on how well Tribal community members are brought into the restoration efforts that follow infrastructure removal.

Researchers aim to repeat this assessment in approximately five years to assess evolving Karuk attitudes and changes in community well-being that are linked to dam removal and river restoration.

1 INTRODUCTION

1.1 Project overview

This collaborative research initiative engages the Karuk Tribe, the Karuk Department of Natural Resources (Karuk DNR), and the Karuk Tribal community to co-develop an assessment tool to evaluate the social, cultural, and economic impacts of dam removal in the Klamath Basin from a Tribal perspective. This research is being carried out after the decision to remove four dams in the mid-Klamath has taken place, and regulatory agencies have already conducted required environmental impact reviews, permitting, and management plans (https://klamathrenewal.org/regulatory/).

The assessment focuses on the social impacts of dam removal to Karuk Tribal community well-being including cultural resources, holistic health, education, livelihoods, and self-governance. By conducting this baseline assessment with Tribal partners, our intention is to produce a Karuk community definition of success for Klamath dam removal that can be used to evaluate its longer-term effects for the Karuk Tribal community.

Our team is composed of Karuk cultural practitioners, Karuk DNR staff, and researchers based at Stanford University and UC Berkeley. Our assessment, developed in collaboration with Karuk colleagues, includes a community-wide survey, focus groups, and interviews. In this case, academic and Tribal research partners are building on collaborative work beginning in 2009. Our collaboration has been supported through Tribal-academic research institutions we have built over a number of years, including the Karuk Tribe-UC Berkeley Collaborative.

Conducted from November 2022 through May 2023, this study is being conducted at a pivotal time. Primary data collection occurred before infrastructure removal, which began in June 2023. This positions our work to function as a baseline for assessing dam removal impacts likely to unfold through the current infrastructure removal process and associated restoration efforts. At the same time, our assessment occurred after two decades of Tribal advocacy for dam removal and river restoration are finally coming to fruition. Thus, our study documents the culmination of community hopes and fears around Klamath dam removal, following twenty years of Tribal science, policy, and community organizing. Considering dam removal holistically, we also describe how the Undam the Klamath campaign itself has already had significant effects on the Tribal community.

Research is motivated by the following factors:

- Historical exclusion of Indigenous peoples in social impact assessment,
- Requests from Karuk Tribal scientists and collaborators for social assessment to fill a gap in dam removal literature to date which is primarily focused on biophysical research questions, and
- Decades of Tribal leadership on Klamath dam removal to ameliorate harmful impacts to salmon and salmon-dependent tribes paired with concerns of whether dam removal benefits will reach Tribal community members.

1.2 Historical context of Karuk Tribal engagement in Klamath dam removal

The Karuk Tribe is federally recognized and the second largest tribe in California with 3754 members as of June 2024 (Robert Attebery, Tribal Enrollment Officer, personal communication). Karuk Aboriginal Territory includes the middle section of the Klamath River and covers approximately 1.048 million acres in California and Oregon. Following the Karuk Tribe's constitution, the Tribe has three Council Districts:

Orleans (Panámniik), Happy Camp (Athithúfvunuupma), and Yreka (Kahtishraam). There is also a diaspora of Karuk people distributed across the country, and beyond.

The backdrop for Karuk participation in Klamath dam removal includes a broader struggle for Indigenous self-determination that has resisted ongoing colonial legacies of state-sanctioned violence and dispossession of Karuk lands and resources. Because the US government never ratified treaties negotiated in good faith with the Karuk people, the Karuk Tribe has been largely excluded from land and water management decision-making affecting Karuk ancestral territory. While the Karuk Tribe is a federally recognized tribe, the Karuk do not have a reservation (although they do have a number of trust parcels), and around 98% of Karuk Territory overlaps with lands that are designated as National Forest and administered by the US Forest Service, posing challenges for self-governance and eco-cultural revitalization. These historical conditions have contributed to intensive natural resource extraction in the mid-Klamath watershed, which includes industrial-scale mining, clear cut forestry, and dam construction for hydroelectric power (Norton, 1979; Diver et al., 2010; Karuk DNR, 2011; Norgaard, 2014; Diver, 2016; Norgaard, 2019; Diver et al., 2022a).

When dams were installed directly upstream of Karuk territory, blocking passage of anadromous fish to the Upper Basin, salmon lost access to 350 miles of spawning habitat (90% of historic range for some species). Note that these particular dams have provided relatively low levels of hydroelectric power, minimal flood protection benefits, and no irrigation waters (see https://klamathrenewal.org/the-project/), yet they blocked fish passage for endangered salmon runs, caused significant water quality problems, and have negatively impacted multiple Tribal communities in the Klamath Basin. The Spring Chinook run, one of the Tribe's principal food sources, was dealt a compromising blow with the construction of Iron Gate Dam in 1963, resulting in the decimation of the run by the 1970s. As a result, average yearly consumption of salmon has dropped from 450 lbs/person/year historically to less than 5 lbs/person/year today. As access to traditional foods like salmon has declined, diabetes and other diet-related diseases have taken root in the community and appear at elevated rates today. These health consequences were a key piece of evidence in the dam relicensing process that demonstrated how Karuk well-being is directly tied to the health of the Klamath River (Norgaard, 2005). Numerous other cultural resources including basketweaving plants, medicine, and other food sources have suffered from dams and other extractive uses in the Klamath Basin.

Given this history, the victory of dam removal as a Tribally-driven campaign is a significant moment of Karuk self-determination. This success is rooted in a larger set of Karuk Tribal leadership initiatives around land and water management of Karuk Aboriginal Territory and Tribal lands related to fisheries, water quality, forestry, fire, and additional natural resource management issues affecting Klamath water governance. The Karuk Tribe's current land management goals in their homeland are based on a vision of ecological and cultural revitalization of the Klamath watershed at multiple scales, including a landscape scale as illustrated in the following reports: the 1998 Ishi-Pishi/Ukonom Ecosystem Analysis, the 2011 Karuk DNR Eco-Cultural Resource Management Plan, the 2014 Western Klamath Restoration Partnership, the 2016 Klamath Basin Food System Assessment, and the 2019 Karuk Tribe Climate Resiliency Plan.

While the Klamath watershed has been impacted by multiple extractive uses, the focus on removing Klamath dams was catalyzed by the 2002 fish kill in the lower Klamath. This tragic event was triggered when Upper Basin irrigators protested water allocations for salmon, which led federal agencies to approve water diversions for agriculture in a drought year – despite scientific recommendations suggesting this decision would have negative impacts on threatened fish species (Doremus & Tarlock, 2008; Reed & Norgaard, 2010; Sarna-Wojcicki et al., 2019). In the fall of 2002, agricultural diversions and resulting poor

water quality conditions culminated in a fish disease outbreak, with 34,000-78,000 adult salmon and steelhead dying without spawning in the lower Klamath (Belchik et al., 2004; CDFG, 2004). Karuk people are salmon people: intimate relationships between the tribe and salmon inform Karuk culture, identity, spiritual beliefs, and law. For the Karuk, the ability to fish comes with an inherent responsibility to take care of the salmon and the watersheds they come home to. Consequently, the fish kill had a devastating impact on Tribal communities (e.g., Willette et al., 2016).

Reservoirs also produced massive harmful algae blooms (HABs) dominated by the cyanobacteria *Microcystis aeruginosa*, which produces the liver cyanotoxin microcystin, contaminating the entire river and turning it bright green every summer. In addition to recreation, this water quality crisis impacted cultural uses of the river include bathing and ingesting river water for ceremony. The Water Quality Program in Karuk DNR worked for years to document the threat, leading the state in HAB response. In addition to regular public health sampling mandated in the Klamath Hydroelectric Settlement Agreement, toxins were shown to be ubiquitous in the river, bioaccumulating in traditional foods, and posing a hazard to recreation (Backer et al., 2010; Kann et al., 2010; Kann et al., 2012; Kann, 2014; Genzoli & Kann, 2017). The Karuk Water Quality Program also maintains an online platform where anybody can access real-time, continuous water quality data across the entire basin (https://waterquality.karuk.us/) and is currently responsible for monitoring 175 miles of river during and after dam removal. Through collaborative work with the Klamath Tribal Water Quality Consortium (https://www.klamathwaterquality.com/), agencies, universities, and other partners, water quality science is one domain where the Tribe has asserted its sovereign authority and stewardship responsibility (Diver et al., 2022a; Diver et al., 2022b).

The Karuk Tribe's response to the 2002 fish kill and severe HABs also included advocating for dam removal in Federal Energy Regulatory Commission (FERC) dam relicensing processes. This is well documented in reports and Tribal testimony (Salter, 2003; Belchik, 2004; CDFG, 2004; King, 2004; Norgaard, 2005). Even while experiencing opposition during dam removal settlement negotiations, Tribal leaders have persisted in demanding the removal of four hydroelectric dams in the mid-Klamath River (Norgaard, 2019). Following twenty years of Tribal advocacy, science, and policy, this is the largest dam removal and river restoration initiative in US history. Watershed restoration will be ongoing for years to come.

1.3 Dam removal settlement agreements and economics

The potential of dam removal for socioeconomic revival in Tribal communities has long been recognized. This has been envisioned through Tribally-led business opportunities and workforce capacity building related to Karuk DNR river restoration and monitoring programs. When entering into this research, we revisited the 2010 agreements on dam removal and restoration, the Klamath Basin Hydroelectric Settlement Agreement (KHSA) and Klamath Basin Restoration Agreement (KBRA), which failed to receive funding requested through Congressional appropriations. In the initial 2010 formulation, the two dam removal settlements would have funded extensive restoration initiatives alongside infrastructure removal. In particular, the 2010 KBRA settlement requested significant federal funding for restoration (estimated in federal reports at $53 million per year for 2012-2026) to support a river-based restoration economy. A 2013 federal report assessing expected benefits of the proposed 2010 agreements indicated that $25 million alone would have gone towards supporting tribal fisheries and conservation projects (US DOI et al., 2013). Thus, dam removal was initially proposed as a central driver for strengthening a Tribal workforce that could implement Tribal eco-cultural revitalization initiatives. In addition, dam decommissioning was projected to create 1,423 jobs and result in $59.70 million in labor income, contributing to livelihoods for mid-Klamath rural economies (US DOI et al., 2013). When Congress failed

to fund the 2010 agreements, however, the KBRA was dropped, and proponents moved forward with a revised version of the KHSA.

In its current formulation, dam removal is targeted almost exclusively at drawing down reservoirs and removing the hydroelectric facilities through contracts with large construction companies (Kiewit) and restoring the reservoir reach through contracts with large environmental consulting firms (Resource Environmental Solutions). Infrastructure removal under current agreements is not directly coupled with large scale restoration funding supporting Tribal communities throughout the basin or a jobs package supporting rural livelihoods as envisioned earlier. With potential restoration funding now moving forward in multiple arenas, it is even more critical to highlight Tribal restoration and workforce development goals that have evolved through Karuk Tribal leadership with their allies on multiple negotiated settlements, including negotiations leading up to the KBRA.

Figure 1.3-1: Ron Reed dip net fishing at Ishi Pishi Falls, the only Karuk subsistence fishing area (legally recognized through protections under California state law) (Photo: Wingspan Media)

1.4 Research motivation, approach and goals

By working with key leaders in the Karuk community, the collaborative research study builds on this current momentum to better understand the immediate and ongoing impacts of dam removal from a Karuk Tribal perspective. In doing so, we hope to center Karuk knowledge and leadership to evaluate whether one of the communities most impacted by dams is benefiting from the processes and outcomes of taking them down.

The origin of this study is the Klamath Dam Removal Science and Monitoring Technical Coordination Workshop organized by Klamath, Karuk and Yurok Tribal representatives and scientists in Medford, Oregon in February 2020. Tribal representatives and scientists observed that the ecological impacts of dam removal were being closely monitored by Karuk Fisheries and Water Quality departments and others. Yet, the social, cultural, economic, and governance dimensions of dam removal were not well understood

or receiving the same level of attention in the research community as biophysical processes. We were invited by Susan Fricke, then Water Quality Coordinator for Karuk DNR, to co-develop a methodology assessing the social impacts of dam removal based on Karuk priorities, experiences, and expertise. Drawing on community guidance and previous research on Tribal assessment, this study examines Karuk Tribal community perceptions of dam removal and relevant indicators of social well-being anticipated to change with dam removal across five dimensions of well-being: access to cultural resources, holistic health, education, livelihoods, and self-governance. This approach is based on community scoping and planning sessions with Karuk Tribal managers and community members, and an analytical framework developed by Donkersloot et al. (2020) derived from Indigenous and non-Indigenous research collaborations studying Indigenous salmon systems in Alaska. While recognizing the uncertainty around dam removal impacts that have yet to occur, this study provides a snapshot of Tribal community knowledge, experiences, and expectations for dam removal assessed primarily during the six-month period between November 2022 - May 2023 leading up to initial infrastructure removal in June 2023. As Klamath dam removal research and monitoring initiatives progress into the future, we anticipate the need for a follow-up study, approximately five years from now to assess changes in Karuk community well-being that are linked to dam removal and restoration.

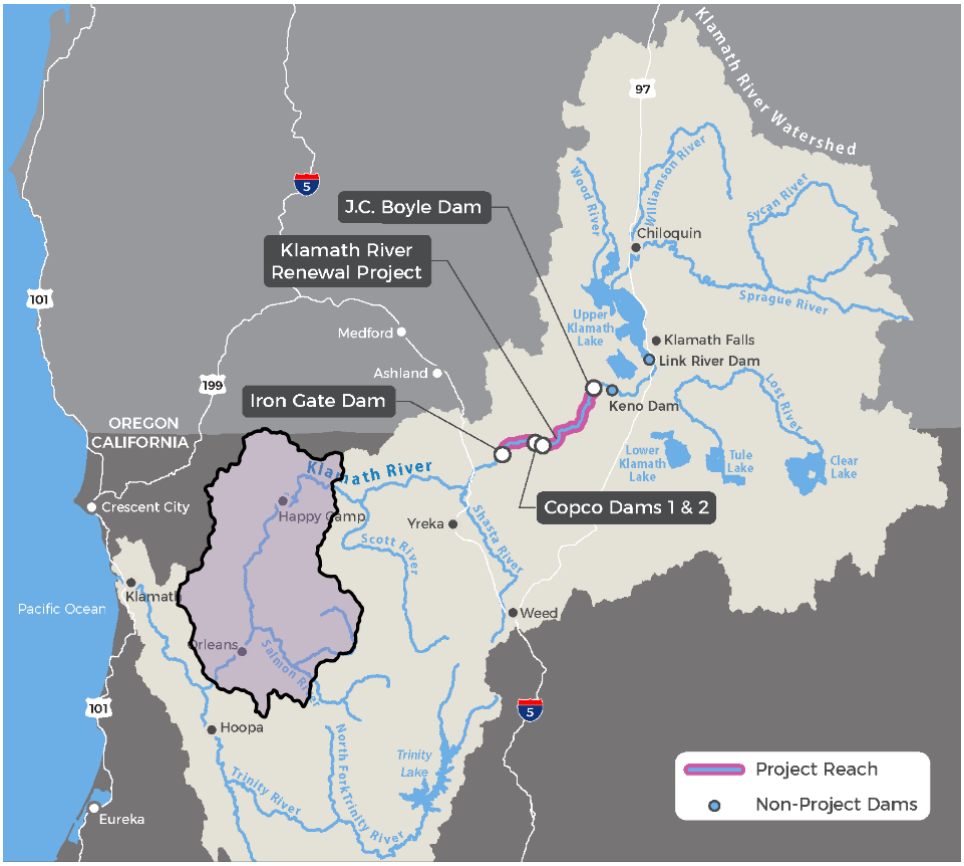

Figure 1.4-1: Karuk Aboriginal Territory and Tribal lands are located in the mid-Klamath region, downriver from dam removal sites (California and Oregon, US). (Map: Klamath River Renewal Corporation base map with Karuk Department of Natural Resources additions, used with permission)

More broadly, this community-engaged research intervenes in an ongoing problem: the exclusion of Indigenous leaders and knowledges in social impact assessment (e.g., Arsenault et al., 2019). We hope that this research can address a gap in the literature and practice around the meaningful inclusion of

Indigenous communities and Indigenous knowledge systems in social impact assessment. By codeveloping an assessment methodology with Tribal partners, we have gained important insights into how social assessment can better reflect the knowledges, values, priorities, and leadership of the Karuk Tribe and other Indigenous communities. Following this approach, our assessment intends to support the inclusion of Karuk Tribal leadership and knowledge systems in dam removal planning, implementation, research, and monitoring moving forward.

2 METHODS

2.1 Methods overview

This project was designed through a year-long scoping and planning project. Planning occurred with Karuk Tribal staff and community members based across the three Karuk Tribal Council Districts: Orleans, Happy Camp, and Yreka, CA. To facilitate this process, research team members wrote a planning grant to support Tribal participation in collaborative research on dam removal.

Figure 2.2.1-1: Research team members and Tribal Enrollment staff addressing almost 8,000 survey postcards to all enrolled Karuk Tribal members and descendants. From left to right: Maria Ridgeway-Elsner, Nate Ramos, Cole Dill-De Sa, Chelsey Cook, Dan Sarna-Wojcicki (Photo: Sibyl Diver)

Our interdisciplinary research team brought together expertise in cultural resource management (fisheries), watershed management and water quality sciences, wildlife management, environmental and water governance, critical science studies, and youth engagement. Several of our academic and Tribal research partners have been working on collaborative writing and research initiatives for 15 years. Dr. Sibyl Diver and Dr. Daniel Sarna-Wojcicki both started working with Tribal partners in 2009 through the Karuk Tribe-UC Berkeley Collaborative, a Tribal-academic collaboration that supports synergistic partnerships for Karuk eco-cultural revitalization.

Dr. Diver now works at Stanford University, where she is teaching in the Earth Systems Program. John R. Oberholzer Dent is a biologist on staff with the Karuk Tribe's Water Quality Program working on dam removal and aquatic ecology. Dr. Sarna-Wojcicki is currently working on initiatives with the Karuk Tribe Wildlife Program as a consultant. Ron Reed is a Karuk Tribal member, traditional dipnet fisherman, culture bearer, and served as a Tribal representative in early Karuk advocacy for dam removal. Cole Dill-De Sa and Nathaniel Ramos joined the research team as students working respectively in the fields of earth systems and civil and environmental engineering at Stanford University.

Following the Karuk Tribe's initial invitation to develop a collaborative partnership, we pursued and received initial funding in summer 2020 from the Strategic Growth Council Tribal Government Challenge Planning Grant Program, supporting a Tribal research planning objective in the Karuk Tribe's *Áhish Áah* ("turn on the light") Project. Objective 3 of the grant laid out goals and objectives for the Klamath Hydroelectric Facility Removal Social-Economic Impact Assessment including:

- Convening a steering committee of Karuk DNR staff across different divisions, Tribal community members, cultural practitioners, educators, and youth,
- Review of community priorities, existing data sources, and frameworks for social and economic impact assessment of dam removal processes,

- Working sessions and interviews to co-design methods and a draft plan for social and economic impact assessment, and
- Working sessions and interviews to finalize an assessment plan and implementation schedule.

Implementing this charge, our research team co-developed an assessment tool to evaluate the social, cultural, and economic impacts of Klamath dam removal. Our study design is rooted in Indigenous methodologies, community-based participatory research approaches, social science research and analysis tools, and guidance from community planning and scoping sessions held in Orleans, Happy Camp, and Yreka. Later, we received additional funding to implement the assessment from a Stanford University Sustainability Accelerator Grant, supporting collaborative environmental justice research.

Following planning and scoping, we completed research proposals for the Karuk Tribe's Practicing Pikyav program and Stanford University's IRB review process. We received Tribal approval to begin research in August 2022, and the study was approved by the Stanford University IRB, eprotocol #67046, on September 30, 2022. Note that all quotes from survey comments and youth focus groups are reported anonymously, while quotes from adult focus groups and interviews are attributed, based on specifications in our research protocols and stated preferences of adult participants. From November 2022 - May 2023 (see project timeline in Table 2.1-1), we conducted:

- Focus groups: eight focus groups ranging from 4 to 11 members in three Council Districts (Orleans, Happy Camp, and Yreka) with cultural practitioners, basketweavers, fisherpeople, Tribal Council members, Karuk Department of Natural Resources staff, and Tribal youth leaders, including members of the Karuk Youth Leadership Council
- Interviews: four key informant interviews with cultural practitioners, fisheries experts, Tribal representatives on dam removal, and consultants
- Online survey: We also created and distributed an online survey to all enrolled Karuk Tribal members and descendants. We notified the Karuk community of the survey through the Karuk Tribe Facebook page, individual email contacts, and sent postcards with links and QR codes inviting all 7,785 Karuk community members (total number of enrolled members and descendants in February 2023) to fill out the survey.

Table 2.2.1-1: Project timeline, 2020-2024

Winter 2020	Initial research concept supported at the Klamath Dam Removal Science and Monitoring Technical Coordination Workshop (Medford, OR) organized by Klamath, Karuk, and Yurok Tribal representatives and scientists
Spring/Summer 2020	Research partners write and receive a California Strategic Growth Council (SGC) grant, supporting Tribal participation in dam removal assessment research planning
Fall/Winter 2020-2021	Initial research and scoping phase
Summer/Fall 2021	Tribal steering committee formed to advise on dam removal assessment research

Winter 2022	In-person scoping visits with key community leaders and cultural practitioners in all three Karuk Districts (Yreka, Orleans, Happy Camp)
Spring 2022	Research scoping report submitted to the Karuk Department of Natural Resources and SGC upon planning grant completion
Spring 2022	Research funding awarded from a Stanford University Sustainability Accelerator Grant, in partnership with the Environmental Justice Working Group
Summer 2022	Research proposal submitted to the Karuk Tribe, receiving approval under the Karuk Tribe Practicing Pikyav Policy, with Ron Reed, John R. Oberholzer Dent, and Carolyn Smith as Tribal Research Committee members
Summer/Fall 2022	Stanford University IRB proposal submitted and received (IRB eprotocol #67046, September 30, 2022), codevelopment of assessment tools
Fall 2022	Research team begins interviews and conducts focus groups in all three Council Districts (cultural practitioners, Tribal Council leaders, Tribal fisheries/watershed managers), launches website (https://damremovalsocialimpact.com) and prepares FAQ (https://damremovalsocialimpact.com/faq/) for Tribal community members
Winter/Spring 2023	Survey launched through Karuk Tribe Facebook page, survey invitation postcards are mailed to all adult Tribal members and descendants in partnership with Karuk Enrollment Department (majority of responses received in March/April)
Spring 2023	Research team continues interviews and holds additional focus groups in all three Karuk Council Districts (basketweavers, Tribal natural resource managers, Tribal youth)
Spring 2023	Survey formally closed on May 31, 2023
Summer 2023	Analysis of survey results
Fall/Winter 2023-2024	Analysis of interview and focus group results
Winter/Spring 2024	Research team prepares written report for Karuk Department of Natural Resources

2.2 Quantitative methods

2.2.1 *Survey implementation*

Acknowledging the complicated history of Indigenous peoples and research, we constructed a survey based on the Karuk values, needs, and knowledge systems (Rainie et al., 2017; Walter & Andersen, 2013). We invited all Karuk Tribal community members to participate in this anonymous survey that was sent to both members and descendants, regardless of enrollment status or area of residence. Survey design drew on earlier planning and scoping conversations, in addition to previous food security

assessment research materials. Our survey included multiple spaces for community members to voluntarily add text responses to survey questions.

Building on other surveys conducted with the Karuk Tribe with surveys that focused on Tribal community members living within the Klamath Basin (Norgaard 2005, 2019; Karuk DNR et al., 2016; Sowerwine et al., 2019), this study cast a wide net to include both local community leaders and Karuk community members located all over the United States. While limited recruitment opportunities meant that we did not necessarily expect a large number of respondents, we did anticipate hearing from a cross-section of both local and non-local Karuk community members, especially given the high profile nature of the Karuk Tribe's leadership on Klamath dam removal over the last twenty years.

We notified the Karuk community of our online survey by sending postcards with links and QR codes to all 7,785 Karuk Tribal members and descendants (as identified by the Karuk Tribe Enrollment Department in February 2023) and posting on the Tribe's official Facebook page, which has 9,700 followers. This is the Karuk government's official page, a widely used Tribal communication platform on which the Tribe is the only entity able to post. After receiving permission from Karuk Tribal Council, the Karuk Tribal media manager posted the survey invitation on our behalf on February 8, and again on April 25, 2023 (see Appendix A for full survey).

With permission from the Karuk Tribal Council, we prepared the postcard mailing in partnership with the Karuk Enrollment Department. Postcards included a QR code and web link sending respondents to the online survey. Tribal members and descendants were also invited to request a paper copy of the survey, if desired. To ensure protection of Tribal membership information, our research team prepared and transported approximately 7,800 postcards to Karuk Tribe administration offices in Happy Camp, CA. Tribal collaborators printed address labels, which the research team attached to postcards onsite at membership offices with Karuk Enrollment Department staff. Postcards were mailed from the Happy Camp post office by Enrollment staff on Monday, March 6.

To provide additional study information to respondents, we developed a project website, where we could fully explain the project, share educational resources about dam removal, and communicate our findings (https://damremovalsocialimpact.com/). The website also invited Tribal members to request a link to the survey by email or by contacting us at our mailing address, which a few respondents did.

As a research incentive we conducted an optional drawing for ten gift cards, valued at $50 each. Drawing entries were stored separately from survey data. Winning entries were selected at random and received gift cards by registered mail in July 2023.

2.2.2 *Survey data set selection*

We received 720 survey responses in total, with the majority of responses submitted in March and April of 2023. After filtering for quality, our survey yielded 238 "high quality" Tribally affiliated responses. Noting that inattentive and fraudulent respondents can threaten the reliability and validity of survey results, we followed accepted methods to screen for "low quality" survey entries, as described below (Buchanan et al., 2018; Hillygus & LaChapelle, 2022). Filtering responses led us to classify 395 surveys as low-quality and 325 as high-quality. We then filtered high quality responses for Tribal affiliation, resulting in the 238 surveys analyzed. Survey demographics are discussed in detail below, and demonstrate that we heard from a diverse set of Karuk community members from a wide range of geographies, genders, ages, incomes, and levels of education.

While we targeted our outreach to Karuk Tribal community members (231 responses self-identified as being affiliated with the Karuk Tribe), some respondents listed multiple Tribal affiliations and/or non-Karuk Tribal affiliations. Additional Tribal affiliations included Yurok, Hupa, Konomihu, Klamath Tribes, and Shasta, among others. Given the extensive kinship and cultural ties incorporated within the larger Karuk community, we chose to accept all 238 survey responses noting a Tribal affiliation. We note that we did not include survey responses with solely non-Tribal affiliation or unknown affiliation in survey analysis. This is because the study aimed to assess social well-being from a Karuk community perspective, and surveys generated limited information regarding anonymous participants.

Filtering for quality responses (not spam) was necessary, due to fraudulent submissions. This occurred immediately following Facebook posts on the Karuk Tribe's official page announcing the survey. Responding to a high influx of suspicious survey responses with data inaccuracies and repeated text, we used a set of filtering criteria to flag surveys for data quality. Entries receiving two flags or more were removed from the data set. As an attention check, we also removed entries where survey duration time was less than or equal to 60 seconds. Filtering criteria included the following:

- Text responses repeated across multiple questions within a single survey entry or repeated short answer text duplicated verbatim across surveys,
- Highly similar timing of survey completion, e.g. same start and end times and/or highly similar survey duration times,
- Mismatched locational data where the zip code did not represent the city or town entered, and
- Multiple survey entries from one device/IP address.

Given our sample frame of 7,785 Karuk Tribal members and descendants, "high quality" Tribally affiliated survey responses represent 3.1% of the community. While this response rate may appear low, we note that survey demographics were well-mixed, suggesting that results effectively represent a cross-section of the Karuk community. As discussed below, studies have demonstrated that low response rate does not necessarily convey bias or affect viability of results. We also note that a lower response was not unexpected given various challenges of engaging Tribal community members in research, shaped in part by the extractive history of academic research focused on Indigenous peoples (Walter & Andersen, 2013; Smith, 2021).

One concern with low response rates discussed in the literature is "nonresponse bias," where aggregated differences between survey responders and nonresponders skew results. However, research over the past decades has shown that low response rates do not necessarily create nonresponse bias and that response rates under 10% can produce reliable results (Krosnik 1999; Groves & Peytcheva, 2008; Hellevik, 2016; Keeter, 2018). Notably, Fosnacht et al. (2017) demonstrated that a 5% response rate can produce minimal bias in a sample frame of at least 1,000. We note that the sample frame in this study was 7,785, and the well-mixed demographics of survey respondents suggest that a broad range of community members are represented.

Nonresponse bias is likely to arise when "the likelihood of response is somehow related to the variable under consideration," and so should be anticipated on a question-by-question basis (Massey & Tourangeau, 2013, p. 228; see also response rates by question, Appendix A, Table 2.2.4-1). For this study, no survey could reach all Karuk Tribal community members; survey respondents are a subset of the community that may represent those interested in dam removal, or willing to take surveys. While lower response rates may favor those with stronger feelings about dam removal, Keeter (2018) has demonstrated that this does not necessarily produce political bias: respondents with strong feelings

represent multiple viewpoints. Ultimately, survey results should be interpreted with the context of the study and methodology in mind, alongside additional context provided by focus group findings.

2.2.3 *Geographic analysis of survey data*

Survey participants responded not only from across the Klamath region, but also from all over the US. This led us to subset survey data by the following categories: 1) local and non-local respondents, 2) political orientation of local counties, and 3) Karuk Council Districts.

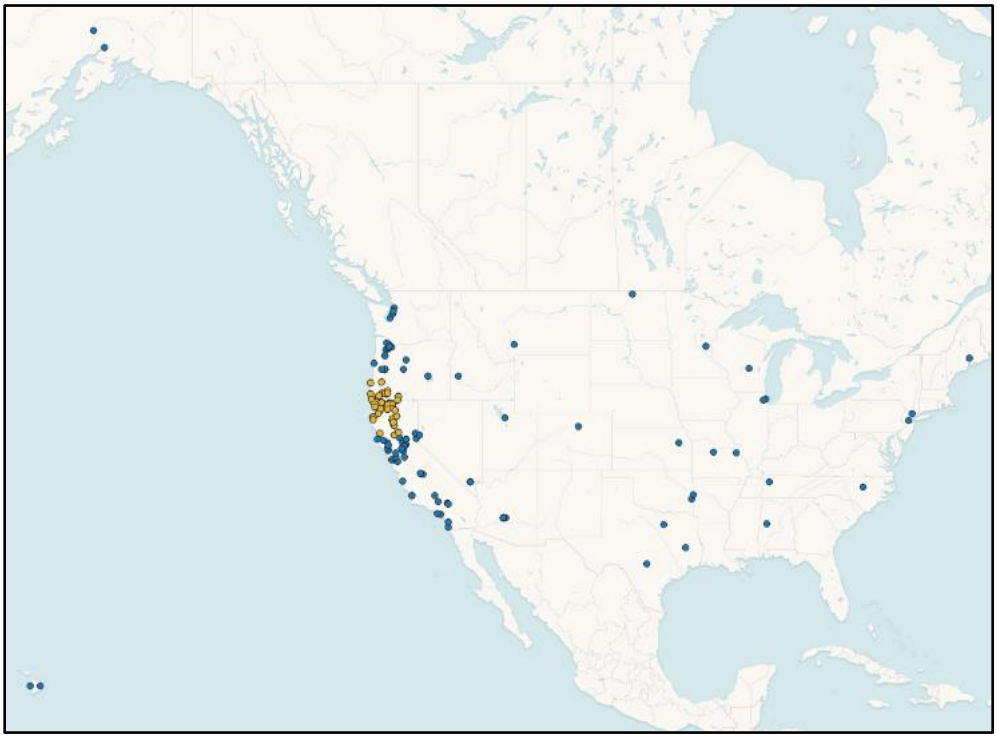

Figure 2.2.3-1: Map of georeferenced survey responses by town

We defined a survey as a "local" response when the town reported was located within three hours driving distance of the Klamath River mainstem. This distance was selected to approximate areas from which community members can comfortably make a round-trip, one-day visit to the river by car. Travel times were calculated with Geographic Information System (GIS) mapping tools, using the TravelTime Isochrone API plug-in. This classification resulted in 107 local respondents from Northern California and Southern Oregon and 118 "non-local" respondents from all other places (Figure 2.2.3-2). Nonlocal Karuk community members responded from all across the US, as far as Alaska, Hawai'i, the Midwest, and the East Coast (Figure 2.2.3-1).

For participants in California and Oregon, the two states with an active political interest in dam removal, we also noted the political orientation for respondents' county of residence. To categorize county political orientation, we examined records for the 2020 US presidential election, and compared county voting records for Democratic (Joe Biden) versus Republican (Donald Trump) candidates. Out of the local population of respondents, 16 lived in “blue” counties and 91 lived in “red” counties. These blue counties significantly overlap with the Orleans Council District (see below), contributing to an upriver/downriver stratification of political orientation. We noted that a majority of local respondents live in red counties. At the same time, when we visualized Karuk community members in California and Oregon (states with a direct interest in dam removal) living further away from the river (more than 3 hours driving distance), we noted most were in blue counties. (The visualization in Figure 2.2.3-4 does not include the 24% of nonlocal respondents residing in areas outside of Northern California or Oregon.) These political trends are relevant for understanding how attitudes towards dam removal shift by geography.

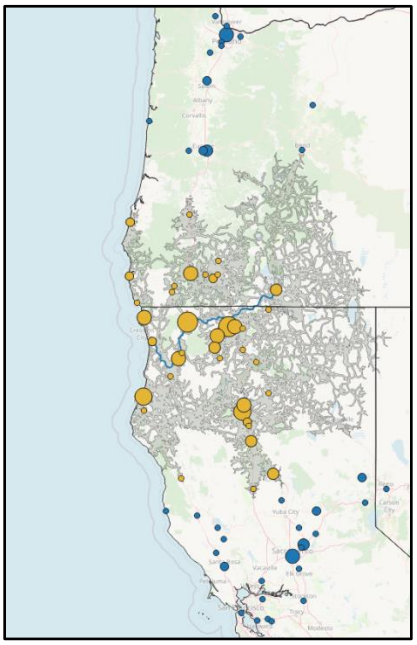

Figure 2.2.3-2: "Local" (gold) and “nonlocal” (blue) respondents, classified by 3 hours driving distance from the Klamath River (gray polygon), with size of dots representing number of respondents

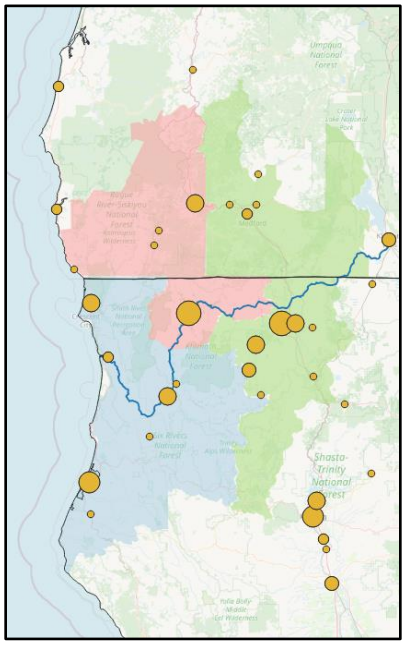

Figure 2.2.3-3: Karuk Tribal Council Districts shown in shaded polygons: Yreka (green), Happy Camp (pink), and Orleans (blue)

- Counties in the “local” area voting majority Democrat were categorized as “blue” counties, with electoral margins-of-victory: Butte (1.9%), Humboldt (33.4%), and Mendocino (35.8%) Counties in CA.
- Counties in the “local” area voting majority Republican were categorized as “red” counties, with electoral margins-of-victory: Del Norte (16.4%), Glenn (27.2%), Lassen (51.4%), Modoc (45.1%), Shasta (33.1%), Siskiyou (15.7%), Tehama (35.6%), and Trinity (5.3%) Counties in CA, and Coos (20.5%), Curry (16.2%), Douglas (37.5%), Jackson (3.4%), Josephine (25.8%), and Klamath (40.6%) Counties in OR.

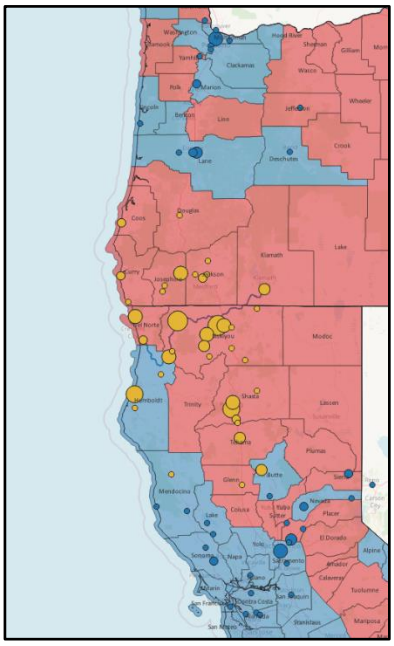

Figure 2.2.3-2: Blue shading represents counties that voted majority Democrat in the 2020 presidential election, and red shading represents counties that voted majority Republican

For a finer scale of analysis, we also grouped data by Karuk Council Districts, as defined by the Karuk Tribe Constitution (Figure 2.2.3-3). These areas are established to ensure a representative Tribal

government elected from each of the Karuk Tribe's longstanding communities. These include 1) the Orleans (Panámniik) District: the towns and surrounding areas of Orleans, Weitchpec/Hoopa, Somes Bar, Forks of Salmon/Sawyers Bar, Weaverville, Crescent City, Klamath, McKinleyville, Arcata, Eureka, Fortuna, and Rio Dell; 2) the Happy Camp (Athithúfvuunupma) District: the towns and surrounding areas of Happy Camp, Seiad Valley, Klamath River, Scott Bar, O'Brien, Cave Junction, and Grants Pass; and 3) the Yreka (Kahtishraam) District: the towns and surrounding areas of Yreka, Montague, Fort Jones, Etna, Hornbrook, Ashland, Talent, Phoenix, Medford, and Central Point. These Karuk political Districts do not perfectly overlap with the "local" category used in this study (3 hours driving distance from the river), and result in a slightly smaller group size, with a total of 75 respondents: 23 from the Orleans District, 21 from the Happy Camp District, and 31 from the Yreka District.

2.2.4 *Survey response demographics*

In addition to gathering information about geography and Tribal affiliation, our survey collected demographic data about gender, age, income, household income, and education (see Appendix A, Table 2.2.4-1 for response rates (N) for each question by demographic). Survey analysis used Qualtrics and R. Demographic analysis of responses demonstrated that a diverse and well mixed set of Karuk community members took the survey. Out of 238 high quality, Tribally-affiliated survey responses, 113 identified as male, 118 identified as female, and 7 identified as either two spirit, transgender, or gender non-conforming, a category recognized in this work as "gender expansive." Gender was presented as a "select multiple" question, with responses indicating that gender categories do overlap. Participants of all ages responded, from 18 to over 85, in a bell curve favoring middle-aged respondents. Around one-third of respondents reported a household income above $80,000, with the other respondents being evenly distributed below that. Approximately one quarter had education totaling at most 12 years (middle school and high school); one half had education totaling 13-15 years (associate's degree, some college, or vocational training); and one quarter totaled 16 years or above (bachelor's or graduate degree). Of the 73% of respondents below age 65, 70% were employed. Of the 215 respondents who reported their sectors of work, the most common were health, education, construction, natural resources, and social work.

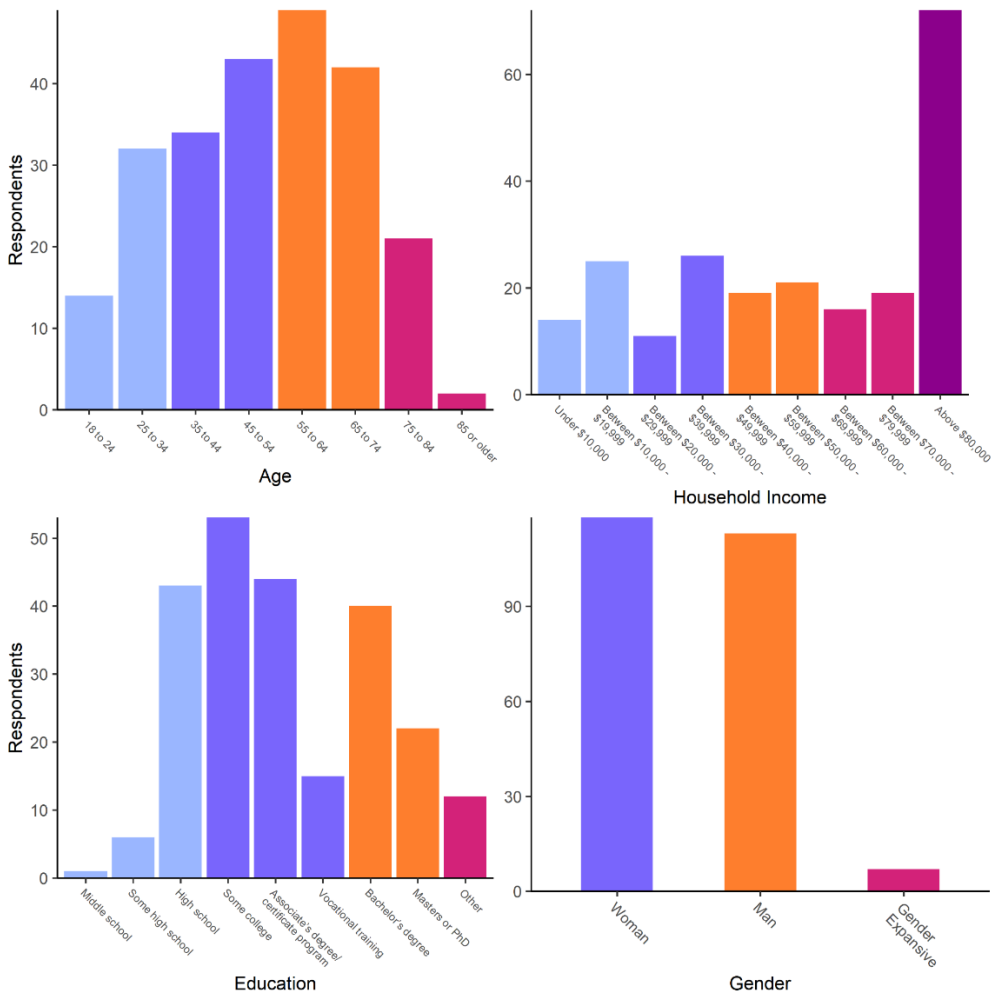

Figure 2.2.4-1: Demographic breakdown of survey respondents, from left to right and top to bottom: by age, household income, educational background, and gender; categories represented by like colors were analyzed together

2.3 Qualitative methods

2.3.1 *Focus groups and interview implementation*

We conducted focus groups to include voices directly from the community, gain a more nuanced view of dam removal, and ensure representation of specific groups within the community. Because Karuk Tribal community members are distributed across a broad geographic area in the mid-Klamath, we conducted in-person focus groups in all three Council Districts. All focus group and interview conversations occurred between November 2022 - May 2023. We spoke to a total of 55 individuals in focus groups and interviews: 30 participants in adult focus groups, 21 participants in youth focus groups, and 4 participants in interviews.

Potential focus group participants and interviewees were discussed with Tribal collaborators during scoping sessions and with our research steering committee. We worked in close collaboration with Karuk Tribe staff and cultural practitioners to invite participants from each District to participate in focus groups:

- In Yreka, we partnered with Florrine Super, Director of the Kahtishraam Wellness Center.

- In Orleans, we worked with Karuk fisherman Ron Reed, Karuk basketweaver Verna Reece, and longtime collaborators at the Karuk Department of Natural Resources to host multiple focus groups.
- In Happy Camp, we conducted multiple meetings with Tribal government and ceremonial leaders, as well as cultural practitioners.
- For youth focus groups held in all three Districts, we worked with Scott Aseltine, Karuk Tribe Education Director, and the Karuk Youth Leadership Council. Karuk youth and education team members showed out to focus groups rain or shine – even during a late winter snowstorm in Happy Camp.

We conducted all focus groups in person, and held individual interviews with key actors by Zoom (see Appendix A, Table 2.3.1-1 for focus group details). Some interviewees and focus group participants were non-Karuk employees tasked with representing the Tribe. We also conducted interviews with Undam the Klamath Campaign leaders and supporters, Tribal fisheries experts, and a Tribal representative with the Klamath River Renewal Corporation (KRRC), the entity that is implementing dam removal. While we had planned an interview with KRRC leadership, KRRC representatives canceled, and we were not successful with rescheduling during the study period. We did, however, interview a KRRC consultant in June 2023, which was considered as background information. Research team members also attended Klamath Basin Monitoring Program and Klamath research coordination meetings, which provided additional background on dam removal processes.

Our approach to focus group design is similar to purposeful and snowball sampling, but is better described as "relational sampling" (Hopkins, 2012; Kovach, 2021). This method supports community members in their own knowledge production process, and draws on established relationships to identify key players and Karuk knowledge holders who could then invite others. This method facilitates more effective meaning-making derived from preexisting relationships and trust held among participants.

All focus groups and interviews were voluntary and followed approved Tribal and university processes for informed consent. We received participant permission to record and transcribe sessions. We also received participant permission to store research materials with Karuk DNR following the study. Adult research participants were asked to indicate their preference for remaining anonymous or using their name in written materials, with most choosing to use their name. Because they are minors, no youth names are used in written materials.

With interviewees and focus groups, we compensated individual participants for their time with a small honorarium in the form of a gift card/gas card that participants could sign for directly following the research session. All Karuk cultural practitioners were recognized for their time and expertise through honoraria. For youth focus groups, we provided meals in addition to modest gift cards.

2.3.2 *Weaving knowledge systems in approach and analysis*

Focus groups blended Indigenous and Western qualitative methods to align with Karuk community protocols and ways of knowing (e.g., Hunt & Young, 2021). Participants and researchers sat in a circle, shared food, and discussed loosely structured questions designed to describe the impact and experience of dam removal. These simple questions often led to extended discussion and connections to other topics initiated by participants, leading to a rich collection of stories and insights connecting the many dimensions of dam removal. Moving in a circle, each participant shared their experience or reaction to the topic and generated further reflection among other participants, bringing context and substance to

the narrative. Depending on the mix of new and familiar faces in the focus group, stories were shared along a continuum of "research as interview," "research as conversation," and "research as chat"; in Indigenous storywork methodologies, these terms describe how varying degrees of closeness in relationships facilitate mutual understanding, especially providing the ability to understand intended meaning (Haig-Brown, 1995; Archibald, 2008). Most of all, we sought to construct knowledge dialogically, encouraging the influence of participants on the direction of the conversation (Kovach, 2019, 2021).

In conducting a social impact assessment of Klamath dam removal that centers Tribal community well-being, questions (see Table 2.3.3-1) focused on:

1) Community experiences, knowledge, and attitudes about dam removal;
2) Goals for what dam removal may bring, and overall significance of the dam removal initiative; and
3) Domains of social well-being currently experienced by Karuk community members who are predicted to change with Klamath dam removal and river restoration (i.e., access to cultural resources, health, livelihoods, education, and self-determination).

When analyzing and interpreting this data, we applied methodologies derived both from Western qualitative and Indigenous knowledge traditions. Different members of the team approached the same material with complimentary methodologies and built a composite understanding together. This meant data was alternately coded through NVivo (deductive and inductive coding) or listened to in full and interpreted as story (Thomas, 2014). Drawing on the different strengths of the research team, we used these approaches in tandem to identify the meanings generated in focus groups. While the former is effective in compiling and analyzing a large amount of data, this procedure involves a loss of information and erasure of voice (Simonds & Christopher, 2013; Hallett et al., 2017). The latter considers the flow of the conversation, the tone of voice, the context within the story, and the greater meanings that are built collaboratively during the focus group (Andrews, 2020).

While coding data seeks to answer certain questions about dam removal framed by the researchers, the story approach helped us to construct an understanding of dam removal as defined and experienced by the community. This aspect of the approach most resembles grounded theory in the Western canon. In the story approach participants' narratives are considered as holistic, subjective experiences describing different facets of the phenomenon, while the coding approach atomizes and recombines data to paint a picture from above. Applying the same principle at a larger level, we considered the narratives constructed by focus groups with different relationships to dam removal together to describe the community impact.

2.3.3 *Youth focus group approach*

A central goal for our assessment was to include youth – both to reflect Karuk values and acknowledge the outsize impact dam removal will have on this generation. Fundamentally, we sought to recognize youth as full participants, agents, and intellectuals representing their community (e.g., Bird-Naytowhow et al., 2017). In holding these focus groups we considered youth as authorities of their own experiences, and their experiences as essential to the phenomenon of dam removal.

Youth focus groups were held with care to diminish barriers between researchers and participants. Focus groups included Tribal Education staff and parents who helped to reframe questions and encourage youth, and at times contributed their own experiences. Questions about areas of well-being were modified to be relevant, specific, and concrete to the youth. In addition, partway through each focus group, we also

invited the youth to ask any questions of the researchers, thereby flipping the facilitation dynamic. This methodological inversion encouraged participation, built rapport, and empowered youth to direct the conversation.

Table 2.3.3-1: Sample focus group questions tailored to adult and youth groups

Topic	**Adult Focus Group**	**Youth Focus Group**
Introduction, opening the discussion	What are your biggest hopes or concerns for Klamath dam removal?	What have you heard about dam removal around your community?
Cultural resources access	What cultural activities and cultural resources within the river corridor are most important to you and your family, if any? What parts of the river do you visit for these purposes? How do you think dam removal will affect your ability to gather, fish, or access the river for your needs?	What kinds of things do you like to do on the river? Where do you like to go, and how often do you go? Do you think dam removal will affect the kinds of things you and your family like to do on the river?
Holistic health	How does the health of the river affect the health of you and your family physically, mentally, spiritually, or emotionally? How do you feel about the current health of the river?	How is the Klamath River part of your life? How do you feel when you go down to the river? How do you know the river is healthy or unhealthy right now? Do you feel comfortable swimming in the main stem river?
Education	What types of education about dam removal have you seen? What do you think needs to happen to educate people about dam removal? Are Indigenous science and Indigenous knowledge being included in dam removal and restoration efforts?	Have you learned anything about dam removal in school? How do you talk about dam removal with friends and family? What would you like to learn about dam removal?

Livelihoods	Have you heard about any job opportunities, or do you know of any job connections on the river? Is the Tribe able to access additional financial support through dam removal for additional wages, improved infrastructure, or other structural support?	How would you like to be involved in dam removal restoration efforts?
Self-governance	Do you feel there is representative input from Tribal voices in the dam removal process? What would be necessary to have Tribal views represented in the decision making process? What do you want to see next in the dam removal and restoration processes?	What do you know about the history of dam removal? How has the Salmon Run impacted dam removal?

3 RESULTS PART I: Community attitudes, expectations, and goals for dam removal and river restoration

Figure 2.3.3-1: Ron Reed, Earl "Scrub" Aubrey, and additional community members dip net fishing at Ishi Pishi fishing rocks (Photo: Sibyl Diver)

Results are based on perspectives across a broad cross-section of community members. We organize our results and discuss findings in three areas:

1) Karuk Tribal community attitudes, expectations, and goals for dam removal, including hopes and concerns for dam removal and subsequent river restoration;
2) Deeper significance of dam removal for the Karuk Tribal community, considering widely held Tribal community knowledge on what dam removal means to the Tribal community at this transitional moment, in the six months leading up to dam removal and after twenty years of advocacy; and
3) Baseline assessment of dam removal impacts on Tribal community well-being, evaluating social well-being factors relevant to Tribal community members that are predicted to change with dam removal. We report on the following components of Tribal community well-being, building on previous social assessment research conducted in Indigenous salmon communities: 1) access to cultural resources, 2) holistic health, 3) education, 4) livelihoods, and 5) self-governance.

3.1 Community attitudes towards dam removal

Our survey results draw on a diverse set of respondents to provide a snapshot of Karuk Tribal community attitudes towards dam removal in the six-month period leading up to breaking ground on demolition. The question from the survey resulting in the single greatest consensus among all participants was: "How important is the Klamath River to you?" Among all respondents, 83% said it was "very important" and another 14% said "somewhat important" (N = 238) (Figure 3.1-1; see also Appendix B, Figure 3.1-3). In general, the Karuk community is strongly supportive of dam removal, with 68% of all respondents reporting support, another 14% reporting "not sure," and 18% opposed (N = 238). We observed majority support for dam removal for almost every demographic group (Figure 3.1-2). The one exception to this rule still had a majority of respondents stating they were supportive or unsure about dam removal. Most respondents expressed positive expectations for all three desired areas of dam removal impacts that we asked about: improvement to health and well-being, improvement to cultural resource access, and the ability for Tribal community members to participate in dam removal and restoration decisions into the future.

These results clearly support the notion that the Klamath River continues to be centrally important to Karuk people, no matter their location, history, or identity. Dam removal affects some of the most fundamental aspects of Karuk community life, namely Karuk connections to the river. While the nature of this connection varies among groups, the overwhelming finding is the similarity of interests held within the community. Further, we observed an overarching positive attitude towards dam removal and how it stands to affect the community. While not all individuals were supportive, the majority of the community stands behind dam removal and believes it will lead to improvements to their lives.

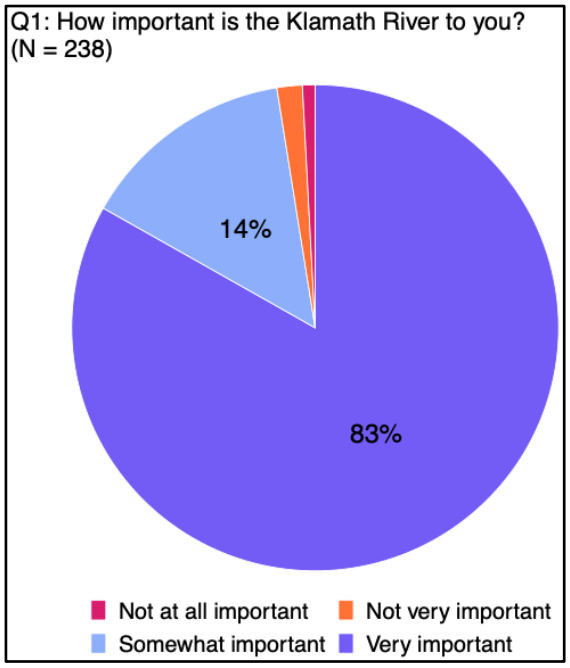

Figure 2.3.3.1-1: Question 1: "How important is the Klamath River to you?" (N = 238)

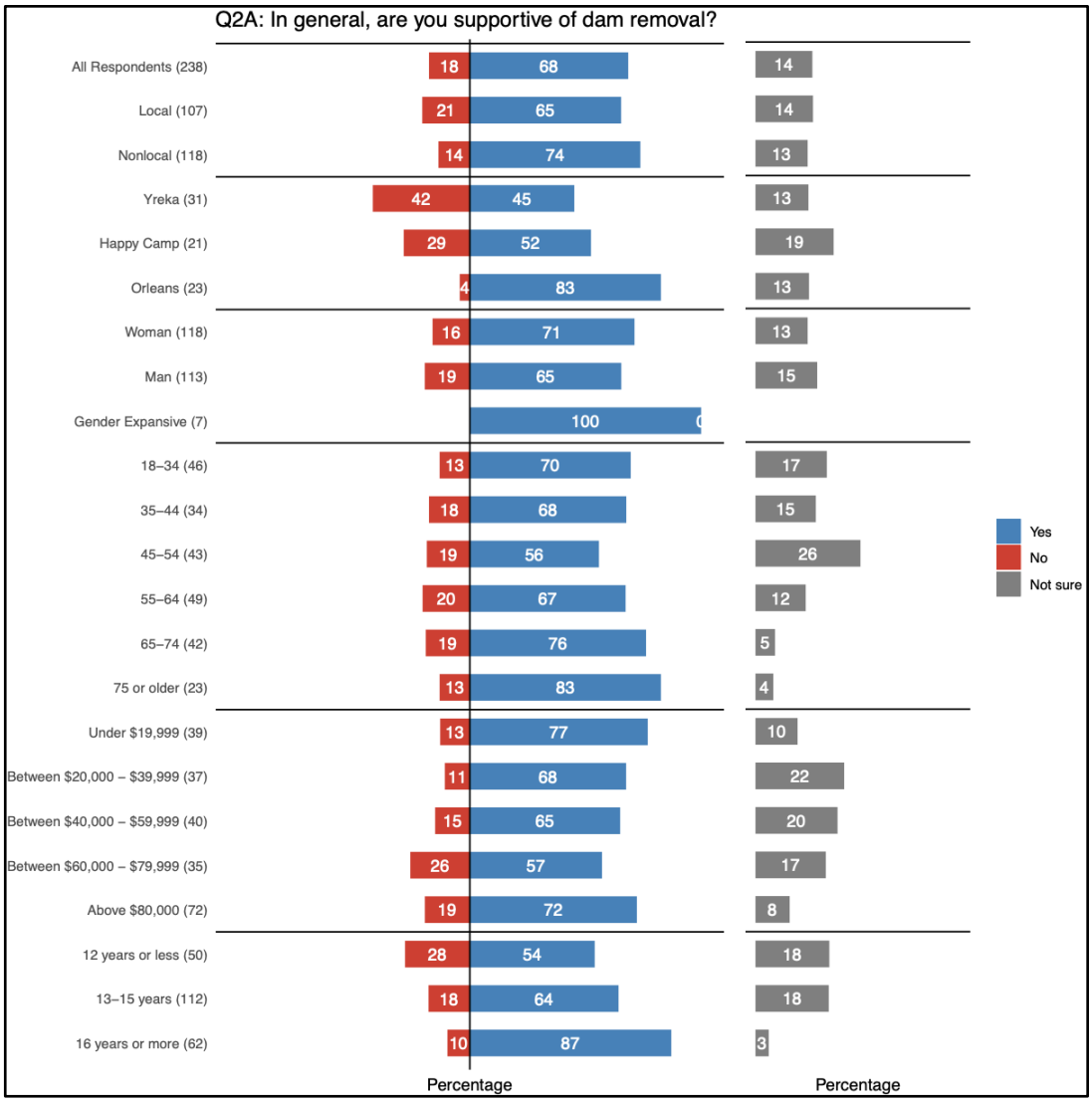

Figure 2.3.3.1-2: Question 2A: "In general, are you supportive of dam removal?" (N = 238)

Here, we share several demographic trends observed in community attitudes, illustrated above in Figure 3.1-2:

- **Local and Nonlocal.** Both local and nonlocal groups reported high importance of the river, but nonlocal respondents were 8% more likely to support dam removal (see Figure 2.2.3-4 regarding the conservative political orientation of counties where most local respondents live). (Local N = 107, Nonlocal N = 118)
- **Council Districts.** We observed an increase in concern when moving downstream through Council Districts, with the river being "very important" to 77% of respondents in Yreka, 90% in Happy Camp, and 100% in Orleans. Support for dam removal matched this pattern, with 45% supporting the project in Yreka, 52% in Happy Camp, and 83% in Orleans. Notably, Happy Camp respondents were slightly more likely to be unsure about dam removal compared to the other Districts and the global average. The highest level of opposition was observed in the Yreka Council District – where the combined total of Yreka respondents supporting dam removal (45%) and those who were

unsure (13%) still exceeded the project opponents (42%). (Yreka N = 31, Happy Camp N = 21, Orleans N = 23)

- **Local County Politics.** Local respondents in red counties were 26% less likely to support dam removal and 9% more likely to be unsure compared to those in blue counties. Despite this gap, a full 63% of local respondents in red counties indicated their support for the project. (Red N = 91, Blue N = 16)
- **Gender.** While women and men respondents answered similarly about the importance of the river, 6% more women supported dam removal. Gender expansive respondents unanimously indicated that the river was "very important" to them and supported dam removal. (Women N = 118, Men N = 113, Gender Expansive N = 7)
- **Age.** The oldest age groups were most likely to report that the river was "very important" to them compared to other age groups. Findings by age group on support of dam removal followed a parabolic pattern where the youngest and oldest groups were most likely to be supportive. Level of uncertainty varied by age group, with the oldest groups least likely to report "not sure" the least. (18-34 N = 46, 35-44 N = 34, 45-54 N = 43, 55-64 N = 49, 65-74 N = 42, 75 or Older N = 23)
- **Household Income.** For all income groups the majority of respondents indicated the river was "very important" to them and expressed support for dam removal. (Under $19,999 N = 39, Between $20,000 - $39,999 N = 37, Between $40,000 - $59,999 N = 40, Between $60,000 - $79,999 N = 35, Above $80,000 N = 72)
- **Education.** Having more years of education was associated with indicating high importance of the river and support for dam removal. In addition, level of uncertainty dropped to 3% in the college-educated group, the lowest of any demographic. (12 years of education or less N = 50, 13-15 years N = 112, 16 years or more N = 62)

Geographic patterns in findings reflect political climate: higher support from nonlocals aligns with the observation that a majority of nonlocal respondents live in "blue" counties while a majority of local respondents live in "red" (see Section 2.2.3). Similarly, for local respondents, those in blue counties (Humboldt, Mendocino, and Butte) were much more likely to support dam removal than locals in red counties. Among locals in red counties, Siskiyou County respondents were significantly more opposed than other counties. A history of opposition to dam removal and general hostility towards Native peoples in this area has made some Karuk supporters of dam removal in the Yreka area targets of harassment (see Section 3.5 and Section 5.3.3). This trend also plays out among Council Districts, with more upriver Districts (Happy Camp and Yreka) expressing higher levels of uncertainty or opposition to dam removal. Patterns in level of education may reflect community resilience to misinformation about dam removal, as well as political trends shaping educational offerings in different Districts. Further suggesting the power of information and education, respondents who received new information about dam removal in the last year were 20% more likely to support and 6% less likely to be uncertain about dam removal.

3.2 Community expectations for dam removal: Health, cultural resources, and Tribal representation

The survey also asked questions about predicted improvement in health, cultural resources access, and Tribal representation in decision-making regarding dam removal, and captured the optimism of many community members. Most respondents expressed positive expectations for all three areas of desired dam removal outcomes that we asked about. In terms of health, 64% of respondents expected their well-being would at least "somewhat" improve (N = 235) (Figure 3.2-2; see also Appendix B, Figure 3.2-4). In terms of cultural resources, 75% of respondents expected access would at least "somewhat" improve (N = 235) (Figure 3.2-1). In terms of representation of Tribal voices in the dam removal process moving forward, 69% of respondents were at least "somewhat confident" that Tribal representation would occur

(N = 238) (Figure 3.2-3; see also Appendix B, Figure 3.2-5). Generally, respondents were more optimistic about improvement in access to cultural resources and Tribal representation than improvement to well-being: 8% and 9% reported no confidence in having a voice in the dam removal process moving forward, no expectations for improvements to cultural resources, respectively, compared to 19% reporting no expectations for improvements to personal well-being.

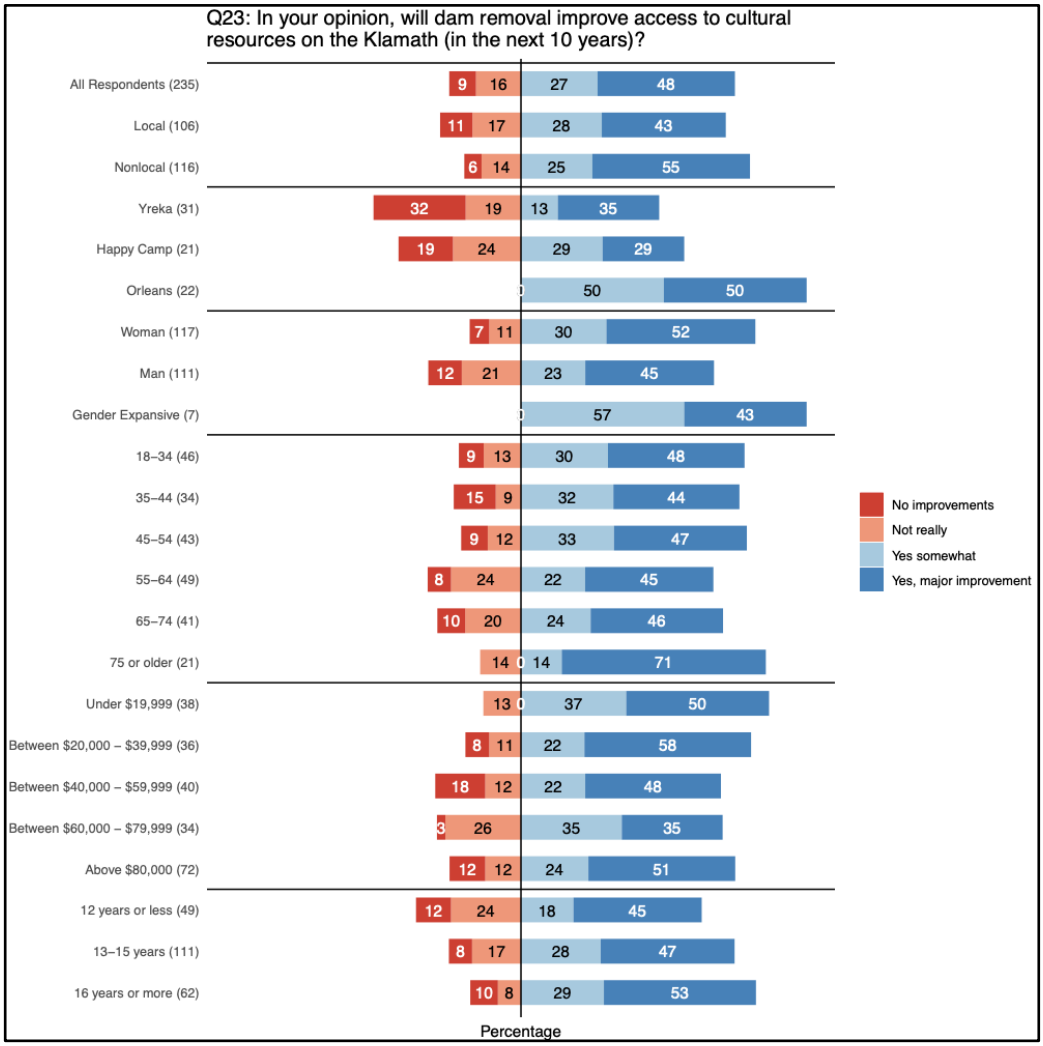

Figure 2.3.3.2-1: Question 23: "In your opinion, will dam removal improve access to cultural resources on the Klamath (in the next 10 years?) (N = 238)

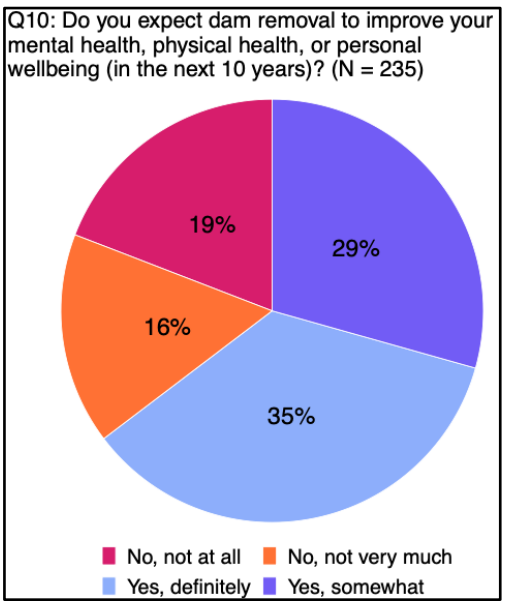

Figure 3.2-2: Question 10: "Do you expect dam removal to improve your mental health, physical health, or personal wellbeing (in the next 10 years)? (N = 235)

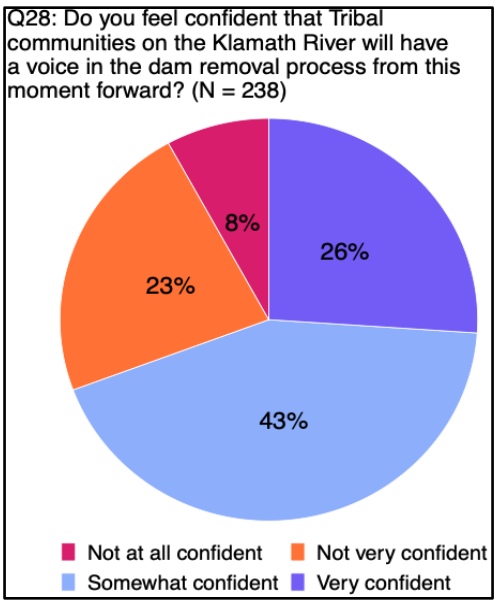

Figure 3.2-3: Question 28: "Do you feel confident that Tribal communities on the Klamath River will have a voice in the dam removal process from this moment forward?" (N = 238)

The figures above demonstrate some of the trends in community expectations for changes to health and well-being, access to cultural resources, and Tribal representation in decision-making moving forward:

- **Local and Nonlocal.** Expectations about health and Tribal representation were similar for local and nonlocal respondents; expectations about cultural resources were more divergent, with nonlocal respondents being 8% more optimistic than locals. (Local N = 106, Nonlocal N = 116 with slight variation in N; see Appendix A, Table 2.2.4-1)
- **Council District.** While respondents in Orleans were nearly unanimous in their optimism about improvements to health and well-being, expectations on well-being were less optimistic in Yreka and Happy Camp. Districts were more in agreement about the future of Tribal representation, with Happy Camp being the most optimistic, Orleans intermediate, and Yreka the least optimistic. (Yreka N = 31, Happy Camp N = 21, Orleans N = 23 with slight variation in N; see Appendix A, Table 2.2.4-1)
- **Local County Politics**. Local blue counties were more optimistic than local red counties, with local red and blue counties separated by 30% on well-being, by 25% for expectations on cultural resources, and by 11% for expectations about Tribal representation. (Blue N = 19, Red N = 88 with slight variation in N; see Appendix A, Table 2.2.4-1)
- **Gender.** Gender groups showed similar patterns in all three topics, with women being slightly more optimistic than men, with 9% difference for health and well-being, 14% difference for cultural resources, and 3% difference for Tribal representation. Gender expansive respondents were unanimously optimistic about improvements to health and cultural resources from dam removal, but not all were confident about ongoing Tribal representation in dam removal. (Women N = 118, Men N = 111, Gender Expansive N = 7, with slight variation in N; see Appendix A, Table 2.2.4-1)

- **Age.** The youngest and oldest groups had the highest expectations for improvements to health, cultural resource access, and Tribal representation. The 45-54 group exhibited high optimism, although elders 75 and older were the most optimistic group on each topic. (18-34 N = 46, 35-44 N = 34, 45-54 N = 43, 55-64 N = 49, 65-74 N = 42, 75 or older N = 21, with slight variation in N; see Appendix A, Table 2.2.4-1)
- **Household Income.** For health and well-being, as well as expectations for improvements to cultural resource access, the lowest and highest income households had the highest expectations for improvement. For Tribal representation, expectations declined with increase in income, and showed a significant drop in expectations for income groups above $40,000/year. (Under $19,999 N = 39, Between $20,000 - $39,999 N = 36, Between $40,000 - $59,999 N = 40, Between $60,000 - $79,999 N = 34, Above $80,000 N = 72, with slight variation in N between questions; see Appendix A, Table 2.2.4-1)
- **Education.** For health and well-being, as well as cultural resource access, we observed increased expectations for improvement with greater number of years of formal education. For Tribal representation in decision-making, the group with the least number of years of formal education had the highest expectations. (12 years or less N = 49, 13-15 years N = 111, 16 years or more N = 62, with slight variation in N between questions; see Appendix A, Table 2.2.4-1)

Expectations for improvements with dam removal were highest downriver in Orleans. But when we spoke with natural resource professionals in focus groups and interviews they predicted that many restoration effects would be felt along a gradient, with improvements attenuating with distance downriver from dam removal areas. This means the Yreka community is expected to see the most change in their local river reaches, compared to other Districts – a finding that contrasts with lower expectations for dam removal. This again speaks to informational challenges in the Yreka area, also the area with the highest level of opposition to dam removal. Council Districts reflected regional political environments. At the same time, similar types of expectations for Tribal representation in dam removal was encouraging, and may reflect the progress made with increasing Tribal presence in regional politics over the course of the dam removal campaign. Elders remembered the river before its devastation in recent decades, which may account for their high expectations for its restoration. Youth expressed more progressive politics, contributing to generational differences. Stratified expectations about health and cultural resources by level of formal education suggest once again the influence of misinformation about dam removal on some groups more than others. The reverse trend for expectations about Tribal representation may suggest that people with 12 years education or less (middle school through high school) feel more empowered by the dam removal movement or view it as more successful. This finding aligns with the lowest income group having the highest expectations for Tribal representation in decision-making, assuming overlap between the two groups.

Analyzing survey data across questions, respondents who were supportive of dam removal were more likely to be confident about future representation of Tribal communities in decision making, as were those who personally participated in a dam removal process (see Section 5.5.1). This may reflect a feeling of success, pride, or empowerment in the community. However, the fact that not all who participated in dam removal processes were supportive highlights the diversity of views and experiences within the community, and potential differences in what may be viewed as “Tribal representation.” Patterns in expectations of Tribal representation may also reflect social position, level of involvement with the Tribe, or exposure to different sources of information.

3.3 Persistence of place connections for Karuk community members

Demonstrating the persistence of place connections for Karuk people living away from ancestral territory and Tribal lands, many non-local respondents to our survey expressed deep concern for Klamath River health and strong investment in dam removal outcomes. Of course, the Karuk Tribe is a diverse community, and some non-local community members reported that dam removal does not affect them. Yet a number of respondents shared that they still have family in the area, or feel connected given their Tribal affiliation even when they are not themselves physically located on the river. Several non-local respondents expressed empathy for local Karuk community members who did experience direct impacts:

- "I don't live in the area but worry about people who do." – *Survey comment*
- "I feel sad for those living along the life-giving River and no longer able to continue to celebrate, catch, smoke, and enjoy their salmon." – *Survey comment*
- "I'm always happy to come back. I really miss home. This definitely is home; this is where my grandma was born. It feels like home to me. It's always nice to be back here on the river." – *Carolyn Smith, anthropologist and basketweaver*

The ability to include voices, hopes, and concerns of the broader Karuk Tribal community is an important contribution from the study, given these ongoing connections. Impacts of management decisions on the river ripple out into the Karuk community in diaspora. This demonstrates how place-specific connections continue to be held over space and time in the Karuk community, and recalls survey findings documenting the importance of the river to the community at large.

3.4 Community hopes for dam removal

Given the extensive work that has gone into negotiations leading to Klamath dam removal, community members expressed a range of hopes and fears related to dam removal impacts on the Karuk community. A number of respondents communicated their hopes for ecological improvements, for healthy salmon, and for river restoration. Many are hoping these ecological improvements will bring back cultural resources and cultural connections between Karuk people and the river. Participants mentioned the numerous ecological benefits that they anticipated related to dam removal, and cultural restoration flowing from biophysical changes (see Appendix C, Table 3.3-1 for quotes discussing ecological benefits anticipated from dam removal). Numerous respondents also articulated their hope for community healing (see Appendix C, Table 3.3-2 for quotes articulating hope for community healing as a result of dam removal). For example:

- "People want to come down to the river when the salmon are running – it revitalizes the sense of being." – *Ron Reed, traditional dip net fisherman and ceremonial leader*
- "I feel like the river will restore itself with the help of some human hands… And then the salmon will go up into the Upper Basin. And so that's a huge hope. And then just seeing the type of return we got this year. It was a very… a healing return for a lot of us. Having access and availability to salmon was huge, so my hope is that the runs get stronger and even better, and, you know, the spring run is able to survive. That would be really incredible, and maybe some of the other species, like candlefish, may make a comeback as well... There's hardly any left, and when you check the traps they're just… occasionally you'll find a candlefish. But maybe they'll come back too." – *Chook-Chook Hillman, cultural practitioner, ceremonial leader, and direct action organizer*

Karuk community members expressed a broader hope, not only for increased abundance of cultural resources, but also the revitalization of Karuk eco-cultural practices like fishing, gathering, basketweaving, and ceremony that connect people to the river and one another (see Appendix C, Table 3.3-3 for quotes expressing community hopes for increased access to cultural resources post-dam removal):

- "Having a free-flowing river will decrease the potential for those stagnant locations [to] build up the toxins and so that definitely will improve as far as people getting out and actually using and having confidence to use the material. So we'll do some more burning along the river systems to restore a lot of the willow that has built up with the infestation of bugs. We want to restore some of the traditional sites along the river system so they can be accessible and maybe bring back ceremonies that were once held in those places. Definitely creating rearing locations for fish to spawn." – *Wendy "Poppy" Ferris-George, anthropologist, basketweaver, and Karuk Tribe appointee to the KRRC Board of Directors*

Many participants expressed their hope that dam removal will lead to a larger role for salmon in Karuk society, returning as the basic fiber of community identity and culture. The return of salmon has the potential to address some of the deepest legacies of colonial genocide, displacement, and boarding schools, including the alienation of community members and the loss of culture. Participants spoke about restoring salmon as a key step to recovering what it means to "act like Karuks again," as expressed by Ron Reed – or recovering the underlying basis of social organization and unity through revitalizing reciprocal relationships with salmon and other cultural resources. This vision for a fundamental shift, catalyzed by the return of salmon, is a powerful meaning of dam removal:

- "It seems like this year and last year at the falls, there's more people coming home. And I think it's all due to those fish. And I think the fish know, I got a feeling the fish know, that we're taking those dams out. Once those dams come out and the fish come home, it's going to make a big difference... I just can't wait." – *Arron "Troy" Hockaday, Tribal Councilmember*
- "My hope is… that salmon plays a role in our society, and it brings our people back together again." – *Ron Reed*
- "I see it as being able to bridge with people within our community." – *Sammi Jo Jerry, cultural practitioner*

In the context of the restoration and repair of colonial legacies, participants were encouraged by additional opportunities for the Karuk community to access land and cultural resources local to them. They were also excited for the possibility of land back for the Shasta tribal community recovering lands in the reservoir footprint areas. A number of people were hoping for ongoing Tribal leadership in the dam removal and river restoration process, and for additional rights for Native people to flow from this process:

- "I would pray that the Klamath River tribes would be able to have a huge say in what happens to the Klamath River and to the removal of the dam. They have lived there for as long as the river has flowed. I know because my ancestors are from there. I used to swim and fish with my great-grandfather in the Klamath River. Before they put a dam in it." – *Survey comment*
- "It could be an opportunity for people to reconnect to the river in an area where it's been difficult, because there's denied access just from a landowner basis but also [because] the river's gone. There's a lake, there's reservoirs up there. I mean PacifiCorp doesn't allow people to use that land." – *Toz Soto, Karuk DNR Fisheries Program Manager*

3.5 Community concerns: Risks, tradeoffs, and information gaps

At the same time, some community members hold strong concerns about dam removal. Even while many were hopeful, they were unsure if dam removal will result in the desired biophysical or social changes that can lead to Tribal community benefits. As one participant put it, "Will it be enough? Will the Karuk Tribe benefit, or will those benefits go to others?" A number of people voiced their uncertainty about whether dam removal will lead to the level of river restoration that people would like to see, especially given ongoing concerns around upstream water diversions for agriculture (see Appendix C, Table 3.4-1 for quotes expressing concern for eco-cultural restoration needs beyond dam removal):

- "What's going on in my mind right now is how water is going to be managed post dam removal and what that will mean for the survival of the salmon in the Klamath Basin. You know… one of the things that I didn't really see in this paperwork is that connection to how ag[riculture] interests and Tribal interests are going to… get sorted out. In regards to how we can ensure salmon are going to live in our future." – *Bill Tripp, Karuk DNR Director of Natural Resources and Environmental Policy*

During focus groups we heard many Yreka residents speak to the hostile and racist conditions they experience in their daily lives. Indeed, respondents from Yreka were the demographic most opposed to dam removal, even though this was still a minority view among the Yreka group. Karuk people in Yreka expressed their reluctance to speak about dam removal due to fear of retaliation and potential violence. For example, one participant shared a story of losing a job after speaking out about dam removal. Sociopolitical conditions in red counties can prevent Tribal members from speaking about dam removal and may lead to higher exposure to one-sided information sources opposing dam removal for local residents (see Appendix C, Table 3.4-2 for quotes expressing concern regarding backlash against Tribal supporters of dam removal):

- "That's what they're talking about out there in Yreka, too… if they're connected to anything about dams coming out, they're afraid right now if dams come out, they're going to get retaliated [against] right now, [by] farming communities right now." – *Ron Reed*

By engaging with a diversity of Karuk community members, we gained valuable perspective on the range of concerns about dam removal. While the vast majority of survey respondents supported dam removal, concerns expressed included the risk of sediment releases, as noted by one survey respondent: "Sediment behind the dam will fill up pools and smother spawning redds." Other concerns relayed by participants included the release of toxic chemicals and pesticides held in sediments, loss of recreation, fishery impacts, washouts, loss of power supply, high costs, and loss of water regulation capacity leading to flooding or dewatering (see Appendix C, Table 3.4-3 for quotes expressing concerns and opposition to dam removal).

In survey responses, Karuk community members also demonstrated a keen awareness of tradeoffs, where they are willing to accept some risks or potential negative outcomes given the greater benefits expected to come with dam removal. For example, participants expressed understandings of the potential tradeoffs entailed in dam removal (see Appendix C, Table 3.4-4 for quotes regarding potential tradeoffs involved in dam removal):

- "The increase of fish also means the increase of food for people and wildlife. The claim of lost recreation revenue is real but will adjust. As the ecosystem recovers, so will revenue

opportunities. This is an exciting time in history to step up and restore what has been damaged for far too long." – *Survey comment*

- "And the sediment coming down, that's going to be short-term anyway. I mean eventually, the river will clean it all out. I mean, there's going to be a lot of that initially, you know, as they take the water out of the reservoir. It's just something that we'll have to live with if we want it to get healthy again." – *Renee Stauffer, basketweaver and Tribal Councilmember (at time of study)*
- "On the negative side, how are they gonna deal with it with the ag[riculture] interests?... Are we gonna be, you know, getting a short shrift because they need to be able, you know, keep the water above Keno so they can, you know, irrigate crops in a high desert? I don't know. We'll see. Plenty of activism still left to be done." – *Earl Crosby, former Karuk DNR Watershed Branch Deputy Director*

Given the complexity of social and environmental issues faced in the mid-Klamath, a number of respondents expressed reservations about what can realistically be expected from dam removal. They emphasized the uncertainty around dam removal impacts that will be realized, and that dam removal is not a "silver bullet." While these individuals were excited for the restoration potential, they pointed out other environmental and social problems, including challenges posed by agricultural diversions, groundwater pumping, cannabis cultivation, overfishing, disconnection of floodplains, catastrophic wildfire, and limitations on efforts to restore Indigenous fire regimes. These individuals emphasized the importance of engaging with these additional issues alongside dam removal to more fully achieve community restoration goals (see Appendix C, Table 3.4-5 for quotes referring to restoration needs beyond dam removal).

Several respondents also explained that dam removal impacts would vary greatly by geographic location up and down the river. While the benefits of salmon return may be seen over a broader area, other impacts such as flushing flows and scour that depend on discharge will be limited to more specific locations. Newly accessible areas will be gained primarily in the radically reshaped reservoir reach. The restoration of this stretch of river will include the reintroduction of ecological processes supporting cultural resources that are prevented by impoundment beyond dams. In terms of flow regime and sediment transport, the stretch of river from below Iron Gate Dam to the mouth of the Scott River is drastically altered and also stands to experience significant benefits from dam removal. However, participants pointed out that dilution effects from large tributaries flowing into the Klamath mainstem, combined with ongoing regulation of water releases at Keno Dam (which does not block fish passage), mean that dam removal effects related to flow regime are expected to attenuate with distance from the reservoirs.

3.6 Challenges of misinformation

Some of the anticipated scenarios voiced by opponents of dam removal were tied to misinformation; we noted a range of misunderstandings about the function of mid-Klamath dams slated for removal. Importantly, the four mid-Klamath dams being removed were not built to provide flood protection or irrigation waters: no water is diverted from mid-Klamath dam reservoirs to serve any farm, ranch, or city. Yet some community members saw the mid-Klamath dams as key infrastructure for regulating river flows and water storage, which is not the case.

As one survey respondent stated, "With no way to hold back water, drought conditions may worsen and salmon and steelhead will have limited seasonal water to migrate up the Klamath." However, regulation of water releases to the mainstem Klamath will continue to occur upriver at Upper Klamath Lake as the

primary location for water storage in the Klamath system, and flow regulation will continue during and after dam removal at upriver dams built with fish passage modifications.

Other community members expressed concerns about water availability, as in the survey comment, "Should there be some water held back somewhere for households or agriculture, other reasons. Yes, we the Karuk people may have ancestral and cultural reasons for wanting a free-flowing river, but do we not need to drink and eat." Flooding was an additional concern, with one respondent stating, "Homes will be damaged and property destroyed. There will be no 'controlling' the flow-flooding or drought." Again, this observation is inaccurate given that the lower dams being removed provided marginal flood control and the upper dams controlling Upper Klamath Lake releases will remain in place.

The impacts on the power system were also not understood by all, with one respondent commenting, "I do not think the alternate power sources will be enough to sustain the power needs of Oregon." Prior to dam removal, water from Klamath dam reservoirs did pass through the dams to spin hydropower turbines, which is the primary purpose of building these dams. Yet, unlike other hydroelectric dams, mid-Klamath dams produced a relatively small amount of electricity (production capacity of the four dams being removed is 18, 20, 27, and 98 MW, respectively for Iron Gate, Copco 1, Copco 2, and JC Boyle; see https://klamathrenewal.org/the-project/), which makes dam removal impacts on power supply minimal (dams produce approximately 2% of PacifiCorp's portfolio). According to PacifiCorp, the dams could provide enough electricity to power 70,000 homes, but dams were consistently operated below capacity. This power has been replaced, in part from renewable sources, without significantly increasing carbon emissions (Associated Press, 2022; Grable, 2022; see https://klamathrenewal.org/faqs/).

It is important to note that responses from some community members may be recalling early hydropower operations called "hydropeaking," or maximizing short-term water storage for peak power generation by spilling larger amounts of water at two of the Klamath dams (Copco 1 and Copco 2). As one respondent stated, "Elders remember how little water was in the river in summer months before the dam was put in. They say it was so low in places you could spit across it." While hydropeaking is no longer practiced on the Klamath, hydropeaking would have affected river levels prior to the construction of Iron Gate Dam in 1962 (see https:/klamathrenewal.org/faqs/ and https:/damremovalsocialimpact.com/faq/; see also Salter, 2003; see Appendix C, Table 3.5-1 for quotes referring to concerns based on misinformation or misunderstanding of dam removal processes, goals, and outcomes).

4 RESULTS PART II: Deeper significance of dam removal for Karuk Tribal community

Figure 4-1: Cutting fish with youth for cooking on sticks, traditional foods workshop at Ti Creek, with Kenneth "Binks" Brink, Jason Reed, and Nate Pennington (Photo: Konrad Fisher)

From the range of perspectives shared through focus groups, interviews, and surveys, three interconnected themes emerged as points of deeper significance for dam removal for the Karuk Tribal community, and its importance for: 1) advancing eco-cultural revitalization, 2) the continuation of ceremony, spiritual practices, and Karuk identity, and 3) supporting Karuk Tribal youth.

These themes are interconnected: the health and well-being of Karuk people depend on interconnections between a healthy ecosystem and cultural practices that are passed on across generations through ceremony and other family-based traditions. Intergenerational knowledge transfer to youth includes passing on distinct Karuk eco-cultural teachings, which convey how humans and nonhumans collaborate toward a life of abundance. Thus, dam removal is viewed as a transformational moment for improving river health and re-enabling cultural practices and ceremony, in part by facilitating intergenerational knowledge transfer through healthy relationships connecting community members and the river. These holistic findings emerged from elements of aspects of Karuk knowledge systems that community members brought into our assessment.

Extending beyond the ecological benefits or the engineering feat of taking out the dams, Karuk knowledge systems recast dam removal as an eco-cultural revitalization initiative, see Diver, Oberholzer Dent, Sarna-Wojcicki, Reed, and Dill-De Sa (2024). This speaks to the importance of dam removal for the Karuk community – not just as an infrastructure removal or salmon restoration project, but rather as a core process for revitalizing Karuk cultural identity that is dependent upon a healthy river and the continuance of Indigenous-led land stewardship. Understanding dam removal and restoration through this holistic perspective, as an interconnected ecological and cultural process, helps demonstrate how and why Tribal advocates have worked for twenty years to realize this accomplishment.

For many Karuk people, youth experiences with the dam removal process are foundational. The culmination of twenty years of Tribally led social movements to undam the Klamath provides a source of

inspiration for younger generations to reconnect to the Klamath River and to learn about the place where their ancestors and families come from. It also provides a reason to celebrate Karuk self-determination and resilience in the face of change. Creating such opportunities to learn, teach, and celebrate Karuk culture with youth is of the utmost importance because Karuk cultural survival depends on passing placed-based Karuk identities and knowledge to the younger generations.

All of these processes are connected to Karuk spiritual beliefs and ceremonial practices – practices that both depend upon and promote healthy river conditions. Tribally-led movements for dam removal were not simply driven by political interests, they are also spiritual in nature, guided by World Renewal belief systems. Following on previous struggles for land protection, the success of Karuk people with dam removal helps them to fulfill part of their inherent responsibility for caretaking the Klamath watershed. In this way, dam removal provides a moment of repair for Karuk community members struggling to maintain their spiritual health and hoping for a life of abundance.

4.1 Advancing Karuk eco-cultural revitalization (Insight 1)

First, Karuk community members discussed the importance of understanding interconnections between the ecological and cultural elements of dam removal, and what this means to them. Many people spoke to the long history that Karuk people have living on the river, and their experiences witnessing ecological decline. Reflecting the importance for Karuk people of maintaining a healthy ecosystem (see Appendix C, Table 4.1-1 for quotes emphasizing the ecological importance of dam removal for Tribal fisheries), many research participants discussed the importance of bringing back healthy salmon runs, a free-flowing river, and a healthy ecosystem on the Klamath, commenting on the survey:

- “Fish gotta live.”
- “Bring the salmon home!”
- “Dam removal will bring clean water and salmon back to the tribal lands.”
- “The free flow of water will decrease, hopefully eliminate, algae blooms that are toxic to people and wildlife, prompting a healthier ecosystem. It’s a win win.”

Given the dependencies between healthy ecosystems and Karuk culture, conversations around restoring salmon quickly flowed into discussions of the cultural importance of dam removal. Multiple respondents described the Klamath River as a home place that holds the cultural and family heritage of Karuk people. Some emphasized the importance of coming from a place-based culture. Thus, one of the most important elements of dam removal for Karuk people is the opportunity for restoring place connections that can help maintain and reconnect individuals and families to their Karuk ancestry (see Appendix C, Table 4.1-2 for quotes describing the importance of dam removal and restoration for connections between Karuk people and their family and ancestors), as expressed in survey comments:

- “It’s my home and connection to my family.”
- “Dam removal gives hope that we as a tribe can continue to renew the land as our ancestors did.”
- “The river is the life line to the native population and is part of our history.”
- “My mother’s ashes are there [in the river]. And I will meet her there when I move on.”
- “I grew up fishin’, swimming and enjoying the Klamath river. It is part of my heritage and important that we leave it better for generations to come.”

4.1.1 *Healing the river to heal the people*

Some respondents discussed their cultural identity as being rooted in an embodied relationship to the river, in a physical, spiritual, and metaphorical sense. A number of individuals spoke of the river as being the "life blood" of the Karuk people and described how the Karuk people and the river are not held separately, but are, in fact, the same (see Appendix C, Table 4.1.1-1 for quotes describing the importance of dam removal and river restoration for cultural identity). Demonstrating how much is at stake for many Karuk people with dam removal and river restoration, respondents discussed how reconnecting people and the river was central to revitalizing Karuk cultural identity, such that healing the river also heals the people:

- "What is the glue that brings the spirit of the Karuk together? The river *is* the lifeblood of that story!" – *Ron Reed*
- "They have to come out. Like I told people here earlier, it's like cleaning my arteries because those dams are clogging my arteries, the Klamath River is my blood." – *Troy Hockaday*
- "I live for this river here. Basketry. I mean, I pick next to the river on the river in the river in the water. My kids have spots that they go on. My grandkid is swimming in the same spots that I swim on. And I want for it to stay at. I can't imagine that it would go away. And for it to come back in full force that we haven't seen, we're going to see something different and new. And it's powerful." – *Elaine Garcia, basketweaver and Tribal Librarian, People's Center Museum*
- "I would die to save the River." – *Survey comment*
- "We are Karuk-arara… the Up-River people… when the river is strong, the people are strong." – *Survey comment*

Specifically, a number of individuals described how their own physical, mental, and spiritual health (as well as the health of the community) depended on having a "free-flowing" river – both in literal and metaphorical terms (see Appendix C, Table 5.2.2-1 for quotes regarding links between the health of the river and the holistic health of the Karuk Tribal community):

- "How can I be healthy when the river is not?" – *Survey comment*
- "I am Karuk therefore the generation of my very being has been/is implicit within the health of the river. Restoration of nature is crucial to the well-being of the earth and all its beings." – *Survey comment*
- "The health of the people is directly dependent on the free flowing health of the river." – *Survey comment*
- "In a time of increasing disconnect from physical features that connect us as a culture and society, I feel that a free flowing Klamath has the potential to reconnect individuals and groups both physically and metaphorically. A healthy ecosystem leads to healthy populations." – *Survey comment*
- "For me, the importance of taking down the dams is because the rivers are a part of who we are… I think it's really important to take them down because the river is sick, and if the river is sick, it affects all of us. It'll make the fish healthy, the plants healthy, and all of the animals that rely on the river. It'll help make us healthier too." – *Carolyn Smith*

4.1.2 *Ecological factors affecting cultural resources*

In considering implications of dam removal for Karuk eco-cultural revitalization, one core aspect is how biophysical changes to the Klamath ecosystem occurring with dam removal are expected to impact Karuk

culture, especially Tribal access to cultural resources. Restoring river connectivity is expected to affect fundamental ecosystem processes that shape the availability and health of cultural resources. This includes river processes and cultural uses that rely on the free movement of anadromous species, flushing flows that are expected to move sediment and sand downriver, and water quality. For example, the current river regime changes how fish swim upriver at Ishi Pishi Falls, which impacts the Karuk Tribe's only subsistence fishery, and the viability of family-based fishing areas:

- "I guess the perfect example would be where the Karuks consider the center of their world in the [Ishi Pishi] falls down there where we do our dip net fishing. And… what has changed in the last couple of years is the flows have become so low that again, the fish, they changed their route. They can now kind of go up the middle of the falls a little bit [preventing dip net fishing], where before they went off to the side so that's changed." – *Buster Attebery, Tribal Chairman*
- "Now we don't have the gathering areas like we used to because of a regulated river. We don't have the fishing holes that dad used to take us to. Whoever used to take you fishing, you don't go there anymore. So there's denied access because of a lack of resources." – *Ron Reed*

As participants discussed the kinds of changes to cultural resource access they are looking for, it became clear that, for many Karuk, dam removal is much more than a fisheries project or an improvement in isolated ecosystem services – it is about landscape-scale restoration. As a case in point, many participants expressed their hope that *the entire ecosystem* would benefit from dam removal. They emphasized interdependent processes and holistic ecosystem health through a wide range of examples, including cultural fire. Some focus group participants shared collective knowledge of river processes impacting cultural resources, where insights connected both Western scientific knowledge systems and Karuk traditional ecological knowledge. A synthesis of these relationships is represented in Figure 4.1.2-1. Restoring and strengthening these eco-cultural links is one way that dam removal contributes to the larger Karuk movement for eco-cultural revitalization.

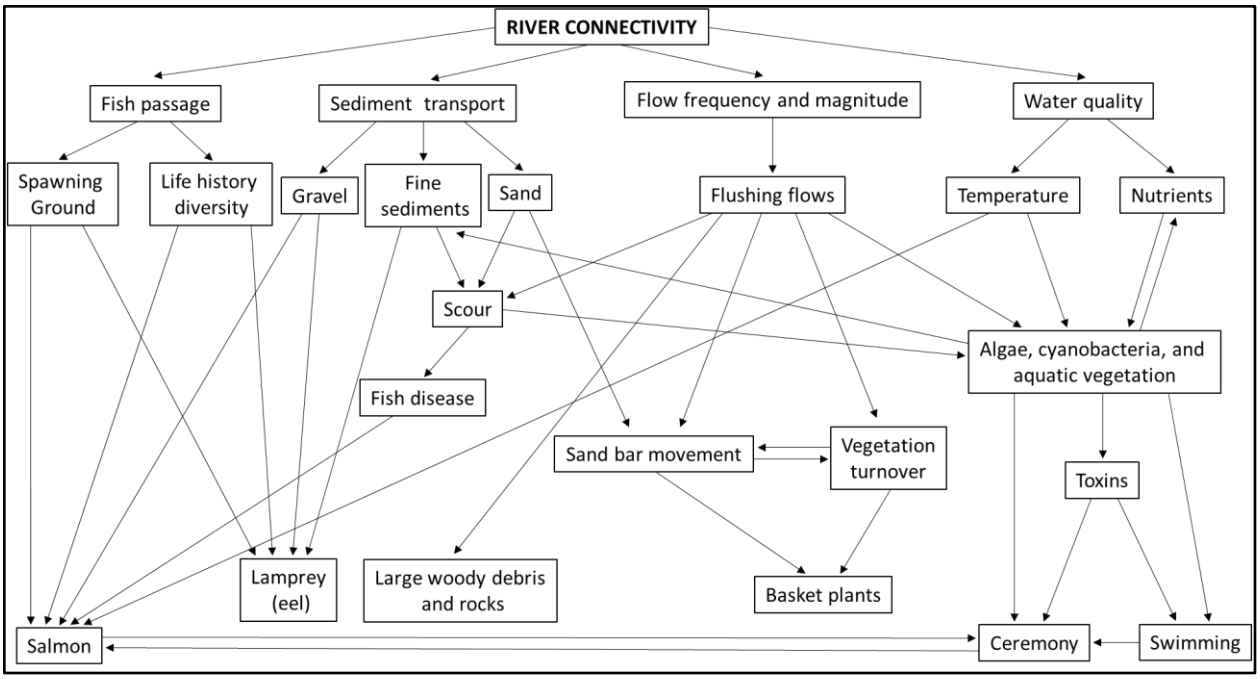

Figure 4.1.2-1: This diagram shows a simplified model of selected biophysical factors characterizing a healthy, free-flowing river that supports cultural resources that we developed to communicate about social impacts with biophysical scientists. The figure is based on focus group and interview findings around expected impacts of river connectivity change on cultural resources, and is not comprehensive. While useful as a schematic, we note that the unidirectional flow of benefits does not represent Karuk models of ecological and cultural revitalization that depend on mutually beneficial caretaking between place and people. For example, Karuk cultural practices, such as coppicing, cultural burning, and ceremony, restore and maintain desirable conditions for all entities, including people and the landscape that they are part of.

After watching the successful return of salmon following Elwha dam removal in Washington (e.g., Duda et al., 2021), many Karuk cultural practitioners were hopeful about Klamath dam removal facilitating the regeneration of the cultural resources – in part by restoring interconnected biophysical and social processes impaired or eliminated by the dams. For example, in regards to Karuk fisheries, healthy populations of salmon require open passage to the Upper Basin spawning grounds. They also require diverse habitats that support a diversity of salmon life histories, cool water temperatures that will be promoted by a free-flowing river, and cold water inputs that will be more readily available from Upper Basin groundwater. Lamprey eel also benefit from these conditions. Further, fish disease levels are controlled thanks to river currents and sediment that scour riverbed surfaces where fish disease hosts live. With a free-flowing river, delivery of gravel provides habitat for salmon and lamprey eel redds, and deposition of fine sediment may provide additional habitat for juvenile lamprey eel.

Regarding the gathering of culturally important basketweaving plants, periodic flooding can help tear out old willow growth to make way for young, healthy willow stands that are suitable for weaving; and free sediment transport is important in the formation of sandbars in which roots used for weaving grow. With a free-flowing river and flushing flows, large wood and rocks used for building structures and processing acorns, respectively, can be exported downstream to support Karuk community use. Additionally, water quality improvements from draining dam reservoirs can reduce harmful algae blooms that impair Karuk ceremonial practices and prevent swimming in the Klamath mainstem.

4.2 Grounding in ceremony, spiritual practices, and identity (Insight 2)

Second, eco-cultural revitalization centered on revitalizing Karuk ceremonies, spiritual practices, and identity. The Karuk World Renewal philosophy vests Karuk people with a deeply held responsibility to actively steward the place that sustains them. This reciprocal relationship requires Karuk people to fulfill caretaking functions for the Klamath watershed health; at the same time, the watershed provides sustenance, both physical and spiritual, to Karuk people.

Thus, focus groups with ceremonial and Tribal government leaders reflected deeply on the meaning of dam removal for ceremony and Karuk spiritual identity. Mutually beneficial reciprocal relationships between the land and the people are upheld, in part, through ceremonial practices and sacredness of the land itself. Many respondents emphasized dam removal as an important impetus for maintaining and restoring place-based ceremonial practices, thereby revitalizing spiritual and physical connections between Karuk people and the place they come from (see Appendix C, Table 4.2-1 for quotes regarding ceremonial importance of dam removal and river restoration). When the river is too unhealthy to properly perform ceremonies, this has significant negative impacts for all:

- "I'm Karuk, upriver, I grew up fishing, swimming, and playing along the Klamath. I attend tribal ceremonies where the river is considered sacred and portions of ceremonies include bathing and swimming. So, yes, it is important like the air is important." – *Survey comment*
- "Thank the Creator, man. It puts a whole different spirit in the river [when there is salmon at ceremony]." – *Ron Reed*
- "It took your pride away just by being a Tribal member because he couldn't finish his duty as a medicine man for the people. And so that's heartbreaking. It's like here we're doing things to help Mother Nature, and Mother Nature is telling us something's wrong. We have to do something, [but] we can't. It's heartbreaking." – *Troy Hockaday*
- "It's like losing a part of themselves 'cause they're really involved with their culture and it's like them losing a part of themselves when they can't perform what the ancestors have done [with ceremony], like elders have done for years." – *Youth participant*

4.2.1 *Colonial legacies of extraction affecting Karuk spiritual practices*

Focus group members connected Klamath dams to colonial legacies impacting Karuk spiritual practices and well-being. Colonization was recognized as a driver for extractive development, including and extending beyond dam removal, that facilitated dispossession of Karuk lands, and deep cultural losses. As one focus group participant, Bob Attebery, explained, "I've been blessed with… being recruited into traditional medicine, [which] has blessed me to be able to understand these types of ideas that have lasted for 50, maybe 100,000 years, however long it was when time began. And now in those short 200 years… it's a religious issue also." This orientation positions Klamath dam impacts alongside other extractive practices, like mining and clearcut logging, as an assault on Karuk spiritual identity, ceremonial sites, and inherent responsibilities.

Ideas around spiritual impacts from dam removal are especially salient for older generations who fought against G-O Road proposals to build additional logging roads across sacred high country areas. In this case, the US Supreme Court ruled against tribes' religious needs to practice a land-based religion and in favor of the US Forest Service. The Court determined that the federal government had full rights to exploit as the "property owner." Although a protected area designation later prohibited roadbuilding, the court's

rationale of property "ownership" was a means of legitimizing desecration of sacred sites for Karuk people and neighboring tribes, which has remained deeply disturbing for many (Bowers & Carpenter, 2011).

Focus group participants discussed the history of Klamath dams as part of this larger trauma and sense of loss, derived from settlers interfering with Karuk spiritual practices and with the land itself – including interferences from contemporary land ownership structures. As conveyed in Karuk origin stories, these are the lands and waters that Karuk people come from. As such, spiritual practices guide caretaking on the land that is required for Karuk people to fulfill their inherent responsibilities vis-à-vis World Renewal belief systems to maintain balance in their world. Settler-driven exploitation of the land, through damming, mining, logging, ranching, and other interventions, has created large scale imbalances that are reflected in both the physical and spiritual worlds that Karuk people depend on for their well-being.

- "I think that's the biggest thing is all this traditional knowledge has been severed. And that traditional knowledge is about... It is hard work. We had jobs back then. It was about eating right and caretaking the place that fed you and asking through prayer, asking the Creator… And that's another reason I say it's a religious issue. Our people didn't need a book to know how to be a good person. You know what I mean? It was about caretaking this place, taking care of your family or your children, being righteous in the process. And we didn't have a lot of this dysfunction that you're seeing now… I mean, that list is a mile long, and it's all righteous stuff. And now we have opposite cultures now everything everybody's an owner. Everybody owns everything." – *Robert "Bob" Attebery, Tribal Enrollment Officer and ceremonial leader*
- "I think the Tribal government and our Tribal community, we need to kind of restructure our cultural wellbeing, our cultural lifestyles… Like, Yreka, yesterday, they're saying before we can get the dam removal impacts, we got to have dance, we got to have ceremony, we got to have salmon out here. We got to kind of be able to kind of act like Karuks again." – *Ron Reed*

4.2.2 *Tribal response: Karuk revitalization and healing through dam removal*

When ceremonial leaders and Tribal leaders met, the conversation engaged with dam removal as part of a larger 200-year history of colonial dispossession and Karuk self-determination initiatives, shaping the physical and spiritual worlds of Karuk people. Karuk concerns with dam removal extend far beyond a single form of exploitation. The larger set of exploitative practices imposed upon the land and the people include legacies of hydraulic mining that destroyed riverbed structure and filled in salmon spawning areas with sediment, clearcut forestry that has diminished important cultural food plants and wildlife habitat, the criminalization of Karuk burning practices that has contributed to catastrophic wildfire, livestock grazing on sensitive habitats leading to land degradation and the introduction of invasive species, state-sanctioned violence that destroyed many Karuk families and villages, cultural assimilation policies separating Karuk people from their language and culture through boarding schools, and more. Dam removal is therefore discussed and understood as part of a broader set of efforts to heal resulting intergenerational trauma by restoring reciprocal relationships held between people and the land, and a sense of abundance.

- "I think another thing that's going to happen is this is going to help calm some of this generational trauma that they don't understand... I don't care if you had a nice two-parent family. You've still got generational trauma. It's in your DNA. It comes from generations of people being murdered, chased, killed, displaced." – *Bob Attebery*
- "I feel like growing up here, I was kind of a product of our government assimilation process. The boarding school theory: kill the Indian, save the man. And then probably even before me,

> our Karuk members were taken from here. So Karuk Tribe never had a reservation. The government basically put the reservation in Hoopa, and they said all the Indians in this area, that's your reservation, go there. Well, it didn't happen, the villages that Karuk Tribe had, we stayed put, but there was still that effort to come and take our children away to these boarding schools, mostly to Chemawa, and some even down to LA area, Sherman or Riverside. So it was a very difficult time. That's why I always praise our elders who fought so hard to keep our ceremonies alive… because they had to hide out for a period of time to do that. There were things they probably changed – their name so they wouldn't come and get their children and take them away, hid out in different places. And then… for a period of time, because of that assimilation effort, our tribal ceremonies were in private, and there was a period of time when they went a little sideways, and so I didn't get to learn that. So I'm proud of the fact that I'm learning that now and learning the importance of the ceremonies." – *Buster Attebery*

When discussing dam removal in this broader context, participants shared their vision for a life of abundance that nurtures a rich ceremonial life. In Karuk culture, revitalization of ceremony is connected to traditional Karuk foodways and caretaking practices, many of which are carried out along the river through active land management. While dam removal is only one action needed for the revitalization of Indigenous lifestyles, this event is understood to be contributing to a larger set of changes desired by Karuk ceremonial and government leaders. Emphasizing one of the main take home messages of this study on the centrality of Karuk youth, focus group participants were particularly hopeful about youth returning to Karuk lifestyles guided by ceremony on the river.

- "What's really neat to see is the younger children learning the ceremonies again. Growing up, I felt like that was an important part of my life that I missed out on. For me, growing up here, the places that we traveled to, or my family did were more about the culture." – *Buster Attebery*
- "I really look forward to those experiences for the basketweavers, for the fish. And then everybody's talking about ceremony, because all of our food, all of our different things are just right around that ceremonial umbrella. And I think that the river is that, and fire is that lifestyle characteristic that we need as Karuk people. And it's all interconnected. So the dam is like a small piece of it, but it's the river, the landscape and all the different attributes of the lifestyle put together that makes us who we are. So that's what we'll be getting back. And hopefully it will restore the cultural lifestyle [and] intergenerational transfer of knowledge enough to where we can kind of get back to where we can live comfortably and not have to be constantly looking over our shoulder or question[ing] that we're doing right or wrong." – *Ron Reed*

At a fundamental level, focus groups conveyed how dam removal provides a transformative moment of spiritual alignment, enabling the Karuk people to fulfill their spiritual, moral, and ceremonial obligations for land stewardship systems as directed by World Renewal philosophy. In this way, dam removal is understood by Karuk leaders to be "righteous," as described by focus group participants, and connected to the moral authority of Karuk people as caretakers of their lands and territories. Moreover, restoring reciprocal relationships and stopping exploitation of the land enhances the ability of Karuk people to live a daily moral life according to traditional lifeways. For those seeking direction and purpose in the midst of generational trauma, these eco-cultural lifeways provide a healthy path forward:

- “Once you get out in the landscape and you're doing the fishing thing or you're doing the basketry or you're just walking, you kind of get that sense of you're doing the right thing. So I think that that's kind of like what the dam is going to bring back.” – *Ron Reed*
- “And I think the Creator sees us, sees us all here today trying to make it better. And he knows we're trying to do better. So I know in the long run he's going to make the world better for us as long as we help and give that way. And by taking these dams out, I think Creator’s going to be so happy to see that we're still here and still thriving.” – *Troy Hockaday*
- “I don't actually know enough about the dam removal to make comments like you guys. I do know that I am very happy that the dam is coming down as a woman, as a Native woman. And I'm not part of all that bigger stuff. And I don't know a lot, but I'm the person that stands on the actual river. I've slept on it. It's important to sleep next to the water. I live for this river… And it's powerful. Humans are powerful, too. Water is the most powerful. But obviously humans are powerful too, or there would be no wall blocking. It's like a prison... We're lucky here, and we're very fortunate to have it come down by the power of human beings that persevere and dedicated to that love for the water, for the river, for the ancestors. I don't know if that goes with you. I don't have all the education to go do that. I'm just that person, walking on the rocks. So I'm very thankful.” – *Elaine Garcia*

4.3 Centering Karuk youth experiences (Insight 3)

Third, across surveys, focus groups, and interviews, research findings emphasized the importance of dam removal for youth and future generations in multiple ways. We heard that the Karuk community prioritizes its children, and that facilitating positive experiences that emphasized Karuk place-based identities and connected youth to the Klamath River were extremely important. Speaking for themselves, youth focus groups expressed their strong connection to the Klamath River, a commitment to river protection, and a desire to grow these place-based connections and commitments.

Karuk people emphasized that Tribal youth must be included in eco-cultural revitalization opportunities that arise through dam removal and river restoration. For the Karuk Tribal community, Tribal youth involvement in dam removal is a defining element for determining project success. For Karuk people, sustaining TEK in future generations depends on maintaining relationships with nonhuman communities and eco-cultural practices that underlie strategies for leading a healthy and happy life.

At the same time, we heard that youth today face obstacles to gaining access to the river and place-based cultural practices that previously infused the day-to-day life of the community. Although youth participated in swimming, rafting, and kayaking, they were aware of the current health risks of entering the Klamath River. Unlike their elders, this generation has never lived with a swimmable mainstem river; the ill health of the Klamath is their baseline condition. With the river impaired, young people have fewer opportunities to experience their culture, participate in Karuk community, and learn important skills ranging from subsistence to prayer that can help them in their lives.

This conveys what is at stake for Karuk people with projects like dam removal and sets the context for Karuk eco-cultural revitalization initiatives. At its core, eco-cultural revitalization initiatives are about cultural survival: protecting, restoring, and recreating the ability to teach Karuk traditional knowledge and culture to future generations. While a healthy Klamath River has yet to be realized, focus group participants were looking for dam removal restoration opportunities that facilitate eco-cultural revitalization for youth.

4.3.1 *Cultural significance of dam removal for Karuk youth*

For many Karuk community members involved in the dam removal campaigns, their primary goal was to renew Karuk heritage for the next generation, so that Karuk people can continue the work of eco-cultural revitalization. Thus, dam removal was viewed as a transformational moment that can help provide the opportunity for the next generation to live as Karuk people in relationship with the Klamath River. First, dam removal anticipates conditions of a healthier Klamath River and inspires hope for maintaining place-based cultural identities for Karuk people across generations. Second, dam removal marks the legacy of a successful Tribally-led social movement that underscores Karuk self-determination and commitment to eco-cultural revitalization.

Speaking to the first point, several adult research participants saw their primary motivation for dam removal advocacy, as building youth confidence, hope and power:

- "The work that I do, I continue to do, is for my children, you know, originally. And now it's for the grandchildren, and as we keep on working, you know, it is for the people whom we are responsible to, you know, to build, provide the truth the way we see it. So yeah, I think that's what really kind of gives us the inspiration to keep on beating our heads against the wall, pretty much like the salmon do, to get to where we need to be." – *Ron Reed*
- "I see our tribe getting stronger as people, and I see that our children can see, if they put their minds to it, that they can move buildings, they can move structures out of the way to keep our culture alive. And that gives them strength to go out there and become a doctor, become a lawyer, and come back and work for the Tribe." – *Troy Hockaday*

To the second point, youth focus group participants reflected on what it has meant for young people to witness the persistent and successful organizing of Karuk people and their allies to achieve dam removal – not simply as a political win – but as a moment of reconnection that asserts the ability of Karuk to care for the river and the fish as part of their inherent responsibilities.

As focus group members explained, there is much at stake for future Karuk generations with the dam removal project. If successful, dam removal restoration outcomes would support Karuk eco-cultural practices and perpetuate important components of Karuk heritage. Of particular concern is the cultural loss that may occur when Karuk youth do not receive traditional instruction in eco-cultural practices that rely upon a healthy river system and also help to sustain river health. Adult and youth participants discussed their worries about Karuk lifeways "dying out," as one focus group participant commented. Without access to eco-cultural river practices, the next generation is in danger of losing this component of Karuk knowledge systems, their heritage, and many important teachings they can use to help them thrive in their lives:

- "When we're not doing those [eco-cultural practices] we're not as healthy, well, as you'd like to be, not as proud. We're not handing off that information that was given to us by our elders. We're not handing it off to our babies so they can move into this life happy, you know, without any worries. So that's the reason why we're here today is connecting our non-human relation to human relation to create that lifestyle." – *Ron Reed*
- "I worry with my students and the younger people that I work with that they don't really understand… how all of this could have magically worked, and the abundance. And how life revolved around the river and the salmon. So hopefully that will come back." – *Scott Aseltine, Tribal Education Director*

- "I have been sad knowing that my Karuk Tribe has not been able to do traditional salmon fishing for many years. As a father, I wanted to participate in this to provide for my family and learn more about my culture. It is an oppressing feeling, and it worries me about the future generations of the native people to have such an important part of our Karuk culture dying away." – *Survey comment*
- "With the youth, the Karuk culture is dying out, hopefully the dam removal will bring youth back and make them more passionate about our culture." – *Youth participant*
- "It's a teaser that there is a possibility we can bring back a society that was potentially lost due to colonization." – *Sammi Jo Jerry*

Youth focus group participants similarly expressed the importance of conveying the legacy of the Karuk culture to future generations for their children and grandchildren. As discussed above, youth themselves understood intergenerational knowledge transfer to be occurring through place-based, eco-cultural practices occurring on the river – and that there is much at stake:

- "I want my family, like I want my kids and my kids' kids, to be able to swim in the Klamath and go swimming in the clean water and stuff like that. And the medicine people [would] not have to bathe in waters like that." – *Youth participant*

Some adult participants expressed a deep sense of loss around impacts from dam building and other extractive practices that have robbed parents of their ability to fulfill stewardship responsibilities and teach Karuk eco-cultural practices. These practices are transmitted through intergenerational connections that are woven into the fabric of Karuk community. Adult practitioners reflected on one traditional practice that has been decimated by the dams – the distribution of fish to elders – which provides food and maintains intergenerational relationships as a crucial component of Karuk social relations. They reflected on how some young children no longer like the taste of fish. Young and old people alike looked to dam removal as an opportunity to facilitate positive relationship building among generations:

- "What's sad for me to see is I always felt a sense of pride when we sat down at the dinner table and heard my dad thank myself or my brother for the food that's on the dinner table that night. And what makes me sad is our Karuk children don't get to experience that feeling, the feeling of receiving thanks from their elders that they took the fish to." – *Buster Attebery*
- "Am I going to have a chance to teach my grandchildren how to take care of salmon? Or what it is to… put them in a smoker, or can them, or take care of them, or give [them] to elders?" – *Ron Reed*
- "The dam removals will help my relationship to the river, and my dad." – *Youth participant*

4.3.2 *Persistence of youth connections to the river*

Despite some of the uncertainties expressed, focus groups demonstrated that many Karuk youth have a strong relationship with the river. Whether that occurred through eco-cultural practice, ceremony, swimming, or other personal connections, youth focus group participants understood dam removal as a critical turning point in revitalizing their heritage and environment. Responding to memories of better times and stories shared by elders, Karuk youth are motivated to support eco-cultural revitalization and some have channeled their energies into dam removal advocacy. Participant sentiments reflected a cultural consciousness among Karuk youth and an active interest in the well-being of their community, in connection with Klamath River. Parents and other adults working with Karuk youth through Tribal youth

education programs spoke to their experience acting as chaperones for recent field trips taking youth to the river:

- "Our children, our students, they thrive on the river and on the creeks here. The confidence. You see it. It is most entertaining. There's something spiritual, magical – just natural. Coming back to the instinctual that comes back on the river, and identifying all the things along the river, the animals and the birds. They're really in tune with it." – *Scott Aseltine*
- "They were all into [the field trip] too, even the naughty ones, you know? Wow, we can do this, you know? Yeah, that's where it starts, that age. Very inspiring." – *Robyn Reed, cultural practitioner*

Youth reflected for themselves on how they currently engage with the Klamath River. Some recounted happy memories swimming, playing in sand, watching otters, gathering willow, participating in fisheries science, rafting, and spending time with the river. Often, these memories were associated with family trips to the river, especially swimming:

- "I've always swam in creeks and rivers my whole life like this. We go rafting. Most of the time I'm not in the raft, I just float along the raft in the river. We have this one spot when we go rafting where we jump off. I could spend hours just jumping off that spot."
- "I spend around almost my whole summer on the river."

At the same time, most youth shared that they avoid swimming in the Klamath mainstem river due to pollution. Rather, many are swimming in creeks or tributaries adjacent to the Klamath. The ability for youth to enjoy interacting with the river was tempered by its ill health. Many of the youth participants described their experience witnessing environmental and cultural decline within their lifetimes, and expressed their frustration with this state of affairs (see Appendix C, Table 4.3.3-1 for quotes describing youth experiences with environmental decline). They were also aware of the health challenges facing the mainstem Klamath River and current impaired water quality. Youth described the water as "icky" or "gross" and spoke about the unhealthy state of important cultural resources, signified by buggy willows and fish kills. Youth were also aware of ceremonial practices that have been negatively impacted by dam removal, and the emotional and spiritual loss associated with these impacts. Youth described their concerns, especially regarding the Klamath mainstem:

- "In Happy Camp, there's countless places to go swimming. But I don't like swimming. Like no one likes swimming in the river because it's never cold or like what you want when you're swimming. It's warm instead of a cool-off spot. It's gross."
- "I barely swim in the river. Now it's been like, really long since I've been in there. Maybe when I was like seven or eight, that's how long it's been."
- "[I know the river is unhealthy] because there's a bunch of algae and the salmon are dying. It's sad."
- "I remember as a kid, [my family] would go fishing together all the time. I would always catch many fish. We were together recently for hours and caught only two fish."
- "For my family, we're really involved in our families' [ceremonial practices] and stuff, and we talk about, like our medicine people – how they bathe in the rivers and the health of the rivers isn't good. So it's how they bathe. And like, we've loved rafting and kayaking our whole lives. And we can't go swimming rivers because it's gross and warm. So we talk about stuff like that [among peer groups]."

4.3.3 *Dam removal campaigns as a point of youth affirmation*

Youth themselves have been actively involved in the Undam the Klamath campaign from the beginning. An entire Karuk generation grew up participating in the campaign, and some are now working for the Karuk DNR or local non-profit organizations. The trajectory of these young Karuk community members reflects the changing conditions of the Karuk people and possibilities for intergenerational healing.

The annual Salmon Run is a demonstration of Tribal community commitment to the fish and a star example of youth affirmation occurring through dam removal. This event was started in 2002 by Tribal youth, and has a ceremonial and spiritual foundation. Through this annual ritual, community members, especially youth, communicate their commitment to bringing the salmon home, both to the salmon and to the world. It also serves as a focal point for the community to renew this commitment, in part by uplifting the next generation. The Salmon Run is one way that this generation is living in relationship with salmon under current conditions of environmental decline. It is a powerful example of the Tribal community's dedication to the salmon and a resounding statement on this generation's current and future impact on the world. Several youth focus group participants had taken part and described their experiences:

- "It's usually once a year, and it's just us running to show our appreciation for the salmon. And some people go all the way to Oregon from here."
- "It's a bunch of people coming together to show their support for the fish every year and [how they're] trying to get them home and to get the dams down."
- "It shows people how much it means and what we'll do for it. And how many people care about this project [dam removal]."

Dam removal is part of a larger community effort to counteract the immense effects of cultural assimilation experienced by earlier generations through boarding schools, and otherwise. Despite their experiences with environmental decline and racialized oppression, Karuk people hope to reverse this trend for the next generation, in part through youth engagement in the dam removal campaign. Importantly, taking action through dam removal advocacy has increased youths' sense of agency and community, as observed by many adult focus group participants. In return, youth feel excited and deeply grateful for what their elders have done for the river.

- "By taking these dams out, like I said, I see it gives our children hope to take them to mountains now. And like I said, they come home and take care of [this place], we bring them back." – *Troy Hockaday*
- "Thinking longer into the future, I'm looking forward to what the kids are gonna really feel powerful about and what they're gonna take on. Because a lot of them are being raised in basically, a different world [from the previous generation] – where their health and well-being are a main priority. And if they're getting more and more good things in school and in their personal lives, they see what's possible." – *Chook-Chook Hillman*

5 RESULTS PART III: Baseline assessment: Evaluating Karuk community well-being prior to dam removal

Figure 4.3.3-1: Scoping conversation held at willow gathering grounds at Ishkeesh Ranch. From L to R: Paula McCarthy, Ron Reed, Verna Reece, Shay Bourque, Colleen Rossier, Dan Sarna-Wojcicki, John R. Oberholzer Dent, Brittany Souza, and Carolyn Smith (Photo: Sibyl Diver)

As discussed in the methods (Section 2), we leveraged a Tribal community well-being framework to conduct a baseline study of social impacts that are predicted to change with dam removal. By focusing on key aspects of social well-being that are relevant to Karuk Tribal community members, this approach seeks to reflect Tribal community members' experiences and perceptions of dam removal prior to demolition, and also highlights changes that Tribal community members hope to see. The study establishes a reference point for evaluating social impacts for Tribal community members after dam removal has been completed. Speaking to the holistic vision for eco-cultural revitalization that many Karuk community members bring to dam removal and river restoration, we evaluate Karuk Tribal community well-being across the following five areas: access to cultural resources, holistic health, education, livelihoods, and self-governance.

5.1 Access to cultural resources (Domain 1)

5.1.1 *Patterns of cultural resource use*

Evaluating the first domain of Tribal community well-being, cultural resource access, our survey demonstrated the extensive cultural use of the Klamath River by Karuk members and descendants that is currently taking place in all areas, from the river mouth to the reservoir reach, at all times of year. A majority of the community accesses cultural resources, with 32% accessing cultural resources at least monthly within relevant seasons (N = 234) (Figure 5.1.1-1). Respondents reported the highest level of cultural use in the summer at 88% of respondents, with 53% using resources in spring and fall, and 25% in winter (N = 215) (Figure 5.1.1-2; see also Appendix B, Figure 5.1.1-10).

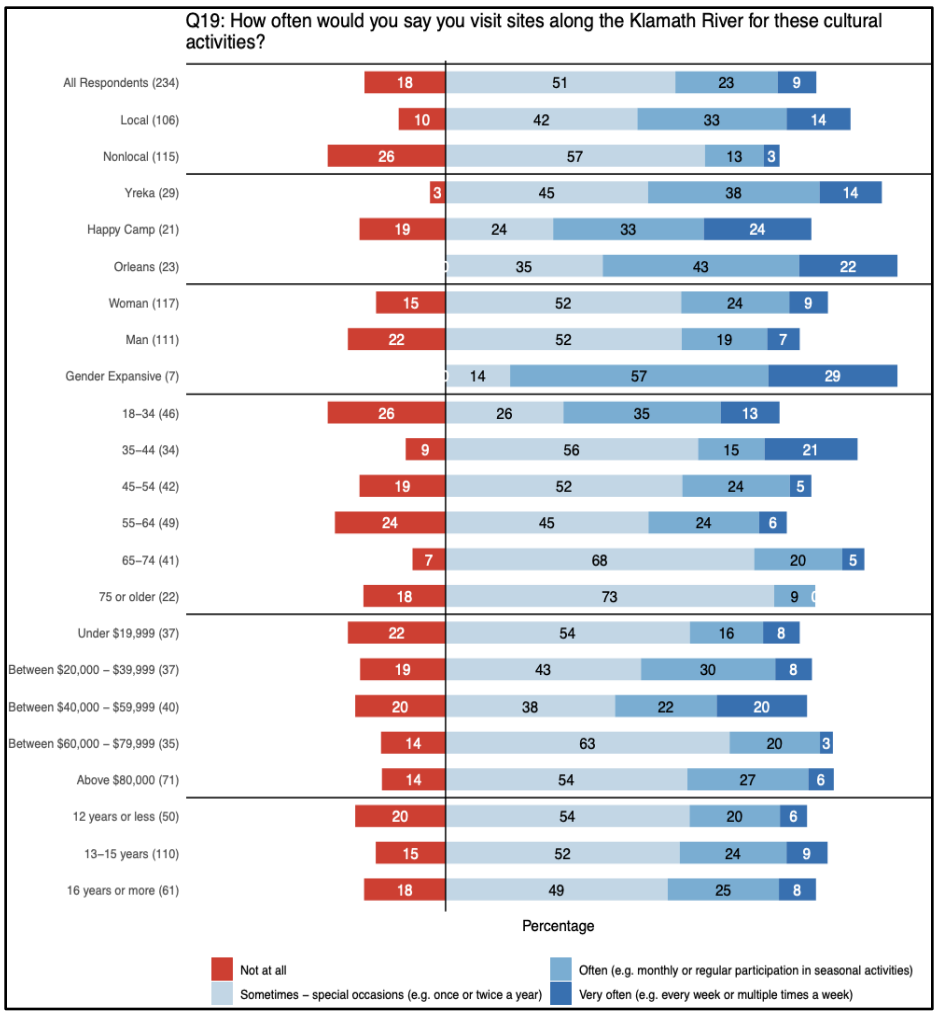

Figure 5.1.1-1: Question 19: "How often would you say you visit sites along the Klamath River for these cultural activities?" (N = 234)

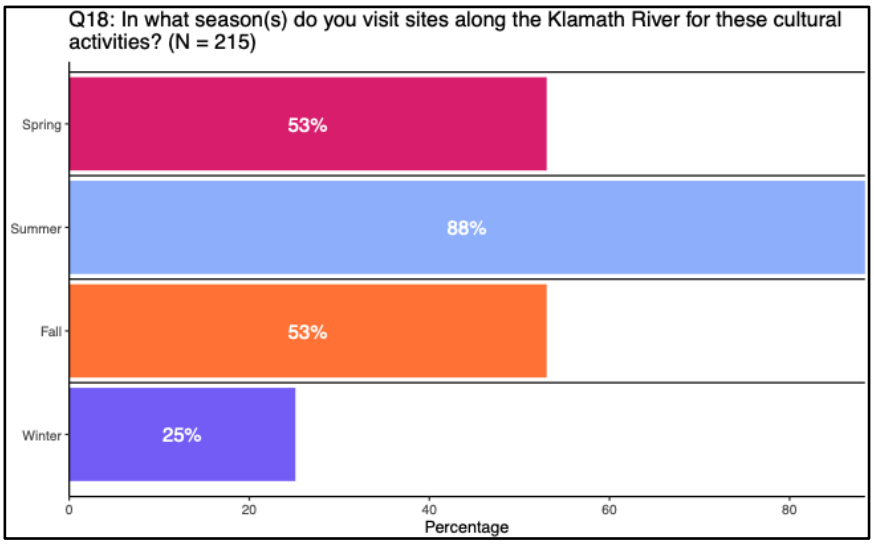

Figure 5.1.1-2: Question 18: "In what season(s) do you visit sites along the Klamath River for these cultural activities?" (N = 215)

The four most popular activities among survey respondents were family outings (54%), fishing (44%), swimming (37%), and ceremony (26%). Other categories reported were hunting (19%), gathering medicine (19%), gathering basket materials (18%), recreational boating trips (17%), education and field trips (17%), gathering food (16%), eeling (9%), and other cultural uses (14%) (N = 238) (Figure 5.1.1-3; see also Appendix B, Figure 5.1.1-11). In addition, 24% of respondents reported no use of the river.

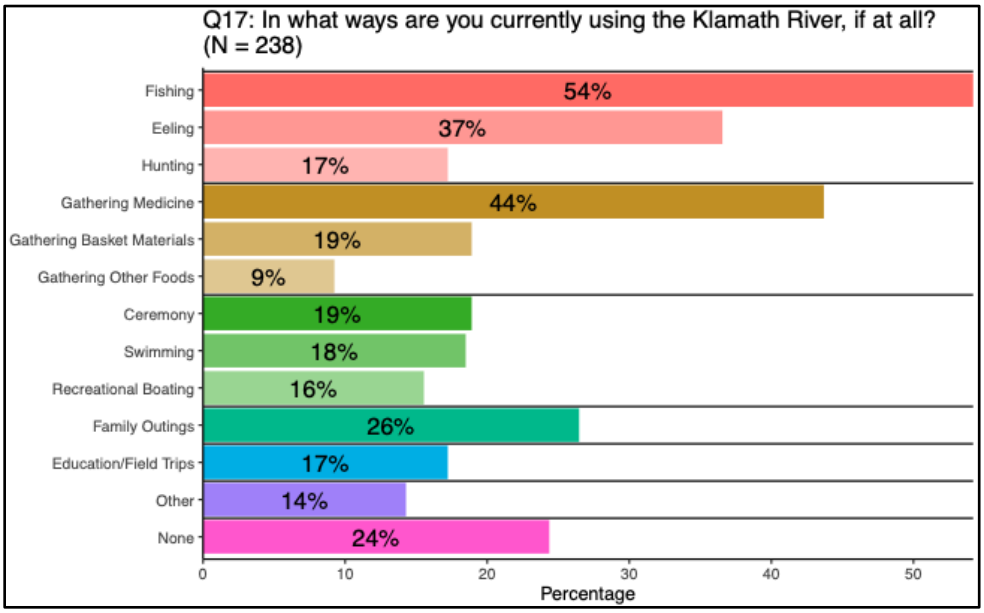

Figure 5.1.1-3: Question 17: "In what ways are you currently using the Klamath River, if at all?" (N = 238)

Fully half of all respondents reported engaging in at least one of the following subsistence activities: fishing, hunting, eeling, or gathering food, medicine, or basket materials. This underscores the contemporary importance of the Klamath River in providing food and additional cultural use materials. Ceremonial use, including "community level, family, or personal" spiritual practice, was well-represented and engaged in by 26% of respondents (N = 238).

When participants were asked about what reaches of the river they visited, Happy Camp (from Dillon Creek to Seiad Creek, 65%) was the most widely used area, followed by Yreka (Seiad Creek to Iron Gate reservoir, 36%) and Orleans (Bluff Creek to Dillon Creek, 35%) (N = 236). Respondents also used the Lower Klamath (mouth of the Klamath River to Bluff Creek, 25%), and the reservoir reach (Iron Gate Reservoir to J.C. Boyle Reservoir 14%) (Figure 5.1.1-4; see also Appendix B, Figure 5.1.1-12).

While there are many barriers to cultural resource use, these results portray a community that is actively and routinely engaged with subsistence use and related river practices. Findings indicate that eco-cultural practices are observed throughout the community – spanning multiple cultural activities, seasons, and different areas of the river. Reports of frequent cultural use across Districts challenge the stereotype that cultural practices are restricted to certain parts of the community, or geographic areas.

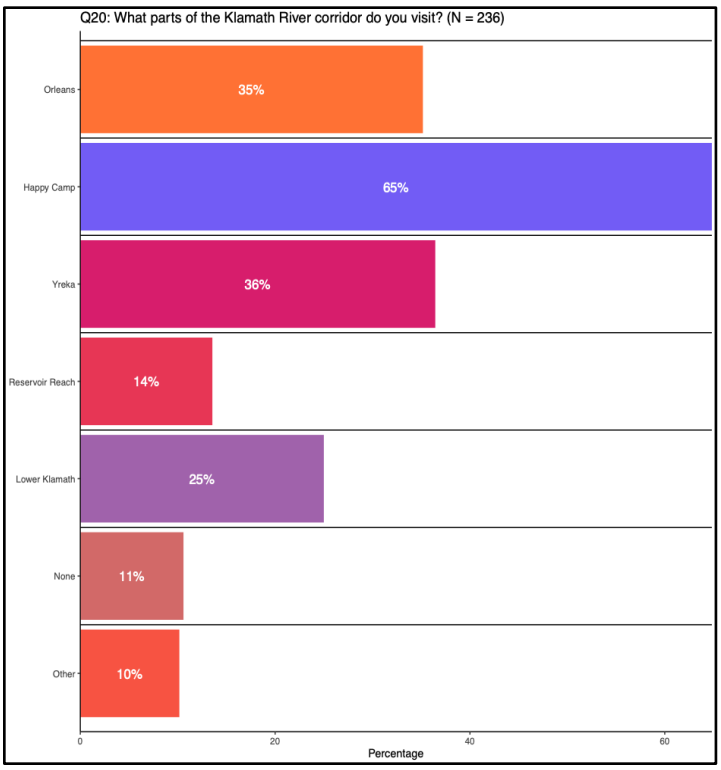

Figure 5.1.1-4: Question 20: "What parts of the Klamath River corridor do you visit?" (N = 236)

Commonalities observed between local and nonlocal cultural resource use patterns were unexpected, and suggest some Karuk community members continue to find ways to visit the river and engage in cultural resources use in diaspora. Responses from nonlocal participants conveyed the continued importance of subsistence use and ceremony in the lives of Karuk people everywhere, not just those who live near the river or near ceremonial grounds. Further, while many community members have place-specific and/or family-specific connections on the Klamath, findings indicated that community members were using different parts of the river that extend beyond one local area. To expand on patterns observed for cultural resource use among subgroups, including subsistence and ceremonial use, we noted the following:

- **Local and Nonlocal.** Overall, 90% of local and 74% of nonlocal respondents reported engaging in cultural resource use over the course of a year. Interestingly, cultural resource use patterns for local and nonlocal users were more similar than expected. Differences between local and nonlocal users ranged from 5-10% for hunting, gathering basket materials, and education, and from 10-20% for fishing, eeling, gathering medicine, gathering other food, ceremony, swimming, and boating. Local respondents were more likely to report engaging in some kind of subsistence use (65%), but nonlocal subsistence use was also remarkably high (41%). Locals and nonlocals engaged in cultural resource use at similar levels in summer, but local respondents were twice as likely to access cultural resources in fall, winter,

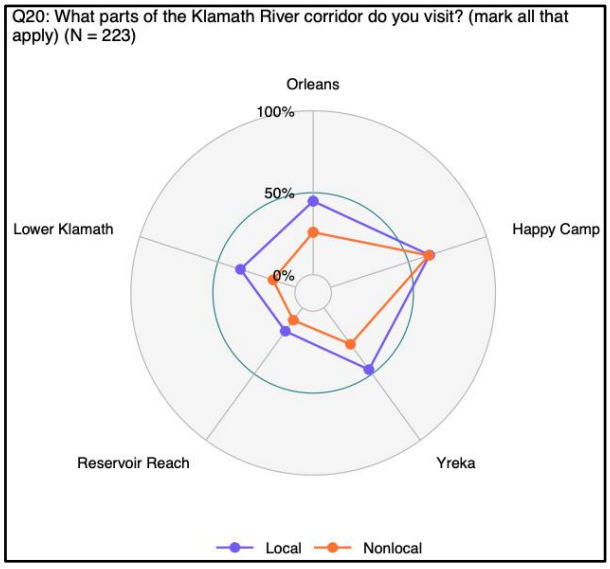

Figure 5.1.1-5: Question 20: "What parts of the Klamath River corridor do you visit?" (N = 223)

and spring. Local respondents accessed almost all sections of the river more than nonlocals, with one exception. This was the Happy Camp District, where nonlocal and local respondents were matched, possibly due to the draw of Tribal events and reunions (Figure 5.1.1-5). In regards to ceremonial use, 36% of local and 18% of nonlocal respondents reported participating in ceremony or spiritual practices (community, family, or personal level). (Local N = 107, Nonlocal N = 115 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)

- **Council Districts**. Subgroups defined by Council District exhibited distinct patterns of cultural resource use. In Yreka, the top activities were family outings (77%), fishing (68%), and swimming (55%). In Happy Camp, top uses were family outings (52%), fishing (52%), ceremony (48%), and swimming (48%). In Orleans, they were family outings (70%), gathering basket materials (57%), ceremony (57%), and fishing (52%) (Figure 5.1.1-7). We noted high levels of subsistence use (defined here as fishing, hunting, eeling, or gathering food, medicine, or basket materials) across all Districts. Presence of subsistence use was highest among Yreka (84%) and Orleans (83%) survey respondents, but it was still high in Happy Camp (62%).

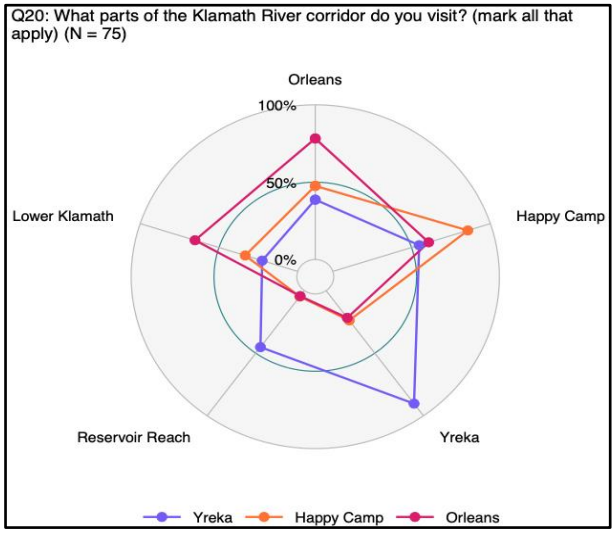

Figure 5.1.1-6: Question 20: "What parts of the Klamath River corridor do you visit? (by District, N = 75)

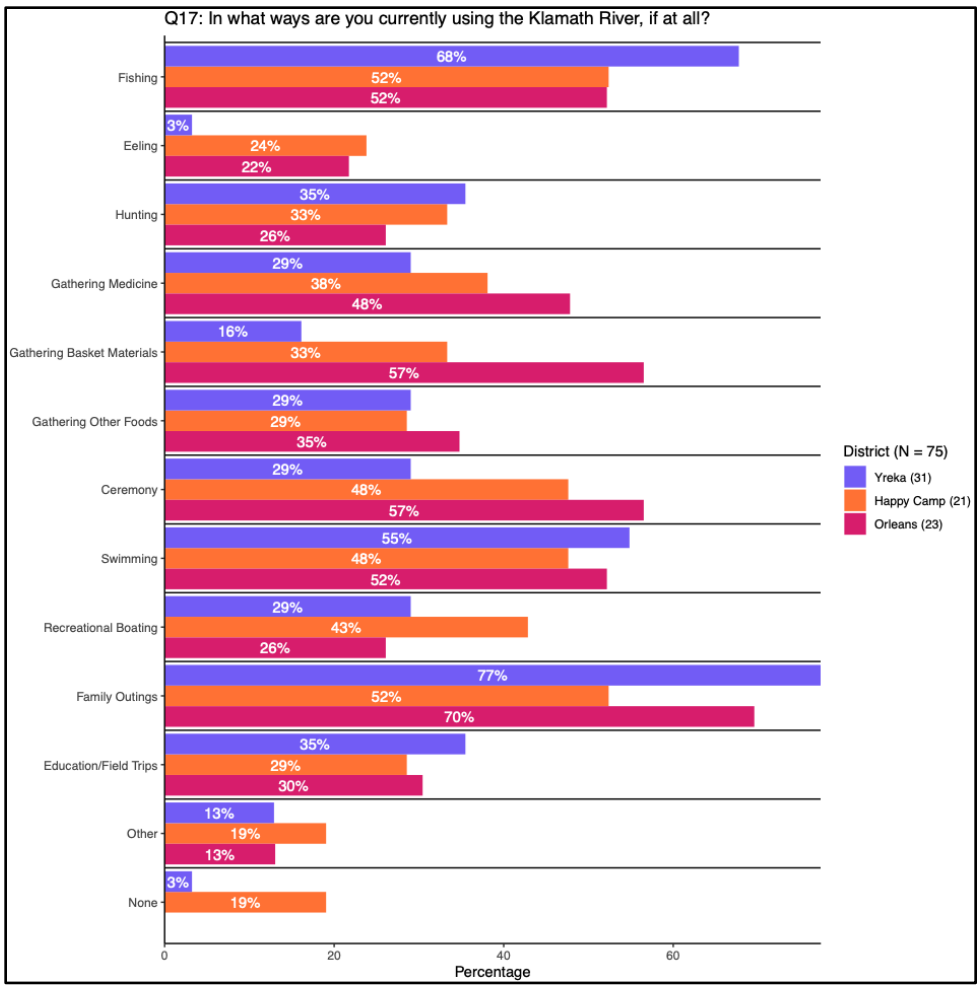

Figure 5.1.1-7: Question 17: "In what ways are you currently using the Klamath River, if at all?" (by District, N = 75)

Respondents were most likely to visit their local area, with many Orleans respondents also accessing the lower Klamath and with Yreka respondents also accessing the reservoir reach (Figure 5.1.1-6). In addition, 62% of respondents indicated use of more than one area. Regarding participation in ceremony, we noted a gradient where participation among respondents was highest downstream in Orleans at 57%, slightly less in Happy Camp at 48%, and lowest in Yreka at 29%. (Yreka N = 31, Happy Camp N = 21, Orleans N = 23 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)

- **Gender.** People of all genders accessed all types of cultural resources. While overall trends reflected traditional Karuk gender norms, substantial numbers of men and women participated in each category of cultural use. Men respondents were 12% more involved in fishing, 9% more in eeling, and 17% more in hunting than women. Women respondents were 10% more involved in gathering basket materials and 8% more in family outings compared to men. All gender expansive respondents reported engaging in all types of cultural use activities, with an emphasis on gathering, ceremony, swimming, and education. Men and women respondents participated in ceremony in similar numbers, and all gender expansive respondents participated in ceremony (Figure 5.1.1-8). (Women N = 116, Men N = 113, Gender Expansive N = 7 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)

- **Age.** Among age categories, participants aged 35-44 were notably more likely to be involved in most cultural use activities, with the level of individual cultural uses declining with age. However, fishing was common up to age 75. Family outings were high for all ages, and especially for the youngest age group. Eeling and gathering basket material were the least reported cultural use categories among the youngest group (18-34; 9% and 11%, respectively). Ceremonial use followed the same pattern as that of many other cultural resources, peaking at 35-44, and then declining with age (Figure 5.1.1-9). (18-34 N = 46, 35-44 N = 34, 45-54 N = 42, 55-64 N = 49, 65-74 N = 42, 75 or older N = 22 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)
- **Household Income.** Most subsistence uses including fishing, hunting, gathering basket materials, and gathering food were disproportionately distributed by income, with the lowest income group (under $19,999/year) participating as little as half as often, when compared to use rates observed in the full set of survey respondents. Gathering medicine and ceremony, however, were favored more among lower income groups (below $59,999/year) compared to higher income groups. (Under $19,999 N = 38, Between $20,000 - $39,999 N = 37, Between $40,000 - $59,999 N = 40, Between $60,000 - $79,999 N = 35, Above $80,000 N = 71 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)

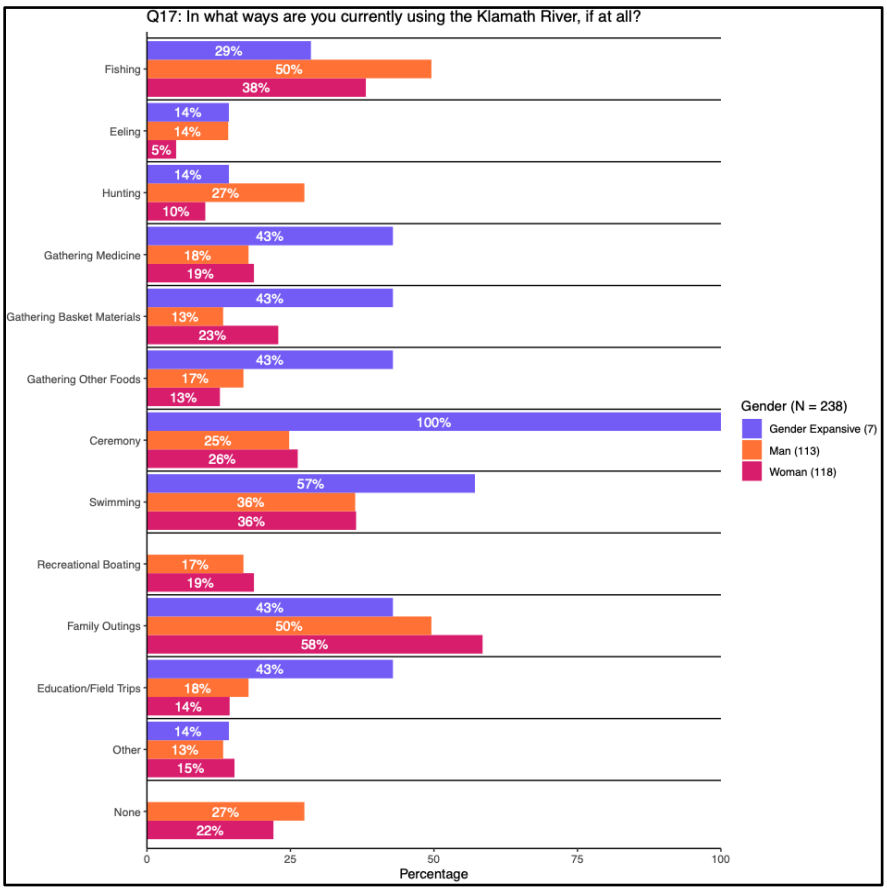

Figure 5.1.1-8: Question 17: "In what ways are you currently using the Klamath River, if at all?" (by gender, N = 238)

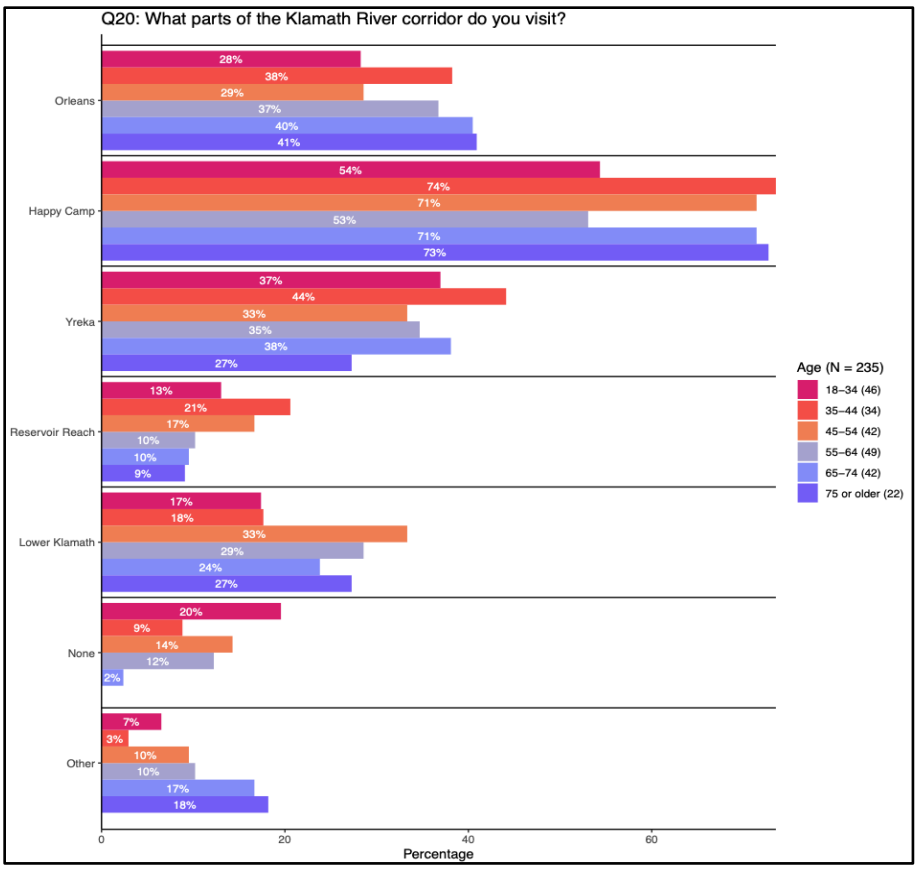

Figure 5.1.1-9: Question 20: "What parts of the Klamath River corridor do you visit?" (by age, N = 235)

The continued engagement of the Karuk diaspora with the Klamath River is an important finding, with significant numbers of nonlocal community members returning to the river regularly to access cultural resources. The geographic spread of cultural resource use across Council Districts reflects the wide distribution of knowledge, priorities, and available resources along the river. In every District, family outings and fishing were among the most popular activities, suggesting some level of universality of these practices across different parts of the community. Results by gender suggest that men and women were both engaging in a wider range of cultural use activities compared to historic roles, although gender-based traditions still endure. Furthermore, gender expansive people participated in in all activities, which suggests their integration into gendered eco-cultural traditions. Trends among age groups may reflect a common pattern of returning to cultural resource use after taking some time with establishing a family, and increased physical and time restrictions with age. While subsistence uses typically decline with age, Karuk cultural practices encourage sharing with extended family and elders. Cultural resource use trends grouped by household income did not match historical patterns, where families most in need engage in subsistence to supplement livelihoods, although gathering medicine and ceremony were exceptions. This may reflect particular types of barriers to cultural resource access experienced by low income community members. Finally, non-subsistence uses (family outings, swimming, education) were emphasized as being highly accessible, popular, and central practices of living in relation with the river, especially for youth.

5.1.2 *Barriers to cultural resource access*

This section of the survey revealed the high barriers to cultural resource use. These results demonstrated that much remains to be done to improve cultural resources access, and that high levels of use and demand did not necessarily imply adequate levels of access and supply. Most of these barriers stemmed from colonial legacies including genocide, displacement, boarding schools, structural racism experienced by Karuk community members, environmental mismanagement, and ongoing denial of Karuk sovereignty and self-determination. Previous studies have specifically documented barriers to accessing culturally important foods, including the loss of salmon that is connected to Klamath dam impacts (Norgaard, 2005).

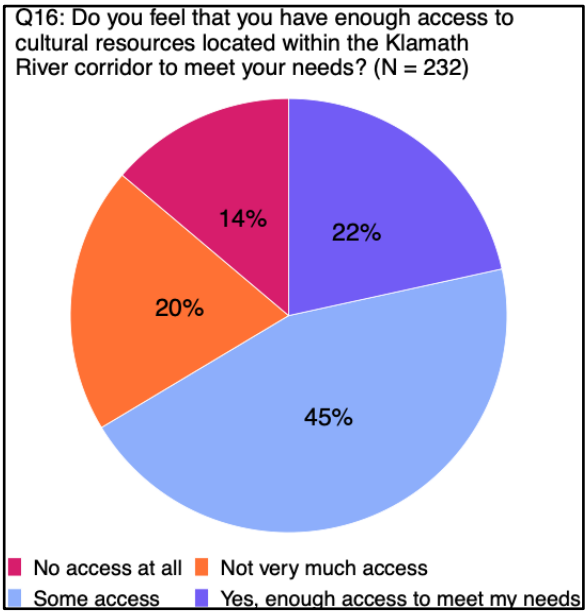

Figure 5.1.2-1: Question 16: "Do you feel that you have enough access to cultural resources located within the Klamath River corridor to meet your needs?" (N = 232)

Despite widespread use of cultural resources, only 22% participants reported feeling they had "enough access to meet [their] needs" and another 45% reported "some access." The remaining 34% of respondents reported having "not very much access" to cultural resources or "no access at all" (N = 232)

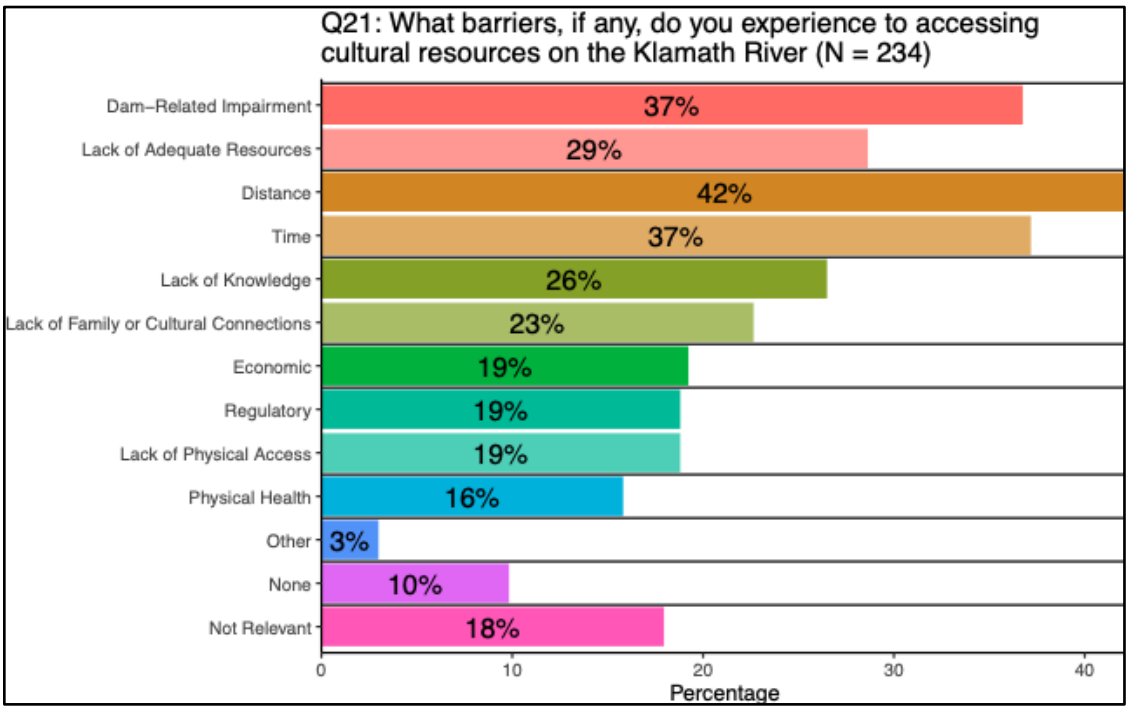

Figure 5.1.2-2: Question 21: "What barriers, if any, do you experience to accessing cultural resources on the Klamath River?" (by barrier type, N = 234)

(Figure 5.1.2-1; see also Appendix B, Figure 5.1.2-4). Respondents identified a wide range of access

barriers, which reflected the large number of community members reporting inadequate access to cultural resources. We note that this question speaks to respondents' subjective interpretation of their needs, and whether or not they felt their needs were being met. The most common barriers reported were lack of family or cultural connections (47%), distance or travel time to the river (42%), impairment due to dams (37%), and time limitations (37%). In addition, 27% reported "no barriers" (N = 234) (Figure 5.1.2-2; see also Appendix B, Figure 5.1.2-5 and Figure 5.1.2-6). Importantly, dams were highlighted as the third-largest obstacle facing the Karuk community in accessing cultural resources.

In addition to the difficulties many Karuk community members faced in accessing cultural resources, these results indicate the determination and tenacity of Karuk people in continuing to practice their place-based culture. Despite hardships, community members still prioritized maintaining place-based connections on the Klamath River. This was demonstrated by participants' descriptions of investing their time, money, and energy to continuing to visit family and spend time on the river.

It is crucial to note that dam removal addresses additional barriers beyond "impairment due to dams." For example, the restoration of the reservoir reach and improvement to upriver reaches near Yreka will likely create more local pathways for community members in the upper basin to access cultural resources – potentially by reducing distance to the river or economic barriers to spending time on the river for some. Restoring natural processes associated with free-flowing waters is also predicted to improve the quality of materials. The return of salmon to upriver areas, alongside other positive effects for cultural resources, are anticipated to enhance intergenerational knowledge transfer and reconnect families and communities along the river – thereby reducing knowledge and family barriers to cultural resource access. Rounding out survey data, focus groups similarly emphasized the interconnected nature of barriers to cultural resource access.

In examining barriers to cultural resource access, we noted a number of demographic trends:

- **Local and Nonlocal.** Local respondents were more likely than nonlocals to report every barrier listed except distance. Locals were 6% less likely to report no barriers, compared to nonlocals. (Local N = 106, Nonlocal N = 115 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)
- **Council Districts**. When grouping respondents by Council District, we observed that different segments of local Karuk communities experienced distinct obstacles to resource access. For Yreka, the top three barriers to accessing cultural resources were lack of physical access (52%), impairment due to dams (42%), and lack of family or cultural connections (39%). For Happy Camp, primary barriers were also lack of physical access and lack of family or cultural connections (both 50%) as well as time limitations and lack of quality resource availability (both 45%). For Orleans, the largest barriers reported were impairment due to dams (83%), lack of family or cultural

connections (70%), and lack of quality resource availability (65%) (Figure 5.1.2-3). (Yreka N = 31, Happy Camp N = 20, Orleans N = 23 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)

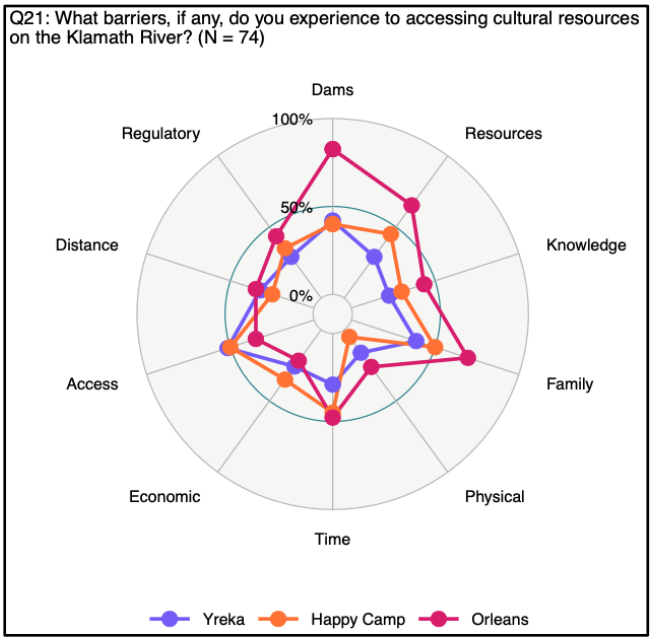

Figure 5.1.2-3: Question 21: "What barriers, if any, do you experience to accessing cultural resources on the Klamath River?" (by District, N = 74)

- **Gender.** Assessing by gender, women reported "no barriers" slightly less than men. Women reported higher frequency of distance barriers, economic barriers, knowledge barriers, and dam-related barriers. Men reported experiencing slightly higher frequency of regulatory barriers. Gender expansive respondents reported experiencing every kind of barrier. (Women N = 117, Men N = 110, Gender Expansive N = 7 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)
- **Age**. Analyzing data by age, strong gradients were seen for dam-related impairment, lack of quality resource availability, lack of knowledge, and economic barriers where young people were most affected. In contrast, time barriers and physical limitations were more commonly represented in older age groups. (18-34 N = 44, 35-44 N = 34, 45-54 N = 43, 55-64 N = 48, 65-74 N = 42, 75 or older N = 22 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)
- **Household Income.** Analyzing results by income classes, economic barriers declined with increasing income, but time limitations and distance increased for higher income groups. (Under $19,999 N = 38, Between $20,000 - $39,999 N = 37, Between $40,000 - $59,999 N = 40, Between $60,000 - $79,999 N = 33, Above $80,000 N = 72 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)

The geographic distribution of self-reported barriers reflected a number of ecological, political, and historical factors that have shaped the experiences of different parts of the Karuk community. However, we noted that lack of family or cultural connections was a common barrier across all geographic areas. Patterns by gender may be unevenly attributed to the variable challenges experienced with gender-specific activities like hunting (such as cost of equipment and travel), although the previous section encourages nuance with interpreting gendered use patterns. Another factor is gendered roles and responsibilities that convey differential levels of cultural resource access, e.g. house work and child care. Finding the highest rates of barriers in the youngest age groups is troubling, especially given barriers affecting cultural continuance: impairment due to dams, lack of knowledge or family connections, and lack of quality resource availability. At the same time, this shows how significant dam removal is for the younger Karuk generations. The potential tradeoffs between economic barriers for those who are economically insecure and cannot afford to travel to the river, and time and distance barriers experienced by those who have moved away and are more economically secure on the other, suggests a troubling dynamic.

5.1.3 *What is at stake with cultural resources and dam removal?*

Access to cultural resources is a foundational domain of well-being and our social impact analysis of Klamath dam removal. Cultural resources play a central role in Karuk community and culture. Interviews and focus groups discussed how cultural resources, especially salmon, sit at the heart of Karuk life. Cultural resources like salmon are a central element of Karuk culture, as well as additional traditional foods like lamprey eel, freshwater mussels, deer, elk, and food plants like huckleberry. Additional forms of cultural resources include basketweaving plants like willow and hazel; medicinal plants; regalia species like the pileated woodpecker; river rocks and wood used to build traditional shelters or sweat houses; and the water itself, which is used for ceremonial bathing and swimming. As described through concepts such as sacred geographies, cultural resources can also be understood through their intangible qualities, such as the spiritual elements of the landscape, where important knowledge is held in particular places that facilitate connections to ancestors or central teachings, sometimes through place-based stories.

Expanding beyond utilitarian uses of providing a meal or material for a basket, cultural resources are part of mutually beneficial and life-sustaining relationships held between Karuk people and the landscape, which are a key part of what defines Karuk people and culture. Ceremony supports this dynamic, reaffirming relationships and responsibilities for stewarding nonhuman communities. Benefits provided by cultural resources strengthen the people, along with their capacity to actively steward those resources, in a positive feedback loop. However, social and environmental stressors have resulted in the loss of cultural resources, as well as the loss of human capacity to care for these resources. Such stressors threaten Karuk cultural memory, healthy lifestyles, and place-based connections with the land. Many study participants discussed the interconnected fates of salmon and Karuk people, for example.

Focus groups demonstrated how participants see improvements in eco-cultural resource access for dam removal would strengthen relationships between the river and the people, as human and nonhuman communities return to balance in their relations. They described how access to eco-cultural resources is a foundational condition for many Karuk institutions, including natural resource management and ceremony. This overarching shift towards a more positive relationship with the river, as an intangible benefit of dam removal are anticipated throughout the basin. At the same time, more tangible benefits from dam removal derived from biophysical changes in the river are likely to occur in local areas closer to the reservoir reach.

5.1.4 *Degradation of cultural resources*

Consistent with previous studies, participants reported that historical abundance of cultural resources has declined. The eco-cultural relationships which have supported Karuk people since time immemorial are under stress, a shift that is undermining the Karuk lifeways and community well-being. Many adult participants had direct memories of better times, and recalled losses that followed the construction of Iron Gate Dam. Grief was expressed, especially for the next generation, who have grown up with severely impaired river conditions as the norm, even while they continue practicing their cultural heritage. Despite the threat of environmental decline, many community members we spoke with believe that another world is possible and maintain a vision for eco-cultural revitalization. Some of these visions are based on a reference condition expressed through memories or stories about past experiences from community members (see Appendix C, Table 5.1.4-1 for quotes expressing community visions for cultural-environmental healing based on past experiences and stories):

- "I just love hearing [my grandmother's] stories about that time where she left the river and talking about acorns on the stone, like the hot ones… And her acorn soup with her salmon and her eels, all of those stories, it seems like such a world… But it wasn't that long ago. She's 94." – *Scott Aseltine*
- "That was like, a treat, when your grandparents had you walk in, you smell smoke, salmon, everything…. It's like when I grew up, that's what I want to have my grandkids come in to. So that's my goal to this day. I'm going to have that just like, where you wouldn't have to go to the store, you grew it, it's healthier for you." – *Robyn Reed*
- "Growing up in Happy Camp, my dad was an avid fisherman. Myself and my brother, we loved going with my dad and fishing. I think it was later in life that I realized to me and my brother, it was fun to go fishing. But the real value in it was the fish were a sustainable, healthy food source for us, and fish was on our dinner table four nights a week." – *Buster Attebery*

Negative impacts from Klamath dams are highly visible for the salmon runs, which suffer due to reduced spawning ground, higher spring temperatures, and poor fish health. Fisherpeople are no longer able to provide for their families and elders, and widespread practices of distributing fish among river communities is diminished. The primary Tribal fishery for Karuk people at Ishi Pishi Falls cannot adequately support the community's need for fish, even small amounts needed for ceremony. While salmon harvest still occurs at Ishi Pishi Falls and additional locations, multiple participants also spoke to problems with fish health due to diseases and parasites that have proliferated in areas below the dams:

- "We have access to resources for daily household use, but with water quality so bad and fish numbers dwindling, it is near impossible for all our elders to have enough fish to last a winter." – *Survey comment*
- "I can start off by just saying that we had a really good year this year. And yet, we still didn't have enough for subsistence needs. We barely had enough for ceremonial needs. We didn't have enough for my own personal family needs. And that's not even talking about my children... So I think there's a dramatic limitation of our fishery, for one." – *Ron Reed*
- "When the fish kill occurred we were catching fish that had gill rot with white balls in their flesh. The skin of the fish was literally falling off. This upset me and I wanted to find out who was responsible for causing our fish to become sick." – *Poppy Ferris-George*
- "I don't fish. Most people who used fish sustenance have gone on." – *Survey comment*

Basketweavers and those gathering food and medicine now face a decline in the quality of materials that are available, as well as increasing difficulty with gaining access to riverside gathering places. River sandbars where roots for weaving grow and are harvested have become difficult for weavers to reach given access barriers, such as private property and the proliferation of nonnative vegetation like Himalayan blackberry brambles. Willow sticks are often infested with bugs, given lack of disturbance events like flushing flows that clean out older willow stands. In addition, pollution, notably agricultural impacts and pesticides from cannabis cultivation, create human health concerns for weavers who work closely with plants and intensively handle materials manually and orally during processing and weaving. Participants linked dam construction preventing sediment transport to a lack of sand bars where roots for weaving grow and the loss of healthy young willow stands. Weavers explained that changes in local ecology from dams and other extractive development in the Klamath affect the quality of their weaving and baskets:

- "We can't get to the river because of non-native berry bushes, I mean, a lot of invasive berries. It's overgrown. Like they did cut a swath by the bridge… [but] I couldn't get in there since it made

the berry bushes grow a little better… My teacher was an elder lady. It was nice [under the bridge], you could walk underneath the trees and crawl around. It was all sand, it was just where we went to get roots." – *Wilverna "Verna" Reece, basketweaver and teacher*

- "The root gathering [for example]. A lot of people don't want to put those roots [in our mouths] because of the contamination. You can't trust [it]. And basketweavers, you know, we run that material through our mouths, and we chew on the material to make it the right size to go into the basket, and we chew on our sticks. It's just a part of the process." – *Poppy Ferris-George*
- Well I'm hoping the river flows, like you said, like get back to what it used to be, and then hopefully clean out what's on the river bar now under the bridge and bring back those sandbars because the river is changing every year, the flow of it. I want the whole thing to come back the way it used to be. You'd have that nice sandbar there, and then you had the nice willows. This is the dream, right*?* – *Deanna Marshall, basketweaver*

Extending beyond degradation of subsistence foods and fibers, participants reported the deep significance of other cultural activities including ceremony, swimming, and family outings and expressed grief around their impairment. Young people, in particular, form fundamental relationships with the river through these activities that occur along the river, which lay the foundation for eco-cultural practice. For years, bathing or swimming in the mainstem Klamath River has been inadvisable due to nutrient loading and harmful algal blooms (HABs), which occur in dam reservoirs and pollute the river with microcystin and algal matter, in addition to unknown quantities of pesticides from tributaries. A combination of impoundment, temperature, and nutrient loading lead to exceptionally strong blooms which dye the reservoirs a characteristic "pea green" and contribute to serious health risks for those entering the Klamath River. This situation has interrupted some of the most essential river practices in the Karuk community (see Appendix C, Table 5.1.4-2 for quotes describing environmental health risks due to compromised water quality in the Klamath mainstem):

- "My vision is to see more cultural activities happening along the Klamath River. For many decades our tribal people have not been able to enjoy family and cultural time at the river's edge because of the high levels of toxins in the Klamath River. It was not safe for us to include the river in our cultural lifestyle like ceremony, fishing, swimming, and gathering materials for baskets. Our traditions are to teach many life lessons to our children by utilizing the river as an educational and survival tool. The river was basically taken away from the tribal people, polluted, and then given back in a manner that is desecrating us. I want to see the tribal people using the Klamath River and teaching the cultural and subsistence uses that it has to offer." – *Poppy Ferris-George*
- "I grew up here, so I know that under the bridge, we used to be able to swim in the Klamath. Some people still do, but I don't. I'll swim in the Salmon, but I don't necessarily swim in the Klamath. That was the big thing, having the river to swim in right here. That's quite sad, it was a big thing to swim here in the Klamath, but now it's not swimmable to me." – *Deanna Marshall*
- "As a kid I used [to] swim and play in the river, now through my adulthood it is filled with deadly algae and is not safe for the fish or people." – *Survey comment*
- "The last time I went swimming in the Klamath River I was sick to my stomach for days afterwards. It needs to be healthier to swim in." – *Survey comment*

In addition to impacting these major cultural practices, focus groups discussed other impacts from the Klamath dams. Reliable supplies of large wood and acorn rocks are no longer transported downriver due to a lack of significant flushing flows. Participants reported it has become less common to see wildlife at the river, and insect communities have also reportedly changed.

5.1.5 *Sociopolitical and economic barriers to cultural resource use*

While environmental decline poses a significant threat to Karuk eco-cultural practices, there are also sociopolitical threats to cultural resources that include permit restrictions, private property, structural racism, and land status, where the US Forest Service claims possession of 98% of Karuk Aboriginal Territory. Additional challenges to cultural resource access included distance and economic barriers, e.g., where community members lack the resources required to access the river or engage in subsistence practices. Focus group participants and survey respondents also mentioned onerous regulations and policing by game wardens. In the context of a place-based culture, losing access to cultural resources results in and is shaped by the erosion of connections to the land, as well as the loss of family-based management practices (see below and Appendix C, Table 5.1.5-1 for quotes describing lack of access to cultural resources for Karuk Tribal community members):

- "Probably maybe eight years ago, I'd go with an elder. We'd go along the Klamath River to get sticks... And we used to be able to go along and get some, but now it's all private property. You can't even go and gather sticks probably from here [Yreka] to almost probably to Happy Camp. Now I think it's all private property. And so sometimes we can go over to Scott Valley, but just talking to some weavers, they said our sticks aren't the same as they used to be. And if we could get them back to that, we could get this really nice, fine weaving." – *Florrine Super, Kahtishraam Wellness Center Director and basketweaver*
- "Tribal people are not supported enough. There is private land and restrictions from Forest Service. We are not able to live as Karuk people and have healthy access. [We] will not get permits. That's ridiculous and dumb. Also, land back. We should have homes and gathering sites and white people should go away like their dams." – *Survey comment*
- "Back in the old times, there was no ownership. And in fact, there was an elder that spoke on a video once and he said, now you're the owner. Everybody owns everything. There's fences everywhere. But back then the only thing you owned was your responsibility. Your responsibility and maybe some [forms of] private property like prayers, the sort of thing that only certain people can handle because it's a huge responsibility and also in the wrong hands, it's not a good thing. So certain families would hold on to that private property and carry it on ceremonial-wise. We want to go to the river. But where do we go? To the river access? Or we have to drive all the way to Happy Camp? Or we go without because it's not feasible and it's not safe right now." – *Bob Attebery*

Write-in responses to the question "What specific actions, if any, are you taking to get around these barriers?" captured the Tribal community's persistence in harvesting or otherwise engaging with cultural resources despite these challenges, with many investing significant time and personal resources to maintaining connections to the land and to family. Some also discussed staying informed, praying, and keeping in touch with relatives as actions they took on the river to overcome barriers. One survey respondent remarked, "These barriers are too hard to get around. It is difficult to be Karuk in 2023," reflecting a web of barriers to cultural activity that, for some, can feel insurmountable. Another wrote, "I attend ceremonies no matter what any outside barrier an entity may throw up," representing the people's commitment to continuing in relationship with the Klamath.

5.1.6 *Interconnectivity: Living in relationship with eco-cultural resources*

Participants emphasized that cultural resources come to flourish under environmental conditions that are beneficial to all human and nonhuman communities. Focus group members discussed how dam removal's

impact on the most basic ecological processes of water quality and flow regime stand to impact the health of the whole ecosystem, from the river bottom to upslope areas. Reflecting Karuk TEK, responses emphasized interconnectivity between multiple components of the ecosystem and people, and described how dam removal impacts would be felt throughout the landscape:

- "Anything that's happening on the mainstem river, tributaries, anything like that is all gonna have an impact on the beavers… And the elk as well too. Elk use the river a lot. We think about the different crossing areas and stuff, and they also eat plants in the river too…" – *Francisca "Frankie" Tripp, Karuk DNR K-12 Environmental Education (at time of study)*
- "Oh, the bears do too, I've watched that one bear up above. He was digging into the river and eating the algae like this." – *Ben Saxon, Karuk DNR Wildlife Program*
- "So my expectation is, yeah, we'll get more access to the river in certain spots. You're going to get rid of all the big dead willow clumps that are along the river. Like I was explaining last night, it's going to get clean, you're going to get better willows, going to get better roots to gather, you're going to get all that stuff in there and then you're going to get more, better insects so fish can feed on there. And then the more fish come up, it's just going to make everything better because then the raccoons are going to eat on the dead fish, and then the bears are going to eat. Everything's going to be healthier because right now everybody's sick." – *Troy Hockaday*
- "Eventually the earth will replenish itself around the rivers. the water will be cleaner, the animals will be healthier. Drinking clean water now. The birds will come and get fresh worms." – *Vivian Jordan, Kahtishraam Wellness Center*

This theme of interconnectivity extends to human management systems. Karuk community members discussed dam removal as a return to the successful model of Tribal management, where the Tribal community is fulfilling its stewardship responsibilities to the environment. This includes Karuk management practices such as the application of cultural fire or the continuation of World Renewal ceremonies that ensure the coordinated abundance of Karuk and nonhuman communities. Here, humans are an integral component of the ecosystem and management processes that are benefitting all. Participants discussed the revitalization of human and nonhuman relationships through eco-cultural practices as one vector through which transformative change could occur. As some participants see it, returning to a place where eco-cultural relationships become viable – through human management and land care practices that include dam removal – can help create enabling conditions for renewed abundance:

- "So in a sense, if you're from a traditional medicine family then you're looking at interconnectivity because you can really look at World Renewal, the White Deerskin Dance picture, and be able to see we have to manage. We have to teach our communities the same things that those species represent. So the interconnectivity of everything being healthy is that level of importance. So we're talking about all the different crayfish. We're talking about all the different fish. You're talking about all the different microorganisms. So I think that's what's important. It's a healthy functioning process that is initiated with fire." – *Ron Reed*
- "I'm interested in seeing what the change is going to be post-dam removal, and I'm really hoping for something good to happen because we have all these missing pieces [of eco-cultural practices]… The more pieces put back together the better, I'm sure. And we don't know what those impacts are going to be… There's going to be some surprises to our cultural resources that we're not thinking about, too. That's kind of the beautiful thing about restoring fire, too. You don't know what seed bed is waiting to have that fresh life be given to it. So, as far as the river corridor

goes, we're about to see something different, and I'm sure we'll have unexpected things happen." – *Chook-Chook Hillman*

- "And that's what I'm hoping, that when these dams come out, it's going to be refreshing. So when we do have those circuits, it's going to be a refreshing feeling. It's not going to be about the water we have to worry about. No… Everything's going to fall into place. And once that falls in place, I think other things will fall in place." – *Troy Hockaday*
- "It's a cliche, but it's not, that everything is interconnected. I think about it as a basketweaver, you know, the interconnection of our baskets to water, to the fire that we made, to the variety of different land management techniques. Plus, it's connected to, you know, thinking about language and history and childbearing and food and everything else, you can't separate them all. Because it is connected." – *Carolyn Smith*

For Karuk people, dam removal is clearly connected with expectations for increased access to eco-cultural resources. This reflects the interdependence of human and nonhuman systems in Karuk knowledge traditions, which are established through place-based knowledge, culture, and foodways that are embedded in the landscape and specific place-based practices. Following this line of thinking, a heathier river should enable cultural practices, which in turn sustain the interconnected health and well-being of Karuk people as well as the river. Access to cultural resources, including traditional foods, is therefore an important indicator of whole system health. Further revitalization of eco-cultural resources means simultaneously contributing to functional eco-cultural systems and a healthy, united community:

- "So we monitor right? I mean, what kinds of acorns we get, what kind of basketry materials, you know? It's like the ethnosciences that we depend on and we practice. How are we all doing? That's the pulse of the community. That's what we're trying to get conveyed to the tribal government. How is our community doing?" – *Ron Reed*
- "I want to see the dams come down, I want to see our basket areas tended and taken care of in the ways that they're supposed to be, I want to see the water rise and lower so it cleans out our willows so we have roots that are good and healthy and bug free, and I want to see our beargrass and our hazel burned when it needs to be burned in those areas tended." – *Carolyn Smith*
- "Yeah, the food and everything for animals. The water, everything. You know, it's just, you know, spurts out everywhere, your food, your medicines, your baskets, you know… Just the berries, huckleberries, you know. It's hard to find to be able to manage our own ceremonies as well. It goes right in with the elk and everything that, you know, we should be able to go out and hunt ourselves, too. You know, for ourselves to just, yeah, be healthy. Be out there to fish for people, everybody." – *Robyn Reed*

5.2 Holistic health (Domain 2)

5.2.1 *Community understandings of river health impacts*

Speaking to the second domain of Tribal community well-being, holistic health, the vast majority of local and nonlocal respondents shared that the river is "very important" to them, (86%, N = 107 and 81%, N = 118, respectively). The majority of survey participants also voiced concern regarding the current state of the Klamath River and believed that the river is currently "Not very healthy" or "Not healthy at all" (59%), while 41% reported feeling positive about river health ("Very healthy" or "Somewhat healthy") (N = 236) (Figure 5.2.1-2; see also Appendix B, Figure 5.2.1-4). Many respondents believed that dam removal will improve the health of the river (62%, N = 235).

Questions about holistic health focused on the relationship between the river's health and personal or community health. We found that 72% of survey participants believed river conditions "contribute" or "somewhat contribute" to mental or physical health problems in their community (N = 235) (Figure 5.2.1-1; see also Appendix B, Figure 5.2.1-5). In addition, 86% of respondents reported that their health and well-being are "highly" or "somewhat affected" by their feelings about the river (N = 238) (Figure 5.2.1-3). We noted a difference in the level of concern around community level health impacts compared to individual health impacts, where the strongest level of conviction was held by 34% for the former question ("yes, contributing" to community impacts) and 18% for the latter ("yes, highly affected" for personal health). Findings demonstrate variation in people's feelings about river health, as a measure that correlates with self-reporting on Karuk health, and indicate how strongly people are experiencing river health impairment as a source of stress in their daily lives.

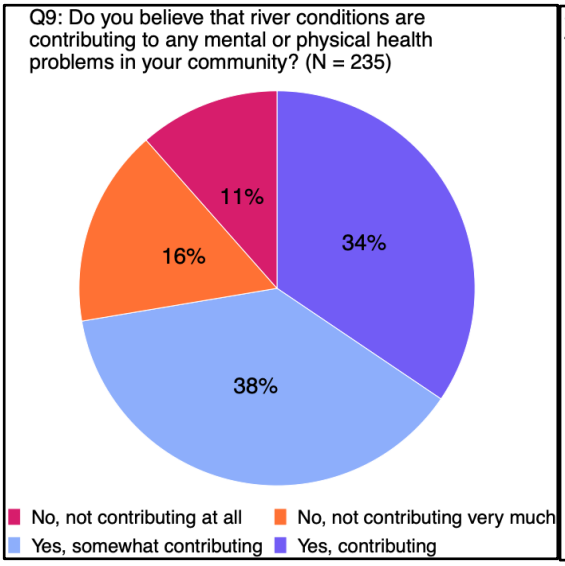

Figure 5.2.1-1: Question 9: "Do you believe that river conditions are contributing to any mental or physical health problems in your community?" (N = 235)

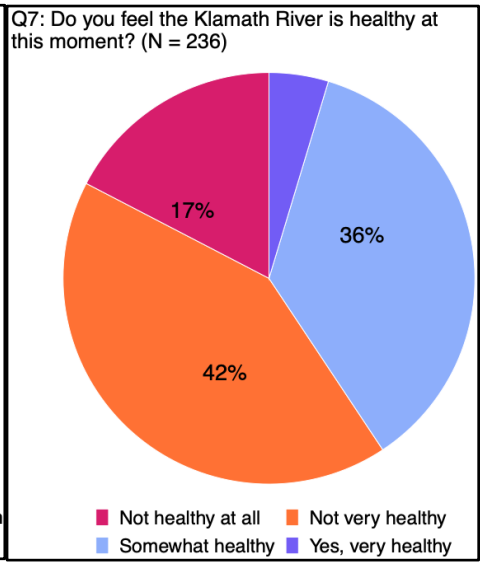

Figure 5.2.1-2: Question 7: "Do you feel that the Klamath river is healthy at this moment?" (N = 236)

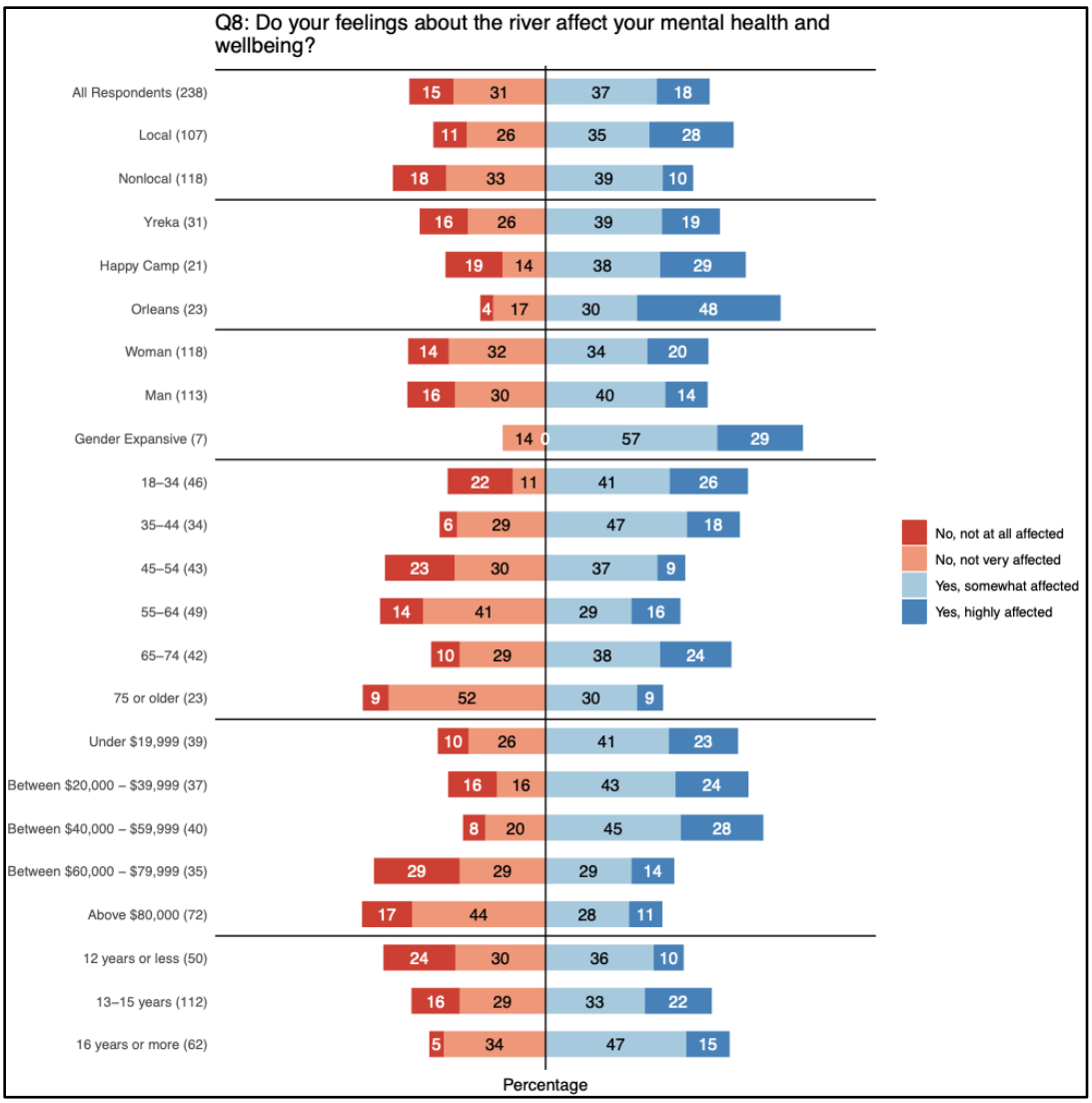

Figure 5.2.1-3: Question 8: "Do your feelings about the river affect your mental health and wellbeing?" (N = 238)

Through our assessment, we identified the following demographic trends on dam removal impacts to holistic health:

- **Local and Nonlocal.** While similar numbers of local and nonlocal residents believed the river was healthy, local respondents were more likely to select "not healthy at all" (10% difference). Local respondents were 14% more likely than nonlocals to be at least "somewhat affected" by their feelings about the river. Locals and nonlocals reported similar beliefs about river contributions to community health. (Local N = 106, Nonlocal N = 117, with slight differences in N between questions; see Appendix A, Table 2.2.4-1)
- **Council Districts**. Respondents from different Council Districts had markedly different interpretations of Klamath River health impacts, with the Orleans District expressing the highest level of concern. For current river health, "not very" or "not at all healthy" was selected by 43% of Happy Camp respondents, 61% in Yreka, and 87% in Orleans. Similarly, for river contributions to community health, "somewhat" or "definitely contributing" was selected by 66% of Happy Camp respondents, 71% in Yreka, and 87% in Orleans. By contrast, river impacts to personal health

and well-being followed a downriver gradient with "somewhat" or "highly affected" selected by 58% of Yreka respondents, 67% in Happy Camp, and 78% in Orleans. (Yreka N = 31, Happy Camp N = 21, Orleans N = 23)

- **Gender.** Men respondents were 9% more likely to report the river was "not very healthy" compared to women respondents, but 12% more likely to believe that river conditions are "not contributing at all" to community health. Men and women were personally affected by river health at the same rate, with 54% being affected in both groups. Gender expansive respondents unanimously or near-unanimously viewed the river as unhealthy, believed in community impacts, and were personally affected by impaired conditions. (Women N = 118, Men N = 111, Gender Expansive N = 7, with slight differences in N between questions; see Appendix A, Table 2.2.4-1)
- **Age.** Age groups had similar perceptions of Klamath River health, while the youngest group (18-34) expressed the greatest level of concern. With responses about community and personal health, the youngest and oldest groups were most likely to report higher levels of health impacts, and those 45-64 were least likely to report impacts. However, while elders over 75 were the most likely to report contributions to community health, they were least likely to report being personally affected by river impairment. (18-34 N = 45, 35-44 N = 34, 45-54 N = 43, 55-64 N = 49, 65-74 N = 42, 75 or older N = 22, with slight differences in N between questions; see Appendix A, Table 2.2.4-1)
- **Household Income**. Similarly, there was little difference regarding feelings about river health among income groups. However, we did observe more heterogeneity in beliefs about impacts to community and personal health. Responses revealed a divide where respondents making less than $60,000/year were up to 30% more likely to report personal health impacts, and up to 18% more likely to report community health impacts when compared to higher income households at $60,000/year or more. (Under $19,999 N = 39, Between $20,000 - $39,999 N = 36, Between $40,000 - $59,999 N = 40, Between $60,000 - $79,999 N = 34, Above $80,000 N = 72, with slight variation in N between questions; see Appendix A, Table 2.2.4-1)
- **Education.** Respondents with more years of formal education were more likely to believe that the Klamath was unhealthy, that river conditions contribute to community health, and that they were personally impacted by river health. We found the opposite for respondents with less education, who were less likely to see the Klamath as unhealthy or to report personal or community health impacts. (12 years or less N = 49, 13-15 years N = 112, 16 years or more N = 62, with slight variation in N between questions; see Appendix A, Table 2.2.4-1)

Although strong feelings about river health, community impacts, and personal impacts were somewhat correlated, responses to these three questions varied across demographic groups. Findings demonstrated the variation in participants' feelings about river health. Such variation may have been linked to differences in proximity to the river, level of cultural and ecological knowledge, involvement in eco-cultural practice, political environment, and a host of other factors. To interpret self-reported findings on health, it is critical to note the distinction: one question asked about "river conditions" which contribute to "health problems in the community," and the other asked if "feelings about the river" impacted "your [individual] mental health and well-being." Differences in response may reveal nuance in how different groups interpreted these two lines of questioning. Furthermore, the subjectivity of responses emphasize how community problems are multifaceted, and community members may experience their own unique relationships to the river. These findings highlight the importance of considering "holistic" health and approaching the topic from multiple perspectives.

5.2.2 *Co-constitution of river health and human health*

Focus groups discussed how Klamath dams were seen as major contributors to health problems for the river and Karuk people, mediated in part through eco-cultural stewardship practices. With salmon historically providing an important source of nutrition, social cohesion, and cultural identity for Karuk people, salmon decline has eroded community health at multiple levels. When individuals shared their views on dam removal, many described how the health of the river and Karuk people are inextricably linked, as exemplified through the Karuk Tribe's goals for eco-cultural revitalization. This is a case of holistic health, where ecological health and human health are interdependent. This reflects a metaphysical component of dam removal, where the physical manifestation of river health is co-constituted with Karuk spiritual health (see Appendix C, Table 5.2.2-1 for quotes referencing links between the health of the river and the holistic health of the Karuk Tribal community; see Section 5.2.4).

Numerous participants discussed how Klamath dams have contributed to negative physical, emotional and mental health impacts for Karuk people. Focus group members and survey participants conveyed feeling sadness, hurt, worry, and stress about the impaired state of the river due to Klamath dams, especially those who have known the river in a healthier state. Some expressed a loss of self-worth, depression, and feeling a lack of agency to restore river health. Such negative emotions were caused by the unhealthy state of the river and salmon, as well as the loss of cultural practices that have historically connected the Karuk Tribe to the river:

- "I had to bathe in the river for ten days [for ceremony]. Well, one year the river was green, like bright green, and… sometimes when I swim, I get stuff in my ear or whatever. Well, my whole face swelled up like this and I had to go get a shot while I was still the priest. [I was] halfway through it before I had to go to the doctor and have him give me a shot of penicillin." – *Bob Attebery*
- "It hurts me to know that the river is unhealthy and that we haven't had the power to care for it properly in recent generations." – *Survey comment*
- "The condition that the river has been in has caused a lot of devastating effects on the environment and native wildlife. It's been upsetting to see the decline in the health of the river and decline in population[s] of fish." – *Survey comment*
- "I am a child of Mother Earth & Nature. I am Karuk & Native Hawai'ian. I have always felt a strong connection to the land, freshwater places & the sea. When I see Mother Earth & Nature abused, used & not cared for, it makes me angry, upset & depressed." – *Survey comment*

Participants frequently expressed grief at the decline of cultural resources on the river, especially salmon, as a result of dams and other impacts. Cultural resources are integral to the social systems sustaining the Karuk community, as well as the personal relationships that individual community members maintained with the environment. Focus group and survey participants discussed how they maintain personal and community health through the harvest and stewardship of cultural resources, with some discussing the mental health benefits. Others conveyed how eco-cultural practices help instill a sense of purpose and value in community members who are managing, using, and sharing these resources:

- "I worry about tribal people getting their fish yearly which is healthy mentally physically and spiritually – the healthy interactions of family catching canning and freezing or smoking their fish bonding with family." – *Survey comment*

- "Fishing brings family members together like back in the days my Dad and our families got together for a few weeks and watching my Mom, Aunts and cousins break down and strip fish." – *Survey comment*
- "And these fish are part of it, you know. That they're not here doesn't… That's kind of the point I was trying to make earlier. As a fisherman, when you have no fish, you have no value. And so these fish are an opportunity for all of us to have value beyond ourselves." – *Alex Corum, Karuk DNR Fisheries Biologist*

5.2.3 *Revitalizing traditional foods to promote Karuk community health*

The broader context for health discussions includes inadequate health provisioning on the river; as one survey respondent noted, "Doctors don't want to come to these rural areas. So we get third world health care." Research has already established the negative health impacts experienced by Karuk people due to the loss of traditional foods through disproportionately high rates of diet-related diseases like diabetes (Norgaard, 2005). Participants emphasized the need to bring back traditional foods for their health provisioning value as a strong message throughout the study. Focus groups discussed the importance of traditional foods like salmon for their nutritional benefits, as well as the benefits provided from living a healthier Karuk lifestyle that supported salmon harvest and tending of resources. Some participants recognized the importance of sustaining these foods to support human and nonhuman communities alike (see Appendix C, Table 5.2.3-1 for quotes explaining the links between dam removal, Karuk food sovereignty, and food security):

- "The subjugation of free flowing water has crippled salmon availability. This is a staple food which enhances health and well-being of my neighbors, me, and wildlife." – *Survey comment*
- "We fished the Klamath in the 60s. The limit then was 10 wild steelhead daily. We miss that a lot. Not just the quantity of fish, but the life of everyone was affected by the quality of fishing. Which in turn is affected by the health of the river and habitat." – *Survey comment*
- "Once the dams are gone, we will see tribal people using the river system like they were intended to do. The fact that we will be able to use the river without getting sick will bring prosperity to the people by eliminating diseases that have impinged upon us due to forced assimilation to this modern world. We are forced to eat food that is full of GMOs, chemicals, plastic, and much more which is causing cancer and obesity. We cannot fish and harvest the foods that bring good health to the people. When the dams are gone and we rebuild our ecosystem, future generations will have an opportunity to revert back to a healthy lifestyle."– *Poppy Ferris-George*

Leveraging dam removal to help restore access to traditional foods and place-based Karuk identities connected to traditional foodways is one important pathway for revitalizing a healthy community and instilling hope for a better future. In this way, participants spoke to the power of dam removal to shift community health trajectories in a more holistic manner: to heal both the river and the Karuk people socially, physically, mentally, and spiritually. In addition to being an avenue for improving physical health, dam removal is also viewed as part of healing from historical trauma (see Appendix C, Table 5.2.3-2 for quotes regarding the power of dam removal to shift community health trajectories and heal interconnected dimensions of social, physical, mental, and spiritual health):

- "So depression is a very big issue here. And you know, when we go through management, allowing ourselves to understand that… the biggest part of depression, it's curing it too to have been out there doing something about it and being out in the landscape and doing those things." – *Ron Reed*

- "Knowing that our rivers will be restored & better taken care of, makes me feel better about the future." – *Survey comment*

5.2.4 *Holistic healing potential for Klamath dam removal*

Dam construction is viewed as a specific type of harm to community health, which is situated within the broader history of colonial dispossession and resource extraction in the Klamath. A number of focus group participants described how historical traumas they have experienced were associated with the dams, as well as other extractive projects impacting the river. These individuals viewed dam removal as an opportunity to heal from historical trauma, in part through Karuk people reasserting their leadership in watershed stewardship. Survey comments also addressed this theme:

- "The dam has been a direct cause and symbol of the impediment of my people. The dam is attributed to the negative well-being and death of our way of life. A symbol of colonialism and theft of the most sacred parts of our heritage. The river gives us sustenance, life, and hope. We believe life begins there and we will take care of it for the rest of time." – *Survey comment*
- "I'm tied to my ancestors' environment and any disrespect to our land dictates further mental deconstruction which as a tribe we were revered to renew and respect the land every year so if that's disrespected then it furthers depression which is all that the white man brings." – *Survey comment*
- "My mother was taken from her family by the government and put in a white home. She then moved to Oregon but kept as much cultural knowledge as she could. The survival of my tribes is very important as I [want] my children to understand the power of their ancestors and the healing power of water. The river which gave us life." – *Survey comment*

Speaking to spiritual health, participants described the negative emotional impacts they experienced from being unable to practice ceremony, particularly since ceremonial practices such as bathing in the Klamath mainstem and ingesting river water have been disrupted with the construction of Klamath dams. The following responses expressed the Karuk community's hope that, with dam removal, ceremonial life and Karuk spiritual health will be renewed (see Appendix C, Table 5.2.4-1 for quotes regarding links between dam removal, river health, and ceremonial and spiritual well-being).

- "[Ceremony is] the foundation of who we are. That's how we monitor the medicine that was made on the river, with how well do your fish run? And we had our traditional fish processes with our weirs… The first salmon ceremony, the second salmon ceremony, all these different things. So everything is based on the fishery lifecycle. And if the fishery lifecycle isn't here as our backdrop, then we're not touching those bases." – *Ron Reed*
- "Unfortunately our traditions have reverted to praying for the river because we are not able to use it. We look at our river, and we know it is sick. Our culture is put on the backburner as we spend our time in meetings advocating for dam removal and for the government to hear our cries for help. My hopes and dreams are for my people to have good health by providing a healthy environment for them to live in." – *Poppy Ferris-George*

Many participants also emphasized the need for a holistic approach to improving community health through dam removal, and more generally. With dam removal, there is a potential for enabling self-fulfillment and healing in the community. This project holds the potential for restoration of salmon, for spiritual connections, and for intergenerational connections that overcome historical trauma (see Appendix C, Table 5.2.4-2 for quotes describing transformation of community holistic health through

Karuk lifeways):

- "So the more we go in that opposite direction back to who we really are, and part of that's going to be taking these dams out because that's its original state, is going to speak volumes to the spiritual realm that exists here that people really don't even understand a lot of times. Because generational trauma, how do you pinpoint it?" – *Bob Attebery*
- "What they're talking about is Indigenous mental health… you go outside and walk, you go out and smell the air, you go out. And then when you start teaching, when you go out with the elders, [it's] intergenerational; that's the healing process that we have, right?" – *Ron Reed*

5.3 Education (Domain 3)

5.3.1 *Community interest and information deficit*

For findings on the third domain of Tribal community well-being, education, survey questions focused on understanding access to information and education about dam removal in the Karuk community. Despite the Karuk Tribe's leadership role in the original campaign and the high level of community interest in learning about dam removal (91% of respondents), findings suggested that remarkably little information about dam removal was disseminated to Karuk Tribal community members in the year leading up to demolition (N = 238) (Figure 5.3.1-1; see also Appendix B, Figure 5.3.1-4). Only 51% of respondents reported receiving new information about dam removal in the year before demolition (Figure 5.3.1-2; see also Appendix B, Figure 5.3.1-5) (N = 238). Even with the monumental impact of dam removal on Karuk life and widespread concern for the health of the river, communication channels with dam removal entities and education opportunities on dam removal appear to have been lacking at this time. Of those community members who did receive information, we noted that Tribal news sources were most important (58% received information through the Tribe), with internet, social media, and friends and family also contributing some information (Figure 5.3.1-3; see also Appendix B, Figure 5.3.1-6 and Figure 5.3.1-7).

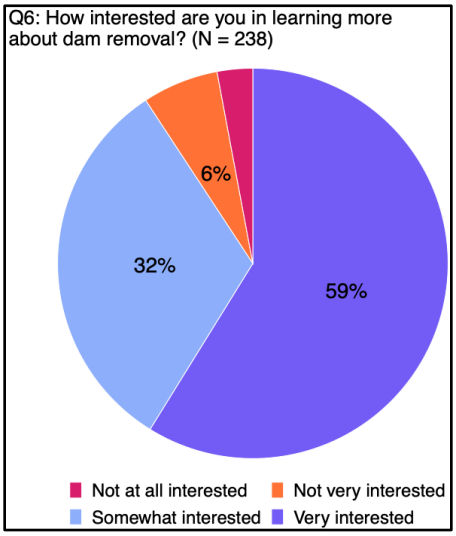

Figure 5.3.1-2: Question 6: "How interested are you in learning more about dam removal?" (N = 238)

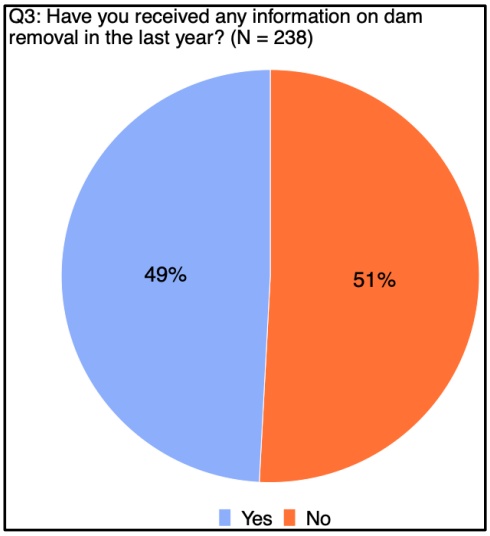

Figure 5.3.1-1: Question 3: "Have you received any new information about dam removal in the last year?" (N = 238)

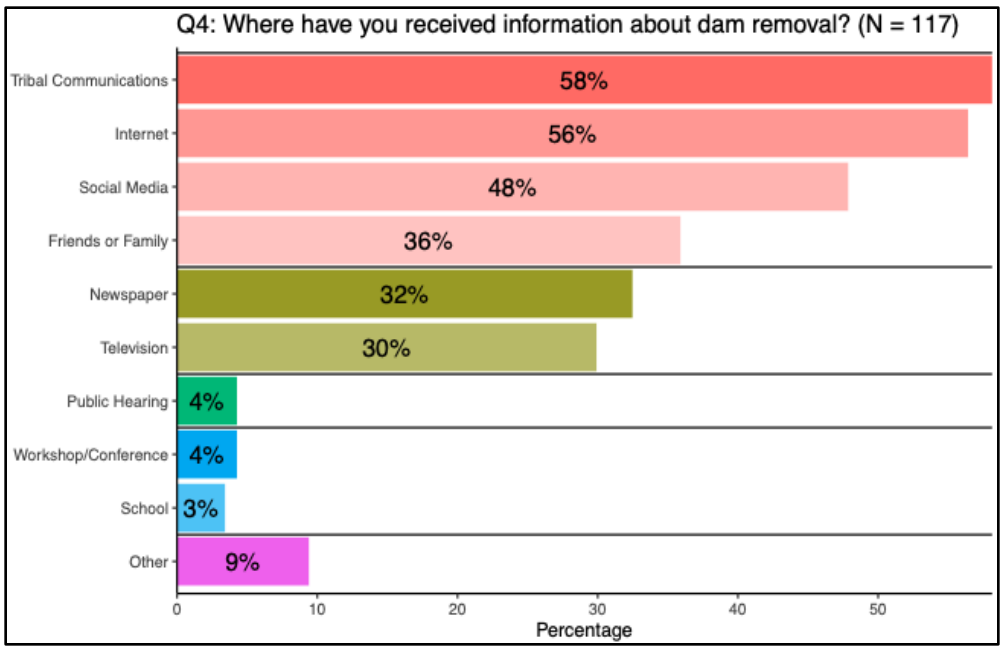

Figure 5.3.1-3: Question 4: "Where have you received information about dam removal?" (N = 117)

- **Local and Nonlocal.** Surprisingly, local and nonlocal participants reported receiving information on dam removal at similar levels. Nonlocal respondents were 7% more likely to report interest in dam removal compared to local respondents. (Local N = 107, Nonlocal N = 118)
- **Council Districts**. Interest in dam removal increased when moving from upriver to downriver Districts, with 71% of Yreka residents, 86% of Happy Camp residents, and 100% of Orleans residents at least "somewhat interested." Participants reported receiving information on dam removal most often in Yreka (58%), followed by Orleans (52%) and Happy Camp (43%). (Yreka N = 31, Happy Camp N = 21, Orleans N = 23)
- **Gender.** Men and women responded similarly about their level of interest and information received. All gender expansive respondents were interested and almost all had received new information. (Women N = 118, Men N = 113, Gender Expansive N = 7)
- **Age.** The youngest and oldest respondents were the most interested in learning about dam removal. Information about dam removal was unevenly distributed with those under 55 receiving less information than the average for all age groups combined, and those over 55 receiving more than the average. (18-34 N = 46, 35-44 N = 34, 45-54 N = 49, 65-74 N = 42, 75 or Older N = 23)
- **Household Income.** Household income findings resulted in a parabolic pattern: the highest interest in dam removal information was observed in the lowest income group, with decreasing interest for income levels up to $80,000, and returning to higher interest again beyond that. No pattern was observed for the distribution of information. (Under $19,999 N = 39, Between $20,000 - $39,999 N = 37, Between $40,000 - $59,999 N = 40, Between $60,000 - $79,999 N = 35, Above $80,000 N = 72)
- **Education.** Interest in dam removal rose with increased years of education, as did reports on level of information received. The proportion of respondents who received information was fully 35% lower for those with 12 years of formal education or less, compared to other groups. (12 Years or Less N = 49, 13-15 Years N = 110, 16 Years or More N = 60)

We noted that interest in learning about dam removal was high for everyone, even though some respondents during the study period expressed uncertainty about whether removal would actually occur or not. Findings raised questions around differences in Council Districts, with Yreka being exposed to the most misinformation and expressing the least interested in dam removal of any group. Differences in access to information by age group may suggest that communication strategies were better geared towards older audiences. Unfortunately, interest in dam removal runs in the other direction – such that young respondents expressed the highest interest in learning about the project. While we observed a modest gradient in interest along years of formal education, there was a strong information deficit for those with 12 years of education or less. This, combined with a global mismatch of interest and information, demonstrates that information about dam removal was not reaching the Karuk community during the study period, and that certain groups were particularly isolated. Findings around misinformation (Section 3.6) emphasized the importance of dedicated public information campaigns that were lacking in the year preceding dam removal.

5.3.2 *Need for additional outreach from dam removal entities*

While the Karuk Tribal community has been highly motivated to learn about dam removal, we observed a disconnect in the flow of information to community members as of late 2022-early 2023. Cultural practitioners specifically expressed how a lack of information on dam operations affected their eco-cultural practices (for example, high flows which disrupt setting eel baskets). Tribal managers shared a desire for additional information on what to expect from the demolition and restoration process from dam removal personnel at the Klamath River Renewal Corporation (KRRC). Karuk DNR staff actively involved in dam removal operations reported experiencing a lack of respect for Tribal personnel compared to government and non-government actors. This reflects an overall community desire for more information on dam removal, as well as additional transparency and recognition of Tribal expertise (see Appendix C, Table 5.3.2-1 for quotes describing the lack of information on dam removal in the Karuk community). As focus group participants expressed:

- "[We need] something that gives people an idea of how the process is going to work and what we should expect from the water quality standpoint, from a fishery standpoint, from a physical standpoint. This is how it's going to work. This is what's going to happen… Putting out there that you know these are the scenarios that are most likely to play out, and these are our expectations. These are our plans. This is how we're going to mitigate poor water quality or impacts on fisheries getting that stuff out there. So the public has a sense that we know what we're doing, we're in control, and we're operating, you know, with the same expectations." – *Toz Soto*
- "I guess just kind of like highlighting the need for some sort of conduit for information exchange so that people can plan and talk about it and know exactly what's going on. 'Cause then it's gonna change. Obviously, fresh snow melt water is different than dam release water and that's, like, different flows and stuff… Those water levels affect folks, like, who are setting eel baskets right now and stuff. Like, should I pull my basket or not? Are you gonna be letting a ton of water out? Those kinds of things are definitely good to know. And so I feel like you do need a conduit for folks to get some information into the community, you know, and kind of spread the word." – *Vikki Preston, Karuk DNR Cultural Resources*

This information deficit may be shaped by a variety of factors, which were not researched through this study. Irrespective of the cause, research team members responded to this issue by developing a frequently asked questions (FAQ) sheet about dam removal that was distributed in the Tribal newsletter and on our website. Tribal representatives on the research team also developed and implemented dam

removal and water quality lessons for youth. We also note that in the year following focus groups and the survey, dam removal personnel at Klamath River Renewal Corporation conducted outreach efforts to the Karuk community via public presentations in each Council District and mailed flyers prior to reservoir drawdown. At the same time, community members reported that this information campaign did not include information specific to cultural practitioners. Since the conclusion of the study, dam removal personnel have provided residents with mailed notifications about the onset of drawdown, assurances that reservoir sediments are nontoxic and water levels will not rise drastically, and public information sessions with the KRRC Public Information Officer in each Council District. However, participants expressed a strong interest in more than basic safety information. Some criticized the belated timing given that dam removal activities in the Upper Basin began a full six months earlier.

5.3.3 *Education for Tribal youth around dam removal: In school and on the river*

Overall, Karuk youth focus groups participants were well informed about river ecology and expressed strong interest in learning more about dam removal. We noted that information available through school-based programs was distributed unevenly, with youth in the Orleans District having greater access to dam removal educational programming. While these learning topics are typically welcomed in Orleans within more liberal Humboldt County, Tribal education leaders discussed the some of the difficulties they had experienced in reaching youth in Yreka schools, due to the hostile environment for Native people in Siskiyou County. Educators and youth we spoke with in Yreka mentioned widespread racism and fear of retaliation from the non-Native community as a major obstacle to facilitating more open dialogue and curriculum about dam removal (see Appendix C, Table 5.3.3-1 for quotes describing educational challenges facing the Karuk Tribal community in Yreka). As focus group participants explained:

- "Siskiyou County's no joke, okay… And it's not easy. Somebody says, hey, who wants to go up to Siskiyou County to teach K-12, to talk about dam removal, right? Nobody's gonna jump out of their seats kind of like, hey, I want to go up there. You have to want to do it. You have to be available to do it. And unfortunately, I can't think of anybody up in those areas that has the ability to do it because you gotta have thick skin by learning things down here, Indigenous, to go up there, and then you also gotta be well aware of western science and you gotta be well aware of academic success, right?... And our youth have to deal with [prejudice] when they're in school sometimes, so I definitely think that's a huge impact… You know, it's nice to be in a room where everyone kind of feels the same as you, but when you're not… it can be like bullying and it can really like, really kill your confidence in a lot of ways." – *Ron Reed*
- "There's been people before me in this position who got extremely burnt out trying to do each area. And then we've had contractors and other things and it's working out, but really what we need is someone based in each community to be able to do that outdoor education." – *Frankie Tripp*

Focus groups suggested that Happy Camp and Yreka youth in Siskiyou County rely only on Tribal programming for culturally relevant education, as well as their own personal connections to the river. Tribally driven dam removal education was extremely important, particularly for Tribal youth, in order to build trust for educators and information sources on dam removal in order to, in turn, build trust in the dam removal process. As a case in point, while Siskiyou County youth reported hearing more misinformation about dam removal, they remained critical of it given what they had learned elsewhere. A number of the focus group youth referenced one important information source: a series of field trips to Iron Gate dam with cultural practitioners organized in spring 2023 by Save California Salmon, a nonprofit

with close ties to the Tribal community. These trips provided an opportunity to contextualize the dam removal with an understanding of Karuk culture, community, and connection to the Klamath River.

5.3.4 *Restoring traditional Karuk youth education*

While today's youth are culturally engaged and have new opportunities available to them, participants felt that there was a disconnect in education around eco-cultural practice compared to past generations. Eco-cultural revitalization through dam removal has far-reaching implications for the continuation of Karuk knowledge and community, with salmon and the Klamath River being integral elements of Karuk education guiding the next generation. Survey respondents and participants frequently cited a desire to teach their children Karuk lifeways as their motivation for supporting dam removal (see Appendix C, Table 5.3.4-1 for quotes detailing motivations for dam removal centered on youth):

- "The way of life here that we lived, it was with the way that Karuk people lived for thousands of years here. Again, we hunted and fished, and we had our certain spots on the river that we went to. We had our certain spots in the mountains that we went to… Just living the culture here and thinking back how big of a key factor the river was in that way of life. And this dam removal project, I think getting back to that and making sure that our children experience that, that's really important to me." – *Buster Attebery*
- "That's really kind of like how we did things back in the day. Are you a hunter, fishermen, gatherer, medicine person, or all these Indigenous responsibilities? That's what you learned. That's who you became. We have to mimic that again… So I guess it's just a missing piece. What I'm trying to say is the missing piece of that formal education is Indigenous education, how do we bridge that gap?" – *Ron Reed*

Karuk goals for dam removal focused on the next generation and reflected a broad desire to revive the culture, protect heritage, and leave a better world for the youth. Participants felt that providing their youth with traditional knowledge as their heritage was important to ensuring cultural continuance for the Karuk people. Parents' ability to transmit culture to their children has been interrupted by the dams, which has further contributed to the endangerment of Karuk lifeways. Engagement in eco-cultural practice is foundational to Karuk life. Through intergenerational connections, youth learn to engage with the world in relationship with the river and its nonhuman communities. Such forms of traditional Karuk education contribute to the social bonds that hold the Karuk community together, building from educational approaches that emphasize the interconnected, holistic nature of Karuk TEK. River-based pedagogies are currently endangered by the poor health of the Klamath and stand to be significantly strengthened by dam removal. Poppy Ferris-George explained:

- "I want to see people using the river. I want to see people sitting along the river banks. I want to see people out gathering. I want to see families being families and enjoying time together because time together is critical, because that's where our lessons are learned. We're taught respect. We're taught about the way we as human beings should act and carry on our religion and there's nothing more important than being together as a family and learning from one another. And that's where a lot of the social activities happen. They happen along the river banks. They happen along the creeks and in the mountains at our spiritual and gathering sites." – *Poppy Ferris-George*

Focus groups discussed dam removal as a remedy for providing both direct educational needs of Karuk youth as well as teaching associated social functions that are gained through traditional education on the river. Intergenerational knowledge transfer between elders and youth becomes more possible with dam

removal: Karuk social connections are augmented both by a healthy river and Tribally-led collective action efforts that achieved dam removal in the first place. Participants emphasized the importance of improving the mental and physical health of the next generation through learning Karuk ways of being, so that a diverse set of Karuk people can find their place in a more unified community – a community that respects the diverse experiences held within its membership and comes together around core issues. Rekindling intergenerational relationships is seen as key to this process of unification, for the benefit of Karuk people as well as their knowledge systems (see Appendix C, Table 5.3.4-3 for quotes regarding intergenerational learning). As stated by Ron Reed:

- "Elders have to step in to provide that eldership for that next generation. Or I might need some youth to come underneath me so I can teach them. We know that if we're disassociated and we're disconnected, the river will reconnect and reassociate the people that have the same concern. So this is something I think we can fix. This is a unification of the voice of the river, of the people of that river." – *Ron Reed*

5.3.5 *Educational trajectories in traditional knowledge and science*

Karuk youth today have grown up alongside dam removal and the expansion of the Tribe's Department of Natural Resources. Given this experience, Karuk youth are well positioned to be leaders in "two-eyed seeing" efforts that involve seeing from one eye with the strengths of Indigenous ways of knowing and seeing from the other eye with the strengths of Western ways of knowing (http://www.integrativescience.ca/Principles/TwoEyedSeeing/). Dam removal has presented many new opportunities and challenges to the next generation for applying traditional ecological knowledge to natural resource management. Currently, Karuk DNR faces a shortage of Native scientists trained both in Karuk TEK and Western science, although the number is growing:

- "At one time, the government tried to eliminate us as a people. They shrunk our native population numbers to almost nothing compared to historical numbers. Our people fought and some survived long enough to create Treaties and Executive Orders which provided us some protection of our resources. They told us we had to become 'civilized' people who could function in a 'white' world. What they didn't realize was that we would do just that! We became educated like they wanted. We became scientists, attorneys, Cultural Resource Specialists and much more, and in the end, we are beating them at their own game! We weren't able to fight with our weapons and hands like our ancestors, but we fought back with our brains, and now the dams are coming down and the salmon are coming home!" – *Poppy Ferris-George*

While many Karuk youth have an interest in environmental science that is rooted in their experiences on the river, the limited amount of educational and economic resources in Karuk service areas poses an obstacle to college education. Furthermore, young people struggle to return to the river given the lack of housing infrastructure. Future development is difficult given that the US Forest Service now claims over 98% of lands in Karuk Aboriginal Territory (see Section 5.4.3). Yet, participants emphasized the importance of Karuk youth receiving both traditional educational training as well as Western educational training so that they might approach Western science from a Karuk perspective. One way this can be accomplished is through hands-on cultural education for youth, including field trips (see Appendix C, Table 5.3.4-2 for quotes regarding place-based learning):

- "It only works when you have the hands-on. You can't just be like, oh, well I'm gonna teach you about this plant, but you've never seen it. You don't know where it grows. You don't know how it

smells. You don't know how it feels. You don't know what it does. Like it's, it's so hard to teach something on paper. And that's the kind of education that I'm trying to get away from." – *Frankie Tripp*

- They took field trips to see the dams recently. And now they're gonna see them come down and what that's gonna bring for their kind of experience, you know, and how that's gonna affect the way that they're, you know, growing up and fishing and weaving and gathering and all those things with the river. – *Vikki Preston*

Particularly in the context of dam removal, this programming has an important impact on the youth who are inheriting a healthier river thanks to the science, policy, and advocacy contributed by fellow community members. While it is difficult to incorporate traditional education into the school system, especially in Yreka where dominant social attitudes often exclude or threaten Native youth, the Karuk Tribe's Education Department and Pikyav Institute are working to provide such programs. At Karuk DNR, Tribally-led education does connect Western science to traditional knowledge for students who may not have the family or community connections to learn outside of school. Focus groups emphasized the importance of including Karuk knowledge and interests in collaborative science, as well as the significance of bringing a Karuk worldview to scientific work. The current moment with dam removal is an opportunity to apply pedagogies that engage with two-eyed seeing and prepare Tribal scientists to engage more effectively with today's land management challenges. For example:

- "I think there's a big opportunity for traditional knowledge to be part of that management process and the Klamath… we're dealing with a fish that doesn't exist. So we need to come up with a management structure for a fish that doesn't exist. Well, when that fish existed, there was a management structure based on ceremonies and that sort of thing. And so that's an opportunity I see." – *Alex Corum*
- "So if we get the foundation of both education systems to be able to do hybrid… for the world we live in today, that's where we get the best traction. And I think it's just not just a combination of the school or the tribe or the federal—it's a combination of all those things, but who's our community?… Let's not make the same mistake we have in all the other things we've done throughout our lifetime and previous to our lifetime: leaving that Indigenous community behind." – *Ron Reed*
- "And thinking about the integration of Indigenous knowledge [and] tribal science… How well has it been integrated into working with agencies or in agency knowledge, policy, practice that you see? And how do you think that could be? How could that augment dam removal and river corridor restoration practices? So it's one of the questions that we have, but it also made me think about… how siloed, water, fire and, you know, other agencies are and I'm just thinking of what are ways that we can sort of integrate this, you know, obvious Indigenous knowledge of how everything is integrated and interconnected." – *Carolyn Smith*

5.4 Livelihoods (Domain 4)

5.4.1 *Interest and information around dam removal jobs*

Investigating the fourth domain of Tribal community well-being, livelihoods, about one-third of all respondents (35%) and half of local respondents (50%) expressed interest in jobs related to dam removal (N=238 and N=96, respectively) (Figure 5.4.1-1; see also Appendix B, Figure 5.4.1-6). Despite this, only 10% of all respondents and 14% of local respondents had received any information on jobs related to dam removal during the study period (N=238 and N=96, respectively) (Figure 5.4.1-2; see also Appendix B, Figure 5.4.1-7). These findings suggest that despite need and interest, dam removal has thus far failed to materialize opportunities for Tribal community members. We noted that the level of job information available to Yreka District respondents was especially low, even though this area is closest to the dam removal site. When participants were asked about preferred job types, interested respondents indicated the following top four choices: Indigenous stewardship/cultural revitalization (65%), native plants restoration (61%), natural resource management and policy (58%), fisheries (57%) (N = 83) (Figure 5.4.1-3; see also Appendix B, Figure 5.4.1-8 and Figure 5.4.1-9).

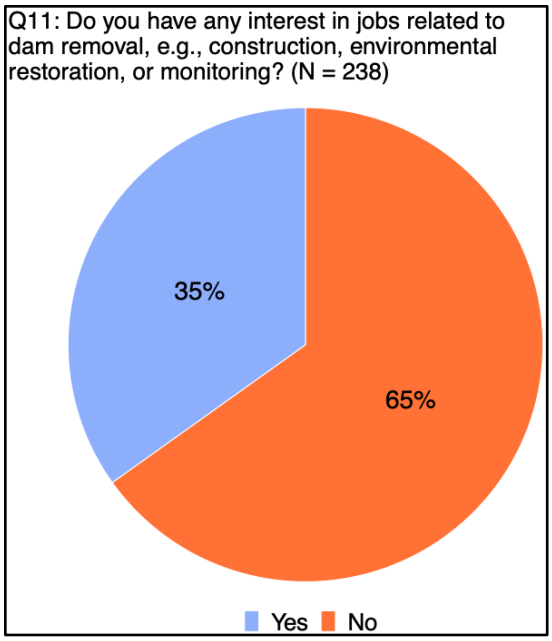

Figure 5.4.1-1: Question 11: "Do you have any interest in jobs related to dam removal, e.g., construction, environmental restoration, or monitoring?" (N = 238)

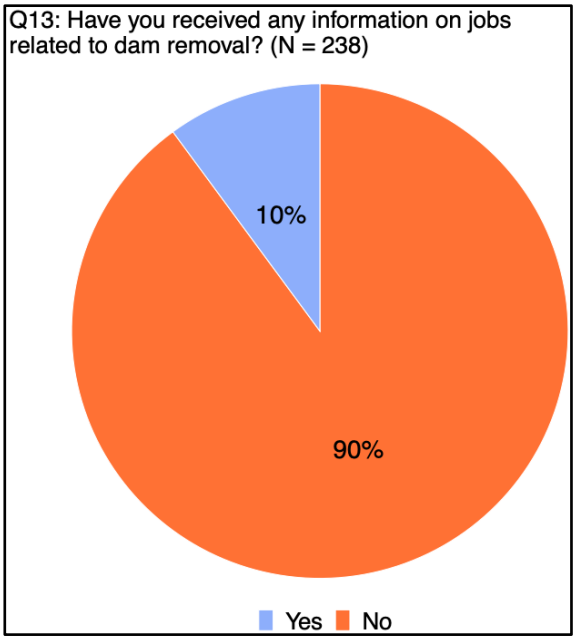

Figure 5.4.1-2: Question 13: "Have you received any information on jobs related to dam removal?" (N = 238)

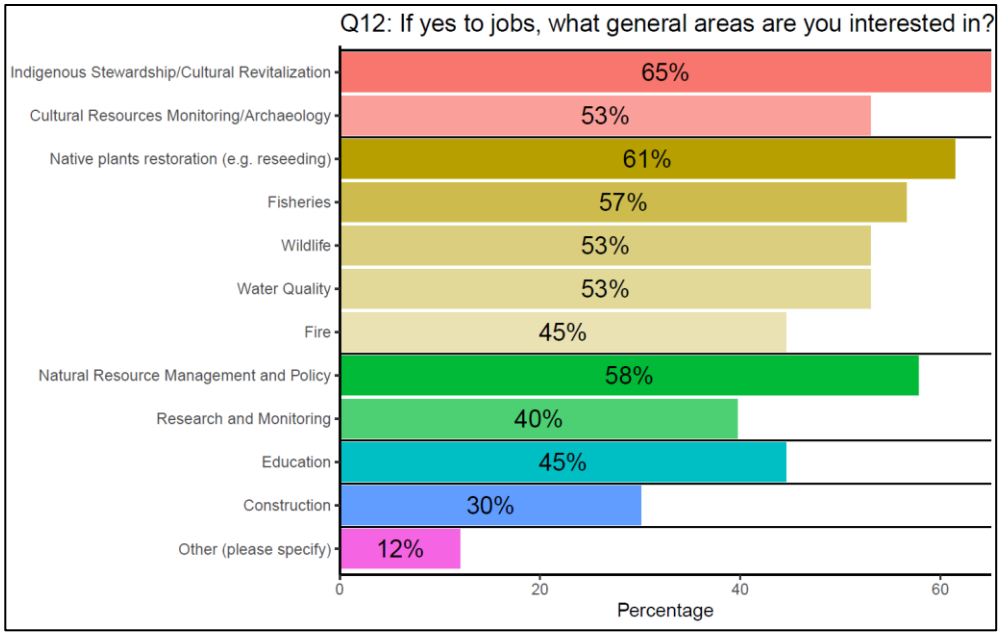

Figure 5.4.1-3: Question 12: "If yes to jobs, what general areas are you interested in?" (N = 83)

Among those who had received information about jobs, the most common source was a Tribal department (71%). Respondents noted the following types of support were most needed for Karuk people to effectively participate in dam removal jobs: Tribally-led training and support (70%), access to information about job opportunities (66%), community outreach (59%), training from external contractors (57%), and more culturally-relevant job opportunities (55%) (N = 226) (Figure 5.4.1-4; see also Appendix B, Figure 5.4.1-10 and Figure 5.4.1-11).

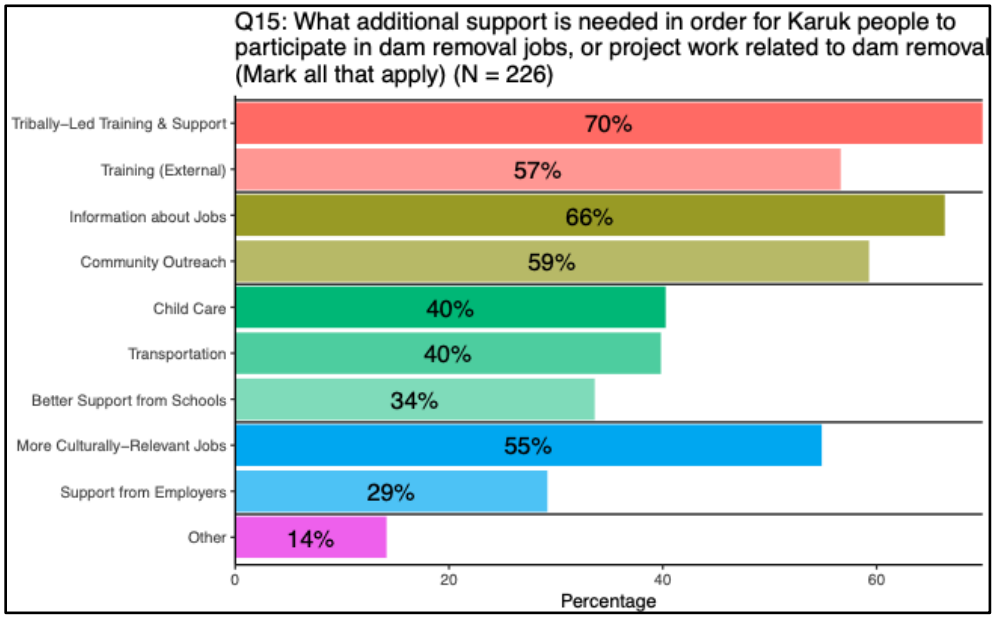

Figure 5.4.1-4: Question 15: "What additional support is needed in order for Karuk people to participate in dam removal jobs, or project work related to dam removal?" (N = 226)

- **Local and Nonlocal.** While local respondents were more likely to report interest in jobs, the rate was still high (26%) among nonlocal respondents (Local N = 107, Nonlocal N = 118). Interest level was similar for jobs in research and monitoring, water quality, wildlife, fire, and native plants restoration. Comparing primary areas of interest across groups, local respondents favored construction (19% difference), cultural resources monitoring/archaeology (12% difference), and Indigenous stewardship/cultural revitalization (14% difference). Nonlocal respondents favored education (22% difference), natural resources management and policy (23% difference), and fisheries (23% difference) (Local N = 50, Nonlocal N = 31). Sources of information about jobs were distributed similarly among groups, except that Tribal departments were more common for local respondents and the internet was more common for nonlocals (see Appendix B, Figure 5.4.1-12). Beliefs about the types of support needed to access jobs were also similar between groups.

- **Council Districts.** Interest in jobs was higher in Orleans (70%) compared to Happy Camp and Yreka (42% and 38%, respectively). Information about jobs was highest in downriver Districts, with Orleans respondents being slightly more informed (17%) and respondents in Happy Camp and Yreka receiving less information (14% and 10%, respectively) (Yreka N = 31, Happy Camp N = 21, Orleans N = 23). For all Council Districts the top two choices for preferred jobs were cultural resource monitoring/archaeology and indigenous stewardship/cultural resources revitalization (Yreka N = 13, Happy Camp N = 8, Orleans N = 16). Types of support needed to enable greater participation in dam removal jobs varied by District (Yreka N = 27, Happy Camp N = 18, Orleans N = 23) (Figure 5.4.1-5).

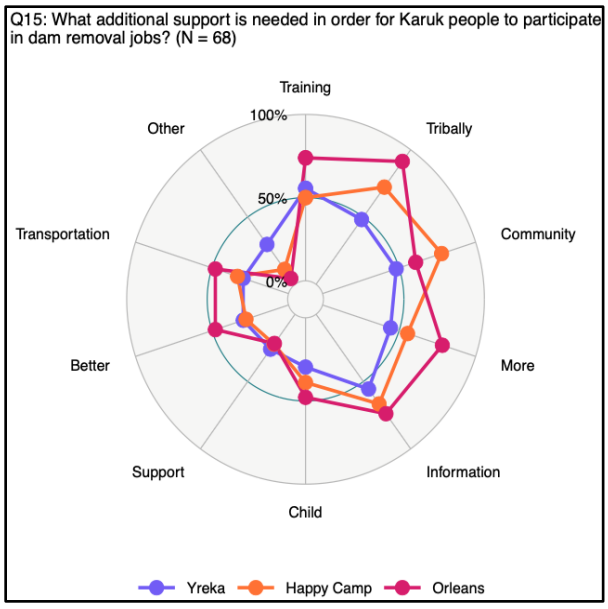

Figure 5.4.1-5: Question 15: "What additional support is needed in order for Karuk people to participate in dam removal jobs?" (by District, N = 68)

- **Gender**. Women were slightly more interested and informed about jobs related to dam removal than men. Gender expansive respondents also expressed significant interest (Women N = 118, Men N = 113, Gender Expansive N = 7). Men and women expressed similar levels of interest in most job categories, except that women favored wildlife and native plants restoration. Gender expansive respondents reported interest in all categories, especially cultural and natural resources work (Women N = 42, Men N = 37, Gender Expansive N = 5). Types of support needed were distributed similarly among groups, with women and gender expansive respondents indicating greater need for support in most areas. The largest area of difference was childcare, which women respondents were 18% more likely to identify as a need than men respondents (Women N = 114, Men N = 105, Gender Expansive N = 7).

- **Age**. Interest in jobs was significantly higher in the youngest age group, 18-34 (50%), while level of information available about jobs was higher for those aged 35-44 and 45-54 (18% and 14%, respectively) (18-34 N = 46, 35-44 N = 34, 45-54 N = 43, 55-64 N = 49, 65-74 N = 42, 75 or Older N = 23). For most job categories, interest generally declined with age; exceptions were research and

monitoring, education, fisheries, water quality, and fire (18-34 N = 23, 35-44 N = 12, 45-54 N = 12, 55-64 N = 19, 65-74 N = 11, 75 or Older N = 6). Although sample sizes were small, access to information through the internet was more common for young people, while Tribal departments were the main information source for those over 45. Young people were more likely to identify needing most types of support except training from external contractors, community outreach, and access to job information (18-34 N = 45, 35-44 N = 33, 45-54 N = 40, 55-64 N = 46, 65-74 N = 38, 75 or Older N = 23).

- **Household Income.** No significant trends were present among household income groups regarding interest in jobs, information received, areas of interest, or sources of information. However, lower household income groups were more likely to indicate needing support across all categories (Under $19,999 N = 39, Between $20,000 - $39,999 N = 35, Between $40,000 - $59,999 N = 39, Between $60,000 - $79,999 N = 31, Above $80,000 N = 69).
- **Education**. Interest in jobs was highest among those with at least 16 years of education (44%), followed by 12 years or less (38%) and 13-15 years of education (27%). Access to information about jobs was slightly higher (15%) among college graduates (12 years or less N = 50, 13-15 years = 112, 16 years or more N = 62). Interest in natural resource jobs, including fisheries, water quality, wildlife, fire, and native plants restoration, was similar among education groups. Interest in construction jobs followed a gradient that declined with level of formal education. All other categories followed a gradient that increased with education (12 years or less N = 19, 13-15 years N = 30, 16 years or more N = 27). Distribution of sources of information and types of support needed were similar for all education levels (except for childcare, which increased with education) (12 years or less N = 44, 13-15 years N = 107, 16 years or more N = 61).

Survey results on livelihoods clearly indicated that economic opportunities associated with dam removal were not reaching the Karuk Tribal community, including groups with the highest need and interest. Differences in local and nonlocal job interests highlighted different educational opportunities that could be relevant for Karuk community members on and off the river. Findings also demonstrated the need for cross-training in Karuk management and more Western styles of cultural and natural resources management that can be applied in an integrated eco-cultural system. However, persistent challenges for community development due to the federal administration of the majority of Karuk lands (see Section 5.4.3) have prevented both local and nonlocal people from making a living on the river. Council Districts have distinct workforce needs that may require significantly different approaches to fulfill local needs, interests, and priorities, as well as to overcome challenges around infrastructure and political climate present across different geographies and community demographics.

However, interest in jobs related to cultural resources and Indigenous stewardship was universal. Stronger interest in jobs and the support needed to access jobs expressed by women and gender expansive respondents may run counter to external stereotypes that assign expertise and formal job occupations to men, so their inclusion in restoration workforce development is key. As with education (Section 5.3), level of interest and availability of job information do not align for age groups: younger people desire work and jobs, but current information communications do not appear to be reaching them. The need for additional support among lower income groups is an important observation for stimulating economic development for the Tribal community. Further, the interest from both high school- and college-educated groups in natural resource jobs highlights the diverse types of expertise held within the community, and the importance of entry-level and field tech positions in natural resources science and management.

Counter to stereotypes about low-income Native communities, construction had far less interest than cultural and natural resources related opportunities. Furthermore, the most common obstacles

mentioned were related to opportunity (access to information, training, and more culturally relevant job opportunities) as opposed to infrastructure limitations (childcare, support from current employer, better support from schools, transportation). This confirms the community's strengths and readiness for restoration, as individuals holding deep knowledge about the river as well as skillsets, interest, and commitment to care for the river. These findings point to the opportunity for restoration work to fulfill specific workforce development needs for Karuk community members, even though the overwhelming majority of community members (90%) had not received information about dam removal jobs in the final months prior to dam removal.

5.4.2 *Reflecting on the Klamath Basin Restoration Agreement*

This discussion on livelihoods focuses on both economic opportunities associated with hydroelectric facility removal and restoration, as well as community access to these opportunities. We also expect that the trajectory of livelihood opportunities in the future will be shaped by longer term funding streams for eco-cultural restoration, research and monitoring, cultural ecotourism and recreation, infrastructure, and related activities. We recall earlier iterations of dam removal agreements that were marketed to community members and policy makers alike as a job creation opportunity, and a broad vision of dam removal as a vehicle for building a restoration economy in the Klamath watershed. Following on this history, focus groups discussed the extent to which the economics of dam removal and river restoration can support eco-cultural revitalization and community well-being for Karuk Tribal community members.

Research findings identified numerous challenges preventing the meaningful participation of Karuk Tribal community members in dam removal and restoration jobs. Common themes discussed included the limited access to information about job opportunities, and structural challenges associated with living in a rural community, especially limited workforce housing and the need for additional job training and capacity building. Some also discussed the challenge of overcoming structural racism that Tribal community members face when attempting to find well-paying jobs and housing. Focus groups and interview participants engaged in constructive discussions on how to address such challenges.

Focus group discussions also raised the need for distributive justice strategy to ensure dam removal benefits reached Karuk Tribal community members. A number of community members shared that they see dam removal as an opportunity for racial repair. The limited progress in extending job opportunities or other forms of economic benefits to Karuk Tribal community members is grounds for concern.

5.4.3 *Structural challenges to accessing economic benefits*

Focus groups considered the enabling conditions necessary for Tribal community members to access jobs on the river. A critical challenge that arose, especially in the Orleans Tribal manager focus group and interviews, was the need for additional workforce housing and basic infrastructure to support the day-to-day needs of Karuk Tribal community members who may want to work in Tribal watershed restoration jobs, but are unable to do for structural reasons that extend beyond lack of job information. Workforce housing was highlighted as a primary challenge, as explained by Bill Tripp:

- "We're establishing regenerative economic systems. All of these things need to connect. And so, you know, it's like the workforce housing issue. There's no place for people to live to even accept jobs." – *Bill Tripp*

Individuals in downriver communities near Orleans and Somes Bar especially raised strong concerns around workforce housing and other infrastructure support needs for Tribal members to participate in

eco-cultural revitalization-oriented jobs in the Klamath river corridor (see Appendix C, Table 5.4.3-1 for quotes regarding challenges around Tribal community access to housing and competitive wages). These sentiments were discussed at length in the Orleans Tribal manager focus group, for example in this exchange among participants:

- "We need infrastructure before we get people." – *Ben Saxon*

  "Yep. We have young college students coming back to their families and there's nowhere to live." – *Emilio Tripp, Karuk DNR Wildlife Program Manager*

  "And no childcare either." – *Frankie Tripp*

  "Yeah. Other, other non-Native communities have pipelines to get their youth in here and get other people in here. [It's] a lot harder for Native people and Native youth after college, people returning back home to be able to find a place to live and work… I have no idea how to address it, but [it would take Tribal] Housing kind of taking a lead for some of that and breaking some of their norms of just providing it for families and [be] more focused on youth coming and returning home–[it] needs to be part of their housing plan… Whatever funding sources I don't know are out there, but the problem needs to be addressed. Young people want to come home and, and be close to their elders and their community, and it's difficult." – *Emilio Tripp*

  "And those are full-time positions that we need permanent housing for! So it's an issue across the board… It's even a bigger issue as far as DNR infrastructure, you know, and people get displaced too." – *Ben Saxon*

  "They have different requirements for people, the type of people they can put into the units they can build…" – *Jessica Camarena, Karuk DNR Wildlife Program*

An additional theme that emerged from focus groups and interviews was the need for competitive wages to do watershed restoration and eco-cultural revitalization work (see Appendix C, Table 5.4.3-2 for quotes regarding challenges around funding Tribal programs and workforce development):

- "Livable wages… I think if you get somebody good enough money to come up, they'll come up. I think that's what it is. If you can't do livable wages, and on top of no land or no housing… you know, there's no community. It's just kind of like, oh, I can't go there." – *Ron Reed*
- "It does start with livable wages. Because at that point, everybody has that agency to make it better around themselves, honestly. Hopefully, and as a community, that would really be powerful. You know, one person doing that isn't going to do it." – *Alex Corum*

5.4.4 *Enhancing Karuk livelihoods through dam removal*

Similar to survey results, Karuk Tribal community members and Tribal staff we spoke with in focus groups described lack of information about jobs or other funding opportunities related to dam removal for Tribal members; in Yreka, Sammi Jo Jerry pointed out, "I haven't seen anything with the Tribe about them getting jobs for people, for heavy equipment, for laborers, for people." Some discussed their expectations around dam removal providing job opportunities for the Karuk Tribal community, and for community members to proactively receive training or certifications that increase job access.

As mentioned in the education and youth sections, participants raised the need for additional capacity building, especially education and workforce training, so that Karuk community members can participate in dam removal research and monitoring opportunities that may arise from dam removal funding. For example, as Ron Reed commented:

- "From every management meeting I've ever been to, there's never the youth, they're never part of the equation... We should be introducing them at a much younger age, they already can be doing this work. And by the time they get to high school and graduate high school, they'll be ready for college… [There's a need for a] certified process where you go through an eight month process or a year process [and] you're gonna have this much knowledge, and to be able to kind of connect that to a good paying job. At the end of the day, that's really what this region needs." – *Ron Reed*

In addition to expressing these concerns, focus group participants shared ideas on strategies for increasing the capacity and basic infrastructure needed for Tribal community members to better access dam removal jobs related to research, monitoring, fisheries, water quality, restoration, construction, education, and eco-cultural revitalization. This included ideas for expanding a recent Tribal demonstration project for workforce housing. Conversations on this topic extended more broadly to housing issues for Tribal community members living away from the river, who would like to reconnect to the area where their family is from:

- "The Tribe has bought a house, a two-bedroom house on Camp Creek… and they're going to be using that as like demonstration workforce housing and … to show how a program like that could work…" – *Frankie Tripp*

  "It's not going to fail if you invest in workforce housing … it's something that we just really need and they just kind of need that like proof. We need housing! People are starting to come back." – *Jessica Camarena*

  "I think the thing that we also have to look out for with the model… is that we're not outcompeting local folks that are ready to buy places. Because the Tribe, you know, they theoretically can buy these places at the asking prices, but we don't want to… set that kind of standard with this model either because there are folks that want to come – are ready to come back [home] and ready to buy, buy places right out of college, you know?" – *Frankie Tripp*

  "It would be nice to have multiple demonstrations. Multiple models. You can see, [what would happen] if the tribes would buy a big [piece of] land and then build a bunch of tiny homes… Forest Service lands though, they just need to give a couple blocks back to use for houses." – *Emilio Tripp*
- "I'd love to be able to come back on the river, which means I need a place to live and a living wage. And that's kind of kept me away as much as I want to work again… or, you know, either be able to just come up for a month or two just to, you know, hang." – *Carolyn Smith*

Focus group participants also expressed their hopes and visions for economic opportunities and additional benefits to Karuk livelihoods from dam removal in the short and longer term that also enhance community well-being. For example:

- "I feel like bigger salmon runs will lead to more resources, jobs, opportunities for those connected to the river." – *Survey comment*
- "We have high hopes that all of these tributaries will be full of salmon in the coming years and it's definitely going to bring more people to those areas and it's going to bring people outdoors and start using the places for fishing. And hopefully, we can further expand the fishing rights of the Karuk people so that their people can be out fishing that river long into future generations." – *Buster Attebery*
- "There's gonna be more fish over here, you know, there's gonna be more opportunities to get to provide our lifestyle and to kind of have that mental wellness to kind of kick in on its own. So I think that not only that, there has to be economic opportunity, as well." – *Ron Reed*

Strategies suggested for creating additional job opportunities included developing additional education, training and certification programs and Tribal youth opportunities. Ideas shared included the need for additional internship opportunities for students from Orleans, Happy Camp, and Yreka and school-based projects related to dam removal monitoring that can grow into meaningful careers for Tribal youth. As one youth stated:

- "I really wanted to study environmental science and marine science because my whole life has, I've been on the river. That's where I've spent all my summers and like, every time I went with my dad, I'd go fishing or something like that. So I'd like to carry it over to my adult life, how I make money and I enjoy being on the river." – *Youth participant*

5.4.5 *Finding cultural fit in dam removal jobs*

Focus groups and interviews clearly demonstrated the opportunity and need for cultural fit with dam removal and restoration jobs for Tribal community members, and aligning with Karuk eco-cultural revitalization goals. A number of focus group and interview participants emphasized the need for grounding economic development in place-based Indigenous cultural practices and values. They further discussed the importance of including youth, women, and elders and centering traditional lifestyles and education in economic opportunities:

- "You need to think ecology first and the economy will follow, because if you don't have a healthy ecological system, you don't have any economy. And there were jobs, preparing the fish, that's hard work. Yeah, I think educating people on the traditional way of thinking, ecology first and the economy will follow, we need to educate the outside world on it. Like I said, it's a method that worked for thousands of years. How do you disregard that?" – *Buster Attebery*
- "The mentors will be able to teach with confidence and then hopefully we can get funding to restructure our lifestyle. It might not be really directed to salmon, but I think getting our programmatic approach together on our cultural lifestyle. We have a youth council [Karuk Youth Leadership] I think we're working with as well. And I think it's the youth that we're missing, we've been missing all along. The patriarchal society is leaving the youth out, leaving women out. Those are our most fierce leaders. And I think that's where a lot of this is going. I see a big, tremendous growth in women and in youth. So I think that is my theory about everything we're doing [with] dam removal. We can all benefit, no matter what part of management you are with the Karuk Tribe. And we kind of like, look in and [ask] how can we go to the center? What's in the center is our lifestyle? Education goes into our lifestyle. Health and wellness go into our lifestyle. Economics goes right into our lifestyle. So we can kind of get more of our managers, more of our leadership, thinking about how can we center our lifestyle into our wellness and happiness. I think then that's when we're connected to everything we do in life, right?" – *Ron Reed*

Participants also noted the importance of including cultural practitioners and Indigenous knowledge from the community level in restoration efforts, and how this expertise is often overlooked. The reference state of the ecosystem is well understood by these practitioners, as well as the necessary human inputs for the landscape to thrive. Yet, basketweavers reflected upon the common dismissal of their knowledge by agency and university professionals visiting the river: "We're not no scientists, we're basketweavers. We know where the river is," remarked Verna Reece archly. "We know what the plant looks like. We know how to gather it," Deanna Marshall responded. Basketweavers discussed the current restoration efforts in light of historic practices:

- "Well my hopes are that the dams come out and fish come back, which is the main focus of the whole thing. But if you're talking about restoration and everything, it would be good to, I don't know, have somebody to look at where it is, what kinds of plants can be put back on the ground. That would be beneficial to basketweavers, for one. And then just, native plants, remove all invasives." – *Renee Stauffer*
- "[If] they put willows in the river too much, [it will be] overplanted… What we got now is too much… That's why you got so many bugs [making willow unusable]." – *Verna Reece*

Further comments emphasized the importance of building Tribal restoration programs rooted in cultural practices despite challenges in doing so. One research participant noted the lack of cultural resource management support with dominant funding programs: "all the things we're talking about is grant driven, it's not like, you know, this is for your fish, this is for your deer, you know… but we're getting there on our own." Tribal community members further discussed the problem of dominant economic models that do not always recognize the value of cultural practitioners or Karuk TEK, and again raised the issue of providing a meaningful wage for those doing eco-cultural revitalization work on the ground:

- "I worked for the Tribe over 20 years, I think every year basically we had to look for money for my position, you know. So that was a lot of stress in itself, and it's because why? Because I was trying to do cultural resource management work that doesn't have a place in the modern economic model. So, with that being said, how do you kind of come in and get the economic benefits or the impacts to basketweavers, to our fishermen, to all these different things, all the different components of resource management?" – *Ron Reed*
- "There's one word that sums it up too, and I think it's called abundance. Whereas if you have an abundant vault, abundant wallet, then you might not have an abundant supply of natural resources because they have to come from somewhere. And I think worldwide you're looking at billionaires that are stashing natural resources like I said in vaults, as opposed to having them swim up the river or be left where they can do some good and replenish and move towards abundance of natural food." – *Bob Attebery*

5.4.6 *Dam removal contributions to reparations and economic justice*

Focus group participants further discussed the importance of distributing economic benefits from dam removal and river restoration projects to Tribal community members as an environmental justice intervention. Several individuals associated dam removal with historical injustices, given the disproportionate negative effects of dams on Karuk livelihoods, cultural practices, traditional foods, basketry fibers, and more. From a Tribal perspective, dam removal is seen as an opportunity for repairing such injustices. Considering governments and industries that have benefited from the dams, Tribal community members discussed how dam removal and river restoration projects could contribute towards reparations for the disruption of traditional lifeways and livelihoods by dams:

- "How do we get that economic model to address the transfer of wealth? When contact happened, the transfer of wealth, dams, all the different mining, all the different logging, all those different things… My biggest fear is that the dams come out and the Karuk people don't benefit, our lifestyle doesn't benefit, we don't get jobs, we don't do all these different things that all the other communities are benefiting from." – *Ron Reed*

Stepping back even further in history, some focus group participants spoke to structural barriers to Tribal land ownership that are the root cause of Tribal housing challenges. This refers to US government decisions claiming the majority of Karuk Aboriginal Territory as federal forestland in 1905 (Klamath

National Forest) and 1947 (Six Rivers National Forest). Land claims were made despite commitments from federal Indian agents to create reservation areas for Karuk people through unrecognized treaties. As Craig Tucker explained:

- "It's harder for Karuk [Tribe] to recruit somebody than it might be for, say Yurok [Tribe] or Klamath [Tribes], just because, like, where you gonna live in Orleans?... I think the fact that Karuk territory is 99% Forest Service is part of the problem. You know it really holds Karuk [Tribe] back for developing opportunities." – *Craig Tucker, Natural Resources Policy Consultant*

Focus group discussions centered on the idea of increasing resources and support for eco-cultural revitalization and specific initiatives that can contribute towards the reclamation of Karuk lifeways. In discussions around reparations, Tribal community members conveyed the importance of supporting community members that have the least access to cultural resource revitalization efforts. Focus groups also noted a specific challenge with structural racism in the Yreka Council District as an area with greater housing infrastructure compared to some downriver areas, but also as a region that can be hostile to Native people. This indicates that the reparations work that is needed extends beyond the redistribution of financial resources:

- "Yreka has, not necessarily, maybe, the resources we're going to get that can directly fix the salmon… But maybe we need some mitigation money there that kind of says, 'Hey, we need to start paying attention to lifestyles. Something that the dam, when they put it in, destroyed – our lifestyle. Here, we have to restore that lifestyle.' Salmon can do a little bit of it, fire can do a little bit of it, education can be doing a little bit of it. So I think we're on the right path here." – *Ron Reed*
- "I do think there's a lot of business opportunities for Karuk in Yreka, but you do have to navigate profoundly racist politicians and the regulators and courts in Yreka. I'll just be blunt. That's a big impediment, and a lot of Native folks don't want to live in Yreka because of it." – *Craig Tucker*

Importantly, participants spoke to the history of initial dam removal negotiations, and the apparent abandonment of early efforts to provide economic benefits to Tribal communities through dam removal. Interviews discussed additional challenges to addressing local economic development needs occurring with dam removal. Yet it appears that initial efforts to fund local restoration jobs through dam removal seem to have gotten lost along the way. Poppy Ferris-George recalled:

- "It's always been my goal to have tribal people working on the project. One of my concerns was how would I make sure that a majority of that money got back into the pockets of tribal people at the end of this project, because I felt like we were the ones who suffered the most… At least throughout this project some of the funds can go back to employing some of the people who have been economically disadvantaged, with limited work sources and opportunity being so remote." – *Poppy Ferris-George*

5.4.7 *Opportunities for moving forward on reparations and racial repair*

Focus group discussions raised a range of ideas on how dam removal processes can contribute to Tribal community well-being through reparations. Given legacies of colonial history and land tenure structures that have prevented Tribal community members from living in much of Karuk Aboriginal Territory, a focus group member raised the issue of providing land back to Tribal communities:

- "I'd like to have my children come back to, you know, I'd like them to have a place to come home

to, because like right now they don't… I have one [that] has a master's [degree]. He says, basically, he needs a place. He needs a community, or he needs a place to live. So I think that has got to be one of the highest priorities of making a livable wage and a place to live. And I think just the way it's set up here on the river, the land ownership, the federal government ownership, that allows for that to really play out. Maybe it is a land back thing for the Tribe to be able to get some of these infrastructural things that are necessary to promote a healthy community." – *Ron Reed*

Focus groups and interviewees discussed the opportunity for leveraging dam removal to realize economic opportunities across the Klamath watershed – both for Tribal and non-Tribal communities – as an intervention supporting racial repair. Some envisioned this intervention through benefits accessed by the Karuk Tribe, as a federally recognized tribe, that would spill over into non-Tribal communities. Others emphasized the importance of leveraging river protection and restoration to help create a common platform for coexistence.

- "I'm not trying to take away your jobs and your livelihood, but at the same time we can live together if we all protect the water and work with each other." – *Troy Hockaday*
- "We begin by talking about salmon restoration. And so we take dam removal from being the goal to being a strategy… Instead of just calling it a dam removal project, it's a salmon restoration project that creates jobs for the community." – *Craig Tucker*
- "That was the epiphany in my mind, is that they're not gonna talk to you about… until you come in and make 'em feel comfortable. They build – you build – that trust. Just like anybody here on the river. In order to go talk to your people or my people you gotta have some amount of trust there." – *Ron Reed*

5.5 Self-governance (Domain 5)

5.5.1 *Tribal community involvement and representation*

Regarding the fifth domain of Tribal community well-being, self-governance, we found that 8% of survey respondents had participated in planning, consultation, or decision-making related to dam removal (e.g., public comment, protest, workshop) (N = 237). Of those who participated, 85% felt their work had an impact on dam removal outcomes (N = 20). As a marker of external recognition of Tribal leadership in dam removal, 59% of respondents reported that information they received about dam removal referred to tribes in the Klamath Basin (N = 233) (Figure 5.5.1-1). Speaking to the future, 69% of respondents felt at least "somewhat confident" that Karuk people would have a voice in dam removal processes moving forward (N = 238). Finally, 71% of respondents reported being interested in participating in opportunities for cultural resource revitalization alongside or after dam removal (N = 235).

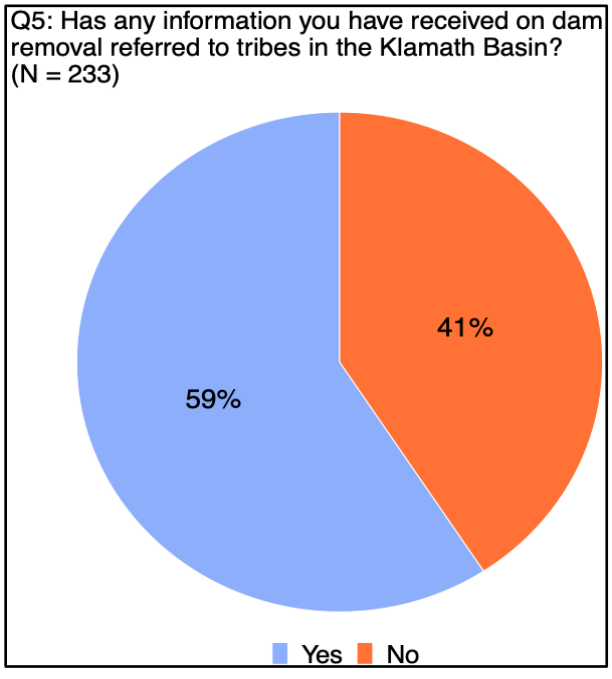

Figure 5.5.1-1: Question 5: "Has any information you have received on the dam removal referred to tribes in the Klamath Basin?" (N = 233)

- **Local and Nonlocal**. While responses about Tribal representation and eco-cultural revitalization were similar for local and nonlocal groups, we observed different levels of participation in the process with 14% of local and 3% of nonlocal respondents participating. (Local N = 107, Nonlocal N = 117)
- **Council Districts**. Expectations around future Tribal representation in dam removal-related processes differed by Council District, with 58% in Yreka reporting positive expectations for Tribal engagement, 81% in Happy Camp, and 69% in Orleans. Community interest in eco-cultural revitalization also differed by District, with 68% in Yreka, 57% in Happy Camp, and 91% in Orleans. Happy Camp respondents had the highest rate of participation in dam removal processes of any demographic at 24%. (Yreka N = 31, Happy Camp N = 21, Orleans N = 23 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)
- **Gender.** Men and women respondents expressed similar expectations around future Tribal representation, but women respondents were 6% more likely to indicate interest in eco-cultural revitalization. Gender expansive respondents expressed low expectations of Tribal representation and high interest around participating in eco-cultural revitalization. (Women N = 117, Men N = 113, Gender Expansive N = 7 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)
- **Age.** No trends were present for expectations about Tribal representation or interest around participating in eco-cultural revitalization. However, no respondent older than 65 reported participating in dam removal planning and advocacy. (65 or older N = 62)
- **Household Income**. Respondents with a household income of less than $40,000/year were optimistic about future Tribal representation. Level of interest in eco-cultural revitalization was similar among income groups, except for a small increase in the lowest income group and a small decrease in the highest income group. All income levels in the survey were represented in dam removal processes. (Under $19,999 N = 39, Between $20,000 - $39,999 N = 37, Between $40,000 - $59,999 N = 40, Between $60,000 - $79,999 N = 35, Above $80,000 N = 72 with slight variation in N between questions; see Appendix A, Table 2.2.4-1)
- **Education**. Respondents with 12 years education or less were more optimistic about Tribal representation and less interested in participating in eco-cultural revitalization. The survey demonstrated that all education levels were represented in dam removal planning and advocacy processes. (12 years or less N = 50, 13-15 years N = 112, 16 years or more N = 61 with slight variation in N between questions; see Appendix A, Table 2.2.4-1).

Considering the visibility of Tribal leadership in dam removal and the active role of tribes in regional politics, representation of tribes in 59% of informational materials is a significant accomplishment. At the same time, this proportion seems low for a project that was initiated and largely accomplished by Tribal community leaders. Focus group participants described the ongoing erasure of Tribal leadership by spectators of dam removal and even by their own collaborators. It is not surprising that a greater number of local respondents directly participated in the dam removal process, but given the types of direct involvement referenced in the survey (public comment, workshop, direct action), the additional participation of 3% of nonlocal respondents was remarkable. Interest around participating in eco-cultural revitalization was high in all communities, and especially in Orleans. Happy Camp had high expectations about Tribal representation. The strong engagement with dam removal among women and gender expansive respondents reflected earlier findings. The economic and educational diversity of participants in dam removal processes speaks to the inclusive nature of the Undam the Klamath campaign.

Overall, the high rate of felt efficacy in dam removal expressed by survey participants reflects the space that has been carved out by tribes in the dam removal process and the strong influence of Tribal perspectives on this process. Focus groups explained that active involvement of Tribal community members (not just Tribal government leaders) in dam removal was key to the success of the campaign. Youth focus groups demonstrated that youth are also involved in dam removal, including through the Salmon Run. Community members showed great interest in participating in eco-cultural revitalization opportunities that arise through dam removal. For a small remote community facing many other challenges, the investment in dam removal across such a large section of the Karuk Tribal community expressed a serious commitment to river protection and self-determination.

5.5.2 *Reflecting on Tribal leadership in dam removal advocacy and colonial legacies*

Klamath dam removal is characterized by a remarkable trajectory, beginning with negotiations over license renewal over twenty years ago and building to the largest dam removal operation in world history. Karuk leadership in the Undam the Klamath campaign can be understood as asserting Indigenous self-determination. This has been achieved despite enormous political opposition given the overarching tensions around the overallocation of water rights in the Klamath Basin, alongside colonial legacies that have shaped development history in the basin. Viewed through the lens of self-determination, dam removal is a landmark moment in history reaffirming Tribal self-governance authority. Alongside hope for river restoration, dam removal has instilled a sense of self-efficacy, self-value, and unity for numerous participants that counters legacies of Indigenous dispossession and trauma. For Karuk Tribal community members, dam removal is also part of a broader process for healing from colonial legacies and rebuilding Karuk self-governance capacities. In moving forward with dam removal, Karuk Tribal community members spoke to the importance of collective action and unity within the Tribe.

- "Throughout this process of dam removal, I would have liked to see more tribal members in high level positions. I hope the knowledge that young people have gained through the last two decades will entice them to go to college to study in areas that help the ecosystem. Unfortunately, tribes will always have to fight for our rights to sustain our traditional values. We have to continue to be prepared and ready to fight back, just like we are doing now. Although our tribal activist groups are small in numbers, we are strong because we are smart." – *Poppy Ferris-George*
- "We can [now] make our own decisions of what we decide is important or not." – *Toz Soto*
- "We may not gain fully to what it was, but to right a wrong is a start." – *Survey comment*

5.5.3 *Tribal leadership in the campaign: Building self-determination and instilling hope*

Tribal community members reflected on collective pressure from the Tribal community as the essential driver behind the success of the Klamath dam removal campaign, with one survey respondent stating, "If not for [N]ative people and communities the dams would not be coming down." They noted that the origins of the campaign were truly grassroots, organized outside of Tribal government: as Troy Hockaday pointed out, "It started with just Tribal members, not the Tribe." According to focus group members it was precisely the grassroots nature of the campaign that galvanized the high level of community involvement. They discussed the arc of the Undam the Klamath campaign as being primarily defined by Tribal water protectors, supported by key allies. As the campaign progressed, Tribal leaders applied pressure to gain a seat at the table and maintain their leadership position. Pushing back on strong opposition, often in a racially charged setting, Tribal leaders and their allies built the political will required for decision-makers to initially consider dam removal as a viable option – a history that was discussed by focus group participants:

- "I feel like we all had to beat down the door. Nothing was just kind of given to tribal people. It wasn't like some of these people in positions of power were really excited to have Ron, or myself, or Troy show up… We kind of shoved and elbowed our way into dam removal. It did take years of people slamming doors on our faces, and that's why we had to yell outside of buildings. Because we weren't invited inside... But then, once the ball was really rolling, it felt like the folks in positions of American power had to work with us... So, I will say that we've had a fairly significant voice, tribal people, in the dam removal process. But definitely not handed to us. It was more about getting kicked out of places, or having awkward, uncomfortable meetings. Having to do a lot of things that we talked about that we didn't want to do, but saw that it was the only way to go about it. Testifying in front of the State Water Quality Control Board, or going to the capital or a million FERC meetings, or those meetings with irrigators and tribes, and whatnot. That was folks pushing and pushing and pushing and pushing, you know. Being the squeaky wheel which we don't really like to be. That's not like our mode that we'd like to be in… We'd rather just be living. And raising our kids, doing our thing. So, I feel like the Undam the Klamath movement really did a good job at doing that regardless of the frustrations." – *Chook-Chook Hillman*
- We started out, really, as kind of a ragtag, grassroots, street protest kind of thing. And now some of the same people are sitting on the board of the Klamath River Renewal Corporation. And so, you know, people went from doing direct action on the street to like, directing the biggest salmon restoration project in the history of the world … Usually when you do stuff like this, the activists do what they do and then this other group of people comes in and actually runs it, right. And that's really not what's happened here. And I think it's unique to work in Indian country. I don't think it would have worked that way were you not doing this in Indian country and it being a tribally led thing… turns out nobody is gonna fight as hard for these fish in the river as Native people." – *Craig Tucker*

Participants were aware of the decades of persistence and negotiation of power sharing arrangements required for tribes to reach this point in dam removal. Thus, participants were divided on whether Tribal views and needs have been consistently represented through dam removal negotiations, depending on the timing of their engagement. Some recalled early stages in the campaign when many could not even imagine the goal of dam removal and expressed deep pride in this accomplishment for Tribal self-determination in the face of general disinterest. They recalled particular moments of Tribal leaders asserting their leadership with environmental NGOs and working through conflict to build new relationships, based on values of Indigenous self-determination (see Appendix C, Table 5.5.3-1 for quotes noting the strengths of Tribal leadership):

- "What I do want to say… [is a] funny story that underscores just what you're saying. I was out with Ron's brother doing a salmon survey last fall and we ran into some guys who worked for Oregon Department of Fish [and Wildlife], this is probably like 2004-ish. And we've told them yeah, we're gonna get these dams taken out of here, and they all but laughed in our face. Like it was such a preposterous idea. One of those guys I think he's retired now, one of those guys has been in those meetings where ODFW is touting their new reintroduction plan and stuff. And it's like… Now they're part of it... And it's cool to think that something that did at one point seem so preposterous is now really likely." – *Alex Corum*
- "I think environmental groups on the Klamath learned how to take the back seat and to be an ally and not to lead. And I think they'd never done that before. And that certainly wasn't the dynamic when this started back in 2003 or 2004. And I think it scared some environmental groups, like some groups, like the Sierra Club – not around. Or groups like Oregon Wild, Oregon Water Watch, they kind of left because they did not want to… I think that the arrangement was not working for

them. But others, Trout Unlimited, American Rivers, PCFFA [Pacific Coast Federation of Fishermen's Associations], CalTrout, I think they've really learned to be a support and not feel like they have to be in the front." – *Craig Tucker*

- "I'm pretty stoked actually on what's occurring right now. I mean, it's an affirmation of what happens when folks, you know, step aside and leave their egos at the table and let the Indigenous people on the river take the lead on what needs to get done, how it needs to get done." – *Earl Crosby*

Participants reflected on their success coming from the unique strengths of the Karuk community leaders, especially cultural leaders participating in negotiations. Some referred to this process of bringing Karuk Indigenous science into dam removal. Over time, cultural leadership in dam removal processes evolved, in part, into "two-eyed seeing" approaches that combine strengths of Karuk and Western knowledge (http://www.integrativescience.ca/Principles/TwoEyedSeeing/). At the same time, the sense of success was tempered by underlying trepidation around follow-through on earlier commitments to Tribal leadership. Focus groups expressed concern that the progress made for Indigenous self-determination with the Undam the Klamath campaign could be easily reversed by project managers and engineers:

- "Things like this are better led by culture bearers and community leaders first, in our experience. Dam removal was certainly the case, right. It wasn't tribal chairmen, for the most part, that led this. It was grassroots community leaders that got it going and then tribal councils and all jumped on." – *Craig Tucker*
- "All that hard work that they did, and getting people to finally recognize that, you know, the Indigenous knowledge, it's science. It's just like any other science, tried and true. And like I said, it makes me very happy to hear and to see that being implemented. And I hope as we move forward in the restoration phase, that that doesn't get left behind. Not, you know, some engineer from somewhere comes in and says, oh no, this is how you need to do this, you need to do that." – *Earl Crosby*

5.5.4 *Responding to colonial legacies after two decades of dam removal advocacy*

Participants spoke about their frustration with the history of exclusion in Klamath Basin management, where the Tribe has often been treated as an afterthought in decision-making processes or not considered at all. When Tribal testimony has been invited, there has not always been room for Tribal community members to express the depth of the impact they have experienced. This exclusion has resulted in environmental devastation and has taken an emotional toll on Karuk people. Such colonial legacies are carried forward in decision-making structures, as with dam removal. In this case state and federal agencies have held primary decision-making authority, although Tribal representatives now sit on the board of directors for the Klamath River Renewal Corporation. Recognizing ongoing colonial legacies that continue to shape dam removal and river restoration is important in conveying the importance of tribes reasserting their self-governance authority, in part through these initiatives:

- "Yeah, you're two people and you have to be two people at the same time because you also have your Indigenous side that's like, you know what, take the dams out, land back, super angry. And then you also have the face where you have to be, like, yes, I hear your concerns… And you have to come with that monotone." – *Sammi Jo Jerry*
- "Until the river is managed by the same people who had 'management authority' prior to the invasion and occupation it will continue to decline and I need assurances that Tribes will be the

voice for Ishkayish since the Klamath cannot speak in words that are understood by existing management." – *Survey comment*

Given the long history of bureaucratic delays and political opposition to dam removal, some expressed a strong sense of caution around celebrating prematurely, sharing the sentiment that they would believe it when they saw it. Youth focus groups noted that Karuk people have been "fighting for dam removal for a long, long time." At the same time, focus group participants continued to convey a sense of accomplishment and pride in the Karuk Tribe's persistent advocacy leading up to this moment:

- "We've done a little bit of celebrating [recently], where[as] we've never let ourselves do that, and that's been demoralizing – not being able to celebrate victories because we don't trust that it's gonna happen. So, we're still tentative. We want to be excited and happy. I'm not trying to be a Debbie Downer. I know some folks are like I'm not gonna believe until I see. And I understand – we're all there, so I'm looking forward to the plug coming out." – *Chook-Chook Hillman*
- "It's been 25 years since dam removal [started]. That's half of my lifetime. And like I tell everybody, I'm not going to get excited when the trucks start moving in, the day we're going to get excited is when you hear that jack hammer hit the top of that dam and that's when we'll celebrate." – *Troy Hockaday*
- "I put a lot of painstaking effort into dam removal. And to be here right now is really an honor to perseverance, vigilance, and keeping an open mind… And now that things are kind of coming out to where it is possible, all these dreams, the work that was put into this by a lot of different people… A lot of dreams, it seems to be coming to fruition right now." – *Ron Reed*

While many felt hopeful, others remained skeptical of the Tribe playing a meaningful role in decision-making. Some spoke to funding deficiencies that continue to prevent meaningful Tribal participation in decision-making and restoration. Many discussed the history of structural racism against Native people, and ongoing racial tensions between Native and non-Native people that continue to hamper Karuk self-determination**.** In particular, focus group participants expressed disappointment with the years of delay on the project, despite ever-worsening river conditions that have continued to harm Tribal communities. While dam removal reflects an accomplishment of Tribal political organizing, participants noted that Tribal interests were often subordinated to federal bureaucracy and agricultural interests:

- "Without tribal intervention they would continue to plunder the resources of our homelands without regard for the local and global effects. I am impacted by this every day. It hurts my heart that the modern culture continues to disregard thousands of years of tribal science and the voices shouting to be heard. It pains me to know that I have actively participated in this process since 2001 and here in 2023 the dams are still in the river, choking the life from the people and the river." – *Survey comment*
- "The dams should have been out several years prior to when removal actually occurred. But due to the complexity of the regulatory and compliance laws, and fulfilling that for two states, it took much longer than anyone could imagine. That was very hard to swallow by the Tribe, because every year that we delayed, we feel like more fish were dying and our people were getting sicker, the water quality worsened, and drought continued. Those are some of the consequences from dams leading towards extinction of the salmon. There was a possibility of that happening, and that is why we were in a hurry." – *Poppy Ferris-George*

5.5.5 *Barriers to self-determination: Juxtaposing moments of racialized dispossession*

Understanding dam removal through the lens of self-determination emphasizes the initiative as a response to violations of Indigenous rights with hopes for restoration and repair. Participants specifically expressed hope more broadly for transcending structural racism experienced in relations with non-Native people. This sentiment recalls the structural racism that some experienced through the process of negotiating dam removal. For some, the current moment with dam removal is a potential turning point in the larger struggle against racialized oppression, which we consider as an important step towards Tribal self-determination:

- "Forced assimilation and intergenerational trauma and historical trauma, all these different things plague us as a people ... They have created an unlivable situation for Indigenous communities. But we know we are inspired to change that, and I think this is a great opportunity to do that." – *Ron Reed*
- "And so, I don't know. I just, I really wish that there wasn't so much racism in Siskiyou County and for us to have such an impact within Siskiyou County, I really hope the tables turn and they see us as people and not as, you know, not demeaning anymore." – *Sammi Jo Jerry*
- "My hope is that people will stop the prejudice and start to work together for everybody as humans to survive for nature to survive, for the medicine, for the whole area to work together for animals, our culture, for all of it, because we all have to work together for our grandkids for the future." – *Vivian Jordan*

Participants in Yreka particularly emphasized that persistent racism against Native people surrounds and is exacerbated by the topic of dam removal in their area. Despite these conditions, it is important to note that the Yreka focus groups were strongly supportive of dam removal and, indeed, the highest level of focus group participation was observed there, both for adults and youth. These participants reported that their ability to advocate for dam removal, or even to passively support the project, was affected by fear of retaliation against their persons as Native Americans. While these dynamics are not unique to Yreka, they are certainly concentrated and were widely reported in Yreka focus groups. In terms of community well-being, the precautionary measures required by Karuk people facing hostility towards Native people in their daily lives clearly takes an emotional toll and inhibits Tribal community formation (see Appendix C, Table 5.5.4-1 for quotes describing racial dynamics of the political environment in Siskiyou County):

- "I work for the Tribe. I'm a tribal member. [I have] mixed feelings about the dam just because I feel like I've been on the side of being in the Yreka community and being, what's that word, ostracized. Because my brother had a business, and the farmers said the Tribe is going to go with dam removal. They were taking all business from my brother at that time and so before it got bad, he had to close his business. So that's kind of frustrating. And when I talked to Sibyl, I kind of told her those are kind of the things that happen in the Yreka area, and not all Natives feel comfortable talking about it or being at a meeting because of what can happen on that outside world." – *Florrine Super*
- "There's a very kind of stuck miner mentality that has been in this part of California and it just has not left–where it's "ours," it's our property, kick off of it. Very protective, no trespassing, just the way that the land has evolved into this day. I feel like those tensions are so present, that it's really present in Yreka especially. You see it in our schools, you see it not as much downriver, but it's a real big problem and I think it's going to be exacerbated for sure. And I worry about our youth." – *Scott Aseltine*

Despite the historical violence inflicted upon the Tribal community and the environment, which was broadly discussed in focus groups, some participants expressed a desire for coexistence. These individuals felt they were seeing a change in attitudes, in part through interactions across highly disparate groups through dam removal. Interestingly, these shifts are occurring alongside the renegotiation of water rights in the Klamath Basin. Alliance-building through dam removal negotiations has forged new partnerships and produced impressive political results. Over time, cross-cultural interactions around dam removal have led to greater willingness among Tribal leaders, non-Native river users, and farmers to look for common ground. These sentiments demonstrate how well-being of all community members, not just Karuk people, is a priority for the Tribe, and that abundance for many is possible for many if relationships with and responsibilities to the environment are maintained:

- "[Dam removal] can promote the river culture and enhance the communication between citizens." – *Survey comment*
- "I tell the farmers I do need alfalfa; I do need potatoes; I do need garlic to garlic my fish." – *Troy Hockaday*
- "The Klamath is a very big diverse river. There's a lot to do, and I think there's room for everyone**,** you know. I think that we're gonna do what's right." – *Toz Soto*

5.5.6 *Moving forward with the community through collective action*

Focus group participants further discussed Karuk self-determination in the context of current efforts to reestablish and maintain community connections. Karuk people are looking to the river as a central gathering place that can bring disparate parts of the Karuk community together. This is important because some expressed a sense of disconnection from the community in the current moment, and conveyed their concern that community members are getting left behind — especially given emphasis on the technical, legal, and scientific analysis required for dam removal. Others felt more positive. These findings reflect a shared understanding around the importance of unity amount Karuk people as a key element of Tribal success in dam removal and in future Karuk self-determination initiatives:

- "We have technical support, then we have technical folks and staff. But then, what's the community? Let's not make the same mistake we have, and all the other things we've done throughout our lifetime and previous to our lifetime, [which] is leaving that Indigenous community behind." – *Ron Reed*
- "Everything's interconnected, I think about it as a basket weaver, you know, of the interconnection of our, you know, baskets to water to fire, the fire that we made to the a variety of different land management techniques, you know, plus, it's connected to, you know, thinking about language and history and childbearing and food and everything else, you can't separate them all. Because it is connected. It's, you know, the, it's wonderful that there are people who are experts in particular areas, but we all have to sort of work together." – *Carolyn Smith*

Some expressed how dam removal has worked to facilitate social well-being and unity for the Karuk Tribe. One participant stated, "So it's all about mental health here and how we do [things] with our families on an everyday basis. And if we can unify and we can hear each other's problems now…," and also, "We need to be united in whatever we do. The more people involved, the less work it will be. We all break it up, and everybody takes a little piece. And we can do it, I think." The story of dam removal emphasizes Karuk independence and self-determination. It is also a story of Karuk interdependence and building a strong Tribal community (see Appendix C, Table 5.5.5-1 for quotes addressing the importance of inclusivity in Tribal political action):

- "And it doesn't just start from removal of a dam, it starts with us coming together to say this needs to happen. So, the movement of the dam, when it comes down, it's going to bring a lot of people together. That's my hope." – *Sammi Jo Jerry*
- "With the rivers running, my family will be able to live their best lives, contributing to a stronger community in the short term and long term." – *Survey comment*
- "The Karuk people need sustainability, and they are connected to the fish. The old ways are the right ways, and we, the children, are the future generations to bringing healthy tribes and turning into beautifully healthy communities. We do this by not relying on government. We create our own path and own ways to support our families and care for them throughout life." – *Survey comment*

5.5.7 *Indigenous governance systems: Connecting to Karuk traditions and ceremony*

Focus group participants discussed Indigenous governance systems as they relate to dam removal. In an Indigenous paradigm, the environment is composed of human and nonhuman relations, and "natural resource stewardship" is understood as the maintenance of reciprocal relationships between them. Thus, Indigenous "self-governance" includes nurturing these relationships through family-based management and ceremony. Some participants stressed the importance of returning to more traditional self-governance. Participants described how Indigenous governance is mindful of future generations and interspecies relations that extend beyond the time scales envisioned by Western knowledge systems, an approach that differs from top-down governance and extractive capitalist economies (see Appendix C, Table 5.5.7-1 for quotes describing principles of Karuk traditional governance):

- "We need to educate the outside world on the Indigenous people's way of relating to Mother Nature, why they have such a great relationship with [her], why they feel they're related to the trees and the forests and the water and the mountains. And it's because they took care of them. Sure, they used the materials for shelter, they used the fish for food, but they also gave back more than they took. And the white man's way was economy first. Again, when they came in to do the logging, they were after the money trees, and they didn't pay attention to the destruction that was happening—clear cutting methods, destroying the creeks and streams." – *Buster Attebery*
- "This state continues to be run by the next 'gold rush' and the health of our environment will always be secondary to MONEY. Until the river is managed by the same people who had 'management authority' prior to the invasion and occupation it will continue to decline and I need assurances that Tribes will be the voice for Ishkêesh since the Klamath cannot speak in words that are understood by existing management." – *Survey comment*
- "I think that's what Indigenous restoration is all about. It's not about an economic platform. It's about knowing the pull to the community. The community needs. And addressing them by way of the community. That standard has been disconnected since contact, and we have a great opportunity right now to re-establish those standards. And the ideologies in these ceremonial families is so important because it connects right down to everything we've learned and everything we need to teach. And it naturally addresses the geographic range physically and psychologically, because our ceremonies are designed to take care of the landscape by way of family place-based management." – *Ron Reed*

Focus groups discussed how the future of dam removal has potential to make lasting positive changes to ceremonial life, in part by improving the health of salmon runs and water quality. Improved environmental conditions can contribute to revitalization of Karuk ceremonial practices governing interactions between the land and the people. Viewing Tribal community well-being in this way demonstrates the deeper

transformative potential of dam removal for Karuk self-governance and self-fulfillment capacities, as participants expressed:

- “I felt so awesome because, like Ron said, it was the first time in 15 years that brought people together. We've seen family and friends that I haven't seen in 10, 15 years. Wow. And it was neat because the fish brought us together. They heard fish were running and they said, all right, we're coming home. And they came home for a couple, two, three days. It was the first time in a long time that we didn't have to have salmon brought up from the Yurok Tribe to help us have our ceremonies. It was nice to see salmon caught at our fisheries and own smoker up there where they had the ceremonies. It was one of the best feelings this year just to be there. And that's what it's all about. And like, Ron hit it on the nail. It was salmon… I think by bringing the fish back and bringing back fire on the land… it’s going to bring everybody back together. It’s going to bring the ceremonies back stronger. It’s going to bring our people back stronger.” – *Troy Hockaday*
- “I think the Tribal government and our Tribal community, we need to kind of restructure our cultural well-being, our cultural lifestyles, and we can kind of come back and make sure… like, Yreka, yesterday, they're saying before we can get the dam removal impacts, we got to have dance, we got to have ceremony, we got to have salmon out here. We got to kind of be able to kind of act like Karuks again.” – *Ron Reed*

6 KEY FINDINGS, RECOMMENDATIONS, AND CONCLUSIONS

Figure 6-1: Sunset over the Klamath River in Orleans, CA (Photo: Sibyl Diver)

Conducted after twenty years of tribal advocacy and during the six months before dam infrastructure removal, this assessment engages with dam removal as a catalyst for collective action in the Karuk community and beyond. The Karuk Tribe has advocated for Klamath dam removal on multiple fronts: by exerting grassroots pressure on federal and state decision-makers; influencing legal, regulatory, and policy arenas; publishing Indigenous-led research and monitoring on the social and ecological impacts of dams; and capturing the public imagination through media and public protest.

While Klamath dam removal is currently viewed by many as an obvious pathway, Tribal leaders can be credited with generating the political will to remove these four Klamath dams in the first place, which was a significant challenge. The success of dam removal for Karuk people has contributed to a sense of identity, community, and self-determination – alongside the struggle. Overall, research participants felt that dam removal has been a positive driver for Tribal governance capacity and self-determination. At the same time, some Tribal leaders in focus groups recalled significant challenges in early dam removal advocacy where Tribal testimony was disregarded, which connects the dam removal experience with the tribe's broader experience with racialized oppression.

By partnering with the Karuk Tribe, this assessment applies community-engaged research methods to better understand Karuk self-determination and eco-cultural revitalization in the dam removal context. By including Tribal partners from the inception of this project, we have analyzed and documented Klamath dam removal as a vehicle for advancing Karuk eco-cultural revitalization and cultural survival, see Diver, Oberholzer Dent, Sarna-Wojcicki, Reed, and Dill-De Sa (2024). The success of the dam removal campaign

reflects the continued commitment of the Karuk community to asserting respect for Indigenous knowledge and governance systems. Of course, dam removal is not a cure-all for the many challenges related to river repair and Karuk community well-being, nor is it the only cause the Karuk Tribe has fought for in recent years. Yet, dam removal is a central element among a constellation of mutually reinforcing Karuk self-determination and eco-cultural revitalization initiatives.

Considering the long history of Karuk people being excluded from resource management decisions, this approach offers a positive intervention in assessment methodologies by enabling the meaningful inclusion of Indigenous peoples and knowledge systems. Findings demonstrated that Karuk Tribal interests for dam removal extend far beyond the basic goals of infrastructure removal and salmon recovery. Responding to the disproportionate level of harm that Tribal communities have experienced from Klamath dams, Karuk community leaders have been powerful advocates for dam removal as a form of restoration and repair by advancing justice and equity in natural resource governance, strengthening environmental protections, expanding community connections to place and access to cultural resources, revitalizing ceremony, and supporting Karuk community health and well-being for generations to come. Karuk leadership in dam removal negotiations has also illustrated the spirit of solidarity and independence that the Tribe has built through its Tribal science, policy, and advocacy.

By focusing on Tribal community well-being, our findings invite a distinct orientation for social impact assessment that starts from Indigenous knowledge systems. We also contribute to Tribal assessment science, or assessment that is conducted by and for Indigenous peoples. Including Karuk people, knowledges, values, practices, and expertise recasts dam removal as an eco-cultural revitalization initiative. This reorientation conveys the deeply held reciprocal relationships between Karuk people and the Klamath River watershed, which are at the heart of Karuk identities and eco-cultural revitalization strategies. This approach also illuminates the importance of including Karuk people and their knowledge in environmental governance decision-making, thereby supporting Karuk self-determination. Viewed through a Karuk Tribal community lens, dam removal can be more fully understood as a transformational moment for improving river health and re-enabling Karuk cultural practices. A key part of such transformation includes facilitating intergenerational knowledge transfer through healthy relationships held among community members and with the river.

Primary study contributions include:

- Implementing a social impact assessment of Klamath dam removal based on Tribal community well-being that is co-designed and implemented with the Karuk Tribal community, and that accounts for a diversity of Karuk experiences and knowledges
- Gaining a deeper understanding of Karuk Tribal perspectives on dam removal and river restoration by recasting dam removal as an eco-cultural revitalization process that reflects the longstanding and reciprocal relations held between the Karuk Tribal community and the Klamath River
- Providing a forum for Tribal members and descendants to express their hopes and priorities for dam removal impacts, as well as their recommendations for harnessing the momentum of dam removal to further Karuk eco-cultural revitalization and community well-being
- Evaluating baseline conditions of Karuk cultural use in the Klamath river corridor that are predicted to change with dam removal in the months prior to demolition, thereby providing a reference point for evaluating dam removal benefits for eco-cultural revitalization

- Documenting the importance of dam removal for Karuk cultural survival, in part through identifying Tribal priorities for youth learning opportunities and engagement in river restoration
- Considering how dam removal may be shifting Native and non-Native relations and possibilities for reparations and racial repair in the Klamath Basin, especially in regions that have historically expressed hostility towards Tribal assertions of self-determination

Key findings, discussed below, emphasize 1) the importance of including Indigenous peoples and their knowledge systems in assessment, 2) the importance of dam removal to Karuk cultural survival and inspiring hope, and 3) advancing Karuk self-determination, restoration, and repair. These are followed by recommendations, and next steps for this research.

6.1 Key findings:

6.1.1 *Including Indigenous peoples and knowledge systems in assessment*

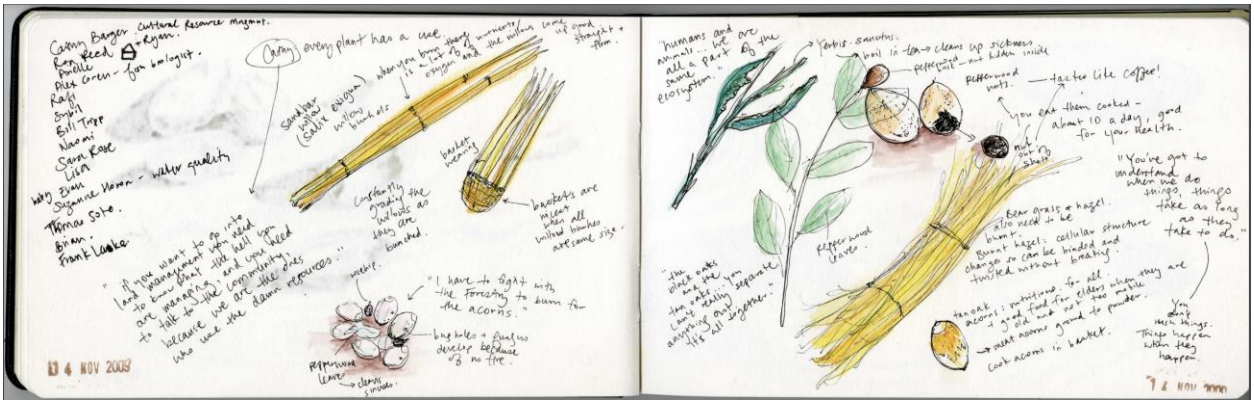

Figure 6.1.1-1: Sketch by student Lichia Liu from cultural resources training held by Frank Lake for Karuk Tribe UC Berkeley Collaborative in preparation for the Karuk Lands Management Historical Timeline workshop (Photo: Sibyl Diver)

In using performance indicators centered on Tribal community well-being, this approach evaluates Klamath dam removal using terms defined in collaboration with Karuk people. This approach deepens our understanding of Karuk experiences and priorities for dam removal and improves the relevancy of this research for Tribal partners. In addition, Tribal methodologies were incorporated in every part of the research, from scoping to review.

We applied mixed methods in order to be as inclusive of the Karuk Tribal community as possible. This entailed reaching out to every single member and descendant through the survey as well as intentionally planned focus groups to capture specific perspectives. In this way, we engaged different parts of the local community most impacted by dams as well as the broader Karuk community, including those who live far away. Collecting demographic data in the survey allowed us to explore relationships held by specific groups to dam removal, including gender expansive people who are often neglected by assessments.

The relevancy of the research to the Karuk community was also improved by speaking to Karuk youth. Youth engagement was extremely important, given the central role of Karuk youth in their community and the central priority of reconnecting youth with the river and their cultural heritage. Numerous research participants shared their interest in leveraging dam removal to facilitate intergenerational knowledge transmission, a key component of Karuk cultural survival strategies.

We hope that this collaborative research helps to increase broader public understanding of what successful dam removal looks like for the Karuk Tribal community. For example, this baseline assessment is intended to spark conversations about how the dam removal and restoration process can productively engage with the Karuk community goals for the project. Given the disproportionately negative impacts of dams on Karuk people and the important leadership role of Karuk people in dam removal advocacy, this research also provides a reference point for future studies post-dam removal evaluating how well the social, economic, and ecological benefits of dam removal are distributed to the Karuk Tribal community.

6.1.2 *Importance of dam removal to Karuk cultural survival and inspiring hope*

Figure 6.1.2-1: Baby rattle (top) and basket (left) by Carolyn Smith, made with willow shoots (right) (Photos: Carolyn Smith)

By surveying a wide spectrum of Karuk community members, this study documents the Karuk Tribe's ongoing interest in and support for dam removal and river restoration. While acknowledging the diversity of Karuk Tribal community perspectives and knowledge, the majority of Karuk respondents supported dam removal. Overarching support among the Karuk community for dam removal was observed across all demographic categories, regardless of age, gender, household income, education, geographic location, or political environment.

We observed deep interest in Klamath River health for local and non-local community members alike, illustrating the ongoing relevance of the Klamath River for Karuk people, including those living in diaspora. Many see the health of the Karuk Tribal community as being bound up with the health of the river and look to dam removal as a catalyst for revitalizing mutually beneficial relationships between Karuk people and the Klamath River – for generations to come. What is at stake with dam removal is the Karuk Tribe's vision, goals and strategies for eco-cultural revitalization, as well as the possibility of reconnecting Karuk youth to their heritage to facilitate cultural continuity.

Building on previous research (e.g., Salter, 2003; Norgaard, 2005; Sowerwine et al., 2019), this assessment documents the current state of cultural resource access in the community, which can be predicted to shift with dam removal. At this transition moment before infrastructure removal has been completed, we found that cultural use occurs across all reaches of the river in all seasons, and that community members who live away from the river are also engaged in cultural resource use. At the same time, Tribal community members continue to experience significant barriers to cultural resource use that vary according to location and other factors. In addition, this work documents the strong interest of Karuk people in participating in eco-cultural restoration initiatives related to dam removal

Our assessment also captures the immense hope associated with dam removal that is held in the Karuk Tribal community at this time. Dam removal is viewed as an important intervention that can help community members increase family connections to one another and to the river – particularly as a catalyst for reconnecting Karuk youth with the river and with their own heritage. In speaking to Karuk dam removal advocates who have worked towards dam removal through multiple sets of agreements, we heard that community leaders had never truly been able to celebrate the work – until this moment. This demonstrates the positive psychological impact of dam removal for the Karuk Tribe that was occurring even before ground was broken for the demolition project.

This sense of hope revolves around the possibility for restoring the environment and Karuk people practicing their culture. Although many struggles remain ahead for the Karuk Tribe, the sense of accomplishment from dam removal helps provide the Karuk community with energy to face them. While dam removal is not a cure-all, it enables Karuk community members to realize some of the ceremonial commitments embedded within Karuk Tribe's World Renewal philosophy of stewardship responsibility towards the nonhuman communities that Karuk people have long lived in relation with.

6.1.3 *Advancing Karuk self-determination, restoration, and repair*

Figure 6.1.3-1: Iron Gate reservoir after drawdown (Photo: John R. Oberholzer Dent)

What is clear from our assessment is that most Karuk Tribal community members have high expectations for dam removal bringing positive benefits to community members. This includes hopes for improved social well-being in the community. Alongside an overarching sense of hope, our findings also identified community concerns about whether opportunities being presented for restoration and repair can be realized in practice: will Tribal community members truly be able to access the benefits from dam removal?

Despite the central role the Karuk Tribal community has played in dam removal, about half of survey respondents reported that they had not received any information about dam removal in the year leading up to the project launch. For a project that has depended so strongly on leadership from the Karuk Tribe and their allies, it was surprising to see the low level of information about dam removal within the Karuk community in the six-month period leading up to the project start date.

Similarly, only 10% of survey respondents had received information about jobs or other benefits leading up to the project launch. This was also surprising given that early settlement agreements envisioned dam removal as means for building a local restoration economy, in partnership with local tribes and non-tribal rural communities. Findings suggested a mismatch between the level of community interest prior to project launch and the number of opportunities made available for Karuk Tribal community members to learn about and participate in dam removal restoration initiatives during the study period.

A number of community members also viewed dam removal as a pivotal opportunity for racial repair between Indigenous and non-Indigenous peoples in the Klamath watershed – where dam removal offered a potential pathway towards overcoming a deep history of hostility towards Native peoples in the region. Yet participants also recognized ongoing challenges of water conflict, including ongoing water diversions for agriculture in the Scott, Shasta, and Upper Klamath basins that are unchanged by dam removal. The overallocation of water resources in the Klamath is understood as an ongoing contributor to racialized conflict in the region.

Contributions from dam removal to Karuk Tribal community well-being will likely depend on how well community members are brought into restoration efforts. In other words, possibilities for restoration and repair are contingent upon the ongoing participation of Tribal leaders in restoration initiatives and related investments. Findings suggest that successful Tribal engagement also depends on engaging Tribal leaders and communications systems to convey dam removal and river restoration information to community members across Tribal Council Districts. This highlights the importance of Karuk involvement in dam removal restoration planning moving forward.

6.2 Community recommendations

Through the survey and focus groups, Karuk DNR staff, Tribal Council, cultural practitioners, basketweavers, educators, and youth leaders provided insights on goals and strategies for dam removal that were important for Tribal community well-being. A number of specific community recommendations were made for: 1) increasing youth engagement, community education, and information access; 2) strengthening connections among Tribal programs and enhancing community engagement across all Tribal Districts; 3) supporting culturally relevant jobs alongside community infrastructure and inclusive workforce development; and 4) revisiting commitments to land back, reparations and repair that support Indigenous self-determination, as discussed below.

6.2.1 *Increasing youth engagement, community education, and information access*

First, Tribal community members suggested multiple opportunities for increasing youth engagement in eco-cultural revitalization through dam removal (see Appendix C, Table 6.2.1-1 for community recommendations for youth engagement and community education). It is important to note that youth programs are already occurring and that community sentiments reflected a desire for additional culturally relevant youth programming, and perhaps more visibility for existing programs. Many participants were excited about the potential for increased Karuk youth engagement in Klamath river restoration, additional opportunities for youth to learn about cultural practices tied to a healthy river, and more youth internships and culturally relevant job opportunities. Specific suggestions to increase youth engagement in this stage of dam removal included developing additional K-12 curriculum related to dam removal and restoration, organizing field trips and class projects, creating summer internships, and supporting youth research and monitoring with elders.

In developing greater capacity for Tribal youth engagement, participants noted the potential for the Karuk Youth Leadership program, Summer Youth Gathering, and other Tribal Education initiatives to connect youth across all three service areas to learning or internship opportunities related to dam removal, potentially working alongside Karuk DNR and the Pikyav Institute. Community members especially noted the challenges experienced by youth living upriver in Yreka. Another common recommendation was to leverage dam removal to provide additional opportunities that facilitate intergenerational knowledge

transfer, both through Tribal programs such as Karuk DNR, the Education Department, or TANF, as well as through school-based curricula and programs.

6.2.2 *Strengthening relationships among Tribal programs and enhancing community connections across all Tribal Districts*

Second, participant recommendations suggested the importance of building greater collaboration across Tribal programs, as well as expanding engagement in politically conservative areas (see Appendix C, Table 6.2.2-1 for community recommendations for holistic and inclusive community connections; see Appendix C, Table 6.2.2-2 for community recommendations for expanding community engagement in Yreka). A number of Tribal community members emphasized the importance of overcoming structural barriers to cross-program coordination. One such barrier is that Tribal natural resource programs are almost entirely grant funded, a condition that makes cross-department collaboration for planning and implementing longer term restoration initiatives difficult. Tribal programs need additional discretionary funding to support coordination across interconnected river restoration projects over the long term.

Given the vital leadership of the Karuk Tribe in realizing dam removal, there is a mismatch between Tribal contributions to and interest in dam removal and the level of information and opportunities directly available to the Tribal community. Tribal community members expressed strong interest in more educational and workforce opportunities related to dam removal across all Council Districts. Survey findings demonstrated significant educational gaps, where community members had not received information regarding dam removal or related job opportunities in the year leading up to dam removal. In addition, we found that many Tribal community members have received misinformation about the dams and therefore may be less likely to support the removal project than their peers.

An additional idea included creating more regular communication channels between cultural practitioners and Tribal staff to encourage greater information exchange for cultural resource protection. Participants also raised the possibility of leveraging additional Tribal resources to expand cultural resource access for practitioners, e.g. by offering boat trips to sandbars for basketweavers or conducting cultural burns on land accessible to Tribal community members. Responding to the challenges of bringing place-based TEK in scientific and governmental processes, Karuk DNR and other Tribal programs that advance inclusive Indigenous science and two-eyed seeing methods are primed to continue as leaders in their important work.

6.2.3 *Supporting culturally relevant jobs alongside community infrastructure and inclusive workforce development*

Third, survey results demonstrate that interest in jobs related to dam removal is significant, particularly in natural and cultural resources. This moment presents an opportunity for efforts to build a long-term sustainable workforce around eco-cultural revitalization, watershed restoration, and Indigenous stewardship of Karuk lands. Key to these efforts will be the expansion of opportunities for Tribal community members to participate in environmental and cultural monitoring and restoration. Yet, it remains to be seen if these opportunities will be realized.

To further enable the community's ability to take advantage of dam removal opportunities and funding, Karuk Tribal community members recommended additional investment in workforce housing, child care, training, and wage increases. They viewed dam removal and subsequent river restoration initiatives as an important catalyst for developing additional Karuk workforce training and capacity building related to natural and cultural resources. Participants recommended investing in additional youth education

programs that could prepare young people for more specialized Tribal eco-cultural revitalization jobs. Such opportunities for expanded workforce to facilitate Karuk community participation in river restoration could also be supported through closer collaborations between the Karuk Tribe and dam removal project leaders at the Klamath River Renewal Corporation (see Appendix C, Table 6.2.3-1 for recommendations for supporting culturally relevant jobs, infrastructure, and workforce development).

We also heard how Karuk DNR is already addressing these issues. For example, rental housing is being developed for Karuk DNR employees to aid those who need to relocate to accept jobs. Some programs are exploring the possibility of satellite offices in Yreka, thereby expanding monitoring and workforce recruitment in that area. And, Karuk DNR has implemented pay parity policies with federal agencies. Beginning with a single employee in 1989, Karuk DNR has grown to approximately 90 employees in nine programs today. The community continues to look to Karuk DNR as a regional leader in management, research, and workforce development.

6.2.4 *Revisiting commitments to land back, reparations, and repair that support Indigenous self-determination*

Fourth, considering the disproportionate level of harm experienced by the Karuk Tribe from dam related impacts on salmon and other cultural resources that have contributed to the disruption of traditional Karuk lifeways, Karuk community members highlighted responsibilities towards advancing Indigenous environmental justice. This work includes identifying opportunities for restoration and repair, including additional funding sources and policies that support the inclusion of Tribal community members in river restoration. For example, consulting companies working on dam removal and restoration could dedicate a meaningful portion of contracts to Karuk-led projects. These opportunities would be especially relevant for Tribal community members located around Yreka, in closer proximity to the dam removal sites. Land back interventions were also discussed, both for Shasta Indian Nation ancestral lands being uncovered after draining dam reservoirs and downriver areas within Karuk territory (see Appendix C, Table 6.2.4-1 for recommendations for revisiting land back and Indigenous self-determination).

6.3 Research team recommendations

Building on community recommendations provided above, the following recommendations are based on synthesis and reflections from the research team, as a mixed academic, Karuk DNR, and community partnership.

1. Dam removal processes should facilitate education opportunities and intergenerational knowledge transfer related to river health and restoration for youth, especially through collaborations with the Karuk Youth Leadership Council, Karuk Education Department, and Pikyav Institute initiatives related to K-12 dam removal education including curriculum development, field trips, and monitoring pilots. This work needs continual support and funding, including staff positions (Karuk DNR, Education Department, and schools) and intra-departmental coordination.
2. To increase the potential for Tribal community participation in jobs, grants, and contracting opportunities related to dam removal, workforce development and training should facilitate capacity building, support Tribal community housing needs, and increase youth training and education in natural and cultural resources.
3. Karuk people and place-based knowledge, practices and belief systems should inform restoration planning, dam removal jobs, and grant opportunities, as well as research and monitoring, given

the disproportionate impacts of the Klamath dams on Karuk people and their key role in achieving dam removal.

4. Dam removal entities should create additional education opportunities for agency staff, contracting and consulting firms, and others to learn more about Tribal relations, including the history of settler colonialism in the Klamath Basin, and self-determination initiatives responding to colonial legacies.
5. Tribal access to culturally important sites and other significant places along the river corridor and in riparian areas, including important fishing and gathering areas, must be protected and enhanced, in part through financial, institutional, and workforce support for Karuk eco-cultural revitalization along the river corridor.
6. Dam removal and river restoration entities that wish to conduct their work in allyship with the Karuk Tribe should partner more closely with a range of Karuk community programs operating in multiple Tribal Council Districts (Yreka, Happy Camp, Orleans), including: TANF (Tribal Assistance for Needy Families), Katishraam Wellness Center, the Karuk Education Department, Karuk Youth Leadership Council, the Karuk basketweaving community, Karuk Tribal Council, and the Karuk Enrollment Department, and also increase connections to the broader Karuk community.
7. Dam removal entities, policy makers, and funders, as well as those leading research and monitoring initiatives, should consider more holistic goal setting and evaluation criteria including Tribally defined goals for community well-being and include social impacts affecting health, education, livelihoods, Tribal self-governance, and cultural resource access, among other factors.
8. Dam removal entities and state entities should continue to support land back opportunities for Shasta people that arise through the dam removal process in the reservoir reach, and promote land back for the traditional lands of the Karuk Tribe and Native peoples elsewhere.
9. Reflecting on the initial scale of restoration envisioned in the 2010 Klamath Basin Restoration Act (~$750 million, plus adjustment for inflation), state and federal government agencies and legislatures should consider providing more significant levels of economic support for developing a river-based regenerative economy, with specific funds identified to support Tribal community participation in river restoration job and workforce opportunities.

6.4 Conclusion

Building on findings from our baseline social assessment of Klamath dam removal for Tribal community well-being, we understand dam removal as an interconnected biophysical, sociopolitical, and eco-cultural revitalization process that is expected to have a profound effect on the Karuk Tribal community. To this point, dam removal is an opportunity for Tribal community members to fulfill their traditional responsibilities to nonhuman communities like salmon while improving their livelihoods. We recognize the hopeful orientation of our findings, alongside the very real uncertainty around what biophysical changes will occur with dam removal. Given this, we consider some of the improvements in social well-being that might be realized – regardless of how fast or how fully river restoration can occur.

If positive changes from dam removal are in fact realized, we may expect meaningful improvements for the river and community health. This may also include improvements to cultural resource access across space and time and reinforcement of Tribal sovereignty. If benefit sharing can indeed occur, we expect increased job access and education opportunities for the Karuk Tribal community. Researchers aim to repeat this assessment approximately 5 years in the future to evaluate aspects of Tribal community well-being that are expected to change with dam removal.

At a policy and operational level, prioritizing Karuk participation in dam removal and river restoration process is a clear next step – both in decision-making and on-the-ground implementation. As dam removal progresses, the Tribe stands to benefit from increased self-determination over Karuk Aboriginal Territory and opportunities to center Karuk knowledge in land management. Through such acts of self-governance, the Tribe will be better positioned to realize its deep commitment to revitalizing the health of its human and nonhuman communities in the Klamath River.

Identifying policy opportunities for reparations is another important step. As expressed in participant concerns, the possibility of reactionary action against the dam removal project and racialized retaliation against Karuk supporters of dam removal remains a consideration, especially in upriver areas that have historically expressed hostility towards Tribal self-determination. Leveraging dam removal as a means for racial repair, building bridges in rural communities, and bringing greater opportunity for all those disenfranchised in our current political-economic system is another point of discussion. The level of solidarity already achieved in bringing upriver and downriver communities together to find common ground and build agreements together for dam removal is a monumental achievement, and a pathway for creating well-being in the Karuk Tribal community and beyond.

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