Food Security Assessment of Native American Communities in the Klamath Basin

with the Karuk Tribe, Klamath Tribes, Yurok Tribe, and Hoopa Tribe

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THE YUROK TRIBE

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Photo credits on the title page from left to right are: Chris Peters (Yurok Tribe), Grant Gilkison (Karuk Tribe), Ben Saxon (Karuk Tribe), Frank Lake (USFS), Stormy Staats (Klamath-Salmon Media Collaborative), and Perri McDaniel (Klamath Tribes).

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EXECUTIVE SUMMARY

This report summarizes the results of a collaborative community food security assessment conducted by UC Berkeley researchers in partnership with tribal colleagues among the Hoopa, Yurok, Karuk and Klamath Tribes in the Klamath River Basin in 2015-2016. Using a Community Based Participatory Research (CBPR) approach, this report reflects an analysis of the results of 711 surveys, 115 interviews, and 20 focus groups with tribal members. The household survey itself was adapted from the United States Department of Agriculture (USDA) Community Food Security Assessment Toolkit (Cohen 2002) in collaboration with tribal partners to capture a comprehensive snapshot of the food system from a tribal perspective. Most notably, tribal partners prioritized the inclusion of questions related to respondents' preferences, habits, knowledge and barriers experienced in relation to Native foods. Semi-structured interviews and focus groups explored barriers to Native foods and healthy food access and consumption, the experience of food insecurity, the use and opinions of community food resources, land and ecosystem management, and recommendations for improving tribal food security.

KEY FINDINGS

Food insecurity rates among Native American communities in the Klamath River Basin are higher than any other rates in comparable published studies in Native American communities to date, with 91.89% of households suffering from some level of food insecurity and over half experiencing very low food security (reducing size of meals, skipping meals). Similarly, poverty rates among tribal households in the basin (42.74%) are *three times* the national rate for 2015, with about 22% of households in poverty not owning a vehicle.

Diet-related diseases are prevalent among the majority of households with 83.58% of all households reporting at least one person in their household suffering from a diet/lifestyle related health issue including high blood pressure, diabetes, obesity and cavities.

There is a strong demand for Native foods and fresh fruits and vegetables that is not being met with 70% of all households rarely or never having access to desired Native foods, and 60% desiring more fresh fruits and vegetables in food assistance programs. While food secure households have the best access to Native foods, food insecure households eat accessible Native foods more frequently.

Food assistance programs fail to address food insecurity. About 64% of households rely on some form of food assistance (compared with 13% of all households nationally) yet 84% of food assistance users worry about running out or ran out of food in the past year.

Access to Native foods enhances food security. Food security is often directly connected with Native foods security. Twenty-one percent (21%) of food assistance users reported they rely on food assistance because Native foods are not available, and nearly 40% of households rely on fishing, hunting, and home canned foods to minimize food insecurity.

Significant barriers prevent access to desired Native foods including legal restrictions, limited availability, degraded environment and climate change. Respondents cite many different barriers to accessing desired Native foods; rules and permits are the strongest barrier particularly to food insecure households. In addition, lack of availability, environmental degradation, and climate change were cited as "strong" barriers to accessing Native foods.

Transportation-related barriers and high cost of local groceries make grocery shopping and healthy food consumption challenging. Barriers to grocery shopping are prevalent among 62% of households, with many lacking transportation or gas to travel to stores in urban centers where food is more affordable. Over 50% of households find red meat, fresh fruits, fish or seafood, cheese, fresh vegetables, and organic foods too expensive at the grocery store closest to their home.

There is a strong desire to achieve food self-reliance and food sovereignty resilient to natural and market fluctuations. Food insecure households in particular desire food-related knowledge, home and community gardens, and more community food resources to support greater food self-sufficiency.

Networks of food sharing are common and are an important food security strategy. About 66% of households share the food they grow or raise with others, 60% acquire Native foods through family or friends, and 55% share Native foods with others.

Having someone in one's family who hunts, fishes or gathers is important for inter-generational food security. Native food-related knowledge is learned through family with about 92% of respondents acquiring this knowledge from other family members.

TRIBAL RECOMMENDATIONS

Native American study participants shared many suggestions on how to improve access to healthy and Native foods as well as improve overall food security for tribal people, ranging from increasing access to healthy foods in local schools and stores, to securing tribal rights to hunt, fish and gather Native foods and the authority to steward those resources in their ancestral lands. Specific recommendations include:

- **Improve access to and abundance of Native foods through eco-cultural revitalization:** There is a strong desire to increase the ability to hunt, fish, and gather in a responsible and culturally appropriate manner, throughout each tribe's ancestral territory. In addition to removing legal barriers, tribal members seek to revitalize the productivity and abundance of cultural resources, through cultural stewardship practices, including the use of prescribed fire, in order to increase access to and consumption of Native foods. Fire is a critical management tool that tribes throughout California have used to promote deer and elk habitat, manage for productivity and quality of cultural foods, fibers and medicines, and maintain overall forest health.
- **Enhance food system self-reliance and food sovereignty:** There is a strong demand for workshops and 1:1 technical assistance in learning production, processing and storage techniques for homegrown and Native foods to support food access during times of crises and to be self-sufficient. Some suggest that tribal member identification cards should serve as permits for tribal members to hunt, fish and gather in their ancestral territory, where they currently lack legal rights to their Native foods.
- **Increase access to more healthy, affordable foods:** Across the region, people express a desire for more affordable and higher-quality healthy foods in local grocery stores, particularly in remote areas of the basin without fully stocked grocery stores. They also recommend that school lunches be made from healthy, whole foods, integrating Native foods when possible. Food assistance recipients also desire more fresh fruits and vegetables and the integration of Native foods in programs such as tribal commodities or WIC.
- **Strengthen youth development and leadership:** There is a call for the tribal community to take greater responsibility for caring for each other: sharing food and knowledge with others, caring for elders, and supporting youth. There is a strong desire to teach and mentor youth in Native food-related skills and also to teach them respect for and responsibility to protect their culture, cultural resources, and environment.

BACKGROUND

ENHANCING TRIBAL HEALTH AND FOOD SECURITY IN THE KLAMATH RIVER BASIN: A FIVE-YEAR PROJECT

This tribal community food security assessment was conducted as part of a five-year USDA-NIFA-AFRI food security project titled, *Enhancing Tribal Health and Food Security in the Klamath Basin by Building a Sustainable Regional Food System* (grant #2012-68004-20018; PI J. Sowerwine), led by the University of California at Berkeley in partnership with the Yurok, Karuk, and Klamath Tribes, with support from the Mid Klamath Watershed Council, UC Cooperative Extension, and the US Forest Service (Photo 1).

The overarching goal of the project was to create a more sustainable food system in the Klamath River Basin, resulting in healthier communities, ecosystems and economies in Klamath, Karuk and Yurok Tribal territories. Project themes and objectives were identified through community and partner meetings, and food security emerged as a rallying point - central to decolonization, ecosystem management, community health, cultural identity, and youth empowerment. Forty-three research, education, and

PHOTO 1.
The AFRI Tribal Food Security project team at the headwaters of the Klamath River in the upper basin.

Photo credit: Stormy Staats

PHOTO 2.
Highlights from the basin-wide activities and workshops designed to actively enhance food security throughout the basin, including community gardening, crabbing, bread making, orchard revitalization, school gardening, and creating a tribal herbarium.

Photo credits clockwise from upper left: Grant Gilkison, Chris Peters, Ramona Taylor, Bari Talley, Ramona Taylor, Ben Saxon.

outreach objectives were developed, ranging from youth camps, traditional food workshops, training in subsistence food-related skill building, community gardens, revitalization of orchards, and the creation of a regional food security library, tribal herbaria, and tribal K-12 curriculum (Photo 2).

Overall, the outcomes of our collaboration were highly impactful; 76% of participants reported that they had learned something new and 68% had applied new skills at home, while 65% felt the community was more food secure and 81% felt that the project had changed the community in other positive ways (Sowerwine et al. 2018). For more information on the activities, outcomes and impacts of the larger project, including project newsletters and other publications, please visit the Karuk-UC Berkeley Collaborative website at: https://nature.berkeley.edu/karuk-collaborative/.

This report summarizes the approach, results and community recommendations from our tribal community food security assessment that we hope will guide and inform future food and land management programs and policies in the Klamath Basin.

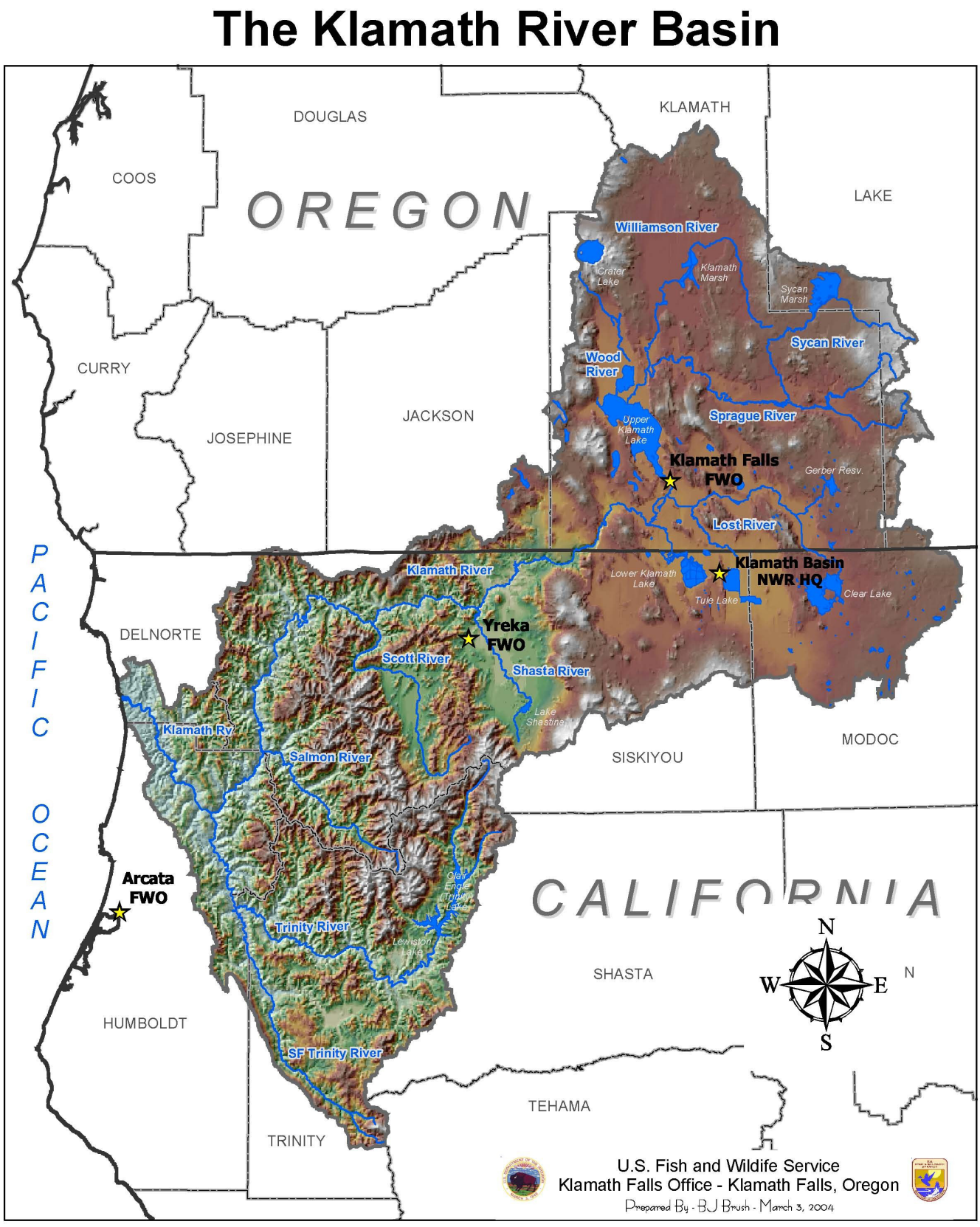

FIGURE 1.
The Klamath River Basin (U.S. Fish and Wildlife Service 2013).

STUDY AREA

The Klamath River Basin comprises 10.5 million acres of land from southern Oregon to northern California and features the 253-mile-long Klamath River (and its tributaries) reaching from the headwaters downstream of Upper Klamath Lake to the outflow into the Pacific Ocean at Requa, California (EPA 2016) (see map in Figure 1). The region is sparsely populated with remote and rural towns; the few urban clusters include Klamath Falls, Oregon and Crescent City, California. Most of the region is characterized as a food desert, as many households live hours from the closest fully stocked grocery store.[1]

This region encompasses highly diverse ecosystems and unique microclimates (DellaSala et al. 1999), ranging from semi-desert and dry alpine in the upper basin to temperate rainforest in the middle and lower portions. While the upper basin receives the least rainfall, it features the most intensive agriculture, with extensive irrigated rangeland developed by the Klamath Project in the early 1900s (Mccool 2018). The middle and lower basin have been predominately managed for timber production and are largely National Forest land. The four Native American tribes included in this study hold significant presence in the basin, with vast ancestral territories, notable tribal communities, sustained practice of Native food traditions and ceremony, and maintenance of ancestral lands. However, legal rights to hunt, fish, and gather vary among the tribes. This is a major deterrent to accessing Native foods, along with a host of environmental barriers aggravated by Federal management of tribal lands, the absence of cultural fire on the landscape, and the presence of dams on the main stem of the Klamath River.

LEGACY OF COLONIALISM

From abundance to food scarcity

The Klamath Basin is one of the most ecologically diverse ecosystems in the western United States (Vance-Borland et al. 1995; Wallace 1983), yet communities that call this area home are among the poorest and most food insecure in the country (Norgaard 2005; Stubblefield et al. 2013; Stubblefield and Stewart 2012; Subramanian 2011). Once replete with an abundance of fresh, nutritious, locally available traditional foods including salmon, deer, elk, acorns, mushrooms and berries (Bell 1991; Davis and Hendryx 1991; Deur 2009; Salter 2003), the Klamath Basin is now considered a food desert (USDA 2017). Tribal elders recall abundant wildlife, and other Native foods and medicinal plants, that were dried, smoked, canned and shared with families up and down the river. Research indicates that at least 150 - 200 native plant species formed the basic diet of different tribes in California, providing between sixty and seventy percent of their primary nourishment (Anderson 2007; Bainbridge 1986; Lake, 2010 pers. comm.). Nine species of native salmonids (salmon and trout) and the endemic Klamath small scale sucker were critical food sources for the tribes in the Klamath Basin.

The genocidal onslaught sanctioned by the Governor of California (Madley, 2016) paved the way for Euro-Americans seeking to extract natural wealth through mining, fishing, timber and agriculture to settle in the Klamath River Basin. Native families were forced from their lands onto reservations with insufficient

[1] The USDA Food Desert Locator has now been renamed the Food Access Research Atlas (USDA 2017a).

resources to sustain their populations. Decades of forced cultural assimilation through boarding schools, compounded by tribal termination for some, resulted in the devastation of whole communities, threatened their knowledge base, and laid the foundation for many of the social, ecological and economic challenges facing Native American communities in the region today.

Dramatic changes to the Klamath Basin and its forests and fisheries, including intense commercial fishing, hydraulic mining, clear-cut logging and fire suppression, six dams, and extensive irrigated agriculture in the Upper Klamath have pushed salmon numbers to near extinction, and altered regional ecosystems, depriving tribal members of access to culturally important traditional foods (Norgaard 2005). Post-World War II expansion of private and government ownership in the watershed has drastically reduced traditional management of forested landscapes for foods (Anderson 2005; Chiu 2008). Years of forced cultural assimilation have further disrupted traditional food systems. At the same time, many once vibrant orchards and home gardens that were once important sources of vegetables and fruits ensuring food self-sufficiency have been all but abandoned. Subsequently, there has been a shift from decentralized community food production to commercially driven centralized food distribution networks.

Existing farms in the Mid-Klamath region export most of their produce to the urban core, while community members, especially elders and the structurally poor, remain hungry. The Klamath Tribes in Oregon have limited capacity to grow fresh fruits and vegetables due to the relatively short growing season and the fact that productive agricultural lands are devoted primarily to export commodity crops such as alfalfa and potatoes. Food grown or processed in Klamath County comprises only 1% of local food sales (Subramanian 2011). Similar to other Native American communities, the majority of foods available in the region are imported and provided by non-Indian-owned businesses or the federal government, with few successful Indian-owned agricultural enterprises.

Poverty and food insecurity

The Klamath, Karuk and Yurok had, until relatively recently, access to some of the richest natural resources of any tribes in the northwest U.S. (Chiu 2011; McEvoy 1986). As Native Americans lost control of their lands, traditional diets once dependent on physical activities associated with hunting and gathering have been replaced by a modern diet of commodity and store-bought foods that are highly processed low fiber foods, and a decrease in physical activity (Anderson 2007; First Nations Development Institute 2014; Grant 1999; NRCS 2011). Today, Native people in California have the highest rates of both food insecurity (37.2%) and hunger (16.9%) (Harrison et al. 2002).[2] The Karuk people have become some of the poorest in California, with median annual income of $13,000 and more than 90% of tribal members in Siskiyou County, California, living below the poverty line (KTOC 2004 in Norgaard 2004; U.S. Census Bureau 2000) . The Klamath Tribes plunged from their status as one of the wealthiest tribes in the nation, to among the poorest when their tribe was terminated by an act of Congress in 1954. Despite reinstatement of their federally-recognized status in 1986, tribal median household income remains below the poverty line at $17,000 in Klamath County, Oregon (Klamath Tribes 2011).

[2] U.S. Bureau of the Census, Census 2000 available online at: http://www.census.gov/

Diet-related diseases

In addition to high rates of food insecurity and unemployment, limited access to fresh fruits and vegetables and traditional food sources has resulted in numerous diet-related diseases including obesity, type 2 diabetes, heart disease and depression (Jackson 2005; Joe and Young 1993; Norgaard 2005). Native American youth are more overweight and obese and participate less in sports than their white peers (Jones et al. 2011). In Klamath County, Oregon, 64% of the residents are overweight, 25% of the adults are obese, less than 56% get enough exercise and only 17% eat enough fruits and vegetables (Klamath County Dept. of Public Health 2008 in Subramanian 2011). The Karuk Tribe in northern California found that 39% of tribal members were obese (Jackson 2005). Diabetes and other diet-related diseases disproportionately affect Native American populations:16.3% of Native adults have diabetes diagnosed, compared with 8.7% of non-Hispanic whites (Indian Health Service 2008). The rate of diabetes in the Karuk Tribe is now almost double the national average, and heart disease is nearly three times the national average (Karuk Tribe 2004 in Norgaard 2005).

It is well known that diabetes leads to a whole host of other ailments including kidney failure, heart disease and stroke, limb amputations and premature death (CDCP 2011). Research has shown that decreased consumption of traditional foods is related to increased rates of diabetes and other diet-related diseases in Native Americans (Conti 2006; Kuhnlein et al. 2004). If community members eat fresh, healthful foods, especially foods that are culturally appropriate, diet-related disease will be reduced. Yet many traditional foods recommended for control of diabetes and weight are either inaccessible or unavailable due to habitat degradation, or too expensive to purchase on a regular basis (First Nations Development Institute 2014). Many Native American people consider restoration of traditional foods and practices essential to regain their health, traditional economy and culture (Conti 2006; Jack 1915). Many communities are revitalizing cultural traditions as traditional cultivation practices are rediscovered (First Nations Development Institute 2014; IITC 2003). Research has only recently begun to demonstrate the connections between problematic policies and the health of Native peoples – and very little information about how communities are revitalizing their food systems in response is accessible (First Nations Development Institute 2014; NIFC 2012; SCS 2012).

Resilience in the face of adversity

It is important to acknowledge that in spite of these serious challenges to cultural and physical health, the Karuk, Yurok, Hoopa and Klamath Tribes are spearheading countless eco-cultural revitalization initiatives across the Klamath River Basin, including both a range of everyday practices and more formalized programs. To name just a few examples, tribal members and descendants are actively engaged in hunting, fishing, gathering and processing traditional foods, fibers and medicines and transferring that knowledge to tribal youth; traditional storytelling and regalia-making following seasonal calendars; engaging in ceremonies to "fix the world," honor young women's passage into adulthood, and promote healing and restoration; leading political actions to restore the health of the Klamath fisheries; teaching watershed education to K-12 youth; empowering youth leaders through traditional cultural teachings; promoting nutrition education programming; restoring cultural burning practices for land stewardship and to enhance the abundance of

Native foods, fibers and medicines; and engaging in multi-agency collaborations to co-manage federal forest lands in an effort to reduce risk of catastrophic fire in the face of climate change.

Researchers have an ethical and moral responsibility to recognize and acknowledge the powerful resilience of the tribal communities in which they study food insecurity or other social challenges. Studying food insecurity with tribal colleagues as co-equal partners in the learning process, from study design and implementation, to data interpretation and recommendations, not only honors knowledge sovereignty, but also strengthens the research analyses and outcomes.

METHODS

A collaborative and participatory approach

Our research approach was guided by participatory action research theory, which seeks to "understand and improve the world while trying to change it" (Baum et al. 2006). The assessment collected data on regional and local food systems serving Native American people, and also mobilized community efforts to improve access to desired foods and related knowledge and ultimately household food security. This project was anchored by a strong ethical protocol (Karuk Tribe 2017) including an extensive human subjects review process, tribal oversight committee, approval by tribal councils, and vetting of interview guides, survey, focus groups, and resulting reports and publications by tribal collaborators. The assessment itself was co-designed by members of the Karuk Tribe's Department of Natural Resources Lisa Hillman, Leaf Hillman, and Bill Tripp, in consultation with the Karuk Resources Advisory Board, Klamath Tribal Health and Family Services employees Shawn Jackson, Perri McDaniel, and Christa Runnels, and Yurok Tribe employees Chris Peters, Rosie Clayburn, and Bob McConnell, together with UC Berkeley researchers. Key members of the Klamath Basin Food Security Team and tribal community members, especially Frank Lake (USFS), Grant Gilkison, Bari Talley, Allie Hostler, and Sinéad Talley and representatives from the Mid Klamath Watershed Council (MKWC), provided invaluable feedback on the research questions, helped encourage tribal members to respond to the survey, and/or assisted in interpretation of the results.

Community food security assessment from a tribal perspective

The USDA Community Food Security Assessment Toolkit, developed for community-based organizations to assess indicators of local food security (Cohen 2002), has been widely applied across the country, including in the Klamath River Basin. In the last six years, county-level food system assessments have been completed in Humboldt County (Stubblefield et al. 2013), Siskiyou County (Great Northern Services 2013), and Del Norte County and adjacent tribal lands (Stubblefield and Stewart 2012) in Northern California, and Klamath and Lake Counties in southern Oregon (Subramanian 2011). These assessments focus on community food security in general emphasizing access to grocery store and agrarian products, yet there is little consideration for biocultural systems or cultural foods and a limited number of Native American study participants. National and regional data on Native Americans in general is sparse, and data focused on Native American food (in)security, food systems, and access to healthy and Native foods is almost non-existent. Reflecting on this data vacuum, a report by the First Nations Development Institute (FNDI) refers to Native people as the "asterisks Nation" because Native Americans are often under-represented in major data collection efforts, making Native people invisible to funders and policy makers (FNDI 2017). In an

effort to elevate food related concerns that may be unique or specific to Native American communities, the First Nations Development Institute has developed a Food Sovereignty Assessment Tool (FDNI 2014) which guides Native American communities in data collection about local food systems including food access, land use, and food policy.

In response to this data gap, we focused our study exclusively on Native American communities and households in the Klamath River Basin (with ninety-seven per cent of survey respondents identifying with at least one Native American tribe) drawing on both the Community Food Security Toolkit and Food Sovereignty Assessment Tool. We apply a biocultural regional approach focusing on Native American communities along the Klamath River corridor rather than bounding the study by county or reservation lines, as many tribal members no longer live on reservations, or in tribal territories and/or members may span several counties and cities. Taking a bio-cultural regional approach, this study affirms historical inter-tribal trade of food and relations, and the shared legacy of colonialism in this culturally specific food environment. It also acknowledges concerns voiced by tribal members that contemporary political boundaries (state, county, city) are artifacts of settler colonialism, in effect part of the "divide and conquer" politics that contribute to the ongoing erasure of aboriginal territories and people.

Defining food security, food sovereignty and Native foods security

The concepts of food security and food sovereignty are inter-related, in that food sovereignty is a necessary precondition for food security *in Native American communities* (see Box 1). Our assessment draws from both the food security and food sovereignty assessment toolkits to evaluate food resources used by Native American households across the basin and the barriers and opportunities to achieve food security in a culturally appropriate way. However, we retain a food security framing in our approach and analysis in order to be in conversation with USDA food security definitions and standardized assessments. We focus on foods from stores, gardens, and food assistance as well as on Native foods (such as deer, elk, salmon,

Food security: "access by all people at all times to enough food for an active, healthy life" (Coleman-Jensen et al. 2017). Includes at a minimum: a) "the ready availability of nutritionally adequate and safe foods," and b) "the assured ability to acquire acceptable foods in socially acceptable ways" (e.g. "without resorting to emergency food supplies, scavenging, stealing, and other coping strategies") (USDA 2017b).

Food sovereignty: "is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (Declaration of Nyéléni, 2007).

Native foods security: Native foods security is having physical, economic, social and legal access to all desired Native foods in the appropriate quality and quantity throughout the year, and the continuity of the cultural institutions that sustain them including traditional ecological knowledge, social support networks, and cultural resource stewardship (Sowerwine and Mucioki et al. 2019).

BOX 1.
Definitions of food security, food sovereignty, and Native foods security

PHOTO 3.
Food plants used by Klamath River Basin tribes. Photos compiled by Frank Lake, USFS.

Credit: Frank Lake, USFS, and Karuk Tribe/Karuk Indigenous Basket weavers

acorns, huckleberries, wocus, etc.) (Photo 3), and the ecosystem management, policy, and knowledge systems that affect their abundance, quality, availability, and accessibility. We developed a novel indicator of food security, access to desired Native foods or *Native foods security*, to explore the contributions of Native foods to overall food security for Native American communities.[3] Through our analysis, we found that Native foods security is an important indicator of overall food security for Native American households and should be considered in standardized food security assessments in Native American communities. *Native foods security* involves more than merely having access to all desired Native foods, as access is contingent upon cultural knowledge related to tending, harvesting and preparing Native foods, as well as an ability to steward the habitats to enhance abundance, quality and availability of Native foods (see full definition in Box 1). This definition is not intended to substitute for the USDA definition of food security but to enhance it; we intend it to serve as a supplement or addendum to the current definition of food security specifically for

[3] By using the term "Native *foods* security," we draw attention to the state of having secure access to Native foods at all times in the desired quality and quantity, as distinguished from the state of Native American people being food secure more generally, which might be referred to as "Native *food* security."

Native American communities. In other words, our data shows that that Native *foods* security contributes to *Native* food security.

Measuring food security and Native foods security

In our assessment, we used conventional definitions and categorizations developed by the USDA to measure food security, examining household food intake, access to healthy foods, and food insecurity coping strategies. To measure Native foods security, we categorized households by degree of access to desired Native foods including those that always have access (Native foods secure), usually have access, rarely have access, or never have access (Native foods insecure). Food security categories used in this study were adapted from the USDA Economic Research Service definition of food security (see Box 1) and are characterized as follows. Households with *high food security* report no indications of food access problems or limitations and are considered food secure. Households with *marginal food security* report some level of change in food sufficiency such as not always having access to healthy foods, sometimes running out of money for groceries, using food assistance and/or buying less expensive food. *Low food security* households are those that report greater reduction in quality but do not yet utilize extreme coping strategies found among very low food secure households. *Low food security* households may report that

	Access to healthy foods	Ran out of money for groceries	Coping strategies	Ran out or worried about running out of food	Used food assistance[a]	Qualified for food assistance but did not use
High food security	Always	Never	None	No	No	No
Marginal food security	**Usually**	**Rarely**	**Buy less expensive foods**	**Yes**	**Yes**	No
Low food security	**Rarely**	**A few times a year**	Buy less expensive foods	Yes	Yes	No
Very low food security	**Never**	**At least once a month or once a week**	Buy less expensive foods **Reduce size of meals** **Adults and children skip meals**	Yes	Yes	**Yes**

TABLE 1.
Characteristics of food security categories used in this study. Households in the high food security category are characterized by no indication of food insecurity and thus must meet *all* the criteria in the "high food security" row of the table. Households in subsequent categories must meet *at least one* criteria in a given category *and* no unique criteria for a more severe category (underlined and in bold).

[a] Excluding free school lunches and senior meals

they *rarely* have access to healthy foods, run out of money for groceries several times a year, depend on food assistance and/or buy less expensive foods. Households with *very low* food security face severe challenges, reporting never having access to healthy foods, often running out of money for food, and reducing food intake (Table 1). Given the vulnerability of many Native American households, to be included in marginal, low, or very low food security categories, households must meet *at least one* of the criteria listed for that category and no unique criteria for a more severe category (see Table 1). For example, a household in the marginal category may *usually* have access to healthy foods, buy less expensive foods, but not use food assistance in the last 12 months. High food security households must meet *all* criteria for that category (Table 1). In categorizing households, we found that most food insecure households have more than one attribute of food insecurity with the average frequency of food insecurity attributes increasing with severity of food insecurity. Specifically, the average number of food insecurity attributes for very low food security households was 5.23, for low food security households, 3.43, and for marginally food secure, 2.44. Only 34 households out of 201 in the marginal category had only one indicator of food insecurity. We also found that very low food security households experienced not only more indicators but more severe indicators of food insecurity, as one might expect.

Data collection and analysis

Quantitative and qualitative data were collected (May 2015 to October 2016) through: 1) a household survey distributed to all Karuk, Yurok, Hoopa, and Klamath tribal member and descendant households (see Appendix I), 2) key informant interviews with tribal cultural practitioners and food system stakeholders and experts,[4] and 3) focus groups with adults, low-income adults, and youth from the Karuk Tribe, Yurok Tribe, and Klamath Tribes.

The household survey, developed in collaboration with tribal partners, captured a comprehensive snapshot of food systems utilized by Native Americans in the Klamath River Basin. Themes covered included *food shopping and consumption, food security, food assistance, home grown and home raised foods, Native foods,* and *household characteristics*. Specifically, the assessment included a household socioeconomic and demographic profile, community food resources (retail and food assistance), an assessment of household food security (including indicators of and strategies to overcome food insecurity), food resource accessibility (including transportation, shopping patterns, and barriers to accessing food), food availability, affordability, and quality, and community food production (community gardens, orchards, etc.). Tribal partners also prioritized inclusion of questions related to preferences, habits, knowledge and barriers related to Native foods. These included current patterns of access to and consumption of Native foods, barriers to acquiring and desire for more Native foods, the acquisition and transference of traditional ecological knowledge associated with the identification, harvest, processing and stewardship of Native foods, social support networks including the acquisition and exchange of Native foods and associated knowledges, and recommendations for increased access. The survey was distributed through the mail using home address listings maintained by each tribe's enrollment office. In total, 711 households with Karuk, Yurok, Klamath, and Hoopa tribal members or descendants responded to our survey.

[4]Food system stakeholders and experts include the U.S. Fish and Wildlife Service, the U.S. Forest Service, local NGOs, school lunch programs, Tribal Temporary Assistance to Needy Families (TANF), tribal environmental programs, Cultural Heritage Officers, local food vendors, local food distributors, food assistance programs, local community and school gardens, and local health clinics.

Throughout this report, we provide aggregate data inclusive of all four tribes, highlighting key differences, when relevant, among households according to:

- basin location (upper, middle, lower and outer),[5]
- urban[6] and rural household location,
- households below and above the federal poverty level,
- households experiencing different levels of food security (high, marginal, low and very low) (USDA 2016) (Table 1).

We intentionally do not highlight differences among tribes in this report for several reasons. First and foremost, our goal is to provide a unified focus on tribal communities within the Klamath River Basin, as a counterpoint to limited tribal voice within county-level food system assessments in the region. Second, while there are many differences among the tribes in the region, they share a common experience of colonization, forced removal from their ancestral lands, cultural assimilation, criminalization of their traditional practices, and desire to revitalize their cultural food traditions. Highlighting differences among tribes would feel like a disservice to our tribal partners, who are seeking to understand their collective experience and strategies to address food insecurity and identify commonalities. Finally, we received different response rates from the different tribes, thereby limiting a meaningful dataset for comparison.

In this report, quantitative data from the survey is analyzed using descriptive statistics, highlighting key trends in the aggregated data, in basin locations, and in food security categories. A forthcoming article (Sowerwine, Mucioki et al. 2019) presents a more rigorous statistical analysis of the data, investigating associations between a suite of household and food system attributes and food security or Native foods security. All quantitative analysis for this report was conducted in Stata. Interviews and focus groups were semi-structured, guided by a collaboratively developed script with opportunity for prompts and follow-up questions. Interviews and focus groups emphasized Native foods and healthy food access, Native foods consumption, culture, and tradition, land and ecosystem management, home and community food production, food assistance, food security, and recommendations. In total, 115 interviews were conducted, 47 with tribal cultural practitioners. Twenty different focus groups (with 128 tribal participants) were conducted with adults, low-income adults, and youth from the Karuk Tribe (five groups), Yurok Tribe (eight groups), and Klamath Tribes (seven groups). Focus groups and interviews were carried out with the assistance of a tribal liaison and were audio-recorded with prior consent from participants. If audio recording was declined, detailed notes were taken. All audio files were transcribed. Interview and focus group data were analyzed using thematic codes for content (Flick 2013). Codes were grouped into broad themes; if warranted, each theme was then further split into sub-codes. After all data were coded, the content of the sub-codes was further summarized for reporting. All qualitative analysis was conducted in NVivo (2015).

[5]The upper basin includes the region of Crater Lake in Oregon south to Iron Gate Reservoir in California. The middle Klamath starts after Iron Gate Reservoir south to Hoopa, California (does not include households in Hoopa). The lower Klamath basin starts with Hoopa, California south to the mouth of the Klamath River in Klamath, California.

[6]Urban areas are defined as towns with 2,500 people or more.

Study limitations

It is important to acknowledge the assumptions and limitations of this study in representing all facets of the tribal community. While we made our best effort to make the survey accessible to all tribal members and descendants, we may not have been able to reach everyone as not all members and descendants' mailing addresses are registered with each tribe. We also may not have been able to reach those experiencing the greatest poverty and food insecurity. This includes those who may not have received the survey as they were no longer at the mailing address on file with the tribe, were homeless, or were elderly and may not have had the means to respond to the survey. In addition, because the focus of our survey was at the household level, in which we requested one response per household, we may not have captured all tribal members living in households as the survey respondent may have represented another tribe. Households often consist of tribal members and descendants from different or multiple tribal affiliations, as well as non-tribal members of the household, and survey responses were categorized based on the primary tribal affiliation of the person who filled out the survey.

FOOD SECURITY ASSESSMENT RESULTS

HOUSEHOLD CHARACTERISTICS

- The poverty rate for Native American households (42.74%) in the Klamath River Basin is three times the national rate for 2015.
- Rates of type 2 diabetes (21.86%) are more than twice national rates, food allergies (15.09%) are three times national rates, and high-blood pressure (50.29%) is 20% more prevalent than nationwide occurrence.

Socioeconomic and demographic characteristics

Respondents are well distributed among the upper (35.73%), middle (27.67%), and lower basin (17.15%), with a portion of respondents residing out of basin (19.45%). Table 2 summarizes household and respondent characteristics. Collectively, 97.26% of respondents are Native American. Based on household size and annual household income, 42.74% fall below the Federal poverty level for 2015, a rate three times greater than the national poverty level for the same year (Semega et al. 2016). Collectively, 54.47% of households reside in urban areas while 45.53% households reside in rural areas, a similar trend to national estimates reported by FNDI (2017). Our survey captured respondents 12 to 93 years old, with an average age of 53.12 years, an older demographic than the average age of Native Americans nationwide (U.S. Census Bureau, 2014). We found that almost 25% of respondents have completed higher education: this rate is about 12% higher than national rates of higher education reported for Native Americans (13% in 2006-2010) (Ogunwole et al. 2012), suggesting more educated people tended to respond to our survey.

Health characteristics

Collectively, 83.58% of households have at least one person in their household with a diet/lifestyle related health issue. When comparing our data with national data sets, our results are striking. Our data tabulates *households* whereas national data tabulates *individuals*; as such we are likely underreporting rates of disease. Approximately half of all households surveyed have at least one person with high blood pressure (compared to 32% of the entire population nationwide [Centers for Disease Control 2016]), 42.04% of households have a member with obesity (compared to 39.80% of the population nationwide [Ogunwole et al. 2012]), 21.86% of households have a member with type II diabetes (compared to 9.4% of the population nationwide [Centers for Disease Control 2016]), and 15.09% have allergies (compared to 5% of the children nationwide [Centers for Disease Control 2015]) (Figure 2). About 13% of households have members with

Household characteristics	Average or proportions
Age	53.12 years
Household size	2.96 people
Child in household (yes)	49.19%
Elder in household (yes)	61.96%
Native American (yes)	97.26%
Gender	male 36.76%; female 62.81%; gender non-comforming 0.43%
Below federal poverty line (yes)	42.74%
Completed higher education (yes)	24.55%

TABLE 2.
A summary of household characteristics.

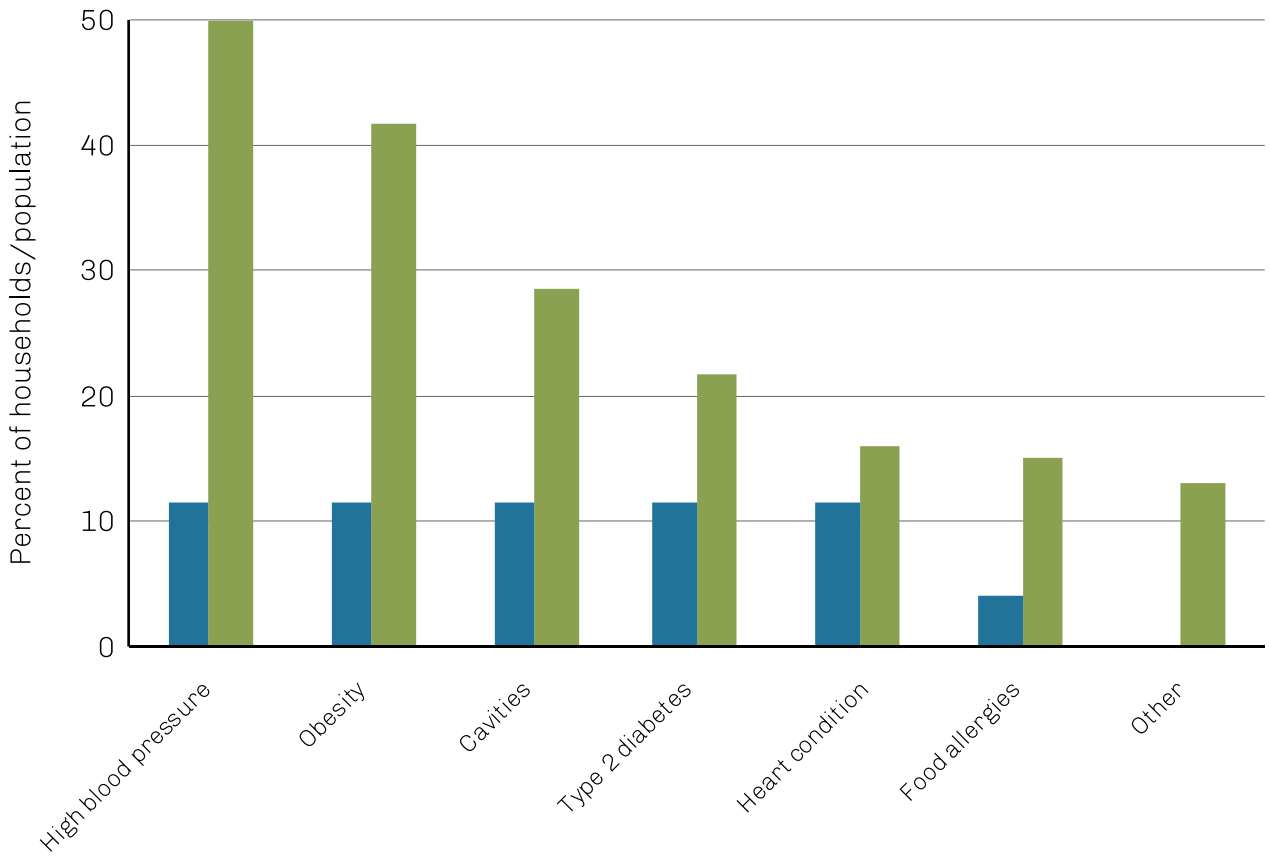

FIGURE 2.
Incidence of health conditions in Klamath Basin Native communities reported as the percent of households with *at least one member* with a given condition (green bar) compared to national rates of incidence reported as percent of the United States' population (blue bar). Since our data tabulates households and not people, we are likely underreporting rates of disease as compared to national data sets. National data sourced from Centers for Disease Control and Prevention (CDC 2016, 2017a, 2017b, 2017c, 2018).

other health conditions including arthritis, asthma, thyroid problems, high cholesterol, chronic back issues, sleep apnea, mental illness, Hepatitis C, kidney stones, cancer, type 1 diabetes, ulcers, multiple sclerosis, Parkinson's disease, pre-diabetes, physical disabilities, and liver disease.

HOUSEHOLD AND COMMUNITY FOOD RESOURCES

- The majority rely on grocery stores, but about 47% of all households get a portion of their food from hunting, gathering, or fishing and 64% also rely on some form of food assistance.
- Food insecure households depend more heavily on food distribution programs, convenience stores, and neighbors, friends, and family.
- About 21% of households rely on food assistance because native foods are not available.
- Respondents desire more native and homegrown foods above more local grocery stores and food assistance programs.
- Well over 60% of respondents want more fresh fruits or vegetables in food assistance programs.
- About 50% of respondents want deer, elk, river foods and seafood incorporated in food assistance programs.
- Households experiencing very low food security attended the most food related classes and desired access to community resources most.

Diversified food sources

Native households in the basin depend on a range of food resources, ranking grocery stores, fast food/restaurant, garden and orchard, and hunt/fish/gather as the top four most utilized food sources. Not surprising, nearly all respondents rely on grocery stores as a source of food (Figure 3), although interview and focus group respondents indicated that today they rely on grocery store food more than some desire because of less availability of and access to Native foods. Many people would like to eat less grocery store food and more culturally appropriate and healthy Native foods.

> **"There's just not enough resources if you're going to do it the old way, you just don't have enough resources out there to gather for you to make it through the year. For you and your immediate family, and your extended family 'cause that's how it goes. And your cousin over here and your cousin over there, so...there's not enough, what you do is go in to the grocery store, because you already had to resort to getting a job, for crying out loud. You know what I mean?"**
>
> **(Happy Camp, Interview #65, 12/8/2015)**

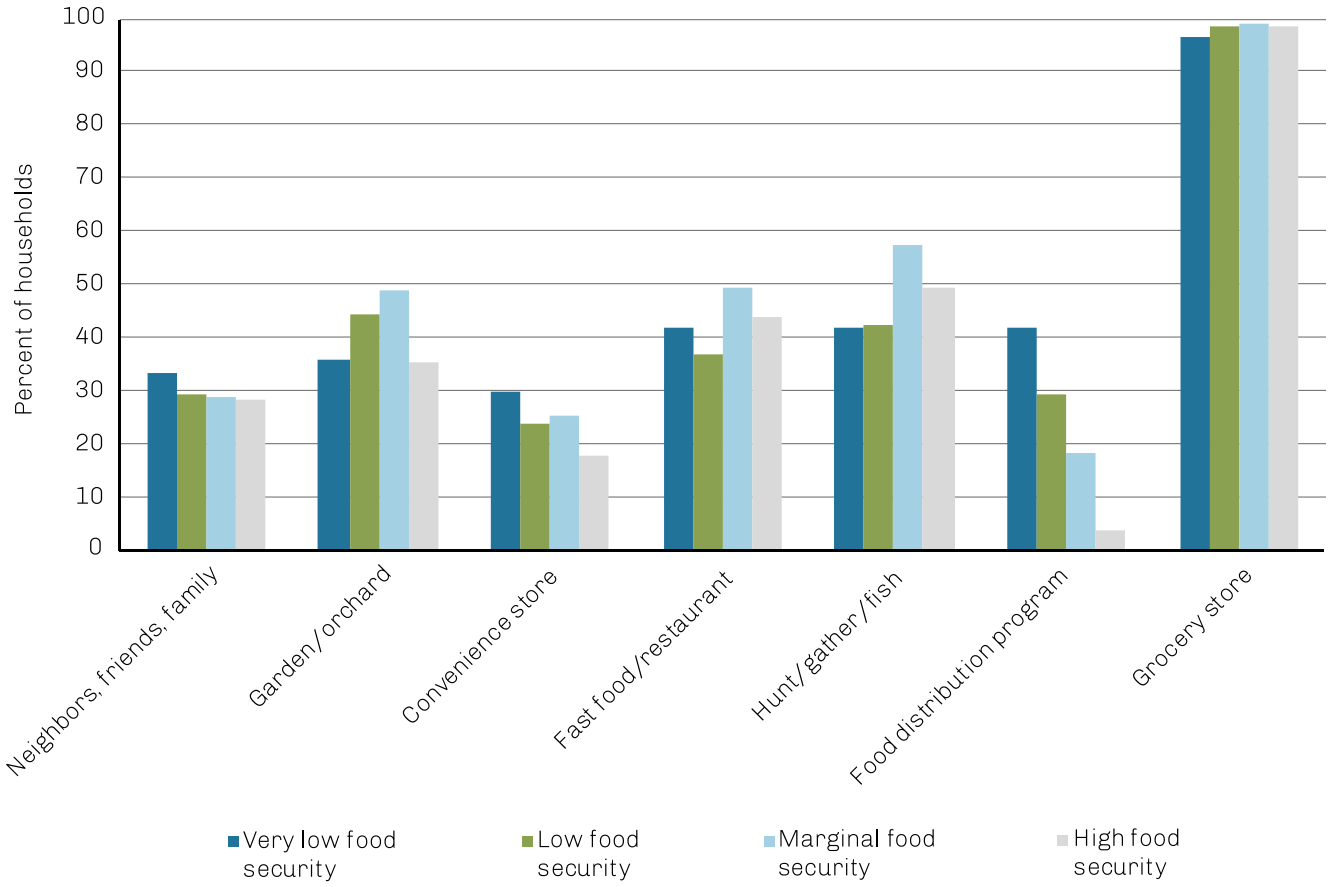

FIGURE 3.
Sources of food that households utilize in each food security category.

Approximately 47% of all households, regardless of level of food security, rely on hunting, fishing, and gathering, with marginal food security households utilizing this food source the most. Those with lower food security rely more on food distribution programs than those in higher food security categories (Figure 3). Fast food is used more by upper basin and out of basin households than middle and lower basin households due to location and prevalence of fast food restaurants. Alternatively, gardens and orchards, hunting, fishing, and gathering, and neighbors, friends, and families are used more by middle and lower basin households (Table 3).

Food assistance programs

The majority (63.77%) of households relied on some form of food assistance in the past year. Figure 4 shows household use of specific food assistance programs in each basin location. Households in the lower basin rely most heavily on all forms of food assistance (except soup kitchens, SNAP, and summer lunch) in comparison with the other regions. Upper basin households rely the most on SNAP (51.36%) compared with other regions. Fewer households in the middle basin participate in the three primary federal food assistance programs (WIC, SNAP, and commodity foods) than the other two regions in the basin, perhaps reflecting poor access to these programs in the middle basin.

Basin Location	Grocery Store	Fast Food	Garden/orchard	Hunt/fish/gather	Neighbors, friends, family
Upper basin	1	2 and 3	-	4	-
Middle basin	1	-	2	3 and 4	4
Lower basin	1	-	3	2 and 4	-
Out of basin	1	2 and 3	-	4	-

TABLE 3.
The top four sources of food for households in each basin location. Repeated numbers in each location indicate a tie between two food sources.

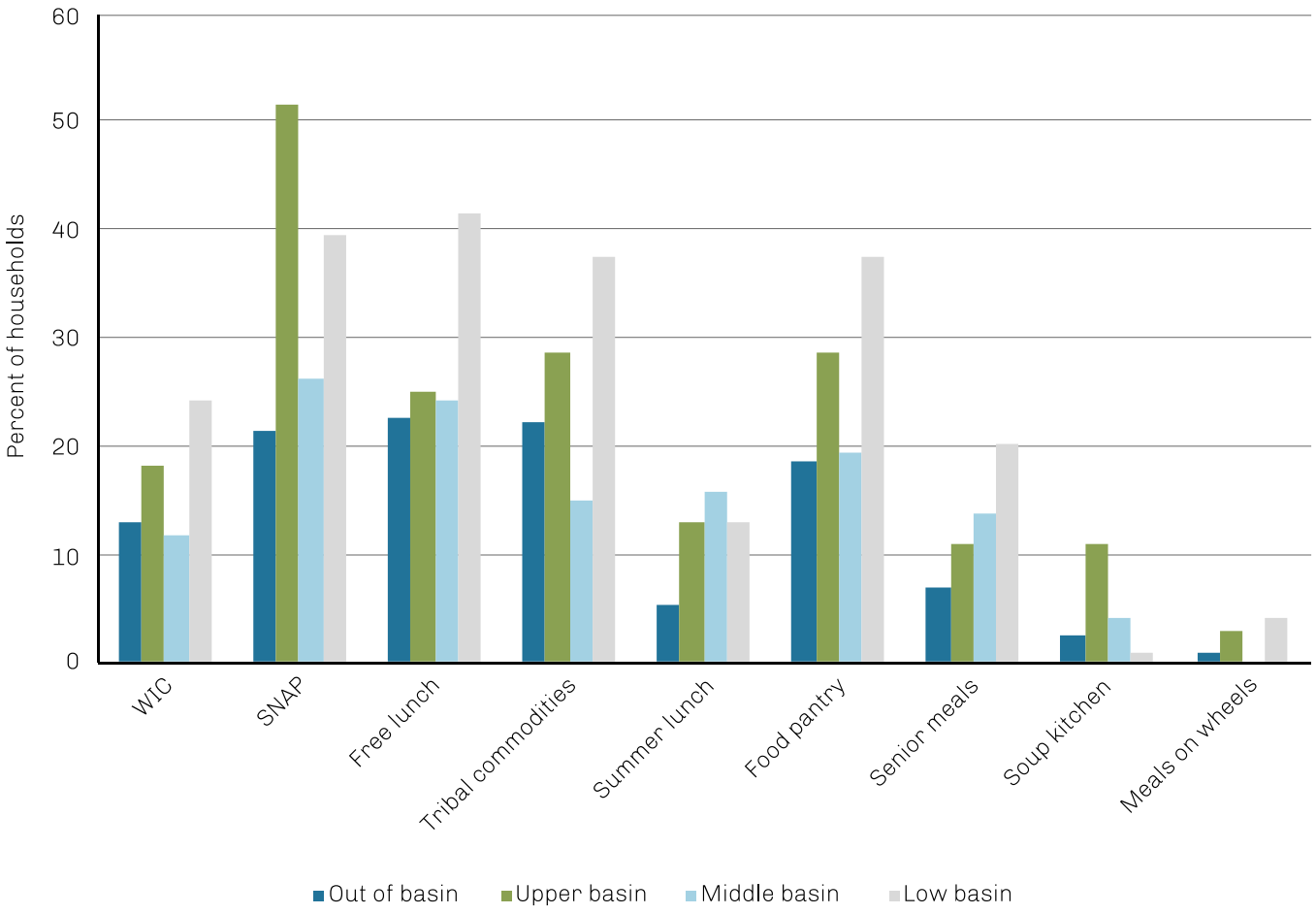

FIGURE 4.
The use of food assistance programs by households in each basin location.

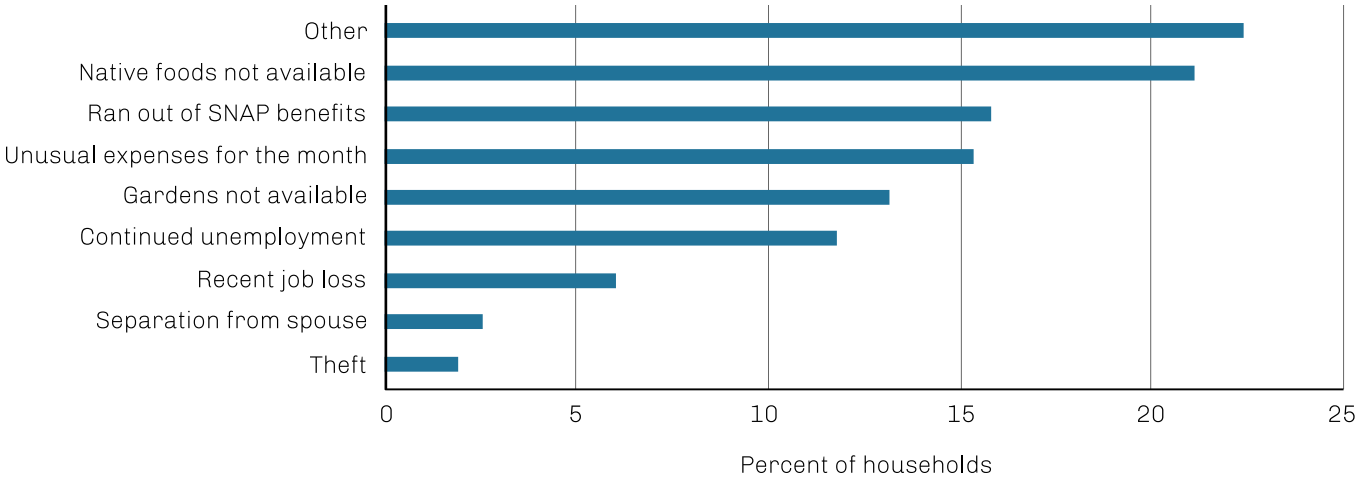

FIGURE 5.
Reasons for using food assistance.

While there are high rates of food assistance use in the region, the complicated void these programs fill today is wrapped up in legacies of denied access to Native foods and tribal lands. Food assistance programs are a contemporary reality for many households but not strongly desirable for household or community wellbeing.

> **One respondent said, "Even though I don't agree with the welfare system, just giving somebody something for nothing, it's very important that, obviously, people have food. Poor people, people in poverty, need food. I just think that it does a disservice to our community members, not just tribal, our community members, just to have that welfare-based reality."**
>
> **(Orleans, Interview #42, 5/3/2016)**

Bearing out this statement, about 21% of households said they use food assistance because Native foods are not available. About 22% of food assistance users rely on food assistance for "other" reasons than those listed in the survey (Figure 5). Some "other" responses include: not having enough income for food even while working full-time, having other expenses, being disabled, socializing and enjoyment (particularly with elder meals), convenience, inability to hunt for Native foods after losing their right to possess a gun due to a felony conviction, inability to get salmon due to poor river condition, being on maternity leave, accessing healthy foods through the free and reduced lunch program at school, and being on a fixed income. One respondent said: "*I depend on commods/food distribution for protein items that are too expensive in the store and to stretch my grocery budget,*" (Happy Camp, Survey #193), illustrating the strategic use of food assistance by some households for particularly costly items.

Desired community food resources

The most desired sources of food (i.e. retail, food assistance, production or Native foods) by all tribal communities are more farmers' markets (50.51%), a tribal farm, garden or orchard (49.78%), and greater hunting (47.07%), and fishing/eeling (46.48%). Significantly fewer households desired more food assistance

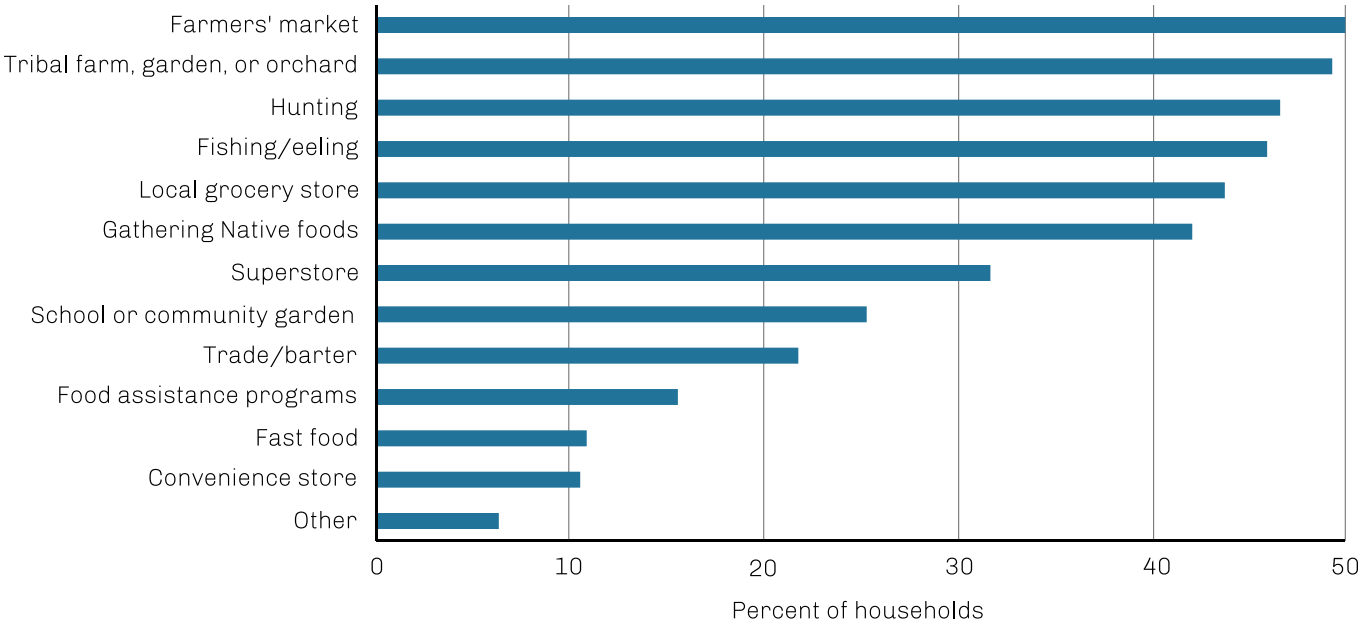

FIGURE 6.
Sources of food that people would like more of in their community.

(15.79%), fast food (11%) or convenience stores (10.69%) (Figure 6). This highlights the tribal communities' strong desire for food sovereignty; that is, the right to feed themselves healthy, locally grown and Native foods, and have local sustainable food systems that are culturally appropriate and ecologically sound rather than depend on unpredictable government food assistance programs of questionable quality.

For those using food assistance, there is a strong desire (over 60%) to have more fresh fruits and vegetables in food assistance programs (Figure 7). In addition, food assistance users want more (or the inclusion of) deer or elk (53.34%), salmon, fish, or other seafood (49.62%), red meat (45.59%), poultry (44.22%), and Native berries and nuts (43.68%) in food assistance programs (Figure 7).

When asked what new community food resources households might like in their community, collectively respondents said they most want a farmers' market, weekly vegetable box, smokehouse, canning equipment, and community garden. A greater portion of households with very low food security desire each community resource more than in the less severe food security categories, with the exception of food buying cooperatives and a farmers' market (notably sources that require cash exchange) (Figure 8). Providing communities access to food processing and storage equipment (perhaps through a community lending program) can support long term food security and food sovereignty goals.

Food education

Collectively, 12.81% of all household respondents attended a food-related class, camp, or workshop over the last few years.[7] A greater portion of households with very low, low, and marginal food security attended classes than those with high food security. **Households with very low food security attended the**

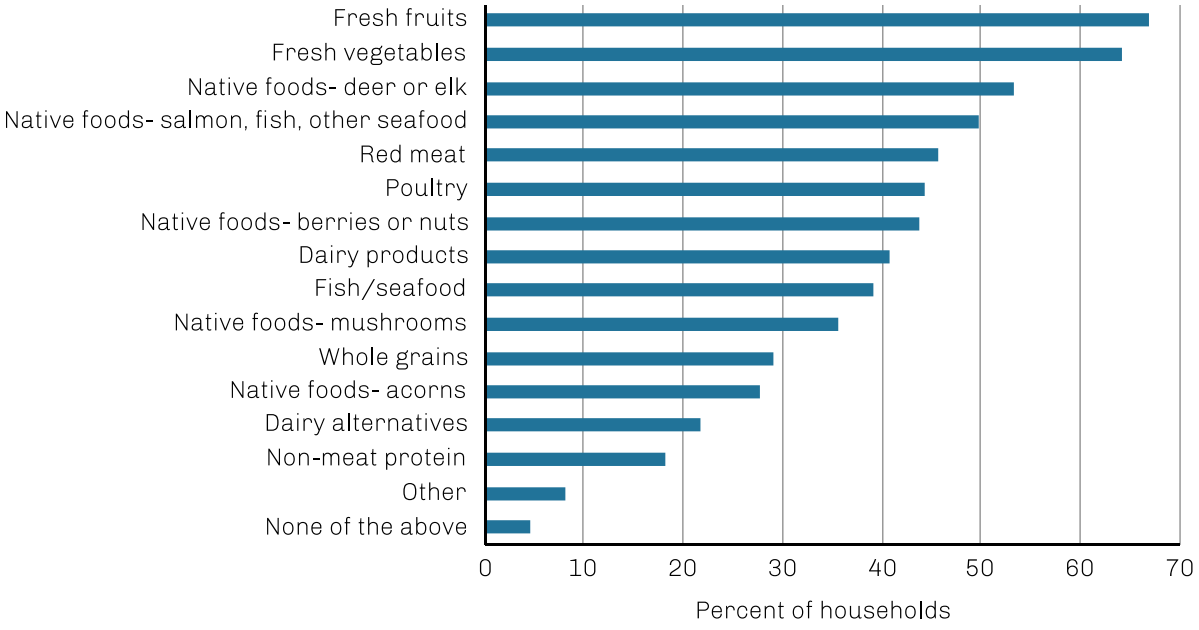

FIGURE 7.
Foods food assistance users want more of in food assistance programs.

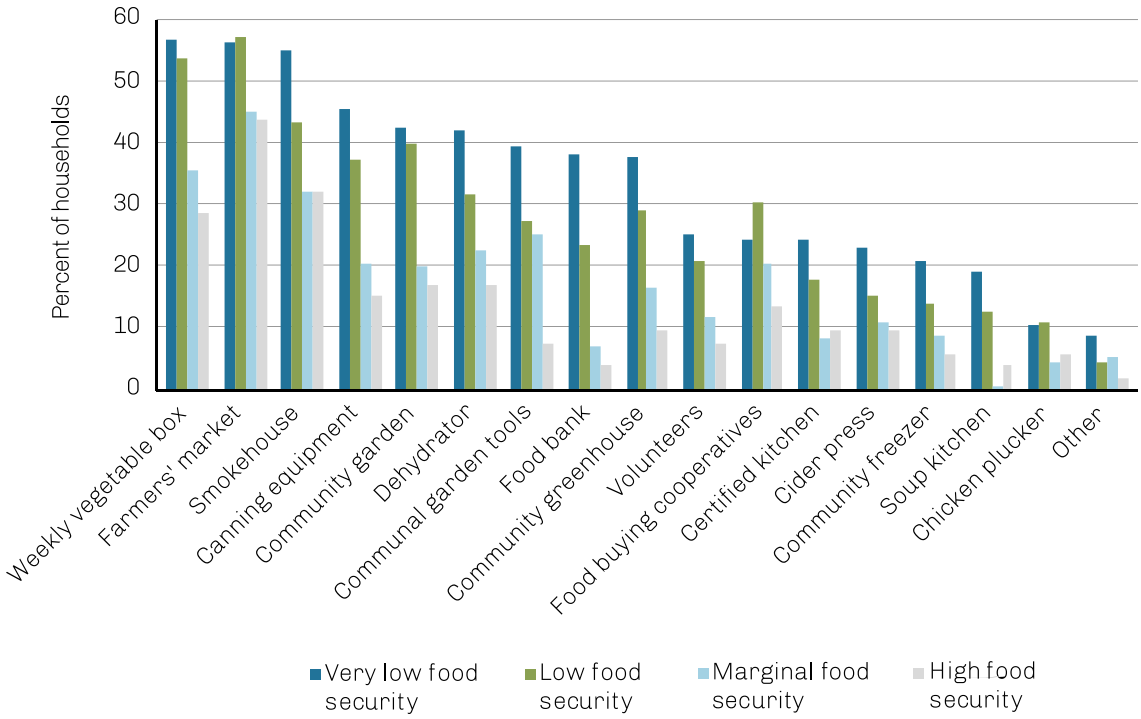

FIGURE 8.
Desired community food resources by household food security.

most food related classes and desired access to community food resources the most (see Figure 8), again signifying a strong desire, held particularly by the food insecure, to achieve greater food self-reliance and independence. Our results emphasize a strong desire for more food related knowledge associated with growing, processing and preserving foods, as well as high rates of attendance to obtain new skills and knowledge, among more vulnerable households, perhaps to bolster their food security status.

HOUSEHOLD FOOD SECURITY

- 91.89% of households are food insecure with 52.49% of households experiencing very low food security.
- About 84% of food assistance users worry about running out or ran out of food in the past year compared to 15.77% of non-food assistance users.
- About 40% of households use fishing, hunting, and home canned foods, respectively, to minimize food insecurity.

Experience of food insecurity

Food insecurity rates are higher than any other rates reported in comparable published studies to date, with 91.89% of households suffering from some level of food insecurity and over half experiencing very low food security (Bauer et al. 2012; Brown et al. 2007; Gunderson 2008; Jernigan et al. 2017; Mullany et al. 2012; Pardilla et al. 2013; Tomayko et al. 2017). Specifically, 52.49% of households have very low food security, 10.81% low food security, 28.59% marginal food security, and 8.11% high food security (Figure 9).

About 79% of all households reported running out of money to buy food at some point over the last year. Of the households that worry about running out or ran out of food, 57.89% live in an urban area and 42.11% live in a rural area, suggesting that living in closer proximity to grocery stores does not necessarily equate to less vulnerability in food supply. Alarmingly, food assistance users are the most vulnerable, with 84.23% of food assistance users worrying about running out or running out of food in the past year compared to 15.77% of non-food assistance users. Introduced as a form of government compensation to Native Americans forced onto reservations with no access to traditional food sources during the time of first colonization, the use of food assistance in our study area today has not minimized household food insecurity but rather shifted the food system away from subsistence living and towards government dependence and greater vulnerability. *In this case we see food assistance as an indicator of rather than a solution to food insecurity.*

Evident high rates of food insecurity in the Klamath River Basin are rooted in a continuing legacy of colonialism, influencing Native people's ability to access enough culturally appropriate, healthy foods, and exercise sovereignty over what they eat and the food system that serves their households and community. Federal policies of termination, relocation, boarding schools, privatizing and allotting land, restricted hunting, fishing, gathering, and land management rights continue to negatively influence Native people's ability to be food secure. Many study participants shared how colonialism has influenced their ability to access food, practice culture, and be mentally and physically healthy.

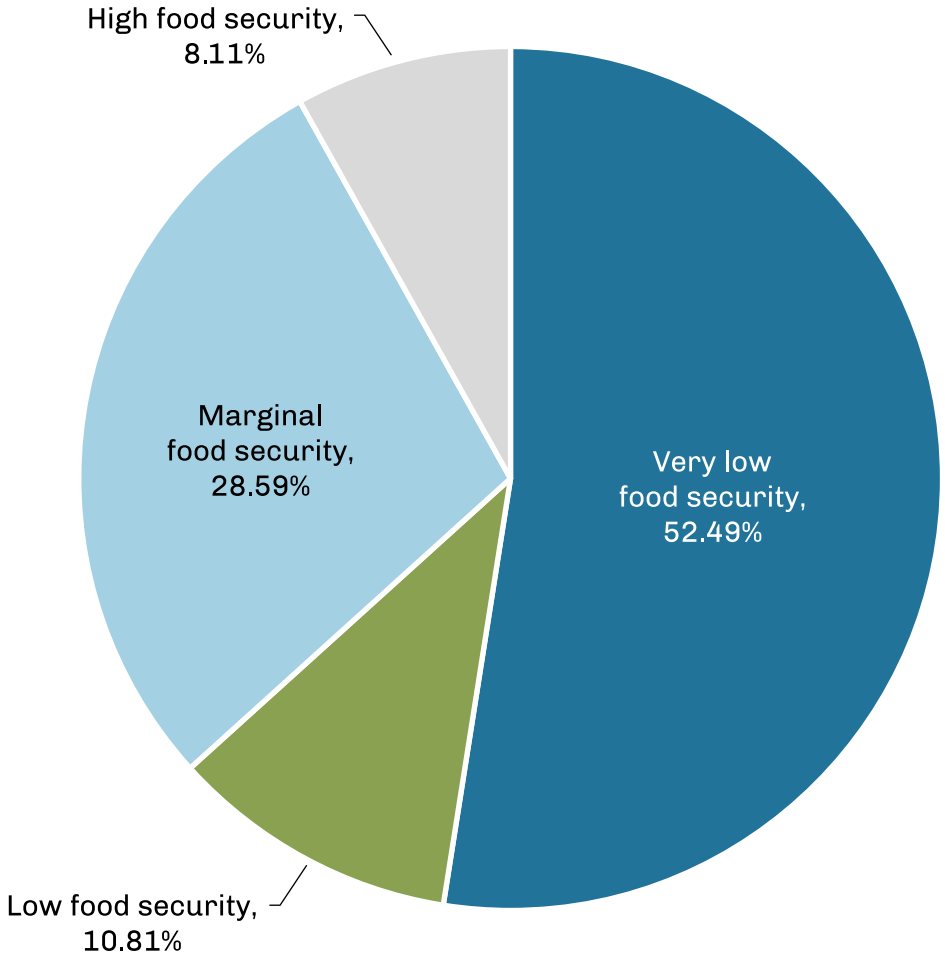

FIGURE 9.
Household food security.

An interview respondent in the middle basin said:

> "They just try to split us apart and that's why they call it "divide and conquer." And really that's like, mostly what you've got is a bunch of hungry dogs. You starve them for so long and you take that one bone that's got a little bit of meat on it. Well, what are the dogs going to do? Are they going to be selfish and want that bone for themself? And that's what they try to do to us. They should starve us out. They try to put us into this poverty. Poverty means you barely eat. You barely eat, you barely have shelter, you barely get money, you barely work. But what do they always put? A lot of corruption. Drugs. Alcohol. Violence. A lot of that comes from our past."
>
> (Orleans, Interview #36, 11/4/2015)

Intergenerational food insecurity, social issues and historical traumas are linked back to government policies of genocide, forced assimilation and relocation from tribal lands designed to tear apart families, cultural traditions, Native food systems, and languages. The brutality and lack of humanity in government actions still resounds today in the basin.

Another respondent shared how relocation to urban areas influences connection to Native foods in the upper basin:

> **"Termination destroyed a lot of our culture and lot of people left here and went somewhere else and when you're growin' up in Portland you don't learn where to pick huckleberries."**
>
> **(Klamath Falls, Focus Group #20, 5/15/2015)**

Today many families in the basin have returned to tribal ancestral territories after being raised elsewhere apart from tribal community. This type of reconnection with land, culture, and food is extremely healing and powerful (Norgaard 2005; Norgaard and Reed 2017).

Food insecurity coping strategies

Households use a range of strategies to cope with food insecurity and feed their families (Figure 10). Of the households that do not have enough money for groceries, the majority (73%) buy less expensive foods, rely on food assistance (46%), hunt/fish and gather (30-40%) and rely on relatives (35%). **Despite these coping strategies, there are large numbers of households experiencing severe food insecurity with about 40% reducing the size of meals, 32% with adults that skip meals, and 4% with adults and children that skip meals**

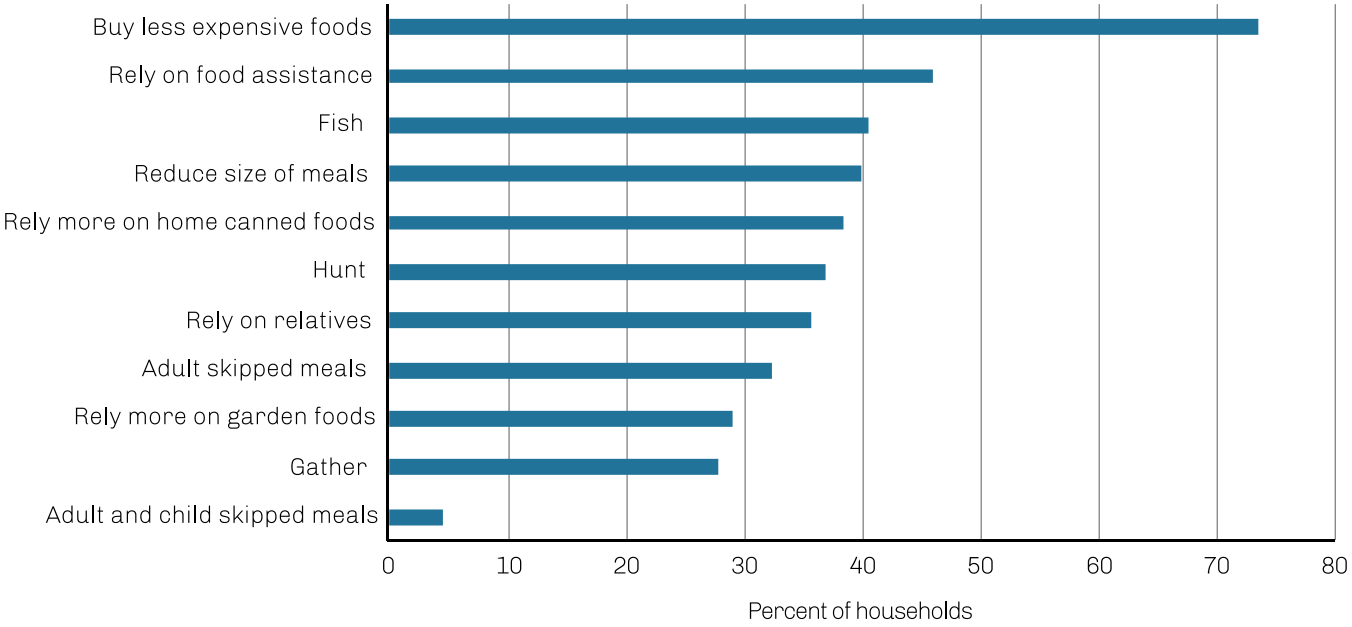

FIGURE 10.
Strategies households use to deal with not having enough money to buy food.

(Figure 10). It is important to remember that these numbers are likely underreported as we were likely not able to reach some of the most vulnerable and food insecure due to lack of communication (no telephone or homeless), physical and mental health stressors, and/or barriers associated with alcoholism and drug abuse.

It is also important to note that fishing was listed as the third most utilized strategy to address food insecurity, yet plummeting fish populations over the last few years have severely limited tribal fishing rights and catch. Protecting and restoring the fisheries is of utmost importance to tribal communities in their efforts to combat food insecurity. Apart from quantitative trends, interview and focus group participants shared experiences of food insecurity and coping mechanisms for this chronic struggle.

Stretching food or substituting foods is common:

> **"Worrying about how I'm going to feed my family. I mean, stretching that hamburger and putting less hamburger in that spaghetti you made so that you can use, y'know, the hamburger for two nights, for dinner. Whereas before, if it wasn't an issue of food scarcity or limited food, you might put it all on the one meal, so it's just stretching it where you can."**
>
> **(Klamath Falls, Focus Group #20, 5/15/2015)**

Others stock up on staples:

> **"I always make sure I have enough of flour and sugar so I can make baking powder biscuits, pancakes, fry bread. I mean just to make sure I got the supplies."**
>
> **(Beatty, Focus Group #15, 5/17/2015)**

Some rely on hunting, gathering, and fishing skills:

> **"I just know that like this last winter, we were, we were pretty scarce on food, and again my uncle went and got deer for us. We survived a lot off that."**
>
> **(Klamath Falls, Focus Group #19, 5/16/2015)**

FOOD RESOURCE ACCESSIBILITY

- About 40% of households shop once or twice a month, with households in poverty shopping less frequently than those above the Federal poverty line.
- 21.96% of households below the Federal poverty line do not own a vehicle.
- 61.66% of respondents experience some kind of barrier to grocery shopping.
- About half of households experience at least one barrier to cooking meals at home, with food secure households experiencing the fewest barriers.
- About 17% of households find cooking too expensive.
- About 63% of households find red meat too expensive at local grocery stores, supporting the need for better access to deer and elk.

Grocery shopping patterns

Grocery shopping is a major hardship for basin residents, particularly those that live more than 100 miles, one way, from a fully stocked grocery store, with limited income for gas or transportation. Over half of all households grocery shop on a weekly basis while about 40% do their shopping once or twice a month. Specifically, 7.27% of households grocery shop daily, 52.23% one to three times a week, 30.46% twice a month, and 9.64% shop once a month. Households in poverty shop less frequently than those above the Federal poverty line, with about 60% of households above the Federal poverty line shopping at least once a

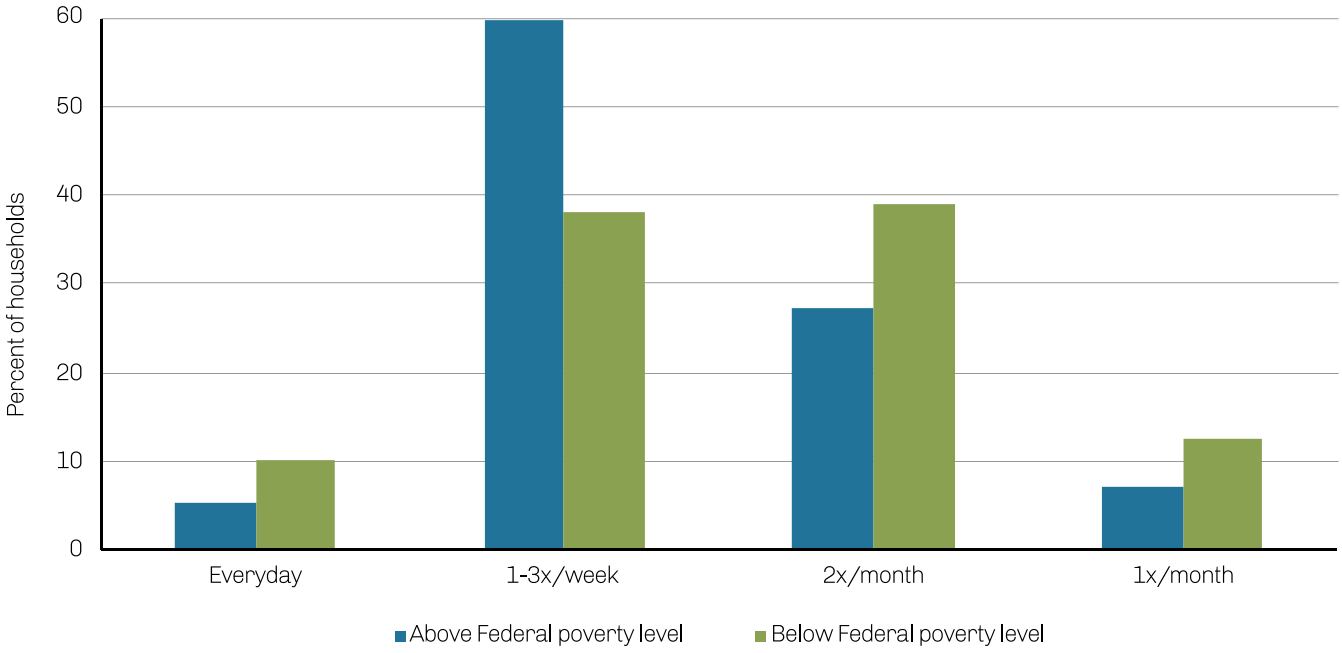

FIGURE 11.
Frequency of grocery shopping for households above and below the Federal poverty line.

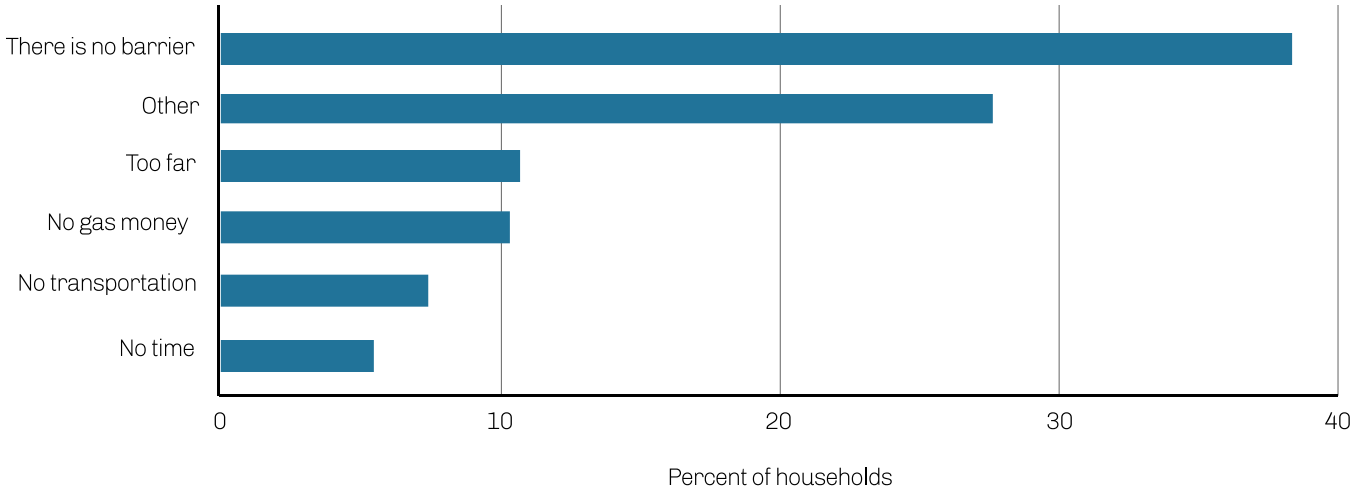

FIGURE 12.
Barriers to getting to the grocery store.

week, while 38.11% of households in poverty did the same (Figure 11). This trend may reflect dependence on monthly food assistance vouchers or inability to afford transport for more than one or two shopping trips a month.

Barriers to shopping

The majority of respondents (61.66%) experience some kind of barrier to getting to the grocery store, with distance and gas money most frequently cited (10.70% and 10.40% respectively). This is followed by lack of transportation (7.43%) and lack of time (5.5%) (Figure 12). However, while respondents were asked to select the *greatest* barrier their household faces getting to the grocery store, a portion of the respondents

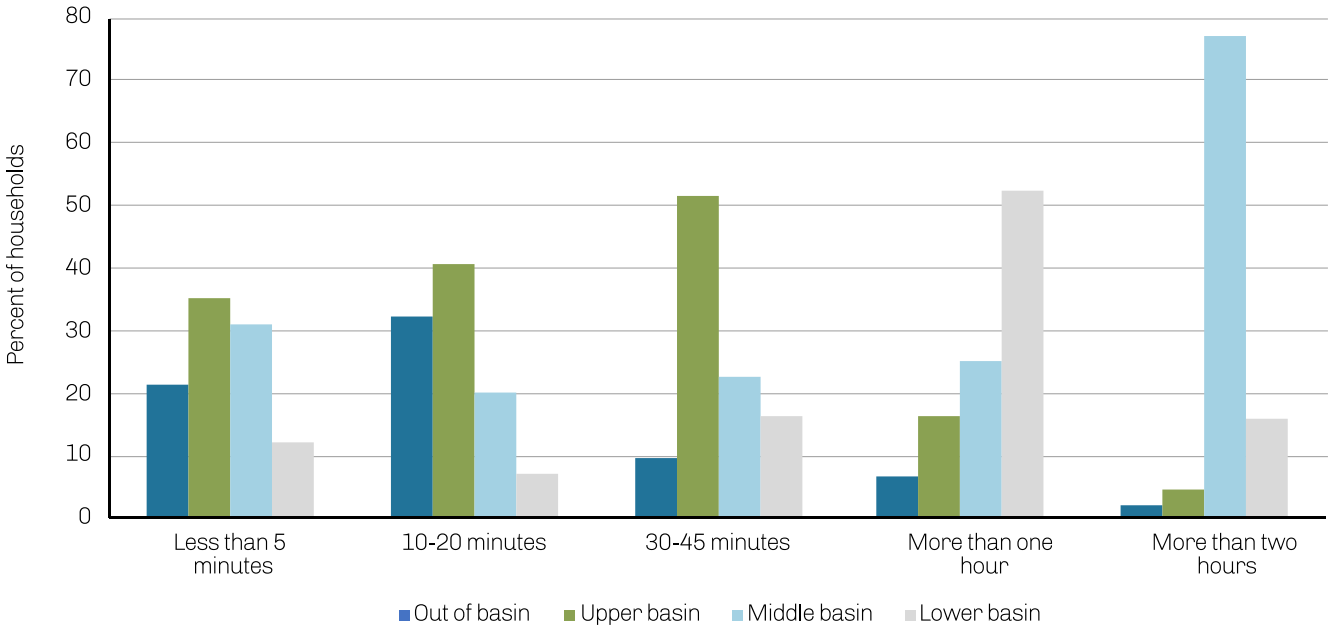

FIGURE 13.
The time to drive one way to the grocery store from respondents' households in each region.

selected more than one barrier, resulting in the "other" category being disproportionately large. The common barrier combinations are "no transportation", "too far", and/or "no gas money." The most common "other" reasons cited are lack of money for food, disability or old age, poor road conditions and weather, inability to afford food locally, poor health, and dissatisfaction with products sold at stores.

Transportation barriers

Households in the middle and lower basin spend the greatest time driving to the grocery store (where they buy the bulk of their food) (Figure 13). Upper and out of basin households spend the least amount of time traveling to the grocery store; despite this trend, a notable portion of households in the upper basin location still traveled 30 minutes or more to get to the grocery store (Figure 13). Most households owned a vehicle (only 11% did not). However, 21.96% of households below the Federal poverty line did not own a vehicle.

A focus group respondent in the upper basin explained that lack of transportation (even in an urban area) prompts her to rely more on convenience foods:

> **"Transportation is a big issue for me, y'know? There are times I feed my kids from Kentucky Fried Chicken instead of going down to Thunderbird (grocery store). And it's a lot easier to carry the bag! (laughter). And it's a lot closer. Yeah, well that's right down the street from me so I'm seriously going, I ain't going to the store today so, y'know, I'll have KFC or Dairy Queen."**
>
> **(Klamath Falls, Focus Group #20, 5/15/2015)**

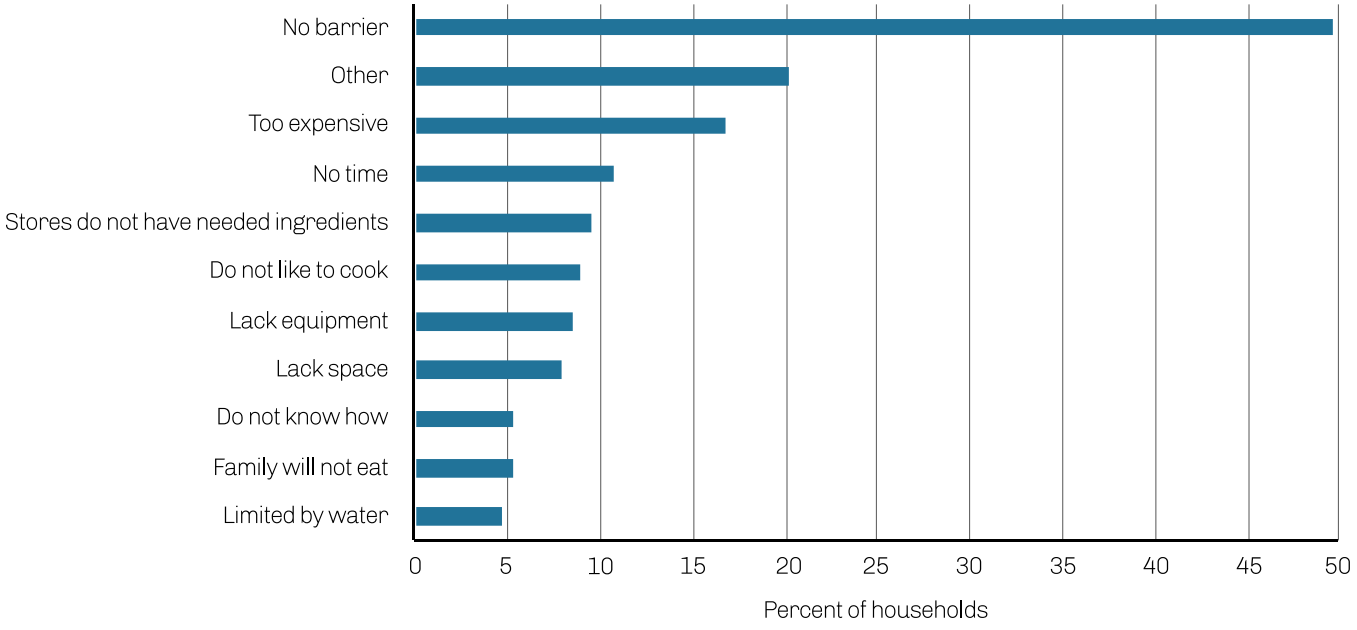

FIGURE 14.
Barriers to cooking meals at home.

Cooking barriers

Not often considered in food security assessments are households' ability to cook meals at home. In our survey, slightly more than half (50.43%) of all households experience some barrier to cooking meals at home for a variety of reasons (Figure 14). Significantly more households with very low food security, compared with the other three food security categories, identify cooking as too expensive, lack cooking equipment, cannot find ingredients they desire in local stores, lack space, do not know how to cook, lack water, or experience other barriers. Additionally, about 17% of *all* households find cooking too expensive (Figure 14). On the other hand, about 87% of households with high food security experience no barriers to cooking. Notably, "other" barriers were cited most frequently, including not knowing how to cook Native foods or not having access to desired Native foods, distance required to travel to the grocery store, malfunctioning oven or no propane, poor health or elderly, local food too expensive or healthy food too expensive, and living alone (Figure 14). Our data suggests strong economic barriers for those that do not regularly eat home-cooked meals, although it is unclear if store-bought frozen meals, other processed foods, or restaurant foods are more economical to consume on a daily basis. They are certainly less nutritious.

FOOD AVAILABILITY, AFFORDABILITY AND QUALITY

- 57 food stores (19 convenience stores and 38 grocery stores) were identified in towns with tribal communities in the basin.
- About 63% of households find red meat too expensive at local grocery stores, supporting the need for better access to deer and elk.
- Over 50% of households find fresh fruits, fish or seafood, cheese, fresh vegetables, and organic foods too expensive at the grocery store closest to their home.

In 2014, a survey conducted of food stores in the Klamath River Basin identified a total of 57 food stores (19 convenience stores and 38 grocery stores) in the towns of Klamath, Crescent City, Orick, Hoopa, Weitchpec, Orleans, Somes Bar, Happy Camp, Seiad Valley, Klamath River, Yreka, Chiloquin, Beatty, and Klamath Falls (Table 4) (Talley 2014). While there are small grocery stores or convenience stores (often poorly stocked with limited quantities of healthy foods) in many of the remote towns in the basin, our data suggests that residents of these towns (e.g. Orleans, Weitchpec, Hoopa, Happy Camp, Klamath, Chiloquin, or Beatty) do the majority of their grocery shopping hundreds of miles or several hours away from their homes in the closest larger town or urban cluster. Most households report shopping at multiple stores in urban clusters or a combination of local stores and out of town grocery stores.

According to O'Brien (2008) the average population needed to maintain a grocery store was 3,252 (in 2005). Considering the low population density in these towns, the very presence of most of these stores is noteworthy. However, while there are some small, locally owned stores in these more remote regions, food items sold are often poor quality/convenience store types of food, or too expensive due to the high

transportation cost of food and other overhead costs of small, rural businesses.

One middle-basin respondent described the limitations of their local grocery store:

> **"The store here is more of a convenience beer and chips kind of store, the only kind of good food you can get is on the coast, so you have to travel a couple of hours, either way, to get food. You need to buy in bulk. If you don't have a car, that's really hard. You're stuck, eating the food that's here, unless you're really good at hunting and stuff."**
>
> **(Orleans, Interview #21, 10/27/2015)**

Regardless of store location (urban or rural), over 50% of households find red meat, fresh fruits, fish or seafood, cheese, fresh vegetables, and organic foods too expensive at the grocery store closest to their home. Furthermore, 23.83% and 22.27% of respondents said that at these stores, fresh fruits and fresh vegetables were of poor quality and also that they had the poorest selection (Figure 15; Photo 4). These results were reiterated by interview and focus group participants, who cited issues with variety and quality of fresh foods, high prices, and worries about buying foods that were old.

	Grocery Store	Convenience Store	% Native American	Population (year)
Klamath[a]	1	1	42%	779 (2010)
Crescent City	7	3	3.45%	6670 (2016)
Orick	1	1	11%	357 (2010)
Hoopa	0[b]	1	82%	3050 (2010)
Weitchpec	1	0	N/A[c]	N/A
Orleans	1	0	N/A[c]	569 (estimate 2010)
Somes Bar	1	0	20%	94 (2016)
Forks of Salmon	0	1	12%	165 (2016)
Happy Camp	1	1	23%	1190 (2010)
Seiad Valley	1	0	1%	379 (2016)
Klamath River	0	0[b]	N/A	190 (2010)
Yreka	5	5	6.3%	7,765 (2010)
Chiloquin	2	0	49%	734 (2010)
Beatty	0	1	15%	262 (2016)
Klamath Falls	15	6	3%	21,332 (2016)

TABLE 4.
Prevalence and distribution of food stores and % Native American residents in each location in the Klamath River Basin.

[a]Tribal headquarters location.

[b]Stores have closed since time of survey and none have replaced them.

[c]Weitchpec and Orleans did not participate in the 2010 census.

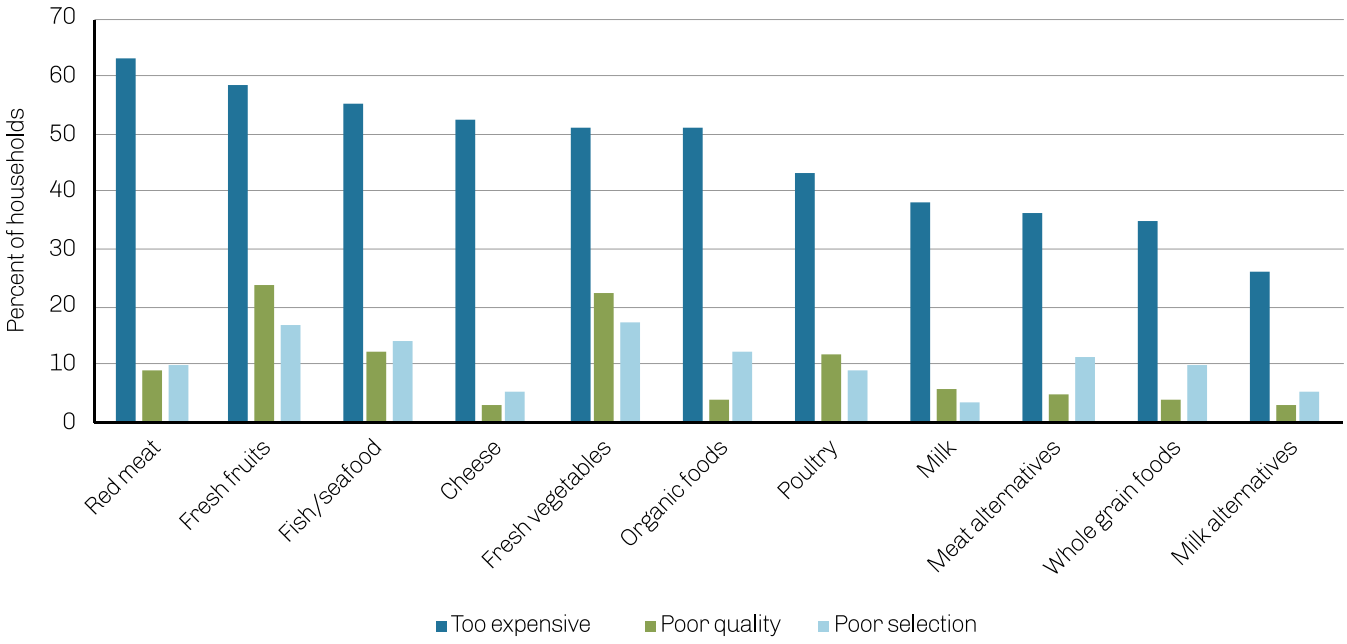

FIGURE 15.
Opinion of foods at grocery store closest to respondents' home.

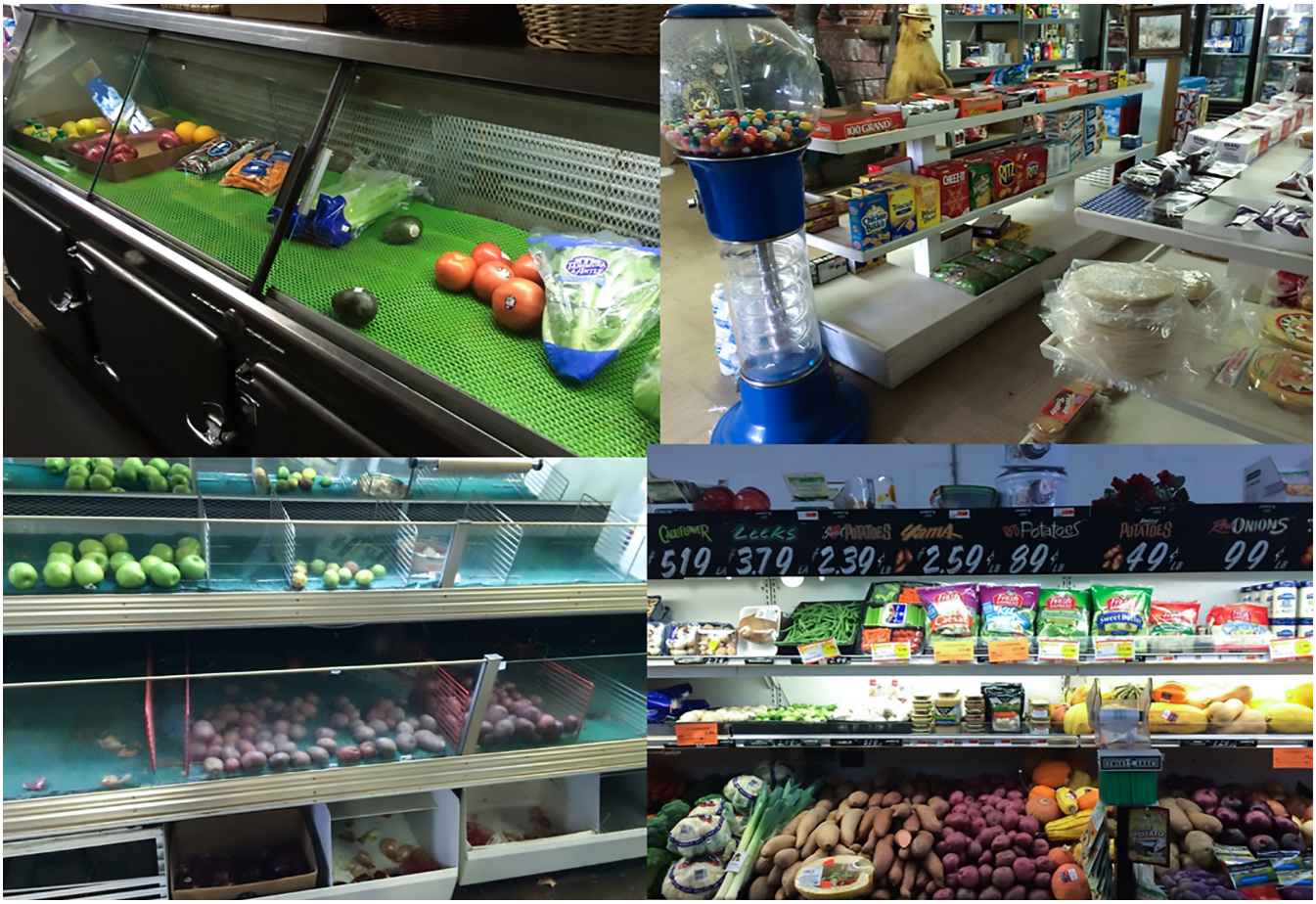

PHOTO 4.
Selection of fresh produce at three stores from towns with populations ranging from 350-1200 and high percentages of Native American residents.

As seen in the example food store photos on the previous page, **the quality and selection of fresh fruits and vegetables is quite limited, and the fresh meats, dairy and vegetables in the stores with better selection can cost more than twice as much as those sold in urban areas including, for example, $7/gallon of milk, $5.19/head of cauliflower (as shown in the picture), $4.39/5-pound bag of flour, and ground turkey for $6.39/pound**. Faced with the high cost of healthy foods, and the need to prepare them, one can understand choosing more affordable snack foods or heat-and-serve products that are lower in nutritional value.

Despite these shortcomings, local stores are extremely important to the most vulnerable people in the area who cannot access other stores. Furthermore, seasonal natural disasters such as flooding or rock slides often inhibit travel, leaving *all* residents reliant on local stores.

One local store owner said:

> **"I feel like these little stores are pretty important for the most vulnerable people here. I feel like a lot of people have the luxury of going to town, but there's a lot of people that don't have that …. I just feel like a place like this [store] is a real safety net for people who are really the most vulnerable people here …. It just seems like figuring out ways to support these little stores, I feel like, is important, because I think there's a lot of social good that comes out of that. There's a lot of social benefits from the little places that support people that wouldn't have alternative options to get somewhere."**
>
> **(Somes Bar, Interview #86, 2/10/2016)**

COMMUNITY FOOD PRODUCTION

- About 41% of households grow or raise food at home.
- About 66% of households share homegrown foods with others.
- Food insecure households have more desire to learn about home food production and start or expand production than food secure households but also experience the most challenges in doing so.
- Food insecure households participate the most in school and community gardens.

Home grown and home raised foods

While tribes in the Klamath Basin do not traditionally cultivate domesticated foods, today homegrown foods are important sources of food, particularly to those who are food insecure. Collectively, 41.01% of households grow or raise food at home (gardens, poultry/livestock, orchards). Homegrown foods are most commonly eaten fresh at home (72.7%) and are also preserved (56.58%). A large number of households also share home grown foods (65.57%), while only 12.5% trade and even fewer (3.62%) sell. This indicates a high

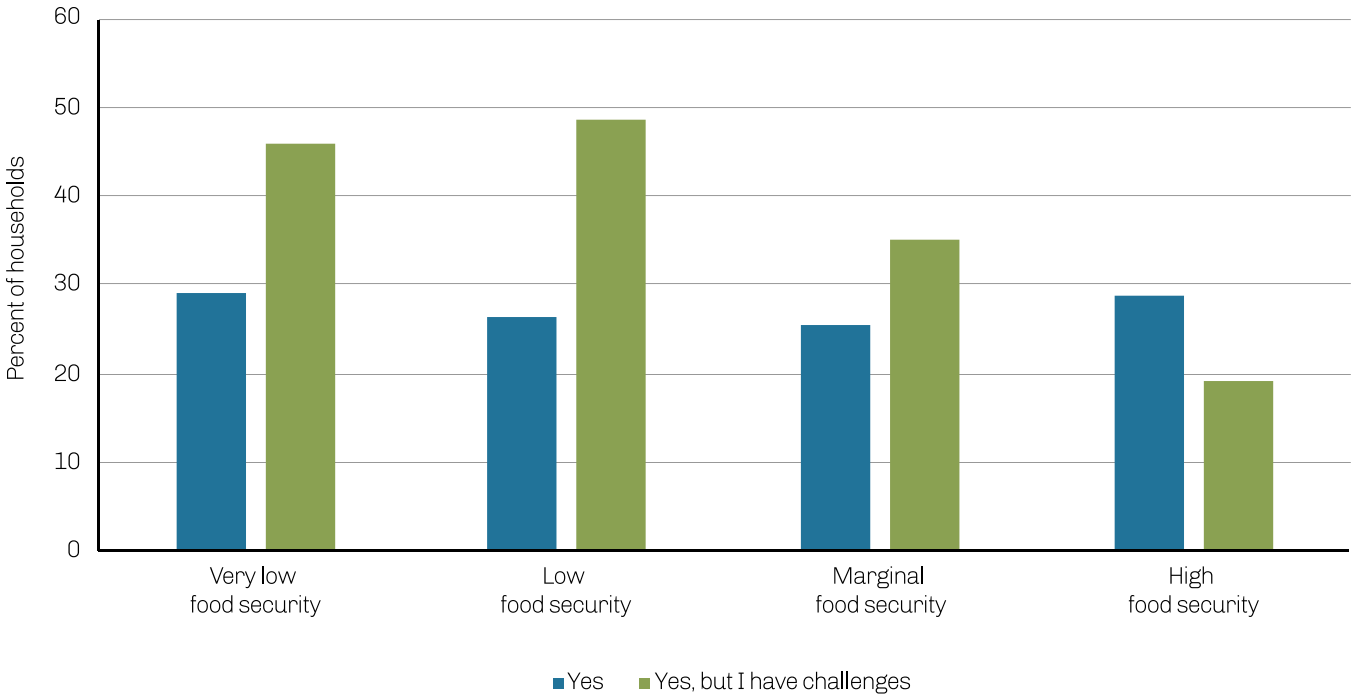

FIGURE 15.
Households that would like to grow or raise food at home or expand current production by food security category.

PHOTO 5.
Ben Saxon, from the Karuk Food Crew, demonstrates butchering of a deer to youth in Happy Camp, CA. Other community members led workshops on butchering pigs, goats, and chickens.

skill level in canning, drying, or fermenting garden foods for future use as well as a vibrant local sharing economy.

Overall, there is a strong interest in gardening and home food production, however many households encounter significant barriers. Collectively, 28.40% of respondents want to start growing or raising their own food or expand their current production, while 43.03% want to do so but encounter environmental, social, economic, and legal challenges such as water limitations, lack of knowledge, lack of space, materials needed being too expensive, lack of necessary equipment, restrictions due to physical disability, unconducive climate or short growing season, lack of time, issues with pests and animals, and limitations due to tribal housing or landlords' rules.

Training opportunities

More than half (54.09%) of all households want to learn more about food production, with more food insecure households desiring this knowledge than food secure households, yet many face challenges (Figure 15). Respondents are most interested in learning about pests and weeds, soil preparation and fertilizer, greenhouse gardening, and crop selection and planning. **Food insecure households have greater interest in learning about greenhouse gardening, irrigation best practices, pruning, chickens for eggs and meat, and pigs and goats** (Photo 5) than food secure households, indicating a desire to diversify home food systems and establish greater ability to feed themselves through home raised vegetables, fruits, meat, and eggs.

PHOTO 6.
Perri McDaniel and some great helpers at the community garden in Chiloquin, Oregon.

Community and school gardens

Only 11.53% of all households participate in school or community gardens (Photo 6); however, 48.48% of respondents said if given the opportunity to participate, they would. Of those who do participate, households with marginal food security account for the greatest participation followed by households with very low food security, low food security, and high food security. **There is interest across all regions for greater participation in school and community gardens; households with very low and low food security express the most interest in school and community garden participation.**

NATIVE FOODS SECURITY ASSESSMENT RESULTS

NATIVE FOODS SECURITY

- Native people in the Klamath Basin have poor access to Native foods: 93.25% of all households do not get all the traditional Native foods they want throughout the year.
- 70% of respondents rarely or never have access to the Native foods they want throughout the year.
- Food security and Native foods security are almost directly correlated, suggesting improving access to Native foods will improved household food security.

Survey respondents consider Native foods vital for both physical and cultural survival: Native foods serve as a link to the continuity of tribal civilization throughout time. Central to this continuity is the intergenerational transference of traditional ecological knowledge associated with procurement, processing and preservation, as well as the strength of social and family relations that ensure family members access to Native foods, and a healthy environment.

> **"Looking at survival and existence through thousands, and even a million years. That's what our goal is, so knowing the processes and how the food gathering, and how our survival is dependent on our environment, and how we can maximize both, to ensure future opportunities, I think that's going to be really what helps us to survive as people."**
>
> **(Orleans, Interview #13, 11/3/2015)**

Using our measure of Native foods insecurity that asks the question, "Does your household get all the traditional Native foods, such as salmon, acorns, deer meat, and others, you want throughout the year" (with "yes always," "usually," "rarely" and "never" as response options), we found that there is a strong demand for Native foods, regardless of food security status, that is not being met. Nearly 70% of all households reported that they *rarely or never* have access to their desired foods, whereas only 6.75% of all households are Native foods secure or report *always* having access to desired Native foods (Figure 16). That means that 93.25 of *all households* do not get all the traditional Native foods they want throughout the year. Slightly over a quarter (26.15%) indicated they usually have access, but more than half (50.86%) rarely get all the Native foods they want at all times, and 16.24% never do.

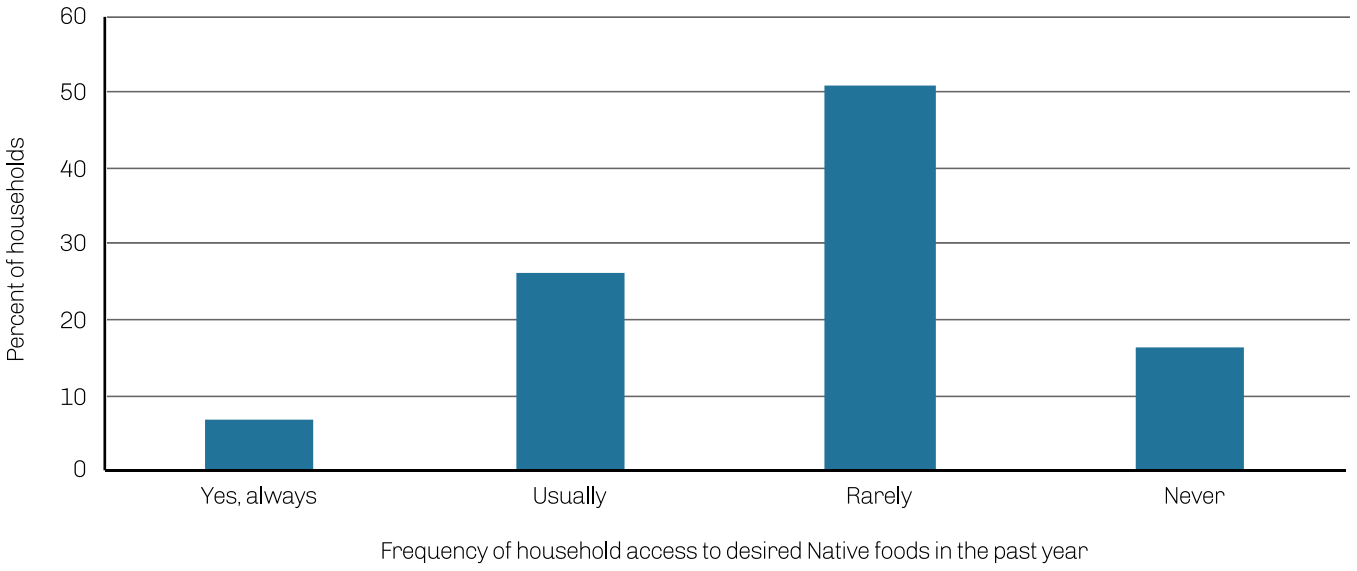

FIGURE 16.
Native foods security based on access to desired Native foods in the basin.

When comparing food security status with Native foods security, we find that food security and Native foods security are almost directly correlated (Sowerwine and Mucioki et al. 2019). Figure 17 illustrates how the most food secure households also have the best access to Native foods (or are the most Native foods secure); whereas households with the least food security have the worst access. **About 78% of households with very low food security never or rarely have access to desired Native foods while the same holds true for just 32.14% of households with high food security (Figure 17). This suggests that promoting policies and programs that increase access to and availability of Native foods for Native people in the basin would support and improve household food security.**

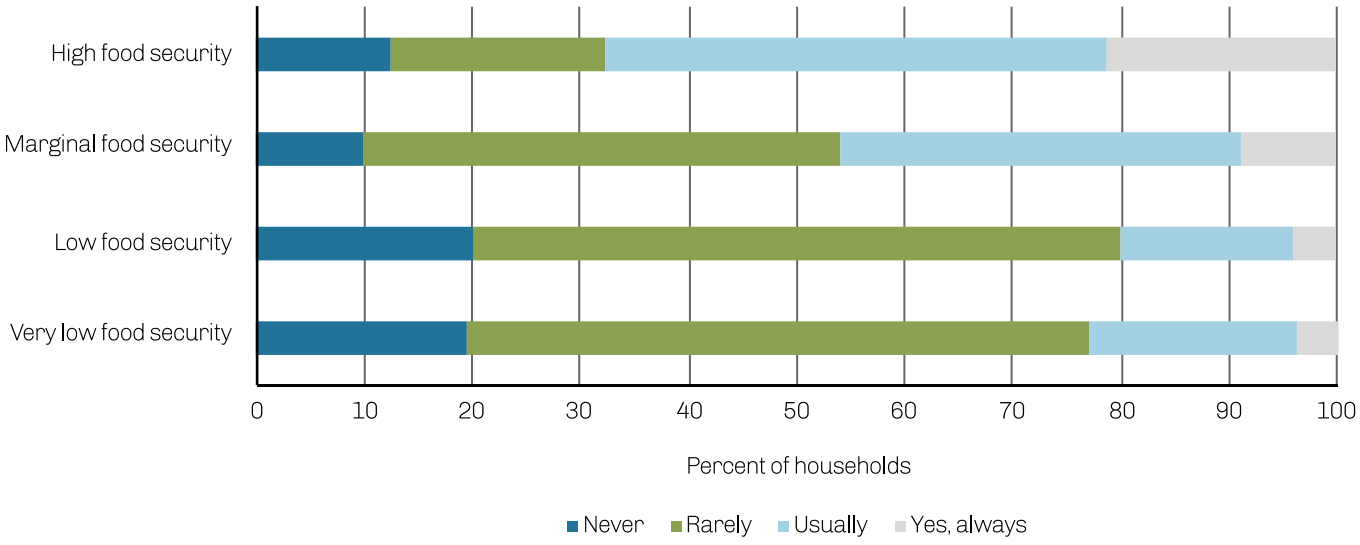

FIGURE 17.
The portion of households with Native foods (in)security in each category of food security.

HOUSEHOLD CONSUMPTION OF NATIVE FOODS

- About 17% of respondents do not eat Native foods even once a year, this is true for about a quarter of households in the upper basin.
- Generally, many Native foods are consumed more often by food insecure households than food secure households, yet food secure households had the best access to Native foods.
- Salmon, deer, and berries are consumed at least once per year by the highest number of respondents.

A large portion of households continues to consume Native foods frequently, with only 16.69% of households not consuming any Native foods in the past year. By region, 23.36% of households in the upper basin do not eat Native foods even once per year, followed by 17.11% of households in the middle basin, 15.67% of households out of basin, and 4.24% of households in the lower basin. **Generally, many Native foods are consumed more often by food insecure households than food secure households, with the exception of elk and seeds which are consumed more often by high food security households** (Figure 18). This emphasizes the importance of Native foods to the most vulnerable households in the basin as well as the inaccessibility of elk to poor households given the high cost of hunting large animals (hunting guns, gear, vehicle and cost of gas) and costly rules and regulations (e.g. an elk tag cost $459.25 in 2018) to acquire this Native food.

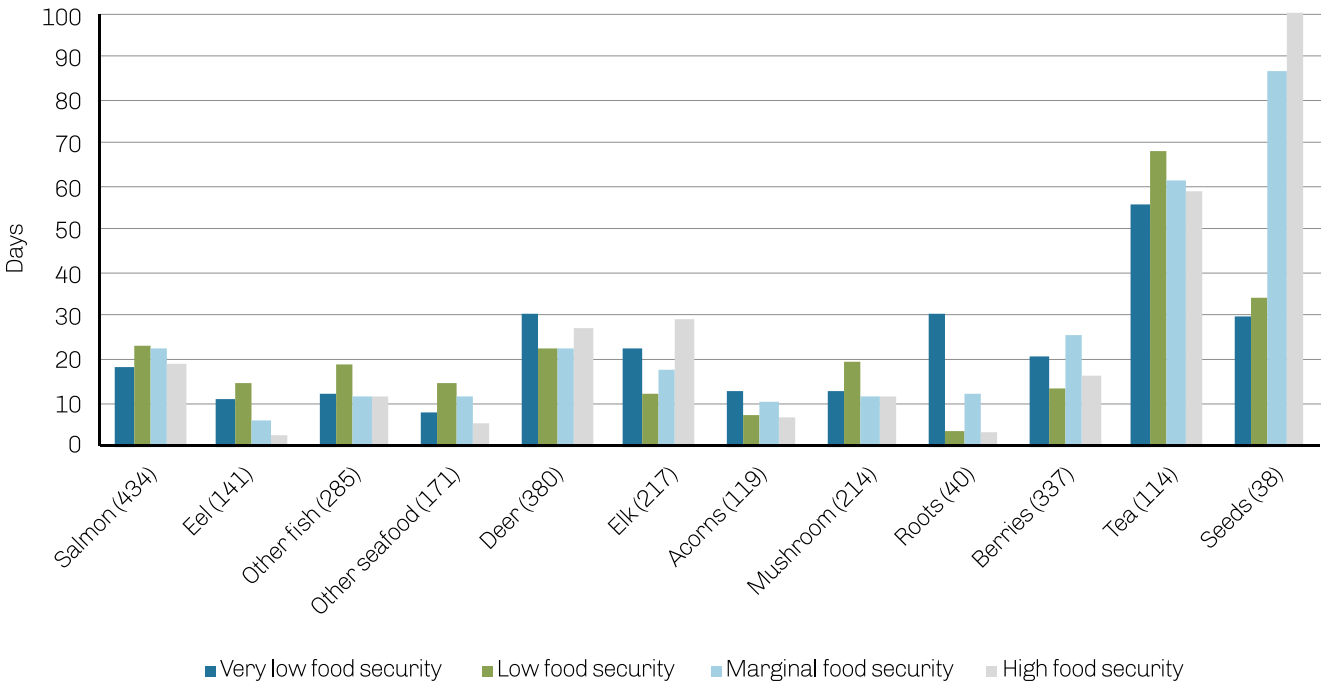

FIGURE 18.
The average number of days each Native food is consumed by households in each food security category. The numbers in parentheses are the number of individuals that consumed each food at least once in the past year.

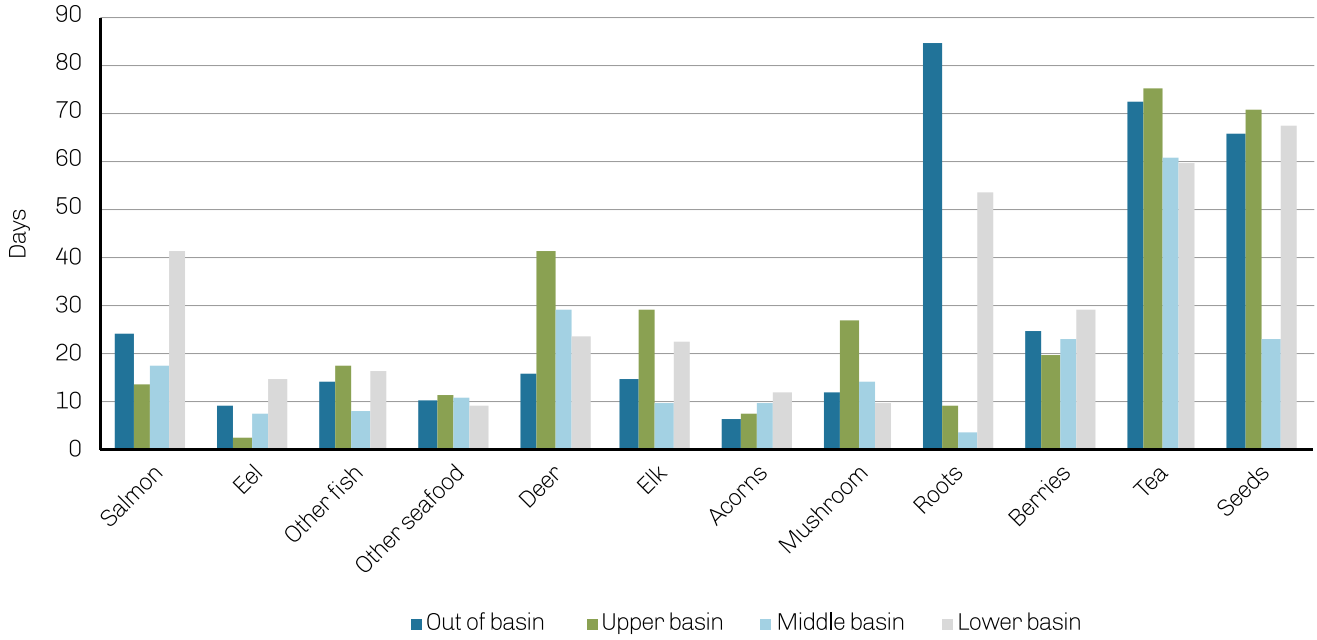

FIGURE 19.
The average number of days each Native food is consumed by households in each region over a year.

Salmon, deer and berries are consumed at least once per year by the highest number of respondents, possibly reflecting the relative ease of berry picking and abundance of deer and salmon at tribal ceremonies or strong sharing networks for these foods. When we compare the frequency of consumption of Native foods with basin location, we see patterns that reflect food availability (Figure 19).

Salmon and eel are consumed least often by households in the upper basin and middle basin, reflecting legal barriers to access and severe decline in resources after the construction of six hydroelectric dams on the main stem of the Klamath River. In comparison, it was common in the 1800s for a Yurok family to dry a ton of salmon for the winter (Heizer and Elsasser 1980) or for the upper basin Klamath Tribes to harvest tens of thousands of pounds of sucker fish (Carter and Kirk 2008). **In the fall of 2017, salmon were so depleted in the Klamath River that fishing the last surviving run of Chinook salmon during the fall was prohibited (Bland 2017) and only one endangered sucker fish could be harvested annually for ceremonial purposes (Carter and Kirk 2008). The dams have depressed or eliminated availability and accessibility of essential river foods like salmon and eel by restricting migration to essential spawning grounds, increasing water temperatures, and decreasing water volume and quality.**

One focus group participant in Orleans said:

> **"I used to get like two hundred and fifty eels. Now you have to worry about mercury or bugs in your salmon or diseases that the fish have or the fact that you're making them sick and die. Because the river is so polluted… These river clams, when I was a little girl we used to just pick them off the rocks and…gather them up like crazy then they told us we couldn't eat them because they were poisonous but we would eat them anyway. Same thing with the crawfish the kids will go and get them from Camp Creek and get their**

> **soda can and rip the top off and boil them in their soda can. There are kids that have never eaten it. It was something that my cousins and I would go and dive off the rocks and gather them. It was something we could just gather and we thought we were really big time Indian kids and we'd swim and gather them and boil them up. Now they tell us we can't even eat them… Well they had that blue-green algae warning that just went out and they said that all the Klamath River and starting the beginning of the Salmon River to not eat anything from it. That's so sad and depressing that the water is so hot it's actually boiling the fish before it can get to us. It's backwards, it used to be you could just walk across [inaudible segment] and now you can't even get one big enough from your arm, they're tiny."**
>
> **(Orleans, Focus Group #5, 7/29/2015)**

Deer and elk are most frequently consumed by households in the upper basin as the size of the territory in which they maintain the right to hunt for subsistence and ceremonial purposes (based on treaty rights) is greater than that of the other three tribes in our study (Figure 19). **Lastly, tanoak acorns are historically one of the most important plant foods in the basin, making up about 56% of California American Indian diets in 1877 (Powers 1877); yet today they are consumed, on average, less than two weeks out of the year (Figure 19).**

ACQUISITION AND EXCHANGE OF NATIVE FOODS

- Nearly half of all households hunt, fish and gather themselves.
- Over 60% of households rely on family and friends for access to Native foods, a method that is particularly important to food insecure households.
- 54.58% share Native foods with others, with a greater portion of food insecure households sharing than food secure households.

While about 50% of all households acquire Native foods by fishing, hunting, or gathering themselves, even more rely on family (60.09%) and friends (59.15%) to share Native foods with them. The least common methods of sourcing Native foods are trade, purchase, and tribal food distribution programs. Food insecure households acquire Native foods through family and friends, as well as trade, food distribution, and tribal gatherings, more than food secure households (Figure 20). More households with marginal food security acquire Native foods by fishing and gathering themselves and more households with high and marginal food security acquire Native foods through hunting themselves than households in more severe food security categories (Figure 20).

The vast majority (77.24%) of households consume and preserve (65.63%) the Native foods their

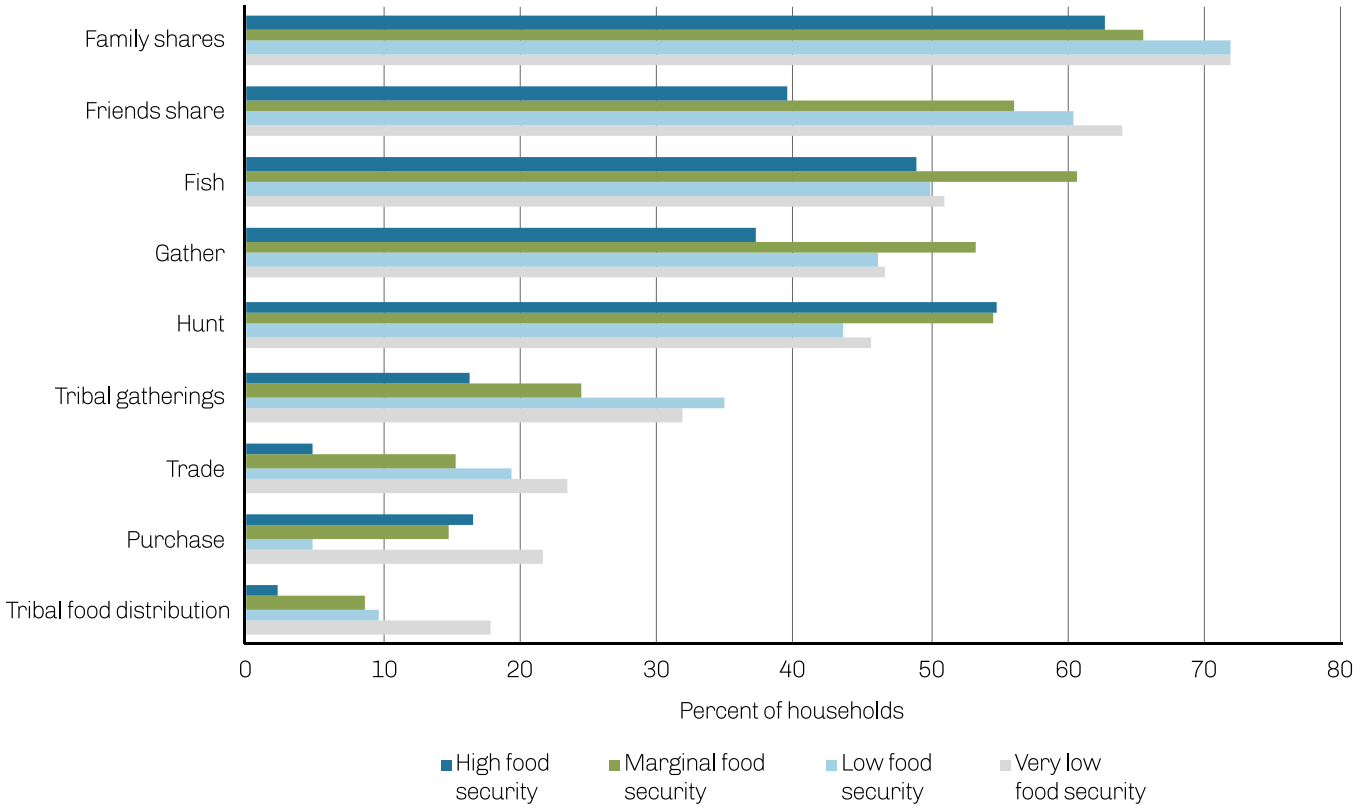

FIGURE 20.
The proportion of households in each food security category that acquire Native foods from each source.

household acquires, **while 54.58% share their Native foods with others.** Only 17% of households donate Native foods to ceremony, with more food insecure households donating than food secure households. **In general, sharing Native foods with others is done by a greater proportion of food insecure households than food secure households. This trend shows that traditional values of food sharing are still being practiced by many households despite the challenges of food insecurity. While trading is not practiced by many households, it is a more common practice among low and very low food security households than high and marginal food security households** (Figure 21).

NATIVE FOOD RELATED KNOWLEDGE

- About 58% of respondents share Native food related knowledge with others
- About 92% of respondents learn from other family members while about 40% are self-taught and 25% acquire the knowledge outside of their family.
- Respondents are most interested in learning where and when to gather native plants and how to prepare traditional medicines and foods.

Sharing of knowledge is widespread, and most often shared with immediate and extended family and among friends, emphasizing the importance of intergenerational knowledge sharing. Throughout the

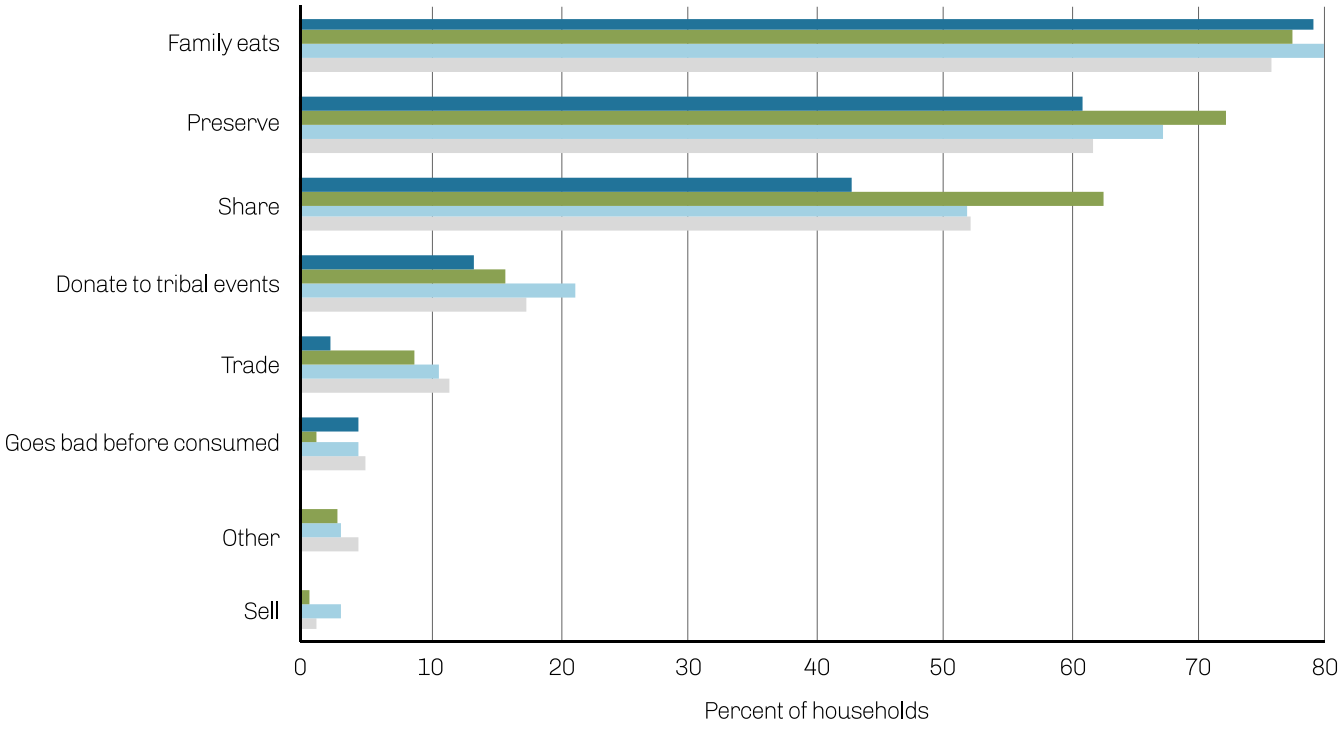

FIGURE 21.
What households in each food security category do with the Native foods they acquire.

PHOTO 7.
Workshops with youth and adults are opportunities to share knowledge and learn about Native foods. Many study participants expressed the desire to continue formal opportunities to learn about Native foods in addition to learning from family.

Photo credits clockwise from upper left: Grant Gilkison, Megan Mucioki, Sibyl Diver.

five-year Tribal Food Security project many workshops, school events, and youth camps also provided models of knowledge and skill sharing (Photo 7). Collectively, 57.79% of survey respondents share knowledge about Native foods and materials with others, with 50% of out of basin respondents, 55.32% of upper basin, 55.68% of middle basin, and 74.36% of lower basin respondents sharing knowledge with others. While 92.40% of respondents acquire knowledge from family members, 39.54% of respondents are self-taught, and 25.06% learn from an unrelated person. Respondents are most interested in learning more about: 1) where to gather, 2) when to gather, 3) how to prepare traditional medicines, and 4) how to prepare traditional foods. Rankings by basin location are almost identical in topics and order.

Many families in the middle and lower basin are revitalizing practices of acorn gathering and processing in their families. New tribal K-12 curriculum, developed as part of the larger five-year food security project, is being introduced into local schools and includes cultural practitioner demonstrations and knowledge sharing on acorn gathering and processing (see Photo 8). This kind of programming

PHOTO 8.
Acorns are a culturally important and nutritious food consumed by tribal people in the basin. Tanoak acorns are preferred by Karuk, Yurok, and Hoopa people (over acorns from black or white oaks, which are preferred by other tribes). Tribal collaborators led youth workshops on gathering and processing acorns and integrated lessons on acorns in the new tribal K-12 curriculum. The acorn illustration by Bari Talley is part of a worksheet in the curriculum.

Photos courtesy of the Karuk Department of Natural Resources.

helps valorize cultural knowledge, providing a source of pride for Native students, and also supplements intergenerational learning opportunities that may be compromised in some families due to long-lasting effects of genocide and forced cultural assimilation.

BARRIERS TO NATIVE FOODS

- Rules and permits restricting access to Native foods are the strongest barrier to Native foods.
- Respondents desire the removal of rules and permits most to help them consume more Native foods.
- Lack of availability, environmental degradation, and climate change are also prominent barriers to Native foods.

Native people experience a host of social, physical, environmental, and law and policy barriers to accessing meaningful quantities of quality Native foods, barriers which have depressed both their ability to consume Native foods and household food security. Rules and permits, lack of availability of Native foods, and environmental degradation of Native food habitat are cited as the strongest barriers to accessing Native foods (Figure 22). Restrictions on the use of fire as a primary forest management tool contributes to reduced access, availability and quality of Native foods and degradation of the environments in which Native foods are found. **Rules and permits in particular are a stronger barrier to food insecure households than food secure households (Figure 23), underscoring the deterrent cost of permits as well as indicating that food insecure households exercise more caution when considering the potential economic risk of**

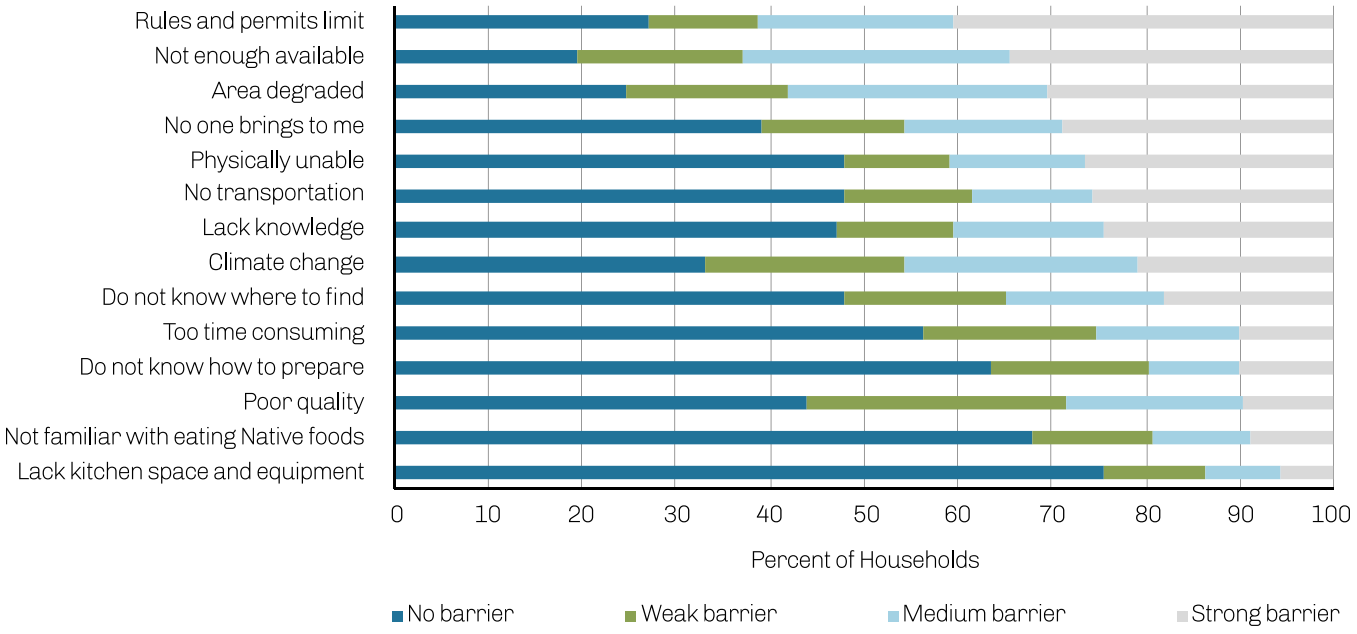

FIGURE 22.
The proportion of households that identifies each potential barrier to accessing Native foods as strong, medium, or weak, or not a barrier at all.

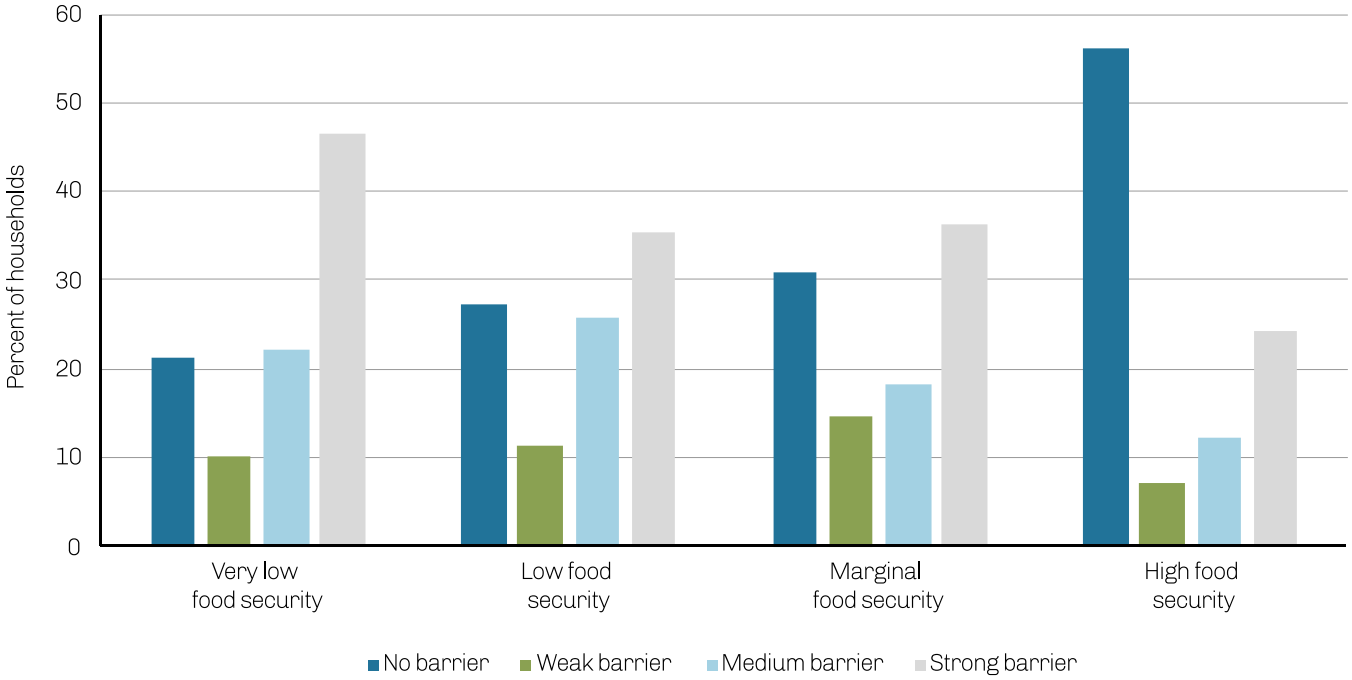

FIGURE 23.
Rules and permits related to acquiring Native foods as a barrier to households in each food security category

acquiring Native foods without a permit.

Many focus group and interview respondents shared challenges related to laws and policies. One respondent said:

> **"Our food source, our main food source was the elk and the deer. Of course, we ate off the river too. The limitations are we don't have no elk or deer no more. We have to go off of the reservation so basically they call us outlaws, poachers, whatever. We're not poachers or outlaws. We are providers. Native man is a provider. He goes out and he gets food for his family. He ain't out there looking for trophies. He's looking for meat to feed his family. Then they turn around and label us as an outlaw, when we're doing what ... The Creator give us these animals so we can live. Now you got to go buy a ticket, a tag, a license to go out and be who you are. I don't agree with it. I've never bought a license in my life, and I never will. If I ever get caught, I'll just have to take it to court and stand on my traditional right as Native American to hunt. To provide for my family."**
>
> **(Weitchpec, Interview #43, 11/10/2015)**

While legal rights to hunt, fish, and gather vary by tribe, all tribes share challenges related to legal barriers to obtaining Native foods. Additional barriers which more than 25% of respondents cited as strong include physical inability (26.52%) and no transportation (25.68%) while climate change was identified as

some kind of barrier by 66.8% of households.

One interview respondent in the upper basin shared her experience with changing harvest times for wocus:

> **"Normally it would be August, September. You usually go and get your huckleberries one weekend, and then you go and get the wocus the next, but the seasons are so different up here right now. It's really fast. August, September is when you'd get the wocus up here, and last year it was done ... It was like the end of July, middle of July, it was ripe. I was like oh my gosh, because I went out to get cattails, or tule roots. The one gal goes, 'You getting wocus?' I said, 'No. Getting tule roots. Wocus shouldn't be done yet.' She goes, 'Oh yeah, it is.' I went out and looked, like oh gosh. Yeah, we ended up gathering wocus that weekend. Then I came back and told everybody, 'You better go get your wocus. They're ready.'"**
>
> **(Klamath Falls, Interview #103, 6/8/2016)**

Other respondents have noticed drought affecting the viability of berries as well as seasonal harvesting times of cultural plants and migration patterns of ungulates. Barriers that pose relatively less concern are lack of space or equipment for processing (75.30% indicate no barrier), being unfamiliar with eating Native foods (67.69% indicate no barrier), and not knowing how to prepare (63.37% indicate no barrier), suggesting that most people know how to prepare Native foods, but according to other data points may be interested in adding to their knowledge or expanding their skills. Interestingly, very few (approximately 10%) indicate that poor quality poses a strong barrier, although quality is at least a weak barrier to over 50% of respondents (Figure 22). This is striking because of the prevalence of worm-infested acorns, parasite-infected fish, and highly polluted waterways which all have heavily influenced the quality of Native foods in the region.

In order to overcome barriers to Native foods, respondents prioritize: 1) removing legal barriers, 2) classes on gathering, preparing, and preserving, 3) classes on hunting, butchering, canning 4) classes on fishing, smoking, and canning and classes on hunting, butchering, canning (tied for 4th selection). Rankings are very similar by basin location except the middle and the lower basin prioritized improved management of Native foods. This data reflects a consistent pattern of recognizing the legal barriers to Native foods and a strong desire to remove these barriers. Additionally, respondents want to expand knowledge and skills related to Native food gathering and processing, championing the efforts of community-based workshops held by our project and emphasizing the need for similar sustaining efforts led by tribal departments and people.

TRIBAL COMMUNITY RECOMMENDATIONS

Interview and focus group participants responded to questions on how to improve community health and food resources, food assistance programs, and access to Native foods. Recommendations from participants center on improving the quality and cultural relevance of community food resources including food assistance programs, strengthening relationships and knowledge within the tribal community, improving access to Native foods through eco-cultural restoration, and improving laws and policies to support Native food security and tribal sovereignty over tribes' ancestral lands and foods.

This statement by one study participant summarizes the goals and passion behind many tribal community recommendations:

> **"I think of restored justice in all the atrocities that have been done. There's a big gaping wound in our culture, our people, the land that we live on. We're in restoration efforts. There's more people here now, and they're not going to go anywhere…We want justice. We're all working together to restore the land. If we want to live with this, we need to emphasize in legislation this is an act of justice, over processes, knowledge and restore justice to our people that are healing from people who have been wronged. There's atrocities that happened across the land that we're all now trying to restore everything. It drives me. Restoring them for the next seven generations because we're struggling now to make it. Getting our deer and stuff like that."**
>
> **(Weitchpec, Focus Group #11, 6/22/2015)**

Improve community health and food resources

Consistently, people expressed a desire for more healthy, affordable and better-quality foods at their local stores rather than junk/convenience foods, as well as more opportunities for gardening. While primarily dependent on grocery stores for their food security, many desire to increase their consumption of Native and locally grown foods. Specific recommendations include investing in fully-stocked local grocery stores with more affordable foods; offering transportation to grocery stores; integrating more healthy, fresh and Native foods into the school lunch program and removing sodas; providing home garden mentors to provide one-on-one gardening support; hiring paid staff to manage community gardens; and promoting local on-farm slaughtering by revising USDA rules.

Improve food assistance programs

Tribal members prefer to have and exercise their hunting, fishing and gathering rights, rather than receiving government-provided commodities. However, given the widespread use of government food programs, there is a strong desire to improve the quality and nutritional value of foods in commonly used food assistance programs, including SNAP, tribal commodities, WIC, school and summer lunch, and elder meal programs, with a strong desire for more fresh fruits and vegetables and the integration of Native foods (see Mucioki et al. 2018). **There is a desire for programs to better meet tribal needs and realities, allow more flexibility for cultural values and perspectives, and be more accommodating of recipients in rural and remote areas where transportation and communication can be a barrier to accessing food assistance.** Specifically, respondents request: eliminating unhealthy processed foods (flour, processed cheese) and replacing them with healthy, fresh and Native foods (e.g. frozen venison) in the commodity food distribution program; allowing Supplemental Security Income (SSI) recipients to receive tribal commodities; improving communication and organization for administering WIC in remote tribal communities; offering healthy eating and budgeting classes for SNAP recipients; and establishing more emergency food supplies in the very remote communities.

Strengthen tribal relationships, knowledge and community

There is a sense of urgency to support intergenerational knowledge transference before it is lost; bringing elders together with youth to learn about traditional hunting, gathering, fishing, processing and cultural story telling.

When asked about what needs to change to ensure Native food traditions continue, one respondent stated,

> **"Well we need to know that we have access to the food. We need to be able to revitalize our traditional knowledge practice and belief pathways. People hold pieces of knowledge, so if people could come together to share the knowledge in the context of practice and utilization that's ... I don't know. That's unrestricted by outside actors, then we ... I think that that's what ultimately needs to happen in order for us to make the most efficient use of our time now, within this generation, because if we wait another generation and expect others to pick it up after we're gone, then they're going to have to rely solely on books rather than to be able to actually talk with people that have done it. We're kind of at a critical point right now to where it's got to get easier."**
>
> **(Orleans, Interview #43, 5/3/2016)**

There is also strong desire to care for each other and share within the tribal community - seeking tribal unity, eliminating isolation of some tribal members, particularly former felons, and setting tribal politics aside. Caring for elders, teaching and mentoring youth not only about their rights but respect and responsibility, and promoting relationships between youth and elders are prioritized as essential components of a strong tribal community that translates to greater food security. Carving out time and

space through seasonal school breaks, or in the form of community Native foods classes and workshops, to allow youth to hunt, fish and gather, and acquire complementary knowledge on topics such as canning traditional foods, preparation for fishing and hunting season, Native plant medicines, deer butchering, wocus gathering and processing, and cultural burns on private properties is highly desired. Offering community services and resources such as motorized acorn grinding, communal butchering area or butcher shop, community ice machine to pack fish, etc. will help people consume more Native foods as well. Finally, tribal members see the importance of educating non-Native American allies and agencies on the importance of Native foods to Native American people.

Improve access to and consumption of Native foods through eco-cultural restoration and increased tribal participation in management of resources

Overwhelmingly, people expressed the desire to eat more Native foods and the ability to include Native foods as a component of daily meals. Currently, that is simply not possible because of limited access and availability as well as poor quality and productivity of Native foods due to the tribes' inability to manage for Native foods over a long period of time. Respondents repeatedly expressed that the goal is to restore and revitalize Native foods to harvestable levels, and they shared many recommendations on how to do so, with an emphasis on reintroducing fire as the primary management tool for tribes on the landscape.

As one respondent summarized:

> **"Give an Indian an artistic license to go out and do the ceremonies that we're meant for, and to maintain our land, and our forest, and our vegetation, and our wildlife, everything. It's all cyclical, everything. The fire helps. It helps the deer. The deer help the plants. The plants help everything, from fire and water. Just let us do what we need to do to get it done."**
>
> **(Orleans, Interview #45, 5/23/2016)**

Additional recommendations include supporting river health and fish and eel populations by removing dams on the Klamath, restoring marshlands, and restricting water and fertilizer application upstream; increasing and sustaining deer and elk populations through fire and tribal-led management of populations and prioritizing tribal take; restoring native plant populations through cultural resource management techniques and restricting cattle grazing and herbicide applications on fiber material used for basketry; monitoring the overharvesting and commercialization of Native foods, particularly by non-Natives; promoting authentic collaboration among tribes and agencies for co-management of ancestral lands and resources; promoting synergies between western science and traditional ecological knowledge to optimize management for different resources.

Improve laws and policies that support tribal sovereignty over Native lands and foods

> **"I believe that Native Americans should be able to harvest their foods wherever, within their ancestral territories. We always have since time immemorial. The government itself is basically tying our hands to being able to live off the lands. I think there should be a policy change where we should be able to take care of our own lands and glean off of them."**
>
> **(Weitchpec, Interview # 19, 11/10/2015)**

Legal access to Native foods varies by tribe throughout the basin. Collectively, respondents expressed the need and desire to freely harvest Native foods, according to tribal seasons, cultural values, and cultural methods of take, throughout their ancestral territories, for home consumption. Currently there is a myriad of laws and policies that prohibit tribal harvest and consumption of Native foods. In addition to law and policy change, law enforcement must be knowledgeable and respectful of tribal peoples' rights to harvest Native foods. Almost all study participants provided recommendations on policy changes that must be made to support tribal food security and sovereignty over their lands and cultural resources including, for example, changing laws, facilitating government to government agreements on tribal hunting and gathering rights, and establishing cooperative agreements with private land owners.

Restoring hunting, fishing and gathering rights plays a vital role in restoring food sovereignty and food security. As one respondent stated,

> **"[It would] basically allow the tribe to have some opportunities to still hunt and fish how they want in places, but do it under contemporary governance at a tribal government to government level with these state and federal agencies that recognizes certain locations and certain ways. I think that would go a long way, that you could do it without threat of prosecution or either as a tribal person, representing your tribal and community interests with that right. You take your best hunters, who are now outlaws, and turn them into valued food service employees."**
>
> **(Orleans, Interview #29, 12/2/2015)**

NATIVE FOODS AS PART OF FOOD SECURITY

Native foods security is having physical, economic, social and legal access to all desired Native foods in the appropriate quality and quantity throughout the year, and the continuity of the cultural institutions that sustain them including traditional ecological knowledge, social support networks, and cultural resource stewardship.

BOX 2.
Developed definition of Native foods security

Our new definition of Native foods security attempts to expand the nutritional definition of food security held by the USDA, to include access to Native foods for their nutritional values (of which there are many), as well as principles of food sovereignty and cultural survival (Box 2).

Key elements highlighted in this definition include "legal" access to Native foods, as many legal constraints continue to inhibit cultural hunting, fishing and gathering practices. We also highlight "economic" access as having the means (equipment, vehicle, tools, guns) to hunt/fish/gather and process Native foods we found are critical to Native foods security. We also want to elevate the notion that these foods are important in many ways beyond nutrition by indicating that households have many reasons for needing or desiring varying amounts of Native foods, beyond satisfying household nutritional needs. By stating, "*in their desired quantity and quality,*" this definition highlights the importance of having access to *good quality* Native foods, and recognizes that quality is intimately connected with how those resources are managed and stewarded with traditional cultural land management practices, such as prescribed fire (i.e. controlled burning), that improves the quality and abundance of Native foods (Lake et al. 2017). This definition also highlights that there may be varying quantities of Native foods people desire at the individual and household level due to preferences and/or social-cultural obligations. For example, Native foods security for a ceremonial leader extends beyond their immediate household's needs, as they have an obligation to provide Native foods at ceremonial events for their extended community, and thus will desire larger quantities. In general, the quantity of Native foods desired may vary by household, based on their role in providing for their broader families; such family obligations are critical to maintaining social relationships through Native food sharing, which plays an important role in strengthening the cultural fabric of the community. Lastly, we highlight that in order to ensure desired quantity and quality, three key elements are necessary to ensure long-term access: intergenerational transference of traditional ecological knowledge, social support networks, and eco-cultural revitalization and cultural resource

stewardship. It requires ongoing transmission of knowledge and associated responsibilities associated with hunting, fishing and gathering from one generation to the next, as well as maintaining the cultural traditions of sharing Native foods with each other and for ceremony, to strengthen family and community ties, and to ensure that those who are unable to hunt, fish, and gather continue to have access. And finally, cultural resource stewardship includes the recognition that tribal people need to be actively engaged in stewarding their ancestral lands for the cultural foods, fibers and regalia species that provide not only vital nutrients, but also plant materials for basketry, and plant and animal materials for making regalia, all of which contribute to cultural health, well-being, and survival.

CONCLUSION

This study integrates mixed methods to evaluate household food security and Native food security, including cultural considerations of Native food systems, and community-based recommendations, expanding the definition and application of food security in Native American communities. In doing so the outcomes of this study speak to issues beyond the economic dimensions of food (in)security, including cultural, ecological, social, and historical dimensions, which are not typically included in food security assessments, but are especially relevant in Native American communities. By using this approach, we found that tribal households in the region continue to hunt, fish, gather, process and consume Native foods, utilize traditional networks of sharing and trading, and share knowledge within families, all important components of household food security for Native American households. Despite strong cultural continuity, there are high rates of food insecurity and poverty in the region, with food insecurity trends higher than any other documented population in the United States. Many households chronically experience running out of food, not having enough to eat during meals, or are even forced to skip meals, with food assistance programs not only reinforcing the legacy of colonialism by promoting culturally inappropriate foods, but also failing to address ongoing high rates of food insecurity. According to community recommendations, **Native people do not want more food assistance, but rather the necessary legal rights and increased opportunities to feed themselves through better access to healthy, harvestable quantities of Native foods; restoration of the landscape using fire; availability of more affordable, healthy, and higher quality foods at local grocery stores; and opportunities to expand their food related knowledge and skills.** Food secure households are also the most Native food secure households, meaning that improving access to, abundance, and health of Native foods in the basin (as the Native community desires and recommends) will contribute to improving household food security for the Karuk, Yurok, Hoopa and Klamath Tribes and other Native American people.

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APPENDIX I

Klamath Basin Food System Assessment

A survey about access to food for Tribal people in the Klamath Basin

THE YUROK TRIBE

Klamath Basin Food System/Sovereignty Assessment
Funded by USDA Agriculture Food Research Initiative Food Security Grant # 2012-68004-20018
CPHS#: 2012-07-4484

Thank you for participating in the Klamath Basin Food System Assessment!

This survey was designed by Tribal employees and UC Berkeley researchers to hear your opinions about how to improve access to food for Tribal people and document the current state of the food system in your community.

Good access to food refers to the ready availability of nutritious and culturally appropriate foods, and the physical, financial, and legal ability to acquire these foods throughout the year.

Does your local food system provide good access to healthy and culturally appropriate food, or are there things that could be changed?

This survey will ask questions about your food shopping and consumption, your opinion on food assistance programs, your experience with growing or raising your own food, and your use of and demand for traditional Native American foods. We will also ask some background and personal questions to help us paint a picture of the community.

There is no 'right' or 'wrong' answer to these questions. Your responses, based on your experiences, observations, or feelings, will be most helpful to us as we try to identify community-generated solutions for improving access to food for Tribal families.

This survey is anonymous. If you don't want to answer a question or you don't know how to answer a question, just skip it. If you have any questions about this survey or project, please contact Jennifer Sowerwine.

I. Background information

1. **What is your age?** _____

2. **What is your gender?**

   ☐ Male ☐ Female ☐ Gender non-conforming

3. **What is your 5-digit zip code?** _____

4. **What town do you live in or live closest to?** _____

5. **Are you Native American?**

   ☐ Yes ☐ No

6. **What Tribe(s)?**

   _____

7. **Please write the age of all the people who currently live in your household, not including yourself.** Your household counts as all the people who live with you currently who don't have another permanent residence.

   Age _____ Age _____ Age _____ Age _____

   Age _____ Age _____ Age _____ Age _____

8. **Does your household get all the healthy foods you want, at all times, throughout the year?**

(*Please select one answer*)

- ☐ Yes, always
- ☐ Usually
- ☐ Rarely
- ☐ Never

9. **Does your household get all the traditional Native foods, such as salmon, acorns, deer meat, and others, you want throughout the year**?

(*Please select one answer*)

- ☐ Yes, always
- ☐ Usually
- ☐ Rarely
- ☐ Never

II. Food Shopping and Consumption

10. Where do you get most of your food?

(*Please check the boxes for all the places you get food, and rank your top 1 - 4 food sources, 1 being where you get the most of your food*)

☐ ____ Hunt/gather/fish (salmon, deer, elk, acorn, berries, greens, etc.)
☐ ____ Grocery store
☐ ____ Convenience store
☐ ____ Fast food/restaurant
☐ ____ Garden/orchard (family, community, school, or tribal)
☐ ____ Food distribution program (Commods, food pantry, free meals, etc.)
☐ ____ Neighbors, friends, family

11. Where do you do most of your grocery shopping?

(*Please write the name of each store and the town where it is located in the space below*)

Name of store Location

1._____

2. _____

3. _____

4. _____

12. How important are the following sources of food to your household?

(*check one box for each food source*)

	very important	somewhat important	not important	doesn't exist in my community
Local grocery store	☐	☐	☐	☐
Superstore (Target, Walmart, Costco)	☐	☐	☐	☐
Convenience store	☐	☐	☐	☐
Farmer's market	☐	☐	☐	☐
Fast food	☐	☐	☐	☐
SNAP/Foodstamps	☐	☐	☐	☐

WIC - Women, Infants, & Children Program	☐	☐	☐	☐
Tribal commods	☐	☐	☐	☐
Food pantry/ soup kitchen	☐	☐	☐	☐
Neighbors, friends, or family	☐	☐	☐	☐
Trade or barter	☐	☐	☐	☐
Fishing or eeling	☐	☐	☐	☐
Gathering wild food plants	☐	☐	☐	☐
Hunting	☐	☐	☐	☐
School or community garden	☐	☐	☐	☐
Home garden or orchard	☐	☐	☐	☐
Meat/eggs/ poultry I raise myself	☐	☐	☐	☐
Other, please list:	☐	☐	☐	☐
Other, please list:	☐	☐	☐	☐

13. Which of the following sources of food would you like more of in your community?

(*Please check all the food sources you would like more of, and rank the top 1 - 5 you most want, 1 being the one you want the most*)

☐ ____ Local grocery store
☐ ____ Superstore (Target, Walmart, Costco)
☐ ____ Convenience store
☐ ____ Farmer's market
☐ ____ Food assistance program (which?)_____
☐ ____ Opportunities for trade/barter
☐ ____ Fast food
☐ ____ Gathering Native food plants
☐ ____ Hunting
☐ ____ Fishing/eeling
☐ ____ Tribal farm, garden, or orchard
☐ ____ School or community garden
☐ ____ Others (please list)_____

14. How often do you get to the grocery store?

- ☐ Every day
- ☐ 2-3x/week
- ☐ 2x/month
- ☐ 1x/month

Comments?:_____

15. What are the biggest barriers you face in getting to the grocery store?

(*Please select the best answer*)

- ☐ No transportation
- ☐ Too far
- ☐ No gas money
- ☐ No time
- ☐ There is no barrier
- ☐ Other barriers or Comments?_____

16. Does anyone in your household have a vehicle?

☐ Yes ☐ No

17. How long does it take to travel one-way to the grocery store where you purchase food to feed your family and/or yourself?

- ☐ Less than 5 minute drive
- ☐ 10-20 minute drive
- ☐ Half hour to 45 minutes
- ☐ More than 1 hour
- ☐ More than 2 hours

18. What is your opinion about the following foods in the stores closest to you?
(*Check all of the boxes that apply for each food category*)

	Affordable, good quality, good selection	Too expensive	Poor quality	Poor selection	Don't know/ Don't buy that product
Fresh fruits	☐	☐	☐	☐	☐
Fresh vegetables	☐	☐	☐	☐	☐
Cheese	☐	☐	☐	☐	☐
Red meat (pork, beef, lamb)	☐	☐	☐	☐	☐
Poultry	☐	☐	☐	☐	☐

Fish/seafood	☐	☐	☐	☐	☐
Meat alternatives (nuts, beans, tofu)	☐	☐	☐	☐	☐
Milk	☐	☐	☐	☐	☐
Milk alternatives (e.g. soy milk)	☐	☐	☐	☐	☐
Whole grain foods	☐	☐	☐	☐	☐
Organic foods	☐	☐	☐	☐	☐
Native foods (e.g. deer, salmon, elk)	☐	☐	☐	☐	☐

19. Are there any other specific foods that you would like, but can't get in the amount, quality, price, or variety that you want in local stores? If so, please list them here:

20. How important is it to you to buy foods that are grown or produced locally?

- ☐ Very important
- ☐ Moderately important
- ☐ Somewhat important
- ☐ I don't prioritize buying local

21. Do you face any of the following barriers to cooking meals at home?

(*Please check all that apply*)

- ☐ I have no time to cook
- ☐ I don't really know how to cook
- ☐ I don't like to cook
- ☐ My family won't eat what I fix
- ☐ It's too expensive
- ☐ I don't have the kitchen equipment I need
- ☐ I don't have the kitchen space I need
- ☐ Sometimes there are water limitations
- ☐ Stores don't have the ingredients I want
- ☐ None

Other barriers or comments?:

22. Has your family either run out or worried about running out of food at any time during the past year?

☐ Yes ☐ No

23. How often do you run out of money to buy groceries:

- ☐ Never
- ☐ Rarely
- ☐ At least once a week
- ☐ At least once a month
- ☐ A few times a year

24. In the past year, has your household done any of the following to deal with not having enough money for food?

Yes	No	
☐	☐	Reduce size of meals
☐	☐	Adults skip meals
☐	☐	Adults and children skip meals
☐	☐	Buy less expensive foods
☐	☐	Rely on relatives for help
☐	☐	Rely on food assistance program(s)
☐	☐	Rely more on home-canned and preserved foods
☐	☐	Rely more on foods from a home or community garden
☐	☐	Hunt for food
☐	☐	Fish for food
☐	☐	Gather Native foods

Others? (*Please list*) Or comments?:

III. Food Assistance Programs

25. In the past year, did anyone in your household take part in any of the following assistance programs?

Yes	No	Not Sure	
☐	☐	☐	WIC – Women, Infants and Children Program
☐	☐	☐	SNAP/Foodstamps
☐	☐	☐	Free or reduced school breakfast/school lunch
☐	☐	☐	Tribal commods/food distribution
☐	☐	☐	Summer lunch program
☐	☐	☐	Food pantry/mobile pantry/food bank
☐	☐	☐	Senior meals
☐	☐	☐	Soup kitchen
☐	☐	☐	Meals on Wheels

Others: (*Please list any other assistance programs your household participated in*)

26. What were the reasons you used the food assistance program(s) you checked in question 25?

(*Please check all that apply*)

- ☐ Did not use any food assistance programs
- ☐ Unusual expenses for the month
- ☐ Ran out of SNAP benefits/food stamps
- ☐ Recent job loss
- ☐ Continued unemployment
- ☐ Separation from spouse
- ☐ Money/food stamps stolen
- ☐ Native foods (deer, elk, acorn, salmon, etc.) not available
- ☐ Home and community garden foods not available
- ☐ Others/Comments:

27. If your household needed food assistance in the past year, but didn't receive it, what were the reasons? (*or*) ☐ My household did not need food assistance in the past year
(*Please list below*)

28. Which of the following types of food would you like to see more of in food assistance programs?

(*Please check all that apply and rank the top 1 - 5 you most want, 1 being the one you want the most*)

- ☐ _____Fresh fruits
- ☐ _____Fresh vegetables
- ☐ _____Red meat (includes beef, pork, lamb)
- ☐ _____Poultry (includes chicken, turkey)
- ☐ _____Fish/seafood
- ☐ _____Non-meat protein sources (e.g. tofu, nuts, beans)
- ☐ _____Milk, cheese, dairy products
- ☐ _____Milk and dairy alternatives (e.g. soy, rice, almond milks, coconut oil, etc.)
- ☐ _____Whole grain foods (e.g. whole grain bread, pasta, and brown rice)
- ☐ _____Native foods (salmon, fish, or other seafood)
- ☐ _____Native foods (deer, elk)
- ☐ _____Native foods (acorns)
- ☐ _____Native foods (berries, nuts)
- ☐ _____Native foods (mushrooms)
- ☐ _____None of the above
- ☐ Other: _____

29. Do you have any other thoughts about how food assistance programs could better serve the needs of your community?

IV. Home Grown and Home Raised Foods

30. Does your family grow or raise any of your own food?

☐ No (***skip*** *to questions 33*) ⟶

☐ Yes (***if yes****, please answer questions 31 - 33*)

31. *If yes*, please tell us what you grew/raised in the past year:

Garden crops (top 5):_____

Orchard crops
(list):_____

Animals for meat
(list):_____

Eggs/Dairy:
_____

Other: _____

32. What do you do with your garden and orchard produce and/or your animal products?

(*Please check all that apply*)

- ☐ My family eats it all
- ☐ I freeze, can, or dry it
- ☐ I share it with others
- ☐ I sell it
- ☐ I trade it for other items
- ☐ It sometimes rots before I get the chance to harvest or eat it

☐ Other: (*Please list*)

33. Would you like to start growing your own food (animals, vegetables or fruits) *or* expand your production?

- ☐ No, I'm not interested in growing my own food OR growing any more food
- ☐ Yes!!
- ☐ Yes! But…(*please list any challenges you face below*):

34. Would you like to learn more about growing or raising your own food?

☐ No
☐ Yes

(***If yes**, please indicate what you would like to learn about*)

☐ Crop selection and crop planning
☐ How to prepare the soil, fertilizer
☐ How to deal with pests and weeds
☐ How best to irrigate
☐ Greenhouse gardening
☐ Pruning
☐ Raising chickens for eggs
☐ Raising chickens for meat
☐ Raising pigs or goats
☐ Other_____

35. Does anyone in your household participate in a community or school garden?

☐ Yes ☐ No

36. Would you participate in a community garden or farm if you had the opportunity?

☐ Yes ☐ No

Comments?:

V. Native Foods

37. Does your household eat Native foods at least once per year? (Native foods are foods traditionally gathered, hunted, or fished for, like salmon, deer, elk, mushrooms, berries, wild teas, etc.)

☐ Yes (***If yes**, answer questions 38 - 40*) ☐ No (***If no**, skip to question 41*)

38. If your household *does* eat Native foods at least once per year, please tell us if your household gets the Native food(s) you eat from any of the following sources:

Yes	No	
☐	☐	Family shares it with me
☐	☐	Friends share with me
☐	☐	I/we purchase it
☐	☐	I/we trade other things for it
☐	☐	I/we hunt for it
☐	☐	I/we fish for it
☐	☐	I/we gather it
☐	☐	I/we get it from Tribal gatherings or ceremonies

☐ ☐ I/we get it from a Tribal food distribution/meal program

39. What do you do with Native food that you gather, hunt, catch or have been given?

(*Please check all that apply*)

- ☐ My family eats it all
- ☐ I freeze, can, or dry it
- ☐ I share it with others
- ☐ I sell it
- ☐ I trade it for other items
- ☐ I provide food for ceremonies or other Tribal events
- ☐ It sometimes goes bad before I get the chance to eat it
- ☐ Other/Comments:

40. If your household *does* eat Native foods at least once per year, please circle which of the following Native foods you currently eat, write in how often you eat them, and rank the top 5 you would like more of.

NAME OF NATIVE FOODS (Please circle or list all that you currently eat)	HOW OFTEN DO YOU EAT THIS? Please write in how many days per year	WHICH FOODS DO YOU WANT MORE OF? Rank the top 1 - 5 foods you most want more of, 1 being the one you want most	Comments?
Salmon			
Eel			
Other Fish: Trout, Sturgeon			
Other Seafood: Mussels, seaweed, clams			
Deer			
Elk			
Acorns			
Wild mushrooms			
Roots What kinds?:			
Berries: huckleberry, blackberry, black cap			
Teas What kinds?:			
Seeds What kinds?:			

Other: Please list			
Other: Please list			
Other: Please list			
Other: Please list			
Other: Please list			

41. Are any of the items in the list below barriers that make it hard for you to get the Native foods you want? (*Please look at the following list and for each statement check one box that best indicates how big of a barrier it is to getting and eating Native foods.*)

	Strong barrier	Medium barrier	Weak barrier	No barrier	Comments?
I don't know enough about how to (hunt, gather, fish)	☐	☐	☐	☐	
Not enough available anymore	☐	☐	☐	☐	
Quality Is poor	☐	☐	☐	☐	
The area where they used to be found is heavily degraded	☐	☐	☐	☐	
No one brings them to me	☐	☐	☐	☐	
I'm physically unable to hunt, fish or gather	☐	☐	☐	☐	
Rules and permits about gathering/fishing/hunting	☐	☐	☐	☐	
Climate change	☐	☐	☐	☐	
I don't know where to find them	☐	☐	☐	☐	
I don't know how to prepare them	☐	☐	☐	☐	
It's too time consuming	☐	☐	☐	☐	
Transportation to collection areas	☐	☐	☐	☐	
I'm not familiar with eating Native foods	☐	☐	☐	☐	

I don't have the kitchen space or equipment to prepare them	☐	☐	☐	☐	

42. If you have knowledge about gathering, fishing, hunting, preparing, or managing Native foods or materials, have you shared your knowledge with anyone?

☐ No (***if no***, *skip to question 45*) ☐ Yes (***if yes***, *answer questions 43 - 44*)

43. If you answered yes to 42 please indicate with whom or where you have shared your knowledge of Native foods or materials.

(*Please check all that apply*)

- ☐ My children
- ☐ Nieces/nephews
- ☐ Other family members
- ☐ Friends
- ☐ Other Tribal members
- ☐ Non-Tribal members
- ☐ At a ceremony
- ☐ At a class or workshop
- ☐ Other (*please describe*):

44. If you answered yes to 42, where did you learn about gathering, fishing, hunting, preparing, or managing Native foods or materials?

(*Please check all that apply*)

- ☐ From a family member
- ☐ In school
- ☐ From someone not related to me
- ☐ From a tribal program
- ☐ From a non-tribal program
- ☐ Self-taught

Other:_____

45. What would you like to learn more about Native foods and materials?

(Please check all that you would like to learn more about, and rank the top 1 - 4 you most want, 1 being the one you want the most)

- ☐ _____Where to gather traditional foods, medicines, and materials
- ☐ _____When to gather traditional foods, medicines, and materials
- ☐ _____How to hunt for food
- ☐ _____How to fish for food
- ☐ _____How to forage or gather food

☐ _____The cultural significance of traditional foods
☐ _____How to manage traditional foods and materials
☐ _____How to prepare traditional foods
☐ _____How to prepare traditional medicines
☐ _____How traditional foods taste
☐ _____How to preserve traditional foods by canning, freezing, drying, etc.
☐ _____Other (*Please explain in the space below*)
☐

46. Many Tribal families have expressed a desire to incorporate more Native foods into their diet. In your opinion, what would make it easier for your household to do that?

Please check all the things that would help you eat more Native foods, and rank the top 1 - 4 things, 1 being the one you want the most)

☐ _____Improve management of Native foods
☐ _____Incorporate it into Tribal commodity/food distribution program
☐ _____Integrate it into school lunch program
☐ _____Offer classes/workshops on how to gather, prepare and preserve
☐ _____Offer classes/workshops on how to hunt, butcher, can
☐ _____Offer classes/workshops on how to fish, smoke, can
☐ _____Remove legal barriers to hunting, fishing, gathering
☐ _____Make it available in local stores

47. Do you have any other comments about the greatest barriers to carrying on Native food traditions or how to make it easier for you to eat Native foods?

VI. Community Resources and Food Education

48. Which of the following resources would you use if they were available in your community?

(*Please check all that apply*)

☐ Certified kitchen
☐ Dehydrator
☐ Canning equipment
☐ Chicken plucker
☐ Cider press
☐ Smoke house
☐ Community freezer
☐ Communal gardening tools (rototiller, etc.)
☐ Food bank
☐ Soup kitchen
☐ Farmer's market
☐ Community garden

☐ Community greenhouse
☐ Volunteers to help harvest your fruit or vegetables
☐ Weekly vegetable box from local farms
☐ Food buying cooperative
☐ **Other community resources you want?** (*please list in the space below*):

49. Has anyone in your household attended any food-related classes, camps or workshops over the past few years?

☐ Yes ☐ No (*if no, please skip to question 52)* →

50. If YES please list what classes, camps or workshops you or your household participated in and indicate if you have applied what you learned yet or not.

Topic of Class	I applied what I learned?
1._____	Yes ☐ Not yet ☐
2._____	Yes ☐ Not yet ☐
3._____	Yes ☐ Not yet ☐
4._____	Yes ☐ Not yet ☐
5._____	Yes ☐ Not yet ☐
6._____	Yes ☐ Not yet ☐

51. If you answered YES to 49, which food related class, camp or workshop was the most useful or interesting and why?

52. In the event of an emergency (e.g. road closure, loss of electricity), what do you have in your home in case you are unable to get food by normal means?

(*Please check all that apply*)

☐ Drinking water to last at least 3 days
☐ Non-perishable foods to last at least 3 days
☐ Propane stove
☐ Generator
☐ Radio
☐ Others/Comments:

53. Do you always have access to drinkable water from the tap?

- ☐ Yes, always
- ☐ Usually, but not always
- ☐ Sometimes
- ☐ Rarely
- ☐ Never

54. How would you like to receive information on anything food related in your community?

(*Please check all that apply*)

- ☐ Public meeting
- ☐ Notice on bulletin board
- ☐ Mailed to PO Box
- ☐ Website
- ☐ Facebook or other social media site
- ☐ Email
- ☐ Local newspapers
- ☐ Local newsletters
- ☐ Local radio
- ☐ I don't want to receive information
- ☐ Other ideas? (*Please share below*)

55. Do you or anyone in your household have any of the following health conditions?

(*Please check all that apply*)

- ☐ High blood pressure
- ☐ Hypertension
- ☐ Heart condition
- ☐ Type II diabetes
- ☐ Obesity or overweight
- ☐ Cavities
- ☐ Food allergies
  (*Please list*:_____)
- ☐ Other (*please list*)

56. What is <u>your</u> current annual income?

- ☐ Under $10,000
- ☐ Between $10,000 - $19,999
- ☐ Between $20,000 - $29,999
- ☐ Between $30,000 - $39,999
- ☐ Between $40,000 - $49,999
- ☐ Between $50,000 - $59,999
- ☐ Between $60,000 - $69,999
- ☐ Between $70,000 - $79,999

☐ Above $80,000

57. What is the current annual income of your household?

☐ Under $10,000
☐ Between $10,000 - $19,999
☐ Between $20,000 - $29,999
☐ Between $30,000 - $39,999
☐ Between $40,000 - $49,999
☐ Between $50,000 - $59,999
☐ Between $60,000 - $69,999
☐ Between $70,000 - $79,999
☐ Above $80,000