**Nixyáawii, Awkú Čáwpam Áḱaatta!** "Nixyáawii, Don't Throw it Away!" Project

# CTUIR Food Waste Assessment





A Report by the Nixyaawii, Don't Throw It Away! Project Team:

Biowaste Technologies, LLC and CTUIR DNR First Foods Policy Program

[Anticipated publication: Fall 2026]

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**Executive Summary**

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) is the federally-recognized Tribal government that represents the Cayuse, Umatilla, and Walla Walla Tribal peoples, and governs services and activities on the Umatilla Indian Reservation (UIR). CTUIR has 176,000 acres of lands in Tribal Trust in Oregon and over 12,000 acres in Washington, and the Tribe reserved rights to hunt, fish, gather, and graze in 1.6 million acres of Ceded lands in both states, and traditional use rights that extend east and west from the Pacific Ocean to the Rocky Mountains in Montana, and north and south from the Canadian border down to the Great Basin in Nevada and California.

For CTUIR, First Foods are culturally significant plants and animals that are part of a seasonal round relationship. Annual Feast ceremonies welcoming back First Foods every year, and involve preparation and consumption of both First Foods as well as non-First Foods that have become a staple of the Longhouse meal table. Because of this strong food-associated culture, our project focuses on this Longhouse community to promote and understand necessary behavior change starting at a community level. With this behavior change, this pilot project explores what resource recovery success and its benefits look like for this unique Tribal community. Food waste diversion initiative documented in this Food Waste Assessment is an attempt to address First Foods with respect at all steps.

Much of the population density on the UIR is clustered around the Mission area, known in the Umatilla Tribal language as Nixyáawii, which includes the Tribal Nixyáawii Governance center Center and Nixyáawii School, as well as a corner market, Elders and Youth services facilities, housing areas, an economic development corridor that attracts consumers from the nearby Federal Interstate I-84 which transects the Umatilla Indian Reservation, and the cultural and community gathering space at the Longhouse.

Our project service area was a roughly 1 mile radius around the Longhouse, which included a number of “host sites” that agreed to participate with the project. These host sites include the Nixyaawii Longhouse Feasts and select other events, the CTUIR DCFS Family Engagement Program’s Culture Nights hosted weekly at the Longhouse, the Nicht-Yow-Way Seniors Center operated by the Yellowhawk Tribal Health Center, the CTUIR Dept of Education’s Afterschool Program, and select residents of Mission. Our project aims to understand the weight, volume, and types of food waste created by our project host sites to plan strategically for the methods and scale of a large organics recovery facility to serve our larger Tribal community. This project creates a baseline understanding of how frequently Tribal entities create food and other organic waste, what the general type and quality is, and what methods of food waste processing would be best to transition this food waste into a recovered resource material.

Food Waste Audit Data

| Diversion Pathway | FW in Pounds |
|---|---|
| Food Waste Diverted FY25 total | 3459.8 |
| Food waste to composting | 554 |
| Food waste to Livestock | 847.5 |
| Food waste to Anaerobic Digestion | 430.5 |
| Food waste to landfill | 889 |
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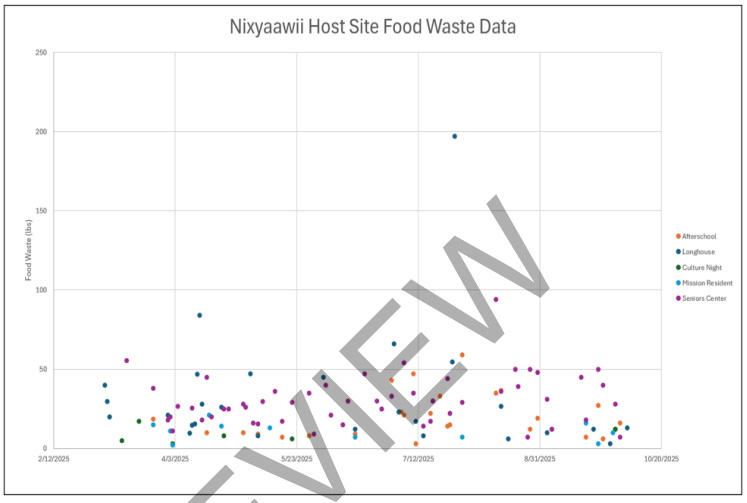



Please find detailed information about food waste collection methodology and data in the full report and its appendices.

Community Perception and Survey Data was also collected as part of this assessment.

Highlighted community responses include:

- 94% of community felt reducing food waste at CTUIR events and food service programs was either Extremely Important or Very Important
- 54% of Tribal community diverts food waste at home All the Time or Often
- Leftovers make up 63% of food disposed at homes while First Foods make up less than 2%
- Food spoiling or becoming stale was the primary reason food is thrown away at 62% of FW
- Reducing waste in all aspects is a primary motivator for food waste prevention at 66%
- 60% said they would participate in a community-scale organics recovery operation
- Lack of knowledge in community was the biggest concern for a large operation at 45%

Food waste collected was processed into diverse locations including a trial anaerobic digester, to local livestock, to composting methods like Bokashi, Vermicomposting, and Aerobic composting. Bio-gas research was explored during this project, and unsuccessful trials illuminated requirements for a successful trial that include airtight design, temperature stability, fresh manure for maximum microorganisms, and insulated design with easy input and output access.

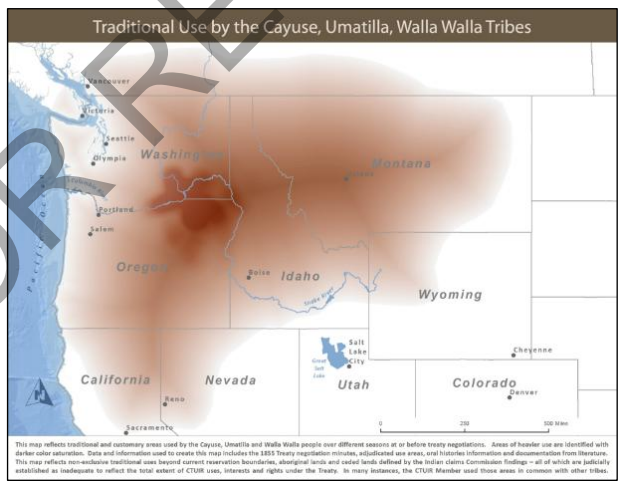
Carbon emissions prevented from food waste recovery are measured in vehicle travel prevented. Our project estimates a prevention of 4,312,354 gCO2 emissions prevented over 2 years. This is a rough estimate; FWA data can be used to understand a community scale operation's carbon reduction potential through the ODEQ Waste Impact Calculator.

# Part 1: Introduction to CTUIR

### 1.1 History and Geography

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) is the federally-recognized Tribal government that represents the Cayuse, Umatilla, and Walla Walla Tribal peoples, and governs services and activities on the Umatilla Indian Reservation (UIR). CTUIR has 176,000 acres of Tribal land in Oregon (Tribal Trust, allotted Trust, and Tribal Fee) and over 12,000 acres in Washington. The Tribe reserved rights to hunt, fish, gather, and graze in 1.6 million acres of Ceded lands in both states, and traditional use rights that extend east and west from the Pacific Ocean to Montana, and north and south from the Canadian border down to the Great Basin in Nevada and California.

More information about the history and geography of CTUIR can be found at the CTUIR website and associated publications.


*Figures 1 and 2: Maps created by the CTUIR Office of Information Technology Geographic Information Systems (OIT-GIS) illustrate CTUIR's physical location within the Pacific Northwest. Figure 1 (left) shows the Ceded lands and Umatilla Indian Reservation in Oregon and Washington states, and Figure 2 (right) is a density map that shows CTUIR historical use documented through both published literature and archeological.*

Within these lands is at least one large commercial landfill, where CTUIR's Tribal community sends its municipal solid waste, along with large and small non-Tribal communities. This large landfill, known as Columbia Ridge, is located along the N'Chiwana, the Columbia River, where it creates air, soil, and water contamination concerns for adjacent communities like CTUIR, as well as for Tribal fishermen that fish in the reserved Zone 6 reach of the massive river basin. Thus, the issue of waste reduction and management is an important issue for Tribal people, not just

as an esoteric concern but of material consequence to Tribal families located near and impacted by the waste management location.

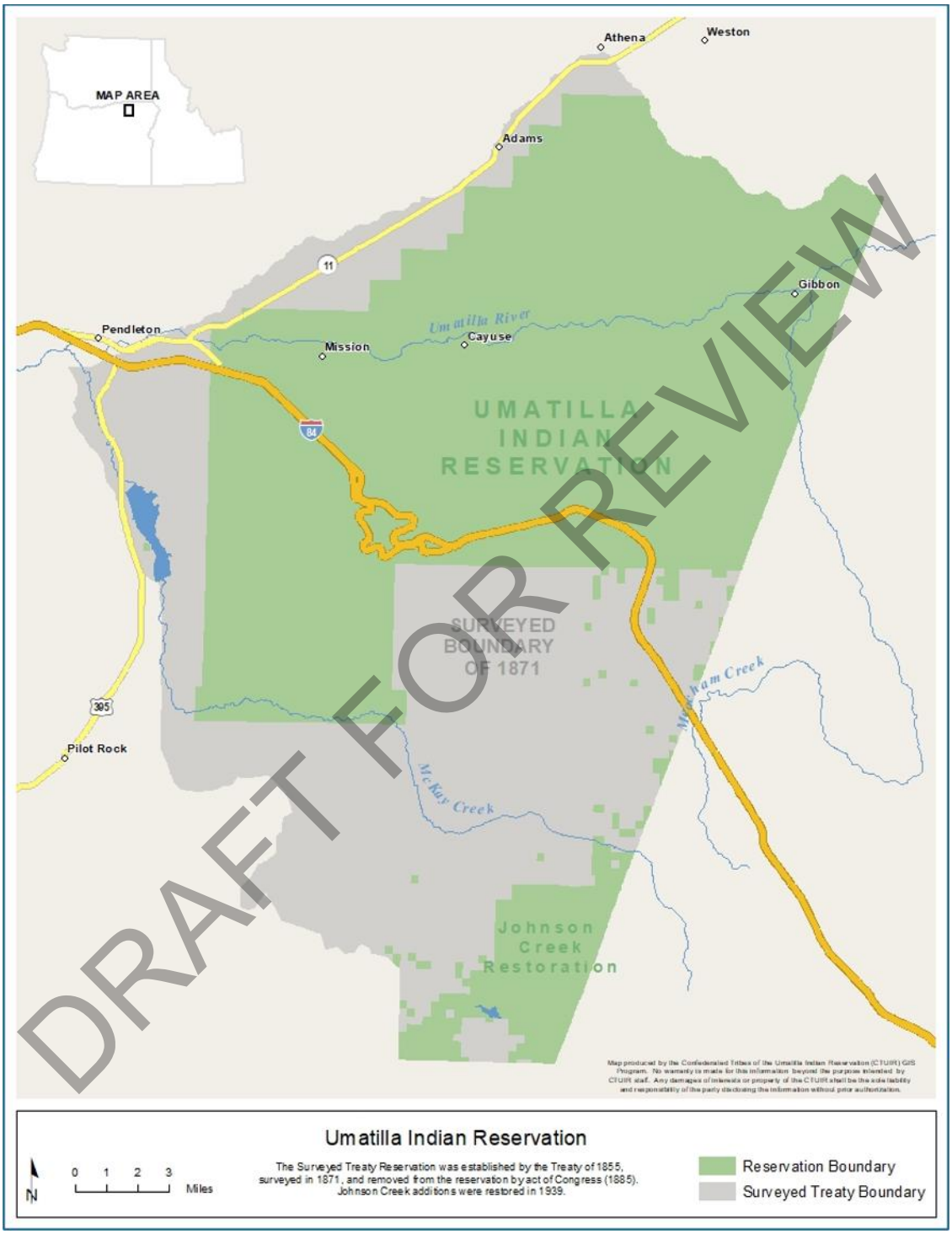





Figure 3: Umatilla Indian Reservation

## 1.2 Governance and Community

Tribal people still exist in modernity and while this may sound obvious, it warrants reiteration especially in materials management conversations. Tribal communities exist in modernity and encounter many of the same challenges as non-Tribal communities.

While CTUIR Tribal members and descendants are found around the world, the concentration of people who identify as part of the CTUIR membership and community are located on and around the Umatilla Indian Reservation (UIR) which encompasses roughly 176,000 acres. Much of the population density on the UIR is clustered around the Mission area, known in the Umatilla Tribal language as Nixyáawii, which includes the Tribal Nixyáawii Governance Center (NGC) and Nixyáawii School, as well as a corner market, Elders and Youth services facilities, housing areas, an economic development corridor that attracts consumers from the nearby Federal Interstate I-84 which transects the Umatilla Indian Reservation, and the cultural and community gathering space at the Longhouse.

The Nixyáawii Governance Center (NGC) is the Tribal government operations center which houses most of the departments that implement services to the reservation and Tribal membership. Many of its departments operate food service and materials management services on the reservation, including as part of the Yellowhawk Tribal Health Center that operates the Elders services facility with the Nicht-Yow-Way Seniors Center.

The CTUIR Tribal membership totals 3,200 enrolled, with a UIR population of at least about 1,165 Tribal members. Members of other tribes and non-Indians also reside on the UIR, though they may or may not consider themselves to be part of the Tribal community. It is the population of Mission/Nixyáawii specifically, roughly 1,000 residents, and of the reservation more broadly, which is the target audience for this project.


*Figure 4: Mission/ Nixyáawii Population Center and Project Service area; CTUIR OIT GIS 2025.*

Figure 4 indicates Project Host Sites within Nixyáawii /Mission Community Core:

1) Nixyáawii Longhouse
2) CTUIR Family Engagement Program (Dept of Child and Family Services)
3) CTUIR Afterschool Program (Education Dept)
4) Nicht-Yow-Way Seniors Center (Yellowhawk Tribal Health Center)
5) Mission Housing Area (CTUIR Housing Dept)

Designed to be "hyper-local" in its focus, this project centered activities on the population and cultural core of the Tribal community, with the hope this would create a seed of behavior change that would blossom into structural change for the reservation and surrounding region. To do this, our project activities focused on the spiritual core of the community, the Longhouse, as well as additional host sites that provide services directly to those in our community.

### 1.3 Historical Context Around Materials Management

#### 1.3.1 First Foods and Cultural Materials Management

"First Foods" are the culturally significant plants and animals that have been harvested and stewarded by Native people since time immemorial. Tribal culture centers on First Foods and the caring for habitats that produce these species in ceremony and belief. These First Foods are served as part of annual seasonal events at the Longhouse, along with other kinds of non-First Foods that are still culturally significant like frybread and "lukamin" stewed chowder, and non-culturally significant foods like boiled potatoes, meatloaf, macaroni salad, parfait and jello salads, pies, and cakes, among others.

More information about First Foods and their connection to Tribal culture can be found in CTUIR Dept of Natural Resources (DNR) publications like the Umatilla River Vision, First Foods Upland Visions, and many others housed on the CTUIR DNR website.


*Figure 5: Visualization of the Longhouse serving order for First Foods, courtesy of the CTUIR Language Program (2026).*

### 1.3.2 Contemporary First Foods Materials Management

Some First Foods also are available in a commercial capacity as well, including at different CTUIR food service locations. These include First Foods like Salmon, Elk and Deer, and Huckleberry products that are served at CTUIR locations like the Seniors Center, Wildhorse Resort and Casino establishments, and Kinship Café at Tamástslikt Cultural Institute.

When working with First Foods, cultural practitioners are responsible for treating plant and animal materials with respect throughout the process. Many cultural practitioners still implement the practice of returning peelings, leaves, bones, and innards back to the land, most appropriately returned to the location of harvest. Historically, many of the plant and animal materials that were not directly edible were used for tools, utensils, textiles, adornments, and other uses. It's worth noting that historically waste was biological in nature, and returned to the land likely at or near the site of harvest. Modernity adds some introduced foods, artificial products, and waste transportation and disposal services to the serving process that change the food waste stream and final end location of waste. These changes have implications for climate health.

*Image 1: Primary processing of First Foods typically includes an initial field processing that removes non-edible materials like organs and fascia tissue and returns these to the land directly. Secondary processing occurs at the Longhouse, where materials like peelings and bones are saved to be returned to the land, though adherence to this procedure depends on families and cook groups. Photo by CUJ/East Oregonian, 2010.*

These practices are still held true in the Nixyáawii Longhouse to a great extent. Many Longhouse Cooks and Harvesters maintain the practice of returning unused plant and animal tissue back to the environment. There is a ceremonial protocol to return materials from seasonal Feast events back to the lands where they were procured.

*Images 2 and 3: Tribal communities are modern communities that face similar challenges as non-Tribal communities, and food waste is no exception. Unavoidable food waste includes things like unripe berries and leaves (left) and Salmon spinal chords and fins (2025).*

In her book on Columbia Plateau basketry art, Mary Dodds Schick recalls an interaction from 1967 receiving Huckleberries from a Yakama Tribal harvester:

> *"[The Tribal harvester] did not deliver the shiny purple berries in the plastic gallon ice cream bucket I expected; she handed them to me in a beautiful coiled Klikitat-style berry basket… 'Don't throw away the leaves,' she told me, 'They need to go back to the mountain.' I looked puzzled. 'So nothing will ruin next year's crop,' she explained (Schlick 1994; 75)."*

Especially within the Longhouse, these ancestral connections are maintained with respect and many still practice the act of returning non-edible First Foods materials back to the land. More information on historical and cultural practices of caring for food is found in the Elders Interviews section on page [#].

### 1.3.3 Note on Attempts to Include Tribal Cultural Knowledge

As an exploratory effort, our project has committed to honestly confronting and documenting issues around materials management that have been encountered by our efforts. Early in the development of the project, CTUIR staff attended an education training hosted by the Portland Metro agency and Oregon Natural Resource Education Program (ONREP) called "Garbology 101" in May 2024. This multiple day training was provided free of charge and was designed to prepare K12 and substitute teachers to offer classroom education about materials management, composting, and garden science to students, and included a tour of the Portland

Municipal Transfer Station, where waste from the city is processed and prepared for transportation to Oregon landfills. It was a robust training that CTUIR staff felt was good preparation for the project, but did include a component that was valuable learning experience in communicating materials management to diverse audiences.

*Images 4 and 5: CTUIR staff attended the Portland Metro "Garbology 101" training course, which included classroom education activities and a tour of the Portland Municipal Transfer Station (May 2024).*

During the classroom education component, ONREP staff made a good-faith attempt to include Tribal perspectives and knowledge in their curriculum. This manifested as a True or False "fun fact" question about the first known "landfill" in human history. This question asked if it was true or false that the first documented "landfills" were found in Crete, in what is now Greece, dating back to 3,000 BC. The answer to the question asserted this statement was false, arguing that Native American "middens" of culturally significant materials are the first documented "landfills" known to history, dating back 10,000 years or more in Oregon.

In archeological terms, a "midden" is a location where materials were collected or deposited as part of human activity. From a Tribal perspective, these "midden" sites were adjacent to migratory or permanent village sites, and plant and animal materials that were not immediately usable were placed in aggregated locations for future use or use by others. These were not thought of as "waste" in Tribal ethos, because they were intended for use and not permanent disposal. Thus, the "fun fact" attempting to include Tribal knowledge in their lesson plan inaccurately assigned a designation of "waste" to items placed in these middens. CTUIR staff addressed the inaccuracy in ONREP's lesson plan, and after a discussion on appropriate use of Tribal knowledge in the lesson plan, the training resumed with renewed understanding.

[WHAT ELSE WOULD WE LIKE TO SAY HERE??]

1.3.4 Tribal Materials Management with TERF

[History of TERF that Ashley wants to use]

When did TERF get started? Has it expanded or changed over time? What are some of the challenges or opportunities TERF has encountered over time? What kind of materials does TERF process?

[PHOTO FROM TERF Image 6]

1.3.5 Connection to Pendleton Sanitary Service Inc. in Pendleton

[Explanation of relationship between TERF and PSSI]

Categories of waste are aggregated at TERF and then transferred to the PSSI location, before being transferred to the large industrial landfill at Columbia Ridge Landfill, outside Arlington, Oregon.

[Food waste management at TERF]

*Image 7: Food waste collected from three locations around Umatilla County are deposited at the processing site at PSSI to be turned into commercially available compost (2024). Food waste has not been collected from locations on the UIR previously.*

### 1.4 Nixyaawii, Don't Throw It Away! Project Pilot

Climate adaptation often begins with a small but meaningful change in behavior that, over time, can add up to have a big impact. Preventing food from being thrown away in landfills has the potential to reduce carbon emissions associated with transportation to landfilling locations and methane created from anaerobic decomposition of organics within landfills themselves. Measuring how much food waste is created from our Tribal entities and events is important for understanding the potential for our community to reduce our environmental foot print and recovery resources to be reinvested back into our community.

Moreover, for Tribal communities uniquely, food is often deeply connected to ceremony and place. For CTUIR, this connection is with the First Foods, culturally significant plants and animals that are part of a seasonal round relationship kept unbroken for millennia. Annual Feast ceremonies welcoming back First Foods every year are hosted at the Longhouse and involve preparation and consumption of both First Foods as well as non-First Foods that have become a staple of the Longhouse meal table.

Because of this strong food-dependent culture, our project focuses on this Longhouse community to promote and understand necessary behavior change starting at a community level. With this behavior change, this pilot project explores what resource recovery success and its benefits look like for this unique Tribal community.

#### 1.4.1 NDTIA! Project Goals and Activities

A typical waste assessment or audit process involves examining waste collected from the target population and a visual analysis of the types and volumes of waste in the sample is documented. Due to limitations of capacity and access for Tribal government staff, our project team took a different approach to understand the types and quantities of organic waste created by our community. This approach involved an initial behavior change to train our host site audiences to divert food waste created from meal preparation and uneaten food from services into a dedicated food waste collection bin, which was then examined for its weight, volume, and general contents categories. Through this behavior change and data collection over time, we developed our understanding of the realistic amount of food waste recoverable through documenting the recovery possible through community action.

Thus, the overall goals of our Nixyaawii, Don't Throw It Away! Project are:

- Goal 1: Food Waste Assessment
- Goal 2: Community Capacity

- Goal 3: Explore the Áq̓paš

Goal 1 is the focus of this report, however it wouldn't have been possible without first implementing Goal 2 and sustaining it through the project's life. Goal 3 is also explore further in Part 4 of this report.

For a more detailed overview of different activities and actions from the Nixyáawii, Don't Throw It Away! Project, please visit the CTUIR website dedicated to project archives.

### 1.4.2 Connection to Single Use Plastics

Within the Nixyaawii, Don't Throw It Away! Project, food waste is the primary focus, with a secondary focus on the reduction and prevention of single use plastics (SUPs) use and waste. A large reason this element was included in the project activities is due to the fact that single use plastic represents the largest source of contamination of non-organics in our collected food waste. By reducing the reliance on single use plastic items like plastic utensils, water bottles, baggies, we are improving circumstances to reduce plastics contamination in future organics recovery efforts, as well as reducing environmental harms caused by pollution from single use plastics.


*Image 8 and 9: Single use plastic is the biggest contamination category our project observed in food waste collected from host sites.*

Globally, food waste is the most abundant category in landfills by weigh, but plastics are most numerous by volume, so addressing both simultaneously is efficient. Single use plastic waste is not explicitly covered in this Food Waste Assessment document, but more information about the connection and associated project efforts can be found in Appendix B.

# Part 2: Understanding Our Organics Recovery Potential

### 2.1 What are Our Organics of Interest?

According to the United States Environmental Protection Agency (EPA), 31 percent food loss at the retail and consumer levels, corresponded to approximately 133 billion pounds and $161 billion worth of food in 2010. The EPA estimates that 38% of food produced nationally is never eaten (ReFED 2024), and that in the United States in 2018, more food was sent to landfills than any other single material in our everyday trash. When this food ends up in landfills, it decomposes in conditions without oxygen, which create greenhouses gases that include methane, which contribute to the global climate crisis. This loss of food waste to landfills also represents a loss of all the resources that were used to create the food, including water, fertilizers, transportation fuels, and human labor.

Thus preventing food from ending up in landfills has many immediate and long term benefits, and community infrastructure to recover organic materials like food waste and other yard and vegetation management can support circular economy initiatives and boost local agricultural production.

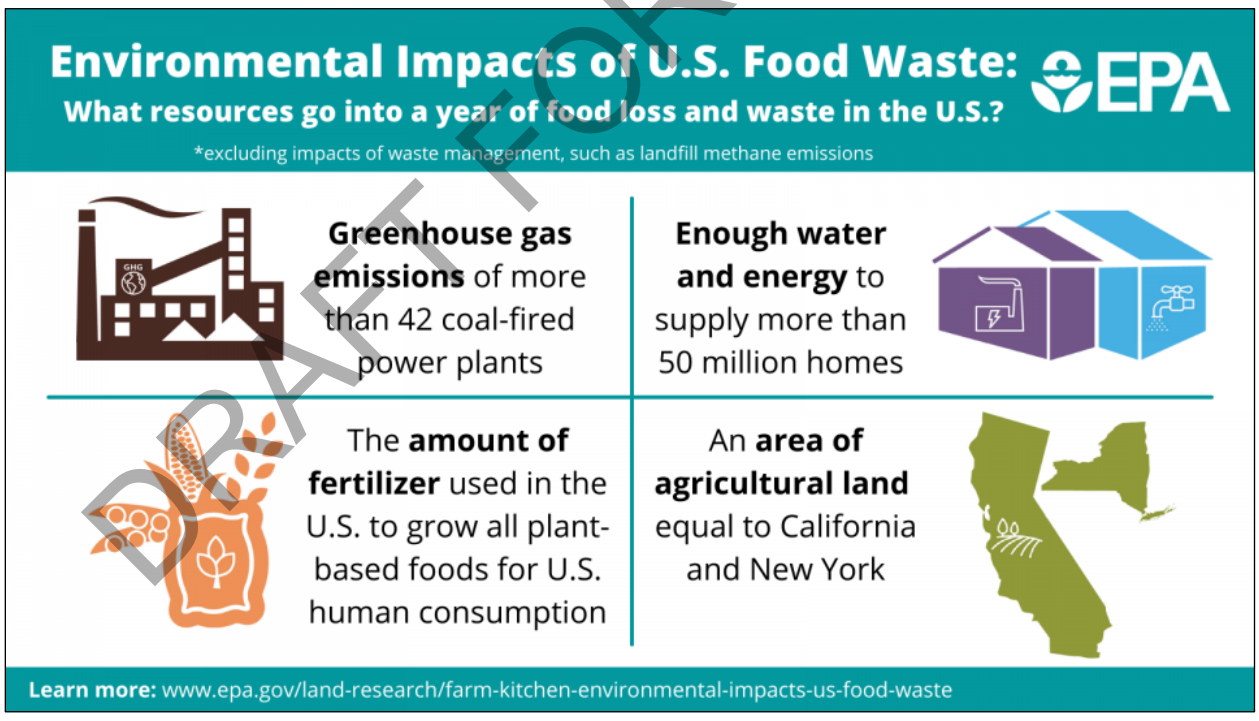



*Figure 6: Wasted food represents resources extracted and lost from our communities; US EPA 2026.*

### 2.1.1 Food Waste in Oregon

In Oregon, as nationally, food waste is a large contributor to landfill materials every year. The state of Oregon has committed resources to addressing this problem of inefficient use of resources through their 2050 Strategic Food Action Plan, which involves a commitment to

Food waste is generated from food service establishments associated with CTUIR. Much of this food waste is unpreventable; this includes non-edible portions of food preparation activities and decorative plant material from commercial operations. There is also a certain amount of post-consumer food waste created from guests and patrons of CTUIR food service and community events.

[Additional information here about food waste in Oregon]

### 2.1.2 First Foods in the Waste Stream

While First Foods are treated with respect and care through the food preparation process by Longhouse Cooks and cultural practitioners, post-consumer food waste does not typically receive equivalent attention to respect of First Foods. Longhouse Cooks can only control waste that may happen in the preparation kitchen, but have far less control of what is thrown away at the end of the meal. Preventing food from being wasted is the role of families and communities, and the Longhouse provides food take-away supplies like Ziploc bags for families to prevent food waste by rescuing it for other family members and domestic animals. However, much of the food waste left at the end of the meal has been partially consumed or contaminated through interaction with guests. For various reasons, this post-consumer food waste is not safe to be rescued for human consumption, and ends up in the landfill waste stream unless diverted. This food waste can often include First Foods, especially Foods that are not commercially or popularly consumed as community members may not be familiar with them or appreciate their taste and texture. Thus these First Foods have the potential to end up in the landfill waste stream, unless a dedicated food waste diversion effort.

Thus the food waste diversion initiative documented in this Food Waste Assessment is an attempt to address First Foods with respect at all steps, even at the end of their time with us before they return to the soil. Through the implementation of this project, we have been able to document and capture First Foods that would have otherwise been lost from our lands and communities forever.


*Image 10: During Longhouse Feast events, project volunteers like Abigail MacIntosh (right) help collect food waste separately from other post-meal garbage in the dedicated food waste collection bin. Photo by Annie Warren, Northwest Public Broadcasting, 2026.*

Throughout the course of this pilot project, Longhouse Cooks and volunteers made it possible to collect post-consumer Feast food waste in a separate disposal container, allowing for the food waste from these meals to be captured, quantified, and processed differently than other non-organic waste created by these ceremonial meals.

*Images 11 and 12: While First Foods are treated with great respect by the Longhouse Cooks and cultural practitioners, these plants and animals are not always similarly treated by guests at Longhouse ceremonial events. Pictured here are Latit latit (Celery) plants that were recovered from the post-consumer food waste collected for the Longhouse Celery Feast (2025).*



**2.2 Project Service Area – Organics Recorded**

Our project service area was a roughly 1 mile radius around the Longhouse, which included a number of "host sites" that agreed to participate with the project. These host sites include the Nixyaawii Longhouse Feasts and select other events, the CTUIR DCFS Family Engagement Program's Culture Nights hosted weekly at the Longhouse, the Nicht-Yow-Way Seniors Center operated by the Yellowhawk Tribal Health Center, the CTUIR Dept of Education's Afterschool Program, and select residents of Mission.

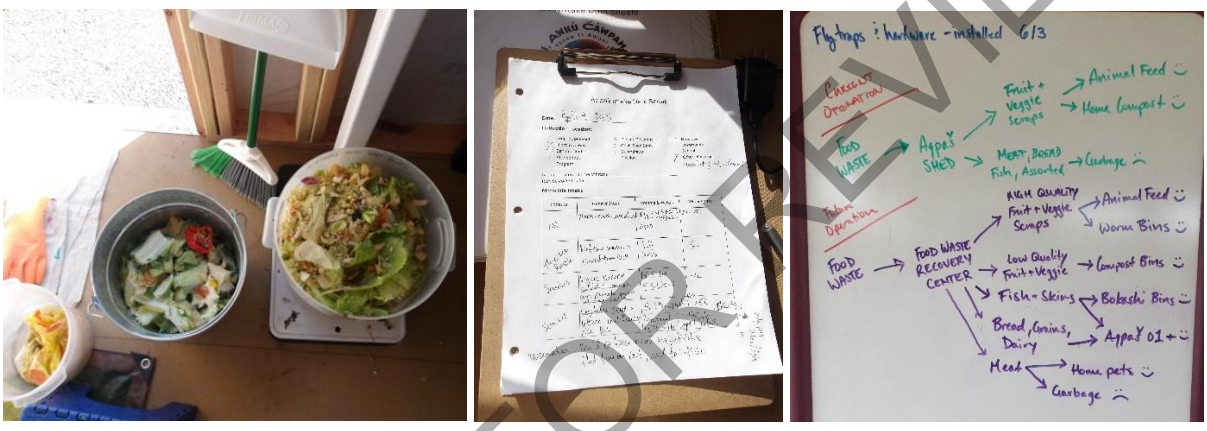
These host sites were selected due to their proximity to a centralized food waste collection point near the Longhouse, their role in food preparation services to the Tribal community, and willingness to participate with project activities.

Longhouse Feast activities occur roughly quarterly, with attendance in the hundreds. Seniors Center serves 30-50 Tribal Elders and their families daily during the work week (Monday to Friday). Culture Night serves a set dinner menu prepared by program staff to 40-100 families roughly weekly during the school year (October to June). Afterschool Program serves snacks

and a light meal to Tribal Youth daily year-round, transitioning from afterschool services during the school year to day camp services during summer months, serving 20-50 students. One Mission family signed up with our project, a household of two.

### 2.2.1 Methodology

Our project aims to understand the weight, volume, and types of food waste created by our project host sites to plan strategically for the methods and scale of a large organics recovery facility to serve our larger Tribal community. This project creates a baseline understanding of how frequently Tribal entities create food and other organic waste, what the general type and quality is, and what methods of food waste processing would be best to transition this food waste into a recovered resource material.




*Images 13, 14, and 15: Food waste collected from project host sites is weighed, volume is measured via calibrated collection buckets, and general contents is noted. Food waste is then diverted to different management channels depending on the types and qualities. These metrics as well as diversion pathway is noted on paper data sheets compiled at the end of the month. Photos by CTUIR DNR First Foods Policy Program, 2025.*

Food waste was collected according to the collection schedule in Table [1]. Throughout the project period this schedule was maintained as strictly as possible. Occasionally host sites would not remember to leave food waste out for pick up but these events were noted in the data. Many events were disrupted by community member funeral services, as it is cultural practice to cancel or postpone events at the Longhouse if a community member's family chooses to host the funeral ceremony at the Longhouse as part of Tribal religious practice. This disruption mostly affected pick up for Family Engagement Program Culture Night.

To adhere to requests by CTUIR Environmental Health and Safety, project protocol directed that no food waste would be left uncovered in the project shed for more than 12 hours, and no food waste would be left at all longer than 48 hours. This was to guarantee that fresh food waste is easier to process to recovered sources

Table 1: Food waste collection schedule for project host sites

| Project Host Site | Collection Schedule |
|---|---|
| Nixyaawii Longhouse | Mondays; as needed with large events |
| Family Engagement Program | Wednesdays after weekly event |
| Seniors Center | Wednesday and Friday |
| Afterschool Program | Wednesday and Friday |
| Mission Resident | On call; typically once per month |

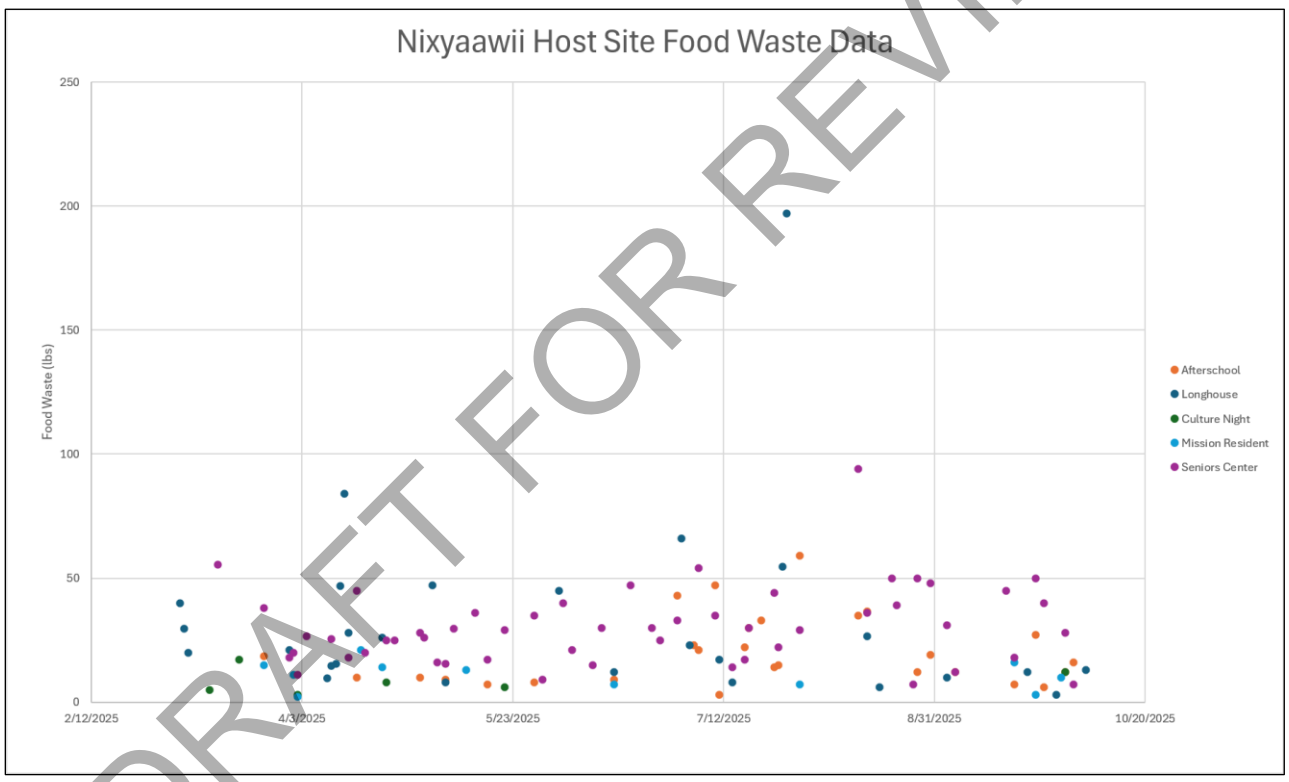



*Figure 7: Food Waste (FW) weights collected from project host sites in the FY25 reporting period.*

Table 2: Highlights from compiled food waste data

| Diversion Pathway | FW in Pounds |
|---|---|
| Food Waste Diverted FY25 total | 3459.8 |
| Food waste to composting | 554 |
| Food waste to Livestock | 847.5 |
| Food waste to Anaerobic Digestion | 430.5 |
| Food waste to landfill | 889 |
| Rescued food to hungry people | 28 |
| Unaccounted for/pre-shed collection* | 698.8 |
| Margin of error | 3 |



* Unaccounted for/pre-shed collection indicated that food waste data collection began before the project infrastructure that would house composting equipment was installed. This food waste was measured and often taken to project team members' home compost pile collections if it was of good quality, or returned to the landfill stream if poor quality. Due to lack of access to equipment during this period from Nov 2024 to February 2025, this food waste has been noted as collected but unaccounted for in our diversion accounting.

[FY26 data pending]

### 2.2.2 Nixyaawii/Mission Longhouse

The Longhouse is the religious, ceremonial, and community center for the CTUIR community. Food waste was collected regularly from Sunday Services that happen weekly and include a ceremonial meal as part of services. Collection also occurred from four seasonal ceremonial events that happen annually, which include "Indian New Year" during December, "Celery Feast" in February/March, "Root Feast" in April, and "Huckleberry Feast" in July/August.

Funerals also happen periodically at the Longhouse, however due to the sensitive nature of these events, project staff only collected food waste if it was specifically requested by the family conducting these ceremonial events. Celebrations and pow wows are also held at the Longhouse at times, but due to the long duration and decentralization of food services during these types of events, project staff did not have capacity to conduct food waste collection during these types of events.

Longhouse Feast activities occur roughly quarterly, with attendance in the hundreds.

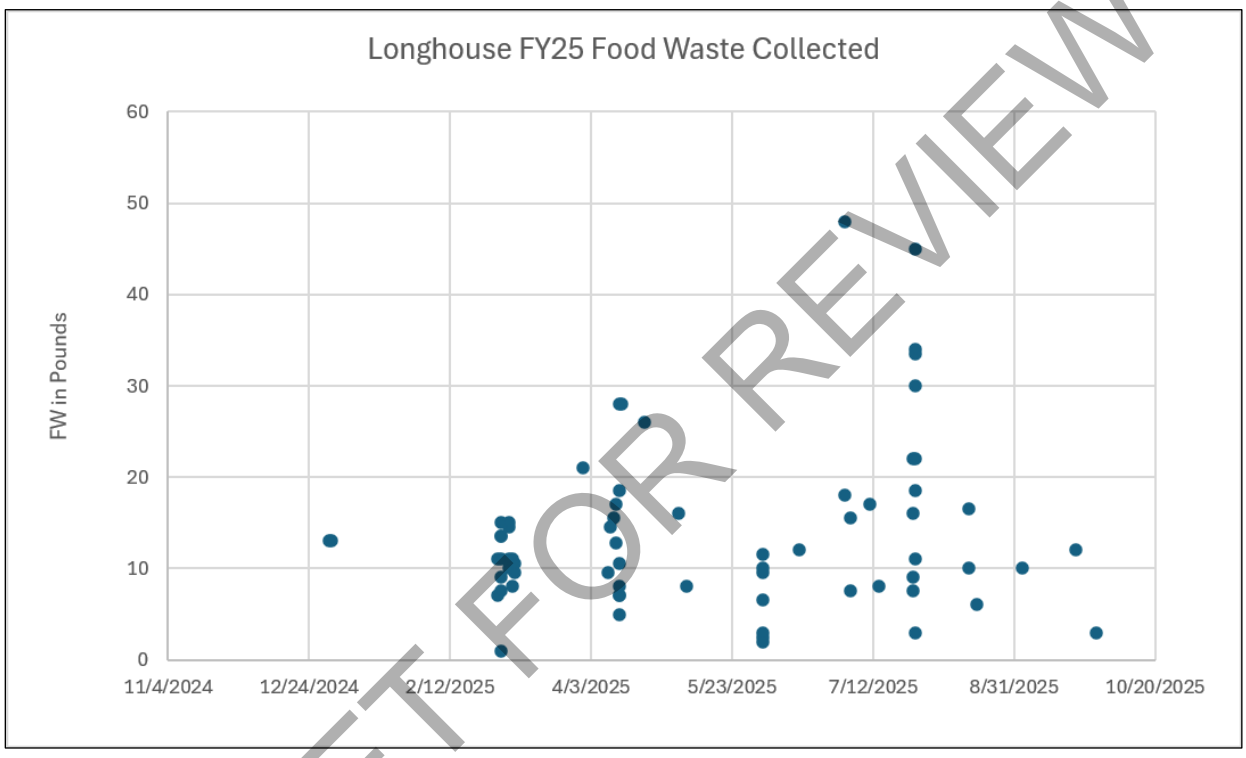





*Figure 8: Food waste weights collected from the Nixyaawii/Mission Longhouse during FY25. The total amount of food waste collected from this host site during this period is 947 pounds.*

### 2.2.3 Nicht-Yow-Way Seniors Center

The Nicht-Yow-Way Seniors Center provides services to Tribal Elders (age 65+) and their families, and is operated by the Yellowhawk Tribal Health Center. Food service is daily during the week days, and the Center is open most weeks out of the year. Estimated patronage of the Center for meals is ~40 people per day.

Seniors Center is the site that offers the most robust food service out of all our host sites and was the most committed to capturing food waste, with Elders even reminding Center staff to set out the food waste collection bucket if they had forgotten. Because of this frequent meal

service and dedication to diversion, Seniors Center represents the bulk of food waste collected from our project service area.

Seniors Center serves 30-50 Tribal Elders and their families daily during the work week (Monday to Friday). Meals are planned by Yellowhawk Tribal Health Center nutritionists and staff to meet Elder nutrition needs.

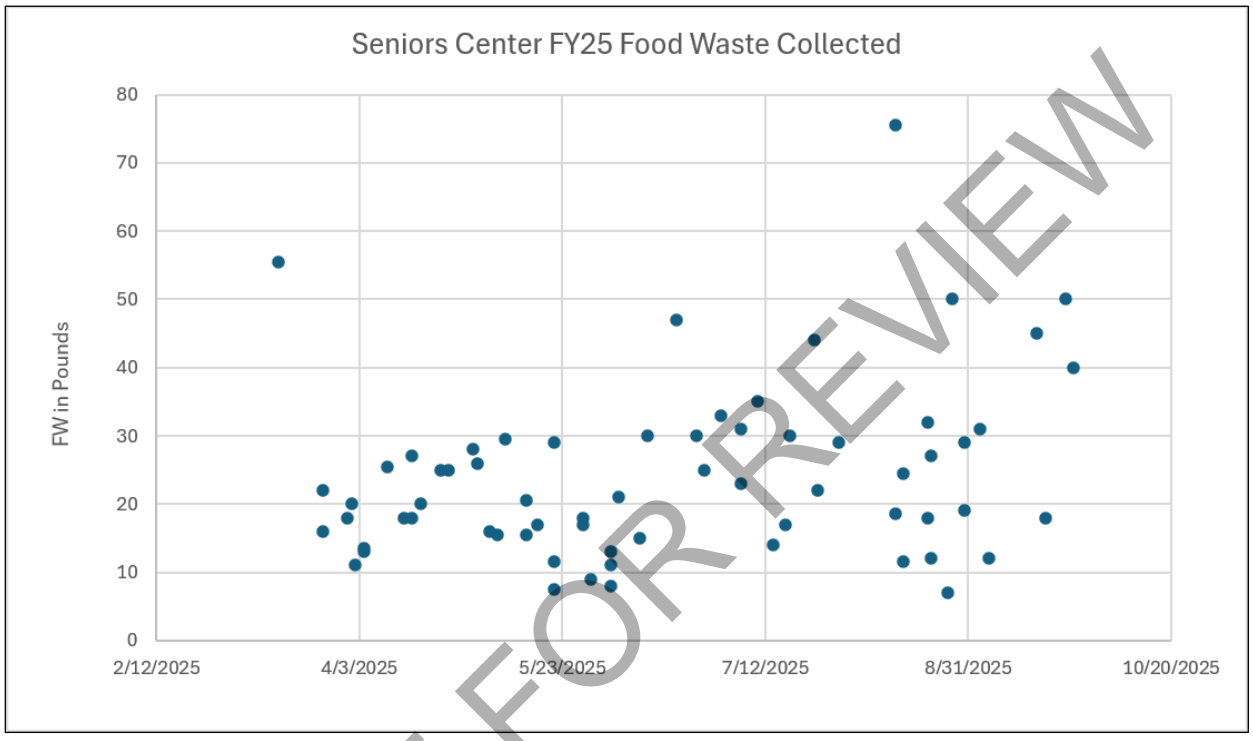





*Figure 9: Food waste weights collected from the Nicht-Yow-Way Seniors Center during FY25. The total amount of food waste collected from this host site during this period is 1,585.5 pounds.*

### 2.2.4 Afterschool Program

The CTUIR Department of Education Afterschool Program operates year-round, and hosts afterschool activities during the school year and day care and camp services during summer months. Afterschool Program serves snacks and a light meal to Tribal Youth daily year-round, transitioning from afterschool services during the school year to day camp services during summer months, serving 20-50 students.

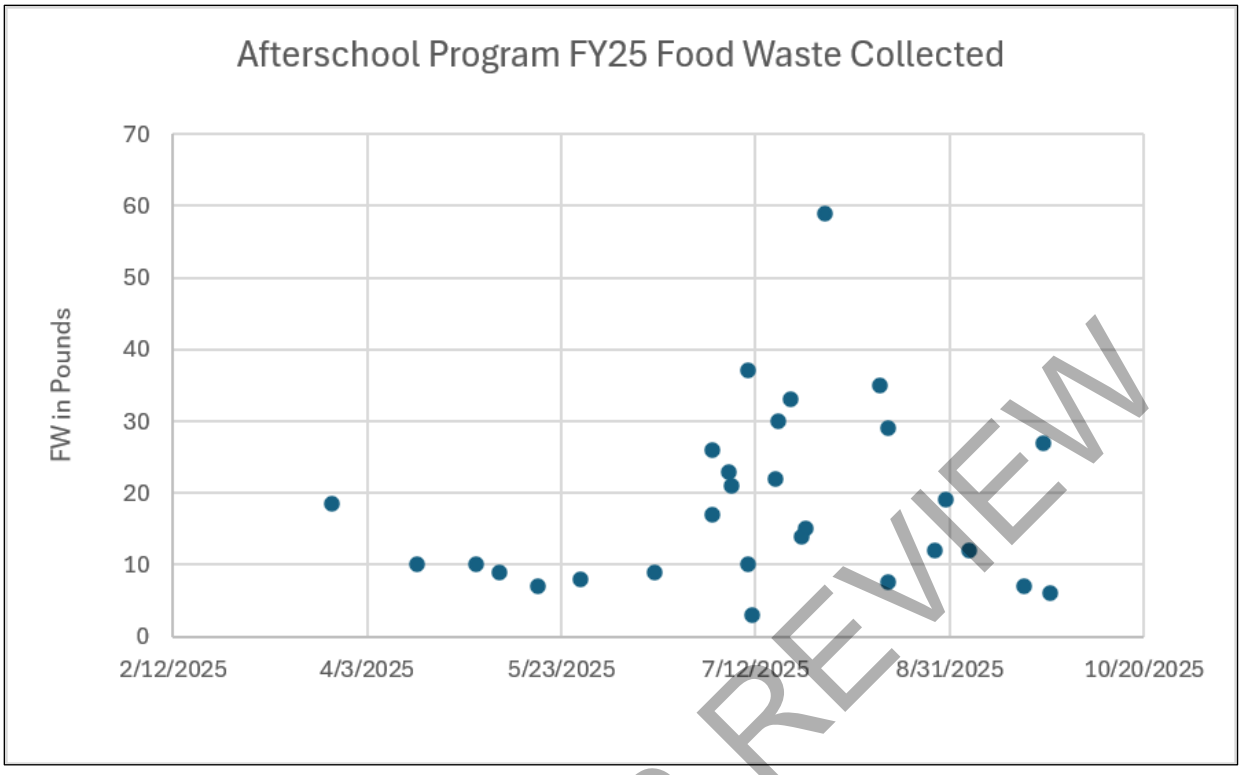



*Figure10: Food waste weights collected from the Afterschool program during FY25. The total amount of food waste collected from this host site during this period is 536 pounds.*



### 2.2.5 Mission Residents

While it was an intention of the project to engage residents in the Mission housing area, organics recovery capacity for the project was quickly reached through other host site contributions. Hesitation to collect and drop off food waste among Mission residents was also encountered, and food waste that was recovered from one household that did sign up to participate was often in a putrid state and was unusable in our operation's composting methods. Food waste amounts were still logged however, and represent food waste potential from a small 2-person household in Mission, and estimates can help us understand the potential for recovery from more households if additional capacity and education can be implemented.

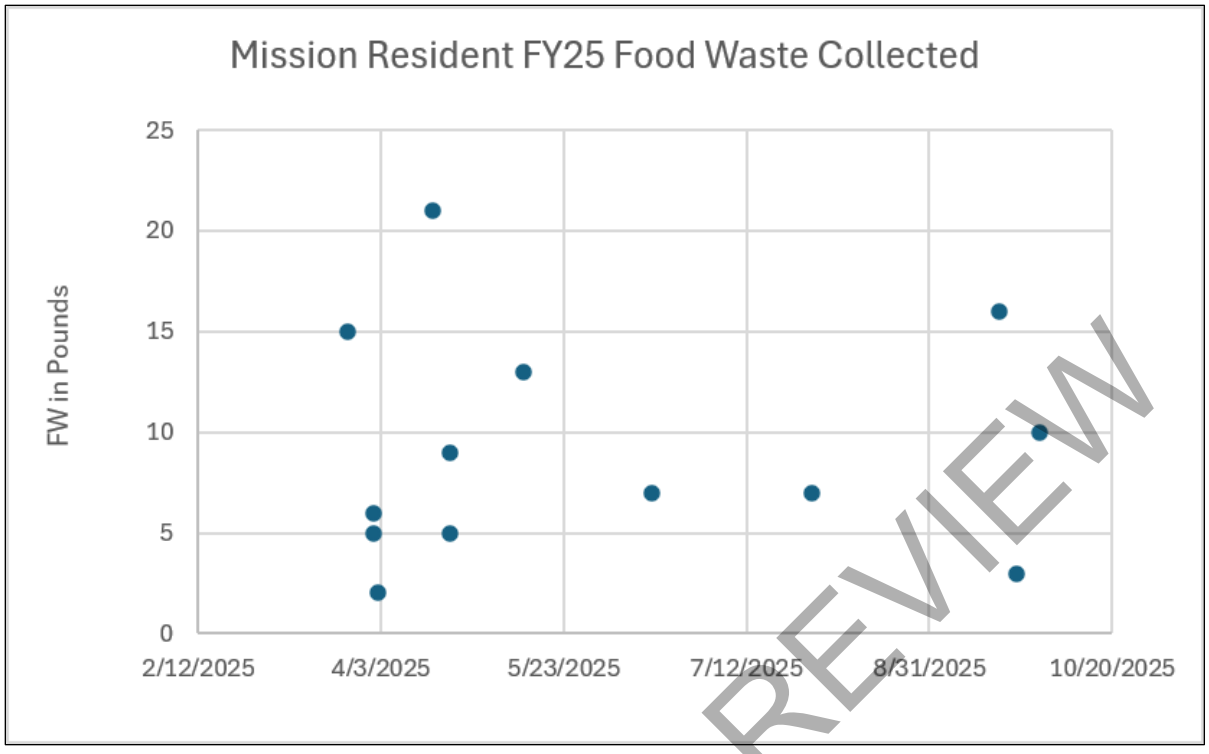



*Figure 11: Food waste weights collected from one Mission household during FY25. The total amount of food waste collected from this host site during this period is 119 pounds.*



### 2.2.6 Family Engagement Program Culture Nights

As a program within the CTUIR Department of Child and Family Services (DCFS), the Family Engagement Program provides education services directly to Tribal families. One long standing program is weekly "Culture Night" that includes a meal to families that participate in the educational activities hosted by this program. This program runs concurrently with the school year, offering weekly events from October to early June. Culture Night serves a set dinner menu prepared by program staff to 40-100 families.

Events would also be cancelled in the event of a funeral in the community, and occasionally due to illness limiting staff capacity.

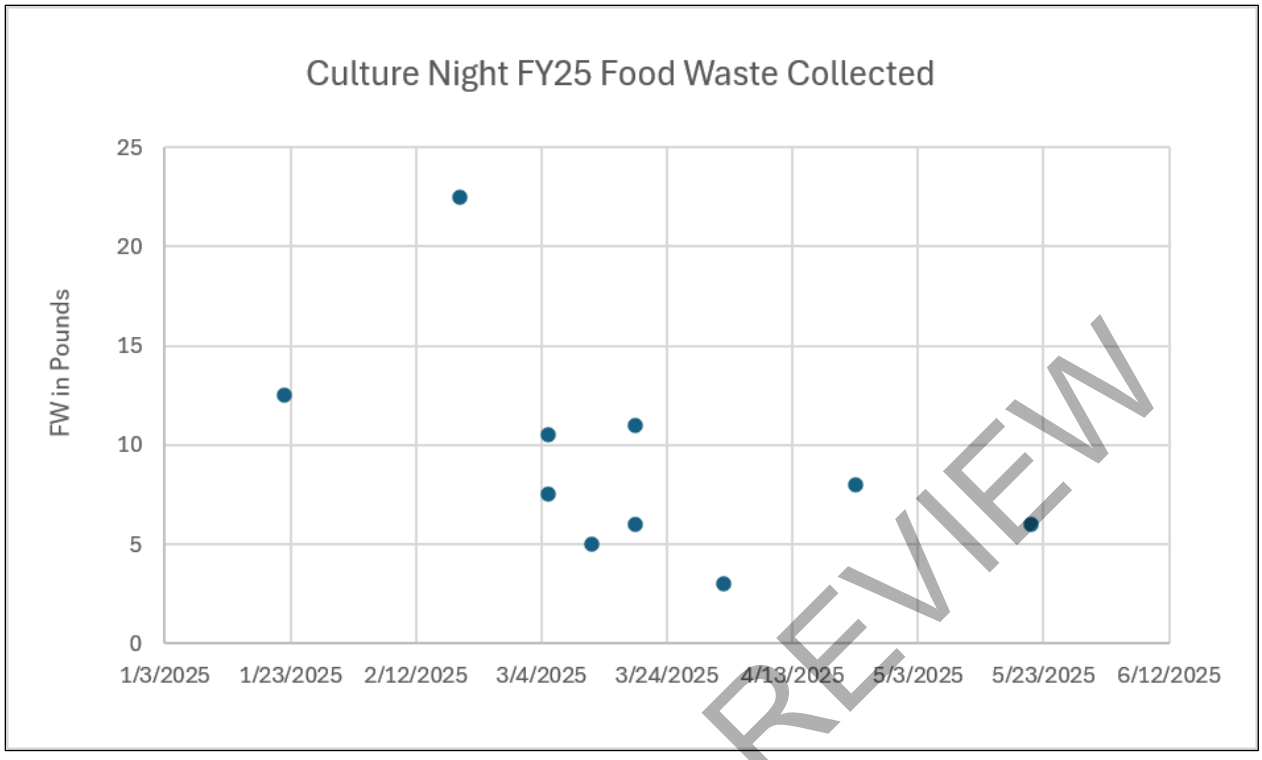



*Figure 12: Food waste weights collected from Family Engagement Program Culture Nights during FY25. The total amount of food waste collected from this host site during this period is 92 pounds.*



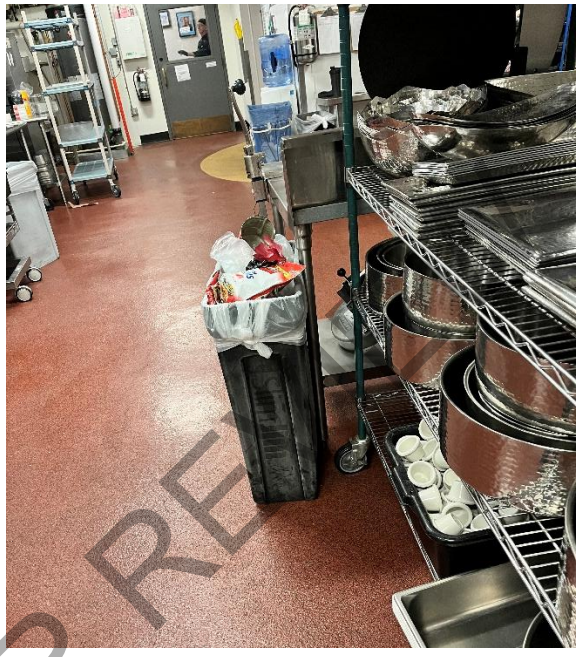
## 2.3 Scaling Up – Estimates for Other Tribal Entities

This project was designed as a "hyper-local" effort to understand food waste and organics recovery for our community, with the expectation that this information can be used to anticipate and plan for implementation of a organics recovery facility at a larger scale. To help inform strategic planning and investment, our project coordinated with food service enterprises

### 2.3.1 Wildhorse Resort and Casino

Wildhorse Resort and Casino (WRC) is the largest Tribal enterprise within the CTUIR community, and one of the largest employers in Umatilla County. The operation generates much of the annual revenue that supports the Tribal government and community, and often implements progressive and sustainable measures without announcement or fanfare. Our project team would like to thank WRC Executive Director Gary George and head chef Jeff Sommer for their hospitality as we toured their food service kitchens and materials management infrastructure.

WRC contains many interconnected and individualized operations that provide food service under management of the casino. Below are provided details about the various food service operations within WRC that affect organics recovery:



*Images 16 and 17: WRC Chef Jeff Sommers provides a tour of the Main Kitchen and other food service infrastructure to our project team and Vahid Biogas LLC. Photos by Biowaste Technologies, 2025. WRC noted limitations and design of existing infrastructure as a primary barrier to food waste diversion.*

*WRC Staff Kitchen*

Food service is provided for staff as part of their work day.

- Employee Kitchen plates served:
  - Hours of operation: 7 days a week, [5-6] service periods correspond to 24-hour WRC shifts. Commitment to providing at least one meal to every employee every shift.
  - ~400 plates on weekends
  - ~700 plates on weekdays
- Uses reusable silverware washed in a dish pit, no disposal cutlery, cups, or plates
- Actively practicing change-of-habit behaviors to reduce waste
- Food waste goes through garbage disposal to wastewater treatment
- Disposal system includes a pulper to reduce water content in food waste

*WRC Banquet Hall Catering*

Three banquet halls are operated by WRC and provide catering to events. This food service is prepared in the Main Kitchen (see section below). Below are details about the food service at WRC Banquet Halls:

- Hours of Operation: as scheduled; busy period is holiday season
- When service is provided (at least once per week)
    - ~150 people served for breakfast
    - ~150 people served for lunch
    - ~700 people served for dinner
- Includes an upstairs bakery for banquet and baking operations throughout WRC

*WRC Main Kitchen*

The main kitchen is the single largest food service preparation facility within WRC. This kitchen supplies food for the Banquet Halls, the fine dining establishment Plateau, and the Traditions Buffet. Below are details for this Main Kitchen:

- Equipped with a waste can chute that transmits single stream waste
- Plateau Fine Dining
    - Hours of operation:
    - Serves 65-70 people on weekdays
    - Serves 151 people on Thanksgiving
- Traditions Buffet
    - Hours of operation:
    - Serves approximately 300 people per day
    - Largest contributor to food waste among all kitchens
- Local food purchases average only 1% annually; limited by access and processing
    - Key barrier to local purchasing: limited availability of clean, pre-chopped and pre-prepared foods.

*Additional WRC Food Venues*

Decentralized kitchens serve individualized food service operations within the WRC food court and Family Fun Center. Below are details for these establishments:

- Hot Rock Bar, Moe Pho, Brigham Fish, and Bowling Alley
    - Together serve approximately 200 people per day

- Bowling alley includes a food garbage filter
- Wild Roast Café
  - Serves approximately 200 people per day

### 2.3.2 Hamley's Steakhouse and Café

In [2021], CTUIR purchased Hamley's Steakhouse and Café to be operated under its management. Below are details that were shared with our project team during a tour of Hamley's food service operations. Our project team would like to thank Hamley's Operations Manager Cal Tyer for his hospitality as we toured their food service kitchens and materials management infrastructure.

*Images 18 and 19: Hamley's Operations Manager Cal Tyer provides a tour of the Hamley's kitchen and other food service infrastructure to our project team and Vahid Biogas LLC. Photos by Biowaste Technologies, 2025. Hamley's noted space was the primary barrier to implementing dedicated food waste diversion.*

- Hours of operation: 7 days per week, 3 meals per day
- Food waste is separated and logged by staff
  - Maintains detailed food waste tracking records that would be helpful in estimating organics recovery potential, including:
    - Type of food
    - Reason for disposal
    - Weight
    - Data recorded

    - Tracks waste trends related to pre-prepared foods stored in refrigerators
- No garbage disposal exists for the establishment
- Barriers to diversion: very limited space for waste handling and storage
- Local food purchasing can reach 100% during summer months
    - All food must be USDA certified, which can be an obstacle for local food purchasing
- Heating and cooking uses natural gas
- Additional data required on the numbers of people served at the Slickfork Saloon Banquet, Hamley's Café, and Restaurant.
  [Can we reach out to Cal Tyer for these numbers?]

#### 2.3.3 Nixyaawii Governance Center

Little food preparation and service is performed at the NGC, with the exception of dedicated employee-focused events.

[Pending]

#### 2.3.4 NCFS Food Truck Park

[Pending]

#### 2.3.5 Kinship Café at Tamástslikt Cultural Institute

[Pending]

### 2.4 Additional Considerations

[Pending, to speak to fertilizer and compost needs for CTUIR and implications of solid and liquid applications of composting methods and concerns]



# Part 3: Community Perception of Food Waste

### 3.1 Project Approach to Community Perception Quantification

Food waste is often discussed as an environmental, economic, and agricultural issue. However, food waste is also deeply connected to human emotions, cultural values, accountability, and social behavior. Across many cultures, including Indigenous communities, food represents labor, relationships, land stewardship, and respect for natural resources. When food is wasted,

people may experience emotions such as guilt, shame, regret, frustration, denial, or avoidance. These emotional responses can influence how individuals and communities respond to waste and whether they take responsibility for reducing it.Research shows that emotions play a significant role in food waste behavior and can motivate both positive change and defensive reactions.

When food is wasted, people often perceive that something valuable has been lost. Studies have found that guilt, regret, and other negative emotions are among the strongest psychological drivers influencing food waste reduction behavior.

For agricultural communities and Indigenous peoples, wasting food may feel especially significant because of traditional teachings emphasizing gratitude, stewardship, and respect for resources.

One of the elements of our project was to apply the concept of Free, Prior, and Informed Consent (FPIC) as outlined in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), and demonstrate what it looks like to meaningfully engage a Tribal community in decision-making. This materialized within the project in the following ways:

- Seeking guidance and feedback from impacted community at every point of decision making and clearly explaining potential outcomes of each decision option;
- Sharing information gathered about the community with the community FIRST and asking if there is anything that should be hidden or corrected;
- Offering "stop all activities/work" options on surveys to provide an opportunity for communities to object to project activities within data; and
- Designing and implementing a project with no lasting footprint on Tribal infrastructure

The following section provides an overview of the ways in which this project conducted our attempts to demonstrate meaningful engagement and consent.



### 3.2 Results from Event Dot Surveys

Dot surveys were used to gather community engagement and input into project activities in situations where extended surveys would not have been appropriate. Dot surveys generally asked 1-3 questions with visualized options (images, infographics ets) and community members could place as many dots on their preferred answers. This allowed the community the opportunity to contribute their opinions on project activities in real time, though does not provide rigorous data for detailed analysis. Photo examples were provided on all dot survey questions to facilitate understanding of the question being asked, to ensure "Informed" consent as much as possible.

### 3.2.1 Pre-Project Data Collection

Celery Feast and Root Feast 2024

Early project engagement booths asked participants what preferences and potential concerns they had for placement of the forthcoming anaerobic digester as well as any concerns they had about the planned project activities. This was necessary to uphold the "Prior" component of the FPIC method, to ask for the community's permission before work even began.

*Images 20 and 21: Photos of the engagement booth for the 2024 Celery Feast (right) and Gathering feedback from community about digester placement preferences and concerns at the 2024 Root Feast. Photo by Biowaste Technologies, 2024.*

Table 3: Detailed Responses from Figure 12 Digester Placement Dot Survey

| Answer | Dot Count |
|---|---|
| No Digester | 0 |
| Not at Longhouse | 0 |
| South Side of Longhouse | 2 |
| Back/West side of Longhouse | 2 |
| Near Longhouse Grill | 3 |
| Place across Longhouse on back side where trees are | |
| Garden would be a maybe mostly because its enclosed and secured by a fence, I could see somebody think its funny to puncture the tarp looking body and ruining it running around at night | |
| Could be a great workforce development project like Climate Corps | |

| |
|---|
| Could pair well with CTUIR waste water facility |
| What is the potential for this to provide [energy] baseload? |
| Garden could have a potential compost which seems similar |
| Housing doesn't allow composting because of visibility |
| Odor? |
| What is the potential to attract wildlife, especially dogs and predators? Fence would be necessary |
| What about [cooking] oil? |
| Potential placement either by dumpster near cooks door in the open space on the hill but not in the parking area. Or between Longhouse and garden in the open area? |

Analysis: While these dot surveys had relatively low participation, we received great feedback about what concerns our community have about a food waste diversion project in the community core, and provided an opportunity for community members to "veto" the project design, which none expressed opposition. Ultimately, the Tribal Public Works and Planning Offices selected the most suitable location across from the Longhouse, though community feedback did result in procurement of the project shed, which would become the "Resource Recovery Center" directly due to concerns about attracting wildlife and preventing mischief.

3.2.2 Longhouse Feast Events

Huckleberry Feast 2024

*Images [22 and 23]: Dot survey questions as part of 2024 Huckleberry Feast. Photos by CTUIR DNR FFPP, 2024.*

Early in the project implementation, we wanted to start engaging our Tribal community in understanding our collective food waste habits. Below are the questions and results of dot survey questions conducted at the 2024 Nixyaawii Huckleberry Feast in early August 2024.

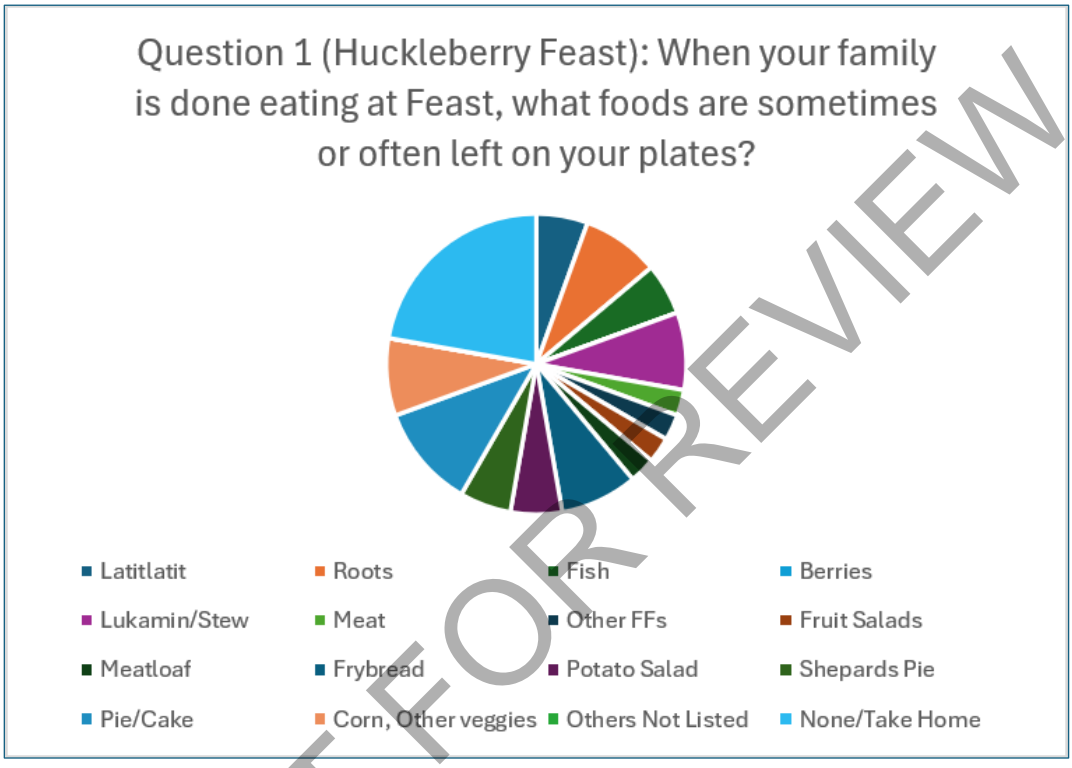


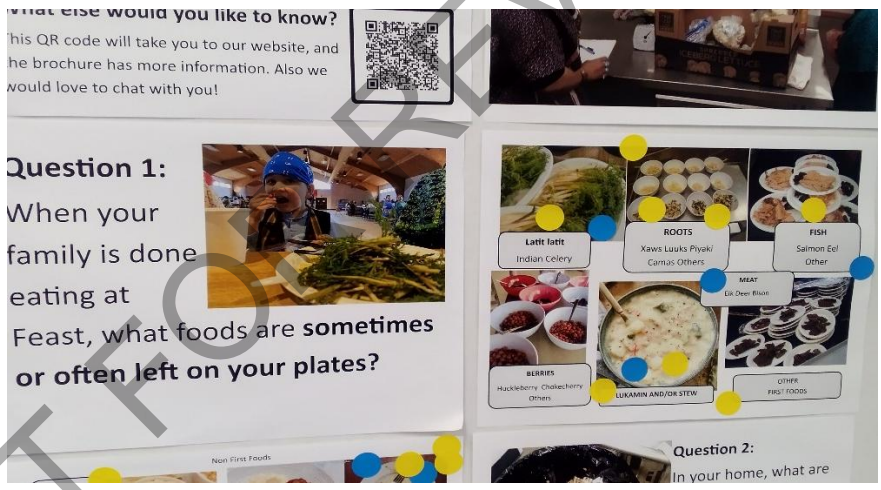

*Figure 13: Visual representation of the information from Question 1: "When your family is done eating at Feast, What Foods are sometimes or often left on your plates?" dot survey responses*

Table 3: Question 1: When your family is done eating at Feast, What Foods are sometimes or often left on your plates?

| Feast Foods Item | Dot Count |
|---|---|
| Latit latit | 2 |
| Roots | 3 |
| Fish | 2 |
| Berries | 0 |
| Lukamin/Stew | 3 |
| Meat | 1 |
| Other First Foods | 1 |
| Fruit Salad | 1 |

| | |
|---|---|
| Meat loaf | 1 |
| Fry bread | 3 |
| Potato salad | 2 |
| Shepards pie | 2 |
| Pie and/or cake | 4 |
| Corn, other veggies | 3 |
| Others not listed | 0 |
| None/Take home | 8 |
| Total | 36 |

Analysis: This dot survey had a small number of responses but already demonstrates the existing level of understanding about food waste, with particular emphasis on not wasting culturally significant First Foods.

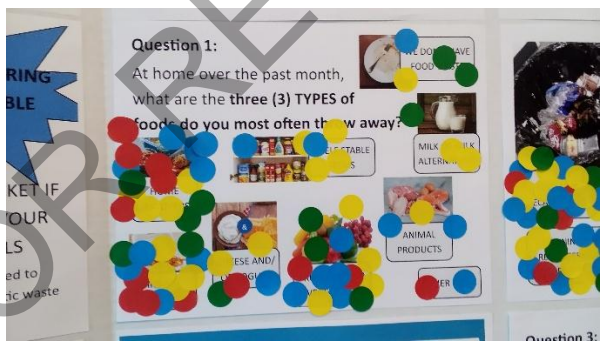

*Images 24 and 25: Huckleberry Feast Question 1 Result. Photo by CTUIR DNR FFPP, 2024.*

### 3.2.4 Annual CTUIR Community Picnics

The CTUIR Community Picnic is an annual event held typically in August that provides a festive opportunity for the Tribal community to gather and celebrate before the start of the school year. Our project team hosted on outreach booth at each annual event, [except in 2026 when the event was cancelled due to local wildfire and smoke inundation].

2024 Community Picnic


*Image 26 and 27: Project team talked with picnic attendees about our dot survey questions and helped attendees record their answers. Photos by CTUIR DNR FFPP, 2024.*


*Images 30 and 31: Examples of dot survey responses to food waste perception questions during early project activities. Photos by CTUIR DNR FFPP, 2024.*

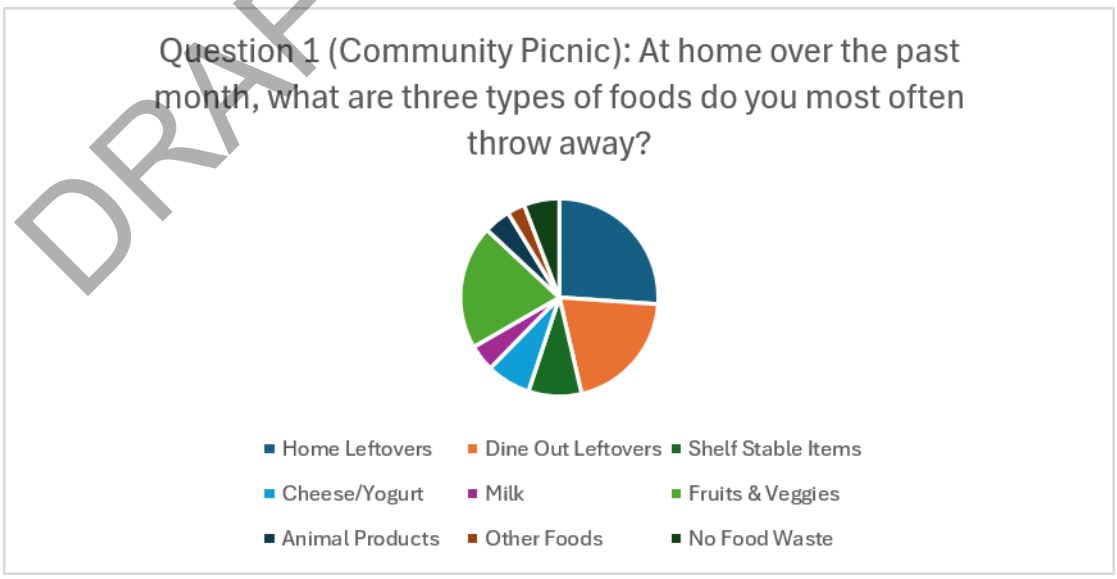


*Figure [13]: Visualization of dot survey responses to Community Picnic Question 1: "At home over the past month, what are three types of foods [you] most often throw away?"*

Table 5: Details of 2024 Community Picnic Dot Survey Question 1 Responses

| Response Option | Number of Responses |
|---|---|
| Home leftovers | 18 |
| Dine Out Leftovers | 14 |
| Shelf Stable Items | 6 |
| Cheese/Yogurt | 5 |
| Milk | 3 |
| Fruits & Veggies | 14 |
| Animal Products (meat and fish) | 3 |
| Other Foods | 2 |
| No Food | 4 |
| Total | 69 |

Analysis: Leftovers and fresh produce like fruits and vegetables seem to be the majority of food waste generated at a household level. Fresh produce is very easy to divert to composting and livestock feed sources, and leftovers can be managed with meal preparation and planning.

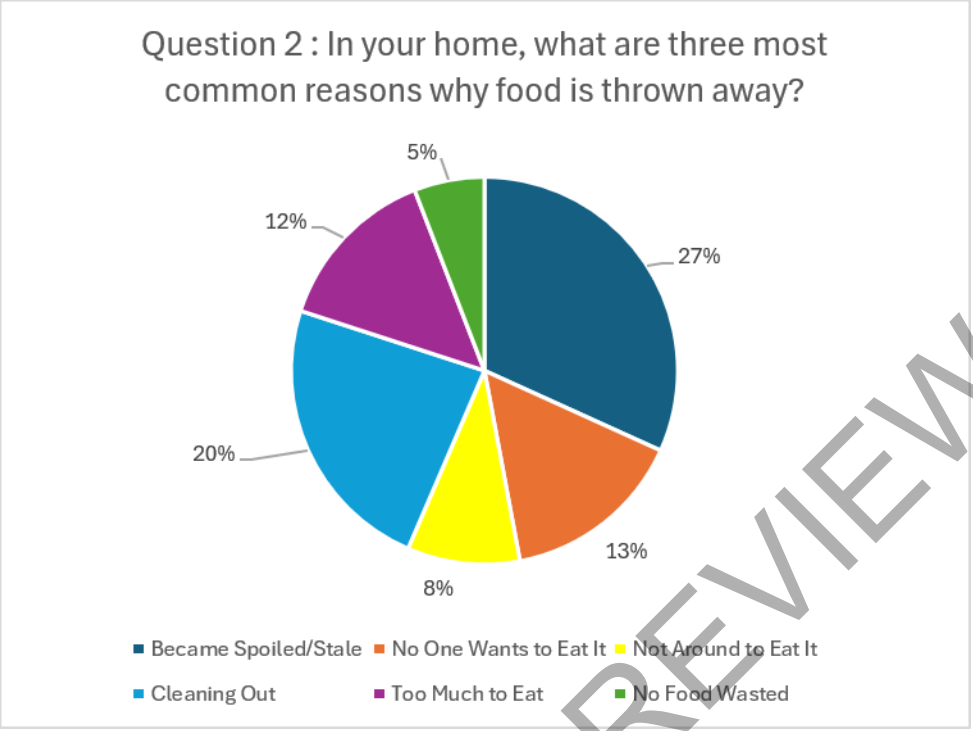



*Figure 15: Dot survey responses for 2024 Community Picnic Question 2: "In your home, what are the three most common reasons why food is thrown away?"*

Table 6: Details of 2024 Community Picnic Dot Survey Question 2 Responses

| Response Option | Number of Responses |
|---|---|
| Became Spoiled/stale | 27 |
| No One Wants to Eat It | 13 |
| Not Around to Eat It | 8 |
| Cleaning Out Fridge/Pantry | 20 |
| Too Much to Eat | 12 |
| No Food Wasted | 5 |
| Total | 85 |

Analysis: Most respondents identified food spoilage and cleaning out their refrigerator and/or pantry as the biggest reason food waste was created in their households. This indicates that meal preparation and planning and food storage optimization could help address food waste being created by project service area families.


*Figure 16: Visualization of dot survey responses for 2024 Community Picnic Question 3: "When getting family groceries, how often is food waste on your mind?"*

Table [7]: Details of 2024 Community Picnic Dot Survey Question 3 Responses

| Response Option | Number of Responses |
|---|---|
| Always | 11 |
| Often | 6 |
| Sometimes | 13 |
| Rarely | 6 |
| Never | 3 |
| Total | 39 |

Analysis: Many people think about previous food waste during shopping within our community based on this data. This shows a strong foundation for awareness within our community about food waste, and project activities built on this existing awareness to provide alternatives and options for food waste prevention and diversion based on these results.

### 3.2.5 2026 Yellowhawk Fun Run and Culture Night End of Season Celebration

Towards the end of the project, dot surveys were used to understand community preference about project activities and what elements should continue past the pilot phase.


*Images 32 and 33: Project engagement booths at the Yellowhawk Fun Run in May (left) and the Culture Night End of Season Celebration in June (right) asked participants in a dot survey what project elements they would like to see continue. Photos by CTUIR DNR FFPP, 2026.*

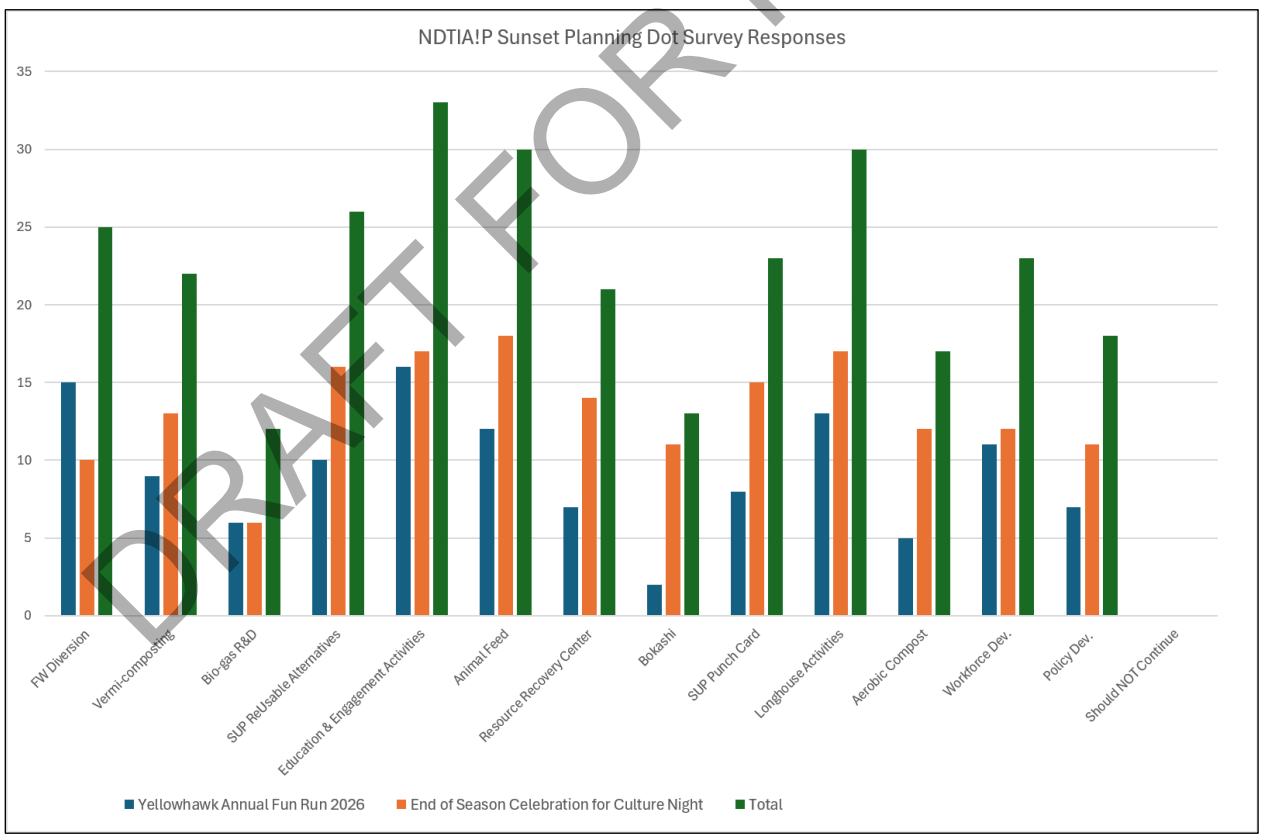



Figure 17: *Visualization of dot survey responses for 2026 Fun Run and End of Season Celebration Question 1: "What project elements would you like to see continued?"*

Table 8: Details of 2026 Fun Run and Culture Night Dot Survey Responses

| Response Option | Culture Night | Fun Run | Total Responses |
|---|---|---|---|
| Food Waste Diversion | 10 | 15 | 25 |
| Vermicomposting | 13 | 9 | 22 |
| Bio-gas Research and Development | 6 | 6 | 12 |
| SUPs Reusable Alternatives | 16 | 10 | 26 |
| Education & Engagement Booth Activities | 17 | 16 | 33 |
| Animal Feed | 18 | 12 | 30 |
| Resource Recovery Center | 14 | 7 | 21 |
| Bokashi Composting | 11 | 2 | 13 |
| SUP Punch Card | 15 | 8 | 23 |
| Longhouse Activities | 17 | 13 | 30 |
| Aerobic Compost | 12 | 5 | 17 |
| Workforce Development | 12 | 11 | 23 |
| Policy Development | 11 | 7 | 18 |
| Project elements should NOT continue | 0 | 0 | 0 |
| Other | 0 | 0 | 0 |
| Total | 172 | 121 | 293 |



Analysis: Results varied slightly between survey audiences, most likely due to what exposure respondents had to different project elements. Most respondents felt the Education & Engagement Booth Activities, Longhouse Activities, and SUP Reuseable Alternatives were the highest priority, with Animal Feed, Food Waste Diversion, and Workforce Development as the next highest priorities. Additional information on this question was solicited as part of the robust individual surveys that were also conducted; see the next section for more information.

### 3.3 Results from Extended Surveys (2025 and 2026)

Once community behavior change became relatively established with our host site audiences, we developed two extended surveys to gather more rigorous data to be analyzed. These

include our Longhouse Sustainability Survey, which was conducted from November 2025 to February 2026, and our End of Project Survey, conducted from June to September 2026. Both of these surveys aimed to provide scientifically rigorous community data on organics recovery related information that will help inform a future Organics Recovery Needs Assessment.

### 3.3.1 Longhouse Sustainability Survey (2025)

This community survey was implemented in the second half of 2025, close to the mid-point of the project.

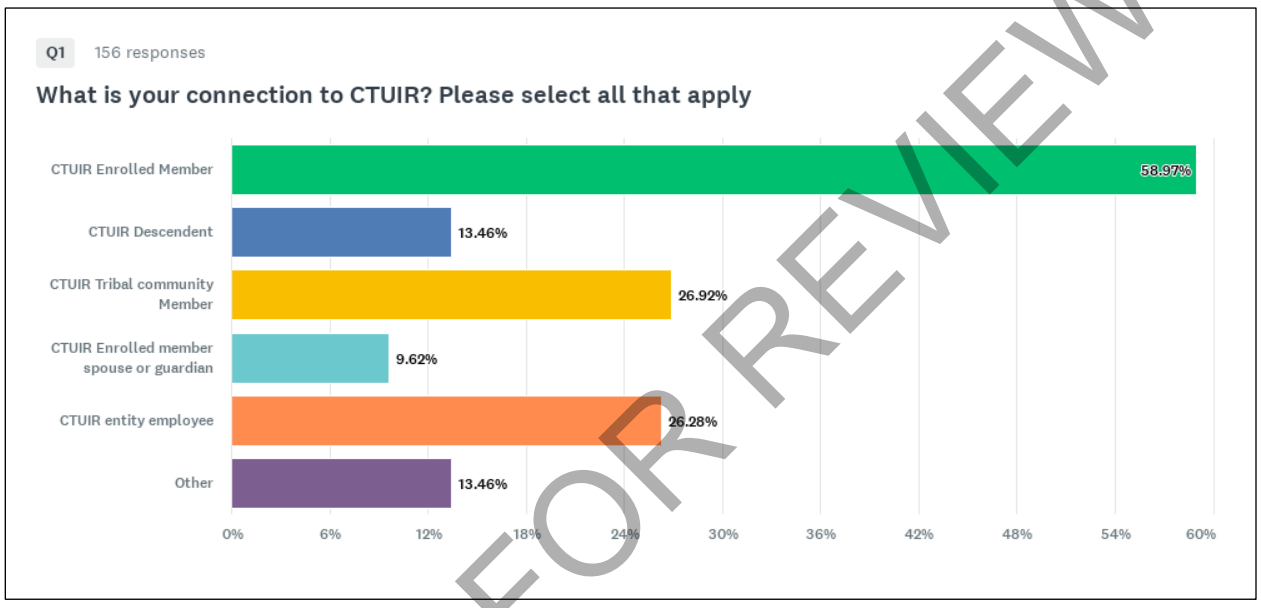



*Figure 17: Visual display of responses to Longhouse Sustainability Survey (2025) Question 1: "What is your connection to CTUIR?" See Table [8] below for details.*

Table 8: Details of Longhouse Sustainability Survey (2025) Question 1 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| CTUIR Enrolled Member | 58.97% | 92 |
| CTUIR Descendent | 13.46% | 21 |
| CTUIR Tribal community member | 26.93% | 42 |
| CTUIR Enrolled member spouse or guardian | 9.62% | 15 |
| CTUIR entity employee | 26.28% | 41 |
| Other | 13.46% | 21 |
| Total responses | | 232 |

Analysis: Our survey shows that the overwhelming majority of those who responded to our survey were enrolled Tribal members (59%) and/or members of our Tribal community (27%) as family of a Tribal member or an employee of one of CTUIR's entities or enterprises (26%). This shows that answers obtained in this survey are directly relevant to our population served.

[Provide definitions to these answers and how they related to community and governance structure]

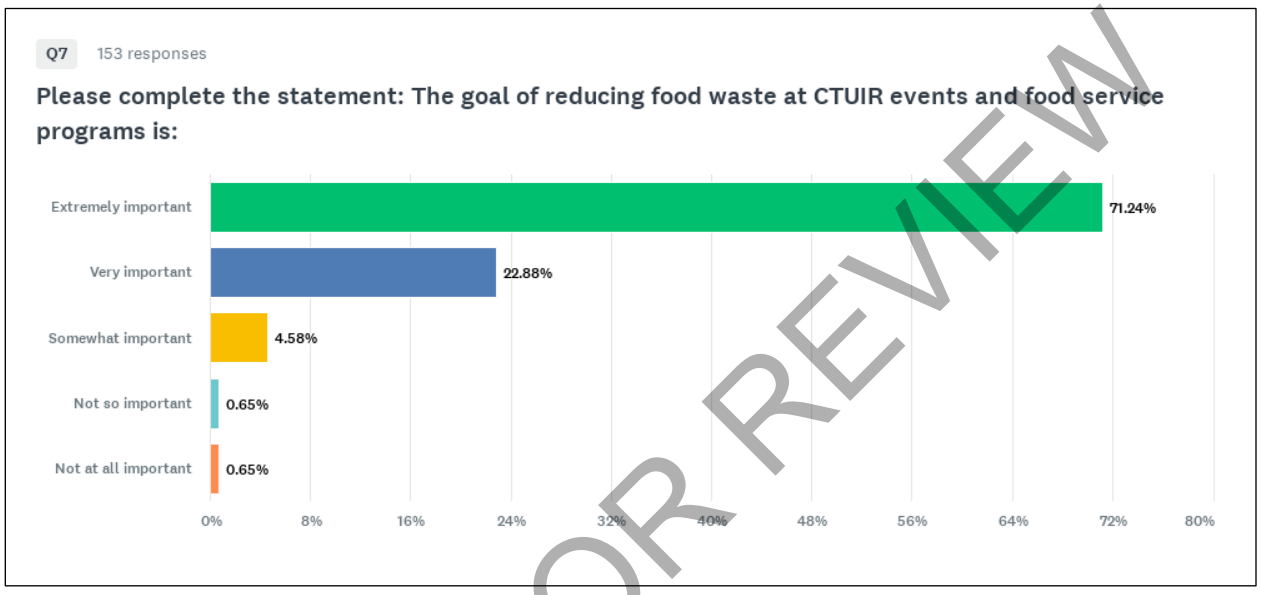



*Figure 19: Visual display of responses to Longhouse Sustainability Survey (2025) Question 7: "Please complete the statement: The goal of reducing food waste at CTUIR events and food service program is:" See Table [9] below for details.*

Table [9]: Details of Longhouse Sustainability Survey (2025) Question 7 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| Extremely Important | 71.24% | 109 |
| Very Important | 22.88% | 35 |
| Somewhat Important | 4.58% | 7 |
| Not So Important | 0.65% | 1 |
| Not At All Important | 0.65% | 1 |
| Total responses | | 153 |

Analysis: Demonstrates community support for food waste prevention and diversion initiatives. An overwhelming majority of respondents felt that reducing food waste is Extremely Important

(71%) or Very Important (23%). This can be used to support strategic planning and funding requests. This support also demonstrates the willingness of our Tribal community to participate in this behavior change.

Other questions centered on perceptions of single use plastic (SUP) items at CTUIR events, and are analyzed in the Appendix [B] dedicated to SUP reduction impacts associated with this project but that are not directly related to food waste reduction. Full survey data is also available as part of Appendix [D].

### 3.3.2 End of Project Survey (2026)

This community survey was implemented towards the end of the pilot project, and its goal was to identify remaining information gaps, understand preferences and perceptions, and build foundations for a future Organics Recovery Needs Assessment and other policies. Tribal resolutions like the Our Sustainable Future proclamation will rely on this information to help Tribal government departments to implement their own roles in community sustainability.

This survey was open from [May] to September 2026, and engagement followed a similar pattern to the approach taken for the previous Longhouse Sustainability Survey in 2025. This included a weekly booth in the rotunda of the Nixyaawii Governance Center (NGC), two booth sessions at the Nicht-Yow-Way Seniors Center, surveys taken at the 2026 Huckleberry Feast and Treaty Day celebrations, and [others]. Surveys were provided in paper form and have been archived with other project materials. Full survey responses to both surveys can be found in Appendix D.

Provided below is a overview of the results of the End of Project Survey (2026).

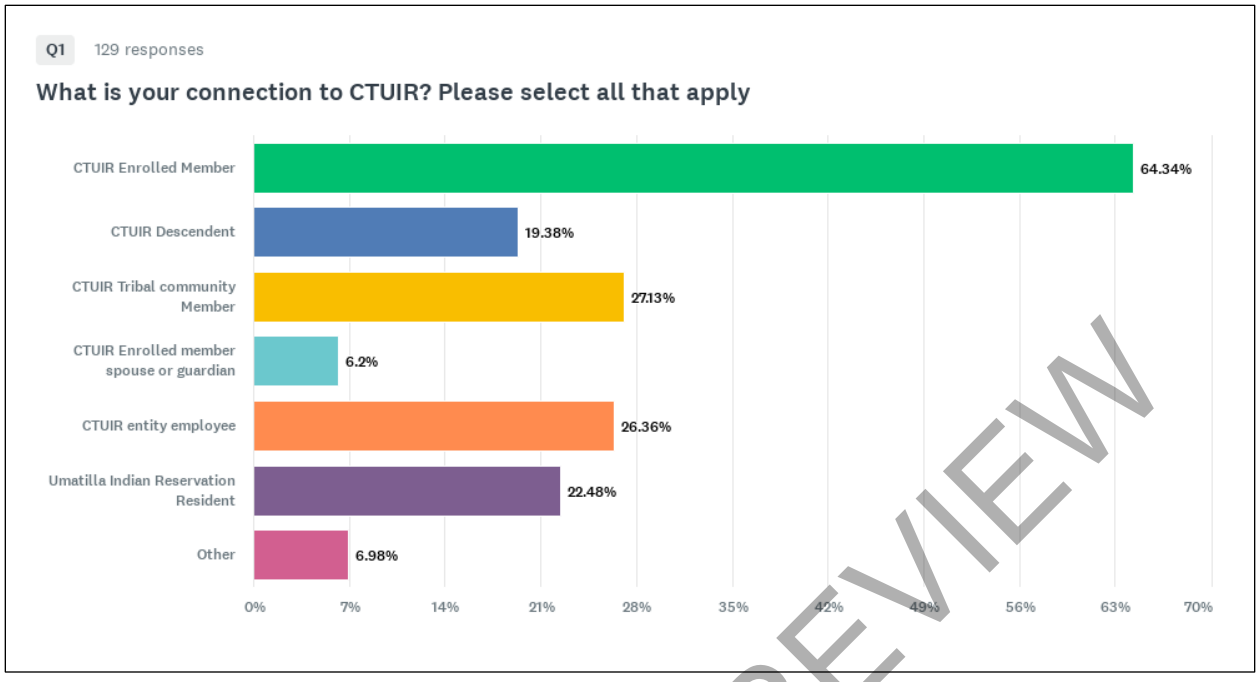



*Figure 20: Visual display of responses to End of Project Survey (2026) Question 1: "What is your connection to CTUIR? Please select all that apply." See Table [10] below for details.*

Table 10: Details of End of Project Survey (2026) Question 1 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| CTUIR Enrolled Member | 64.34% | 83 |
| CTUIR Descendent | 19.38% | 25 |
| CTUIR Tribal Community Member | 27.13% | 35 |
| CTUIR Enrolled Member spouse or guardian | 6.2% | 8 |
| CTUIR Entity Employee | 26.36% | 34 |
| Umatilla Indian Reservation Resident | 22.48% | 29 |
| Other | 6.98% | 9 |
| Total | | 223 |

Analysis: Our survey shows that the overwhelming majority of those who responded to our survey were enrolled Tribal members (64%) and/or members of our Tribal community (27%) as family of a Tribal member or an employee of one of CTUIR's entities or enterprises (26%). This shows that answers obtained in this survey are directly relevant to our population served.

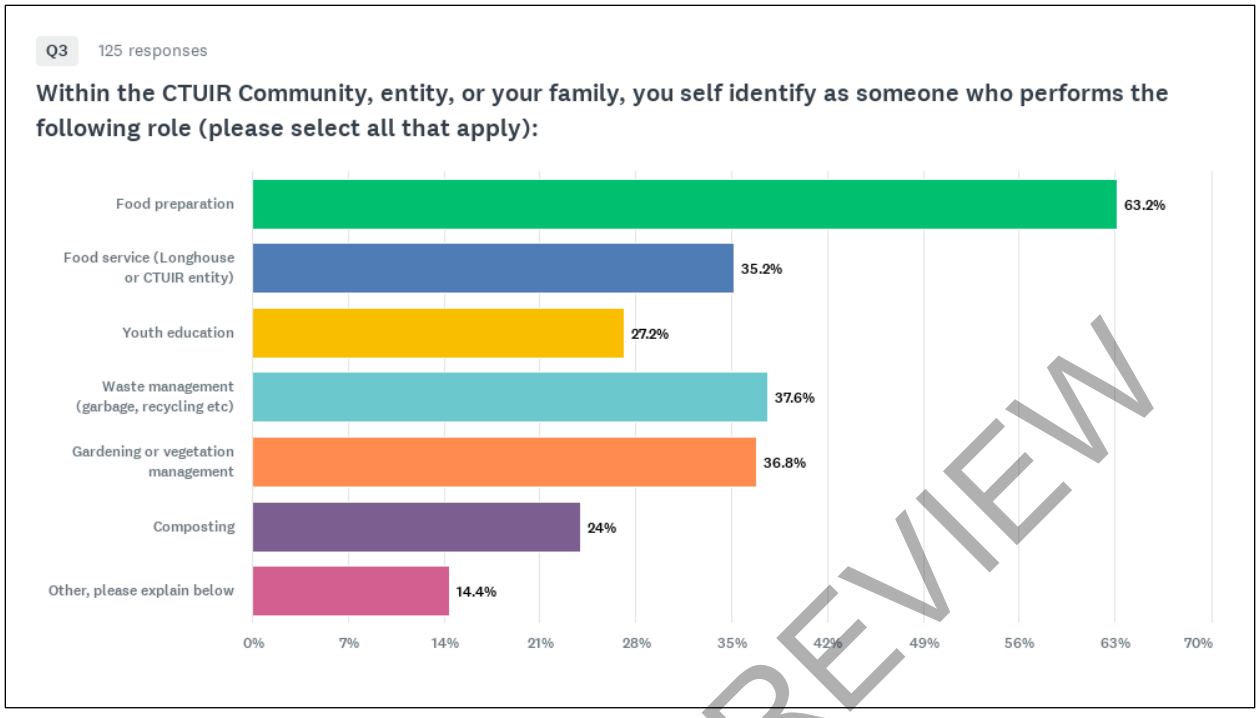



*Figure 21: Visual display of responses to End of Project Survey (2026) Question 3: "Within the CTUIR Community, entity, or your family, you self identify as someone who performs the following role (please select all that apply)." See Table [11] below for details.*

Table 11: Details of End of Project Survey (2026) Question 3 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| Food Preparation | 63.2% | 79 |
| Food Service (Longhouse or CTUIR Entity) | 35.2% | 44 |
| Youth Education | 27.2% | 34 |
| Waste Management (garbage, recycling etc) | 37.6% | 47 |
| Gardening or vegetation management | 36.8% | 46 |
| Composting | 24% | 30 |
| Other, please explain | 14.4% | 18 |
| Total | | 298 |

Analysis: Identifying capacity within our community to disrupt single stream waste management. A large portion of our community prepare food for themselves and/or others (63%), followed by three categories in close proximity: Waste Management (38%), Gardening

and/or Vegetation Management (37%), and Food Service (35%). The biggest gaps were observed with Youth Education (27%) and Composting (24%).

"Other, please explain" responses included:

| | | |
|---|---|---|
| I have hunted for the longhouse in the past, when I was younger + have since passed on the torch to younger hunters. | Too many | I consider myself a harvester for my family + I have taken youth out to dig roots and harvest tule. |
| Maintenance | Tribe & law | Disabled to serve |
| Live by the land | Wildhorse employee | None |
| N/A I don't do much with food besides it. | Environmental health and safety | Enjoyed you at family engagement |
| First foods gathering & hunting and fishing prep and storage etc. | Art basketry for gatherers, beadwork/regalia for participants. If it's for traditional use (not to sit on a shelf or display) the baskets are always given - not sold/profited | |

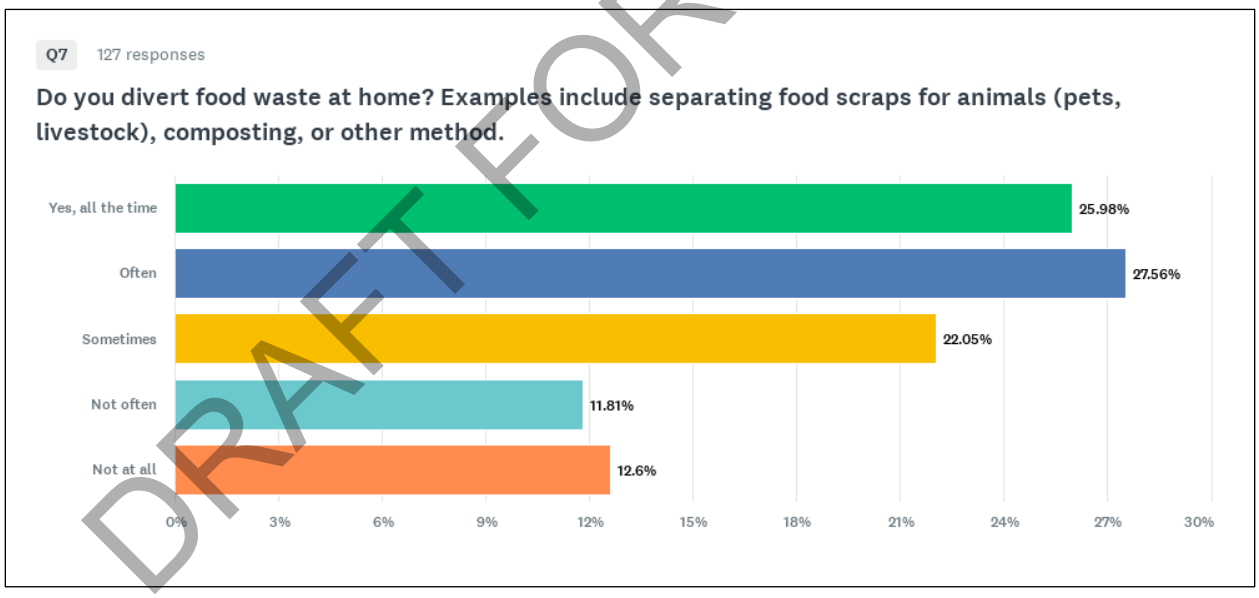





*Figure 21: Visual display of responses to End of Project Survey (2026) Question 7: "Do you divert food waste at home?" See Table [12] below for details.*

Table [12]: Details of End of Project Survey (2026) Question 7 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|

| | | |
|---|---|---|
| Yes, All the Time | 25.98% | 33 |
| Often | 27.56% | 35 |
| Sometimes | 22.05% | 28 |
| Not Often | 11.81% | 15 |
| Not At All | 12.6% | 16 |
| Total | | 127 |

Analysis: Understanding existing food waste management behaviors. Many people divert food waste at home Often (28%) or All the Time (26%), with additional others Sometimes (22%) conduct food waste diversion at home. This indicates a foundational existing behavior at a household level, and future organics recovery efforts can focus on making the connection between this household practice and a community scale one.

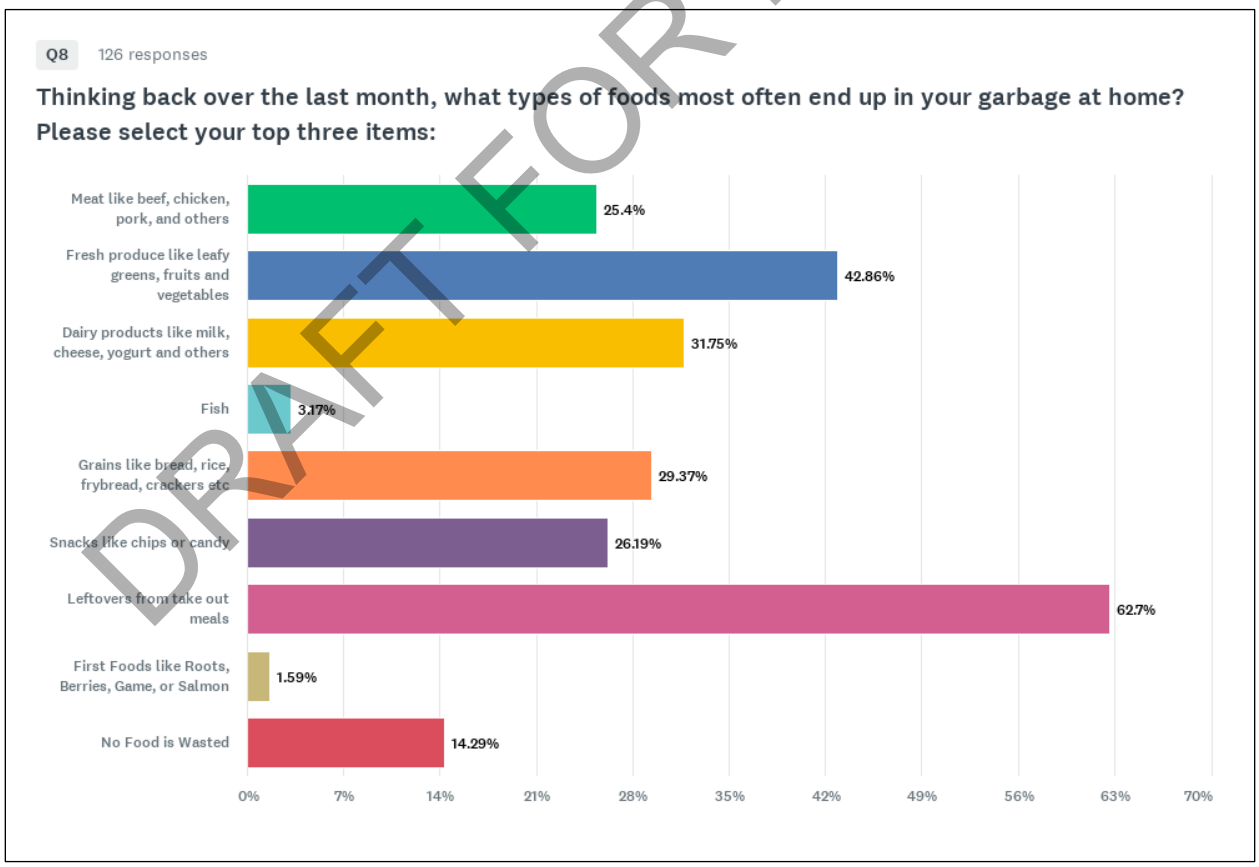


*Figure 22: Visual display of responses to End of Project Survey (2026) Question 8: "Thinking back over the last month, what types of foods most often end up in your garbage at home? Please select your top three items." See Table [13] below for details.*

Table 13: Details of End of Project Survey (2026) Question 8 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| Meat like beef, chicken, pork, and others | 25.4% | 32 |
| Fresh produce like leafy greens, fruits, and vegetables | 42.86% | 54 |
| Dairy products like milk, cheese, yogurt and others | 31.75% | 40 |
| Fish | 3.17% | 4 |
| Grains like bread, rice, frybread, crackers etc | 29.37% | 37 |
| Snacks like chips or candy | 26.19% | 33 |
| Leftovers from take out meals | 62.7% | 79 |
| First Foods like Roots, Berries, Game, or Salmon | 1.59% | 2 |
| No Food is Wasted | 14.29% | 18 |
| Total | | 299 |

Analysis: Understanding what kind of feed stocks might be generated from a community food collection initiative. Overwhelmingly, the predominant form of food waste from respondent households is Leftovers (63%) with Fresh Produce (43%) at a distant second. Harder to compost sources like Dairy (32%) and Grain (29%) were also indicated. Notably, First Foods were the least wasted (2%), reinforcing what community members have expressed about respecting these materials.

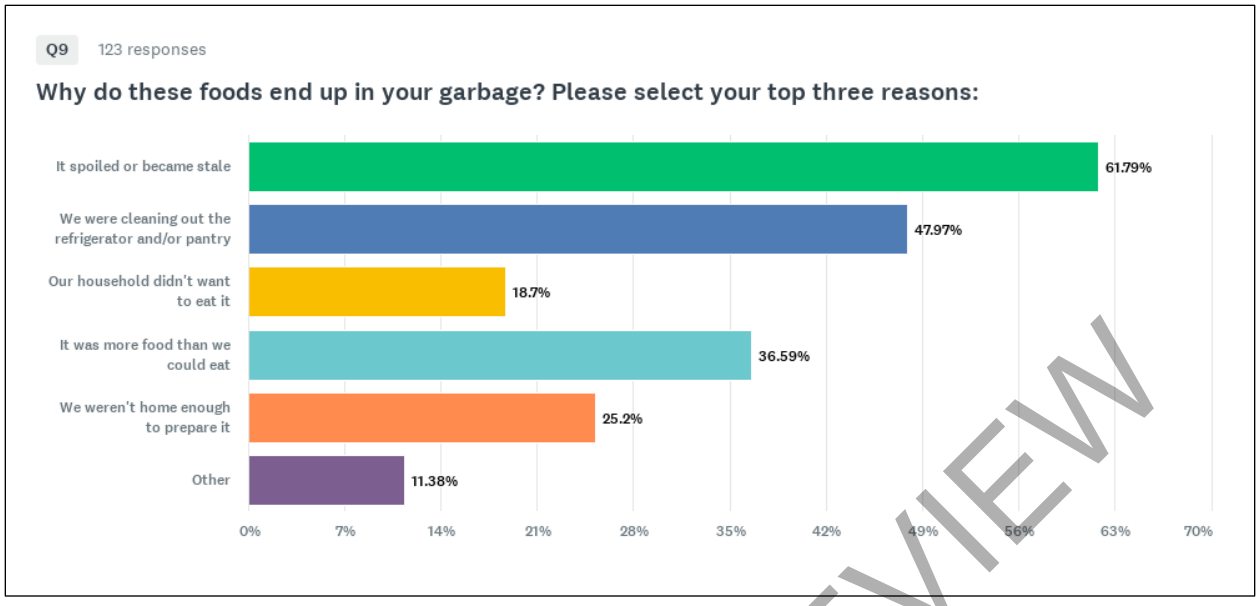



*Figure 23: Visual display of responses to End of Project Survey (2026) Question 9: "Why do these foods [from Question 8] end up in your garbage? Please select your top three reasons." See Table 14 below for details.*

Table 14: Details of End of Project Survey (2026) Question 9 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| It Spoiled or Became Stale | 61.79% | 76 |
| We were Cleaning Out the Refrigerator and/or Pantry | 47.97% | 59 |
| Our Household Didn't Want to Eat It | 18.7% | 23 |
| It was More Food Than We Could Eat | 36.59% | 45 |
| We Weren't Home Enough to Prepare It | 25.2% | 31 |
| Other | 11.38% | 14 |
| Total | | 248 |

Analysis: Understanding behaviors that contribute to food waste creation. A majority of respondents identified food Spoiled or Became Stale (62%) before they could eat it, with more Cleaning Refrigerator and/or Pantry (48%). Future food waste prevention education and activities should emphasize strategies that address these reoccurring ways food waste is created at a household level.

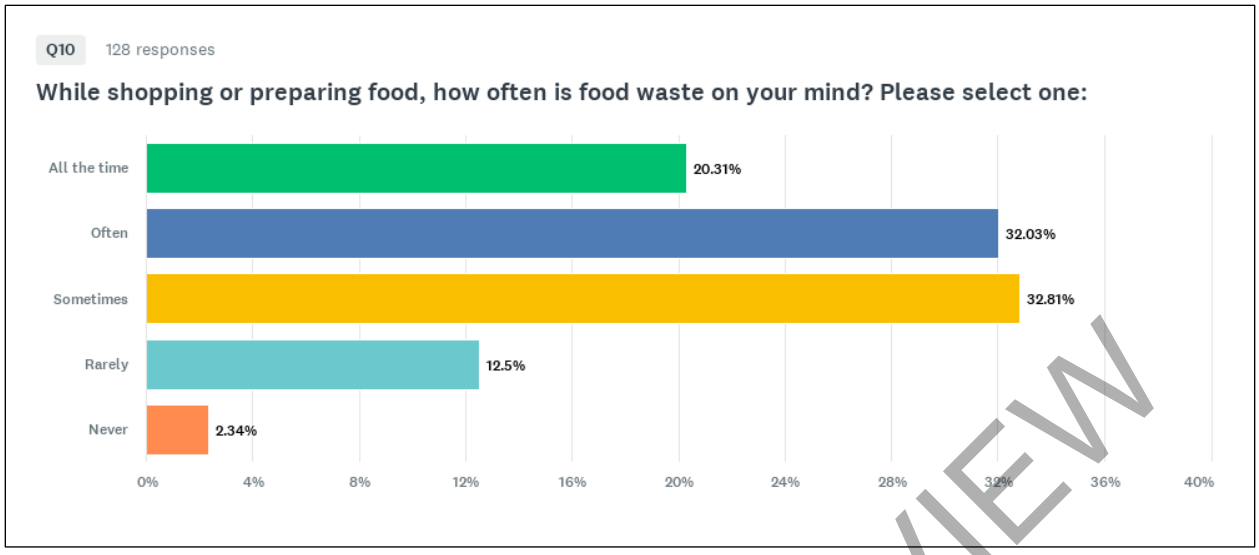



*Figure 24: Visual display of responses to End of Project Survey (2026) Question 10: "While shopping for preparing food, how often is food waste on your mind? Please select one." See Table 15 below for details.*

Table 15: Details of End of Project Survey (2026) Question 10 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| All the Time | 20.31% | 26 |
| Often | 32.03% | 41 |
| Sometimes | 32.81% | 42 |
| Rarely | 12.5% | 16 |
| Never | 2.34% | 3 |
| Total | | 128 |



Analysis: Understanding the potential for preventing food waste within our community.

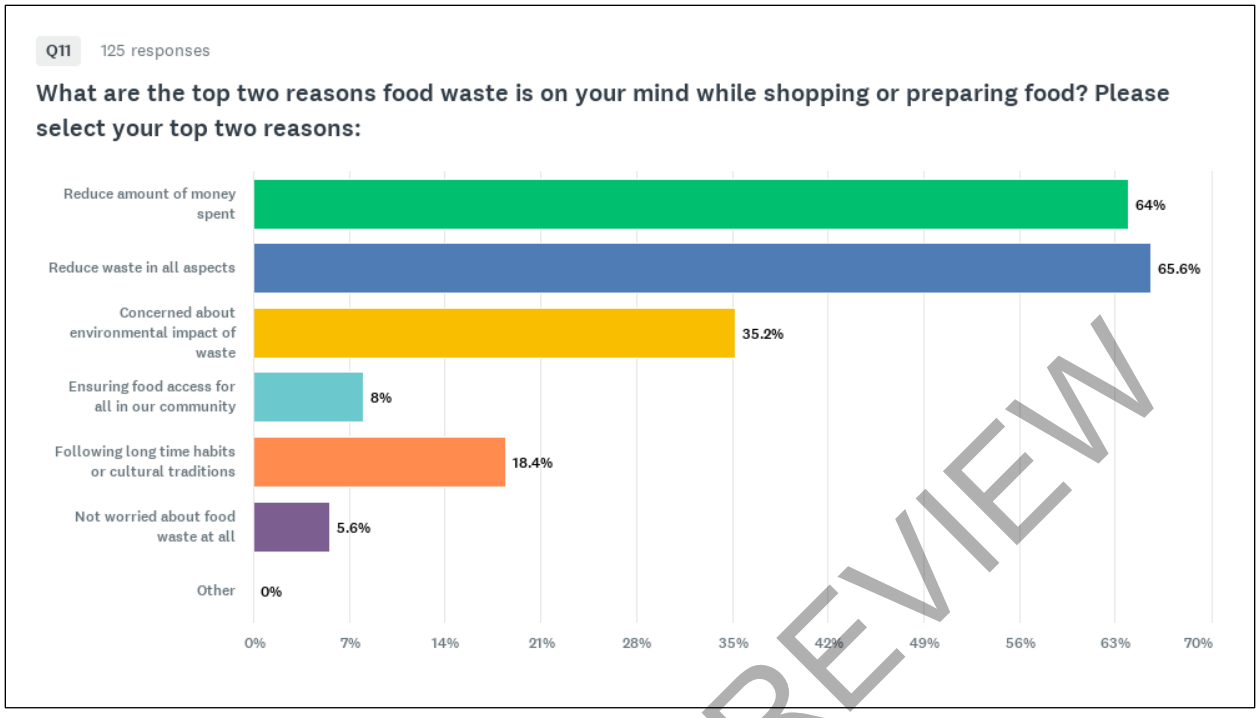



*Figure 25: Visual display of responses to End of Project Survey (2026) Question 11: "What are the top two reasons food waste is on your mind while shopping for preparing food? Please select your top two reasons." See Table [16] below for details.*

Table 16: Details of End of Project Survey (2026) Question 11 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| Reduce Amount of Money Spent | 64% | 80 |
| Reduce Waste in All Aspects | 65.6% | 82 |
| Concerned about Environmental Impact of Waste | 35.2% | 44 |
| Ensuring Food Access for All in our Community | 8% | 10 |
| Following Longtime Habits or Cultural Traditions | 18.4% | 23 |
| Not Worried About Food Waste at All | 5.6% | 7 |
| Other | 0% | 0 |
| Total | | 246 |

Analysis: Understanding motivations for food waste prevention measures, for communication and messaging efficiency. A majority of respondents felt Amount of Money Spent (64%) and Reducing all Waste (66%) were motivators for preventing food waste, with Environmental Impacts (35%) also indicating a strong community commitment to managing all resources and relationships with place responsibly and sustainably.

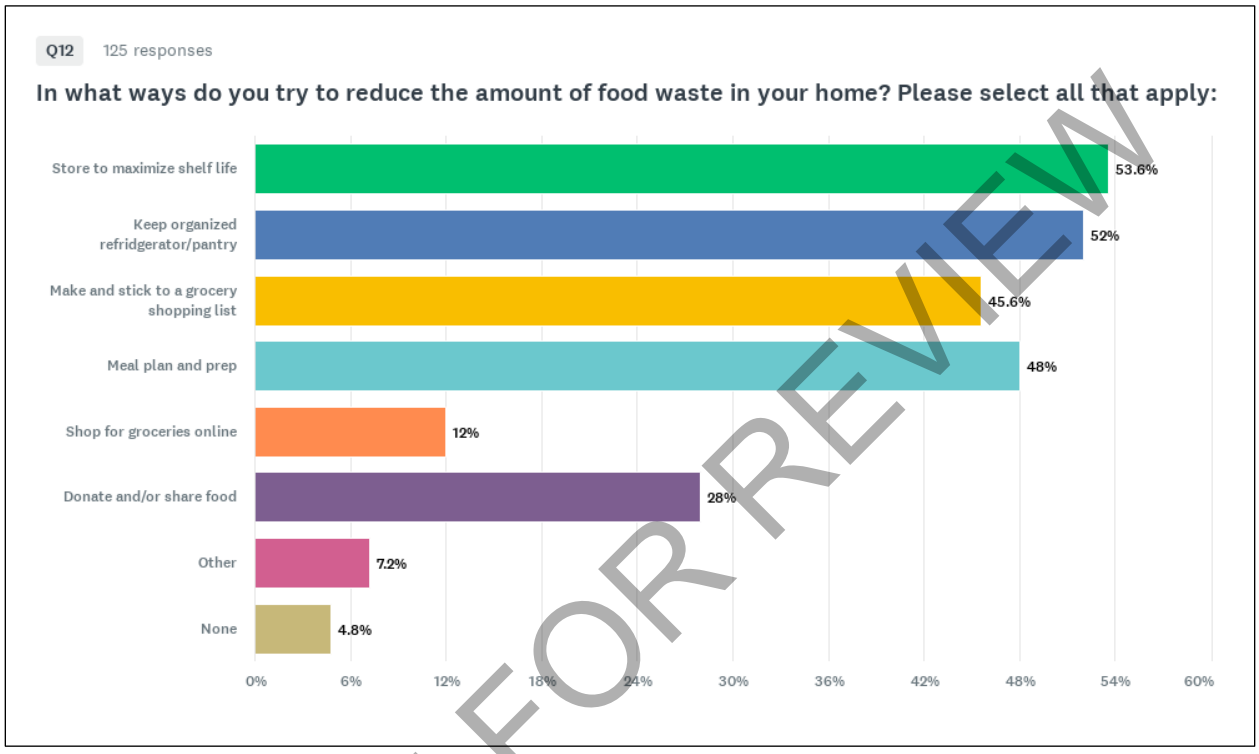



*Figure 26: Visual display of responses to End of Project Survey (2026) Question 12: "In what ways do you try to reduce the amount of food waste in your home? Please select all that apply." See Table [17] below for details.*

Table 17: Details of End of Project Survey (2026) Question 12 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| Store to Maximize Shelf Life | 53.6% | 67 |
| Keep Organized Refrigerator/Pantry | 52% | 65 |
| Make and Stick to a Grocery Shopping List | 45.6% | 57 |
| Meal Plan and Prep | 48% | 60 |
| Shop for Groceries Online | 12% | 15 |

| | | |
|---|---|---|
| Donate and/or Share Food | 28% | 35 |
| Other | 7.2% | 9 |
| None | 4.8% | 6 |
| Total | | 314 |

Analysis: Understanding potential for food waste prevention at a household level.

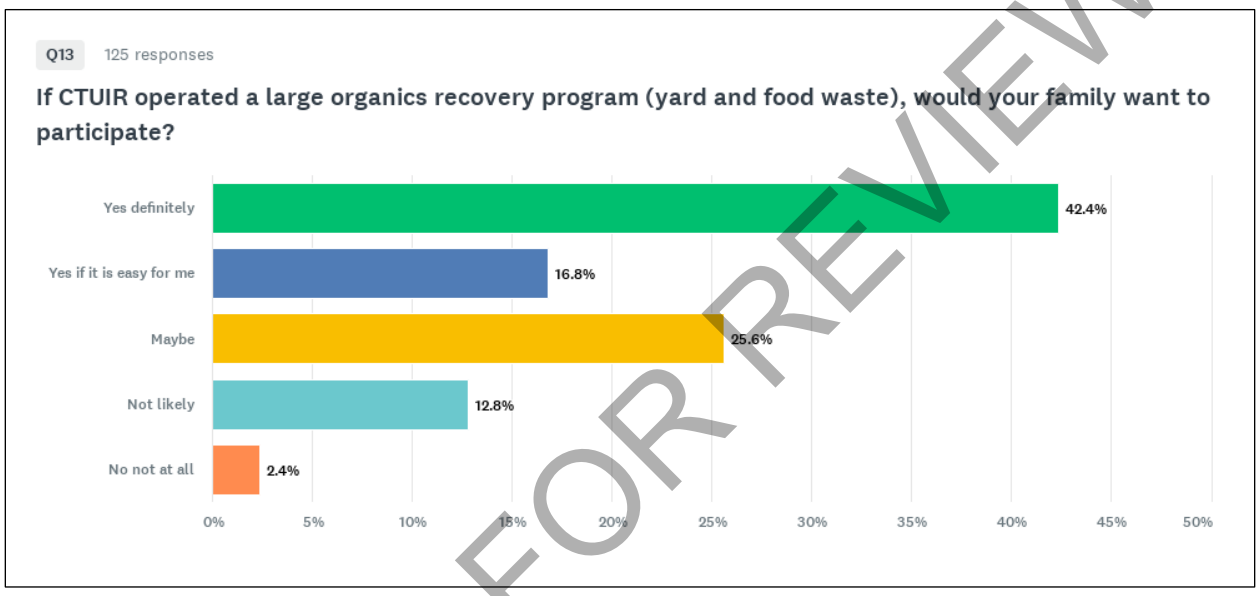



*Figure 27: Visual display of responses to End of Project Survey (2026) Question 13: "If CTUIR operated a large organics recovery program (yard and food waste), would your family want to participate?" See Table [18] below for details.*

Table 18: Details of End of Project Survey (2026) Question 13 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| Yes Definitely | 42.4% | 53 |
| Yes if it is Easy for Me | 16.8% | 21 |
| Maybe | 25.6% | 32 |
| Not Likely | 12.8% | 16 |
| No Not at All | 2.4% | 3 |
| Total | | 125 |

Analysis: Demonstrates community support for a community-scale approach to organics and food waste management. Also documents potential customer base for a potential operation. A majority of respondents would Yes Definitely (42%) and Yes If It Is Easy For [Them] (17%) participate in a community-scale organics recovery operation.

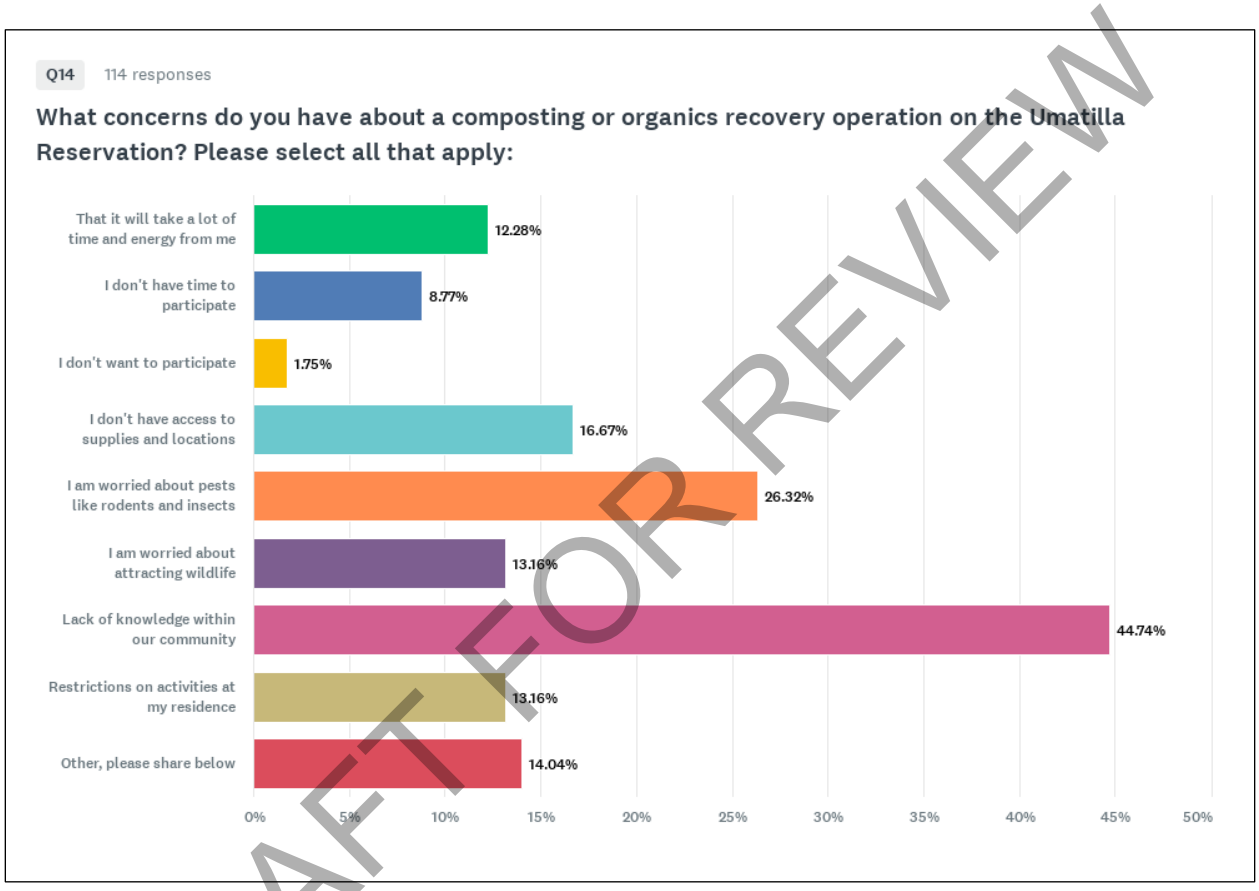





*Figure 28: Visual display of responses to End of Project Survey (2026) Question 14: "What concerns do you have about a composting or organics recovery operation on the Umatilla Reservation? Please select all that apply." See Table 19 below for details.*

Table 19: Details of End of Project Survey (2026) Question 14 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|
| That it will take a lot of time and energy from me | 12.28% | 14 |
| I don't have time to participate | 8.77% | 10 |

| | | |
|---|---|---|
| I don't want to participate | 1.75% | 2 |
| I don't have access to supplies and locations | 16.67% | 19 |
| I am worried about pests like rodents and insects | 26.32% | 30 |
| I am worried about attracting wildlife | 13.16% | 15 |
| Lack of knowledge within our community | 44.74% | 51 |
| Restrictions on activities at my residence | 13.16% | 15 |
| Other, please share | 14.04% | 16 |
| Total | | 172 |

Analysis: Understanding concerns and potential barriers to success for a community scale organics recovery facility. A surprising majority of respondents felt Lack of Knowledge Within the Community (45%) would be a potential concern to a large operation's success, with Pests and Insects (26%) and Access to Supplies and Locations (17%) could present challenges. These results reinforce the investment this project made into education and engagement, and planning for a large operation will need to account for potentially remote pick up sites from disparate housing centers like Cayuse and Gibbon upriver.

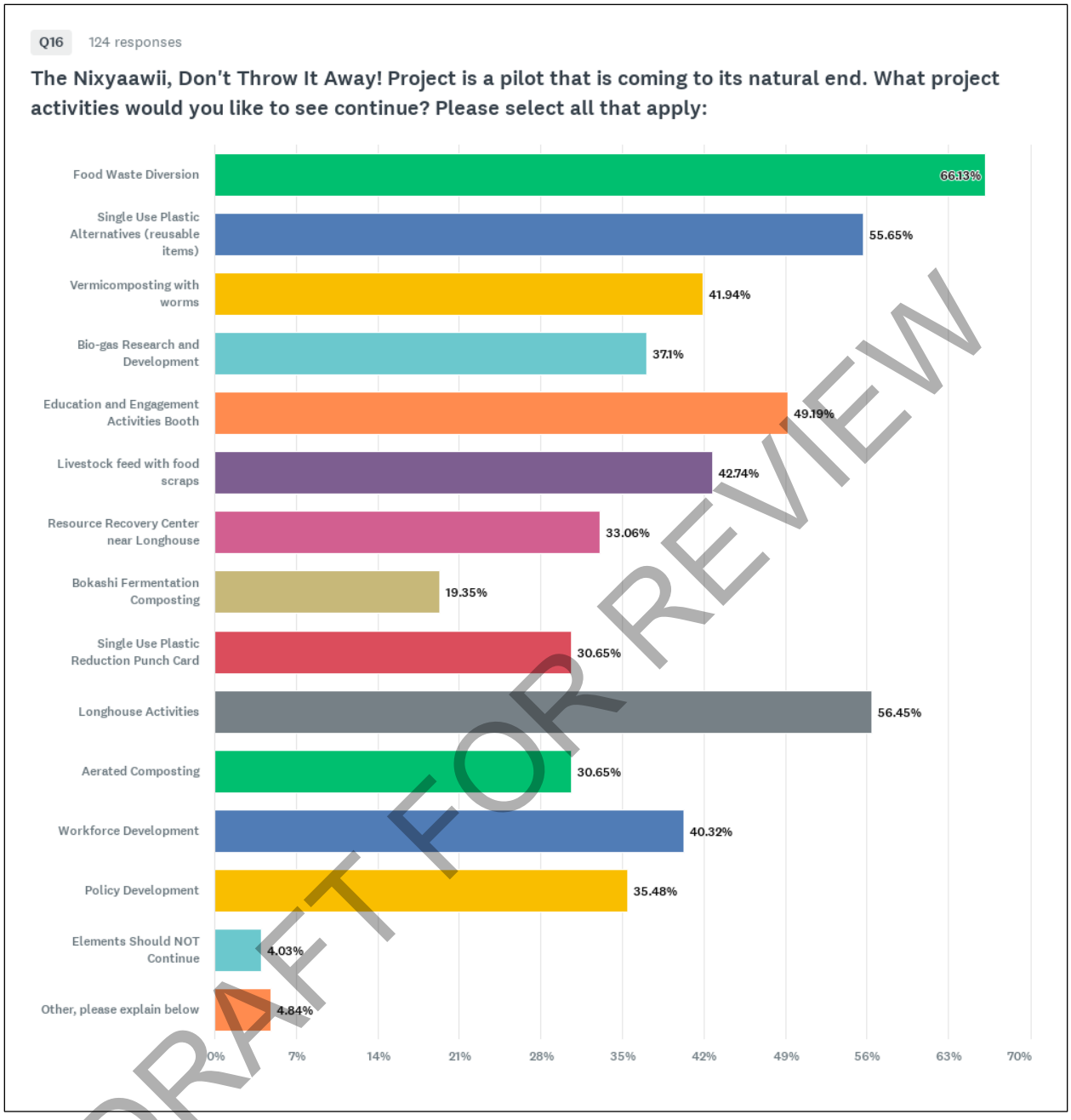





*Figure 29: Visual display of responses to End of Project Survey (2026) Question 16: "The Nixyaawii, Don't Throw It Away! Project is a pilot that is coming to its natural end. What project activities would you like to see continue? Please select all that apply." See Table 20 below for details.*

Table 20: Details of End of Project Survey (2026) Question 16 Responses

| Response Option | Percentage | Number of Responses |
|---|---|---|

| | | |
|---|---|---|
| Food Waste Diversion | 66.13% | 82 |
| Single Use Plastic Alternatives (reusable items) | 55.65% | 69 |
| Vermicomposting (with worms) | 41.94% | 52 |
| Bio-gas Research and Development | 37.1% | 46 |
| Education and Engagement Activities Booth | 49.2% | 61 |
| Livestock Feed with Food Scraps | 42.74% | 53 |
| Resource Recovery Center near Longhouse | 33.06% | 41 |
| Bokashi Fermentation Composting | 19.35% | 24 |
| Single Use Plastic Reduction Punch Card | 30.65% | 38 |
| Longhouse Activities | 56.45% | 70 |
| Aerated Composting | 30.65% | 38 |
| Workforce Development | 40.32% | 50 |
| Policy Development | 35.48% | 44 |
| Elements Should NOT Continue | 4.03% | 5 |
| Other, please explain | 4.84% | 6 |
| Total | | 679 |



Analysis: Community-identified preferred activities they would like to see continue for strategic planning and funding proposals. Majority of people felt they wanted "Food Waste Diversion" and "Longhouse Activities" from the project to continue, with many other people expressing support for the continuation of "Single Use Plastic Alternatives," "Education and Engagement Activities Booth," and "Workforce Development" to continue.

It should be noted that of those who responded to this Question 16, 6 respondents checked all options, including "Elements Should NOT continue," suggesting at least 6 of those who selected this answer may not have intentionally chosen this option.

Table 21: Question 16 "Other, please explain" responses:

| | | |
|---|---|---|
| Stay strong w/ senior food for tribal members only to what grants/written for. Don't hide signs. | Meal plan | 1. In support in support to do at home & support my garden effort. 2. Tribal government steps entity |
| Didn't know about this program | This program should continue in some shape or form. It was an original idea, that picked up some steam + momentum. It's a shame for it not to continue. | I like alternatives for single use that aren't plastic. Mason jars for drinking water and storing food? |
| Great initiative- we need a full recycling program on the CTUIR | Just more of it | Any + everything we could do to lead by example especially when it's hard /takes work/time…Japan (Portland, Or ) can do it, why not us? |
| Would love to learn. | Question 10 response: rinds, skins removed to prepare food. | What is bokashi? |
| Lots of waste @Wildhorse casino, utensils + food in restaurants | Group composting, access to equipment | Question 6 response: just a note - my mom brings them w/her every weekend to longhouse, she loves them! |
| Tribal government needs to support/create the community our ancestors once had by acknowledging time in most important. Allow time/support to community + employees to grow/mange their own food + food waste. | | |

**Survey total responses across two community surveys**: 156 respondents to 2025's Longhouse Sustainability Survey and [93 currently, survey is still open] respondents to 2026's End of Project Survey, for a total of [249] survey respondents.

Some quotes from the surveys:

*"The program help me more aware how to take care of food wisely."*

*"I enjoyed learning all the different things about waste diversion, how can I help."*

*"I wish the fenced tribal garden was used."*

*"Feed for chickens list"*

*"Kids love to see this stand up during culture night. And us adults want to see more support to keep this opportunity and education going to grow with our youth/elders."*

*"You did a great job of introducing it and giving examples on how to do. I appreciate your efforts."*

*"I think compost is a good idea!"*

*"I like being able to collect food waste while cooking at the longhouse."*

*"Tribe to invest in food waste reduction since youth + elders are well established in diversion. Outreach is a must."*

*"Your program is a joy to see. The knowledge you carry to share is so important. Our community and my home need a change. Thank you for all you do!"*

*"I am just learning about this. It is very interesting & would like to learn more."*

*"I applaud your efforts and bravery to start something totally new in concept. To me it seemed successful and started a grassroots + communal level. Well done! Interesting + holistic approach to reduce waste + also be a steward program of foods + waste."*

*"I don't think this project has enough support for dept leadership because of this it will die. In a year or two community + BOT leadership will ask what happened to that food waste project?"*

*"Thank you for your efforts to help our community, hopefully we will work together to be less wasteful!"*

*"Hopefully, you will post results or rec's on the website so your work is memorized for future (and present)"*

*"I struggle w/ disposable of clothing & shoes - I'd like a way to recycle threads & shoes."*

*"Me and my grandchildren really enjoyed this project. We look forward to learning more."*

*"Great communication and energy/passion when presenting. When prepping for BAAD tourney LY. I was able to compost in longhouse kitchen. It brought a good feeling doing that vs putting it in the garbage."*

*"If we do this, raise our youth/kids to already practice these things, it will work."*



The full range of survey responses for both the 2025 and 2026 surveys are compiled and available in Appendix B.

### 3.4 Elders Interviews Excerpts

Several Tribal Elders were interviewed to understand specific knowledge of how unpreventable food waste was managed before many modern conveniences disrupted resource management. Below are excerpts from these interviews that highlight how this project is connected to a long tradition of preventing food waste.

Fred Hill Sr.:

> *"I think it's important to just for the awareness of that discarded food that people that don't eat it if it can be utilized in some of the form that's important. Rather than then it just being discarded in garbage disposal and then throw it out in the garbage container or whatever. And then it just ferments and it just, you know, rots or whatever and that kind of thing. And so I think in this way it teaches us, like the food that maybe the peelings or the peelings of melons or you know, bananas, what have you.*
>
> *And I remember as a young boy, because we had dogs, you know, just dogs and my Grandmother had a pot that was always on a part of the wood stove. It was one of those oven wood stove types that build a fire to cook. She'd have that pot and if she peeled potatoes, she'd throw the potato peelings in there. So for the most part, the dogs eat everything. Once it was boiled and softened up and whatever else was put in there. If there was, maybe deer bones or "suit" bones, what have you, You know that that would be given to them. We didn't buy them dog food; that's what they got. So that was what we ate and what was leftover are discarded in Grandma's pot was given to them."*

Lona Pond:

> *"That's why what we're talking about waste and things in the longhouse, what are left behind going to trash. No, not just the roots, or the Indian medicine, or this or that, berries, they're not the only things that go back to the mountains. Those back, the salmon backs, the tails, the heads, the eggs, everything goes back to the river.*
>
> *But that doesn't happen anymore. They threw it all in the trash. So that's part of what your guy's study is, well there is another part that's important.*
>
> *That what we're not doing right. And when I'm in a longhouse, and I take care of the salmon, I threw it all in my plastic bag, and I go to the river, and I got to say a prayer over it, and then pray to god, those fish can come find their way back up*

*here. Their family or their own eggs, they just, they can smell that. Their own ancestors…. with their noise in the water."*

*Image 32: Local livestock like goats and chickens feast on tomato slices and lettuce leaves leftover from the July 2026 Employee Appreciation Picnic event at the Nixyaawii Governance Center. Photo by CTUIR DNR FFPP, 2026.*

# Part 4: Project Outcomes, Conclusions, and Next Steps

## 4.1 Organics Recovery Summary

This section attempts to create a baseline and estimate for potential organics recovery potential for CTUIR. Much of the information our project sought to generate was a baseline estimate of the kinds of food waste were most often observed being thrown away, and at what volumes, to better understand what kinds of food waste were likely to end up in a diversion program. This information will be useful to an Organics Recovery Needs Assessment that would provide feasibility planning to Tribal departments for investment into a larger operation.

### 4.1.1 Overview of Estimates

From both our dot surveys and our individualized community surveys, we understand that much of the food waste created at a household level comes from leftovers, both from home-cooked and take out sources. This kind of food waste tends to be more processed that preparation waste sources, with additives that make it challenging to process like condiments and biological materials like saliva. While options exist that are able to process these food waste sources safety, they tend to be more complex and large investment equipment that would need significant land use and financial investment into procurement and staffing to conduct these forms of recovery.

The second largest source of food waste was indicated to be from fresh produce like fruits and vegetables that were uneaten or spoiled past food safety. These forms of food waste are incredibly easy to divert to recovery sources such as composting and livestock feed. To capture these food waste sources for diversion, additional capacity towards community education and behavior change would be necessary to ensure just produce items were diverted. Our project did not request participants separate fruits and vegetables from other food waste items, due to the existing burden of separating food waste from other general landfill waste. Additional outreach would be necessary to explain and implement produce diversion specifically.

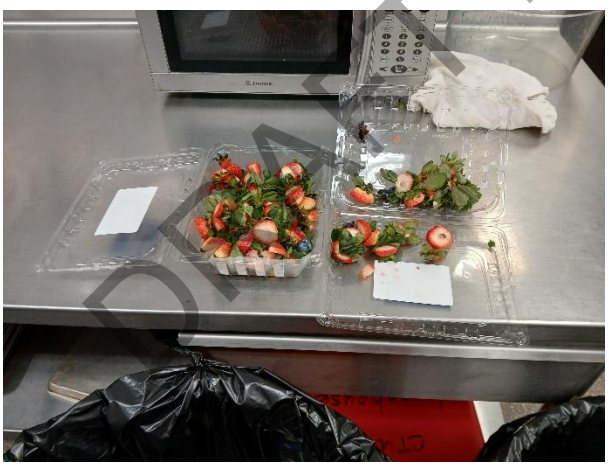
Our data indicated that First Foods are rarely thrown away by our community, so their appearance in food waste collected from the Longhouse Feasts indicates that those outside our community who attend community events are largely the source of these important Foods being discarded.

### 4.1.2 Food Waste Actual from Project Service Area

Much of the food waste that was collected from our host sites was of high quality and could be easily recovered using our diversified methods. Fruits and vegetables of high quality were

diverted to livestock feed, with a handful of commercial and backyard livestock owners picking up fresh food waste on a first-come-first-served basis. Lower quality fruits and vegetables were diverted to aerobic and vermicomposting sources, due to these sources having a higher capacity to process food waste that had sat for a period of time but was not yet putrid. Light grains like rice and beans were often also diverted to livestock if they were of high quality, though low quality sources were diverted to anaerobic digestion and later to Bokashi methods. Meats that were high quality were diverted for dog food, and were distributed to Longhouse cook families who had dogs and indicated a desire to take this food waste back home. Lower quality meats and fish were diverted to Bokashi methods, were they were processed using the Bokashi fermentation composting that used an anaerobic and high acidity process to more safely break down these difficult food waste items into material that could be further processed in the aerobic compost method. Composts from both the traditional aerobic compost and compost from Boshaki solids were then further cured using a small enclosed outdoor windrow method for several months before being weighed and distributed to outputs study participants. Please see 4.2 following for more information on how compost outputs were managed and evaluated. Food waste items that were extremely difficult to process like cooking oils and highly processed snack foods, and sources that were heavily putrefied upon delivery were weighed and thrown back into landfill waste options.

From Table [2], [577] pounds of food waste was processed through various composting methods, nearly [800 pounds] was diverted to local livestock and pets, [306 pounds] was diverted to anaerobic digestion, which was later pumped to wastewater treatment facilities in the region, and over [1,000 pounds] was unrecoverable and was sent on to landfill options.



*Images 33 and 34: Much of the food waste recovered was high quality fruits and vegetables (left) that was distributed primarily to local livestock, while other lower quality and difficult to process food wastes were processed using a combination of methods. Photos by Biowaste Technologies, 2025.*

### 4.1.3 Food Waste Potential Estimated for UIR

An element of this project is to project potential organics recovery from CTUIR establishments outside our project's minimal service area. Part 2 of this report offers an overview of other food service establishments that would likely be served by a community-scale recovery operation. In this section, we use the information provided to us by these establishments for what a large community scale operation is likely to encounter for a organics recovery effort.

Our project also hosted two sessions at the Nixyaawii Governance Center to invite our Tribal staff to participate in these conversations to better understand the needs and concerns that exist for an organics recovery operation. Representatives from Tribal Planning, Water Resources Program, and Department of Economic and Community Development participated in these discussions. Details of these meetings can be found in Appendix H: Other Documents.


*Images 35 and 36: Project team and Vahid Biogas tour CTUIR's Tribal Native Plant Nursery and host several interdepartmental conversations about the benefits and risks of food waste recovery to better understand the needs and potential for fertilizer and biogas for CTUIR. Photos by CTUIR FFPP, 2025.*

[Estimates pending]

## 4.2 Composting and Resource Recovery Summary

### 4.2.1 Introduction

Composting is the natural breakdown of organic materials such as food scraps, yard waste, crop residues, and manure by microorganisms and decomposing organisms into a rich, dark material called compost. Compost improves soil structure, increases soil organic matter, enhances water-holding capacity, supports beneficial soil biology, and reduces waste sent to landfills (U.S. Environmental Protection Agency [EPA], 2025; U.S. Composting Council [USCC], 2025).

Compost improves soil health by increasing organic matter content and supporting beneficial microorganisms. Healthy soils provide improved nutrient availability, greater water infiltration, increased drought resistance, and improved plant productivity (USDA Natural Resources Conservation Service [NRCS], 2025).

Most organic material can be recovered in some way if the right methods and infrastructure are in place to do so. Much of the project focused on anaerobic digestion and investigation of the potential to create renewable natural gas from food waste sources. Once the digester was decommissioned, other forms of composting were implemented to ensure food waste collected from host sites continued to be processed. This included aerobic composting, Bokashi fermentation composting, and vermicomposting with worms. Bio-gas research and development efforts are detailed further in 4.4, including troubleshooting and potential for food waste to contribute to renewable natural gas generation for our region.

*Images 37 and 38: Resource Recovery Center shed across from the Nixyaawii/Mission Longhouse (left) was the collection location for host sites. Once the anaerobic digester was decommissioned in July 2025, diverse composting methods were implemented and a complex triage for food waste was conducted to ensure materials went to the most appropriate diversion options. Photos by Biowaste Technologies, 2025.*



### 4.2.2 Project Compost Evaluation

Community review and guidance was again at the forefront of working with outputs from our food waste processing methods. To receive compost solid and liquid outputs, recipients agreed to only use the output in raised beds or in garden planters that would allow for this soil to be kept separate from the surrounding soil. This was to manage for any potential introduction of harmful insects to the region's soils. Compost evaluation forms were also administered to recipients to understand the quality of the project's outputs, and what positive or negative impact they have on recipient plant and soil health. Due to project activities ending somewhat

early, only a couple of these evaluation forms were returned to the project team, but these and the evaluation template can be found in Appendix H: Other Documents.

*Images 39 and 40: Project staff put together planter buckets with compost created from the project to evaluate the quality of compost produced by the project. Photos by CTUIR DNR FFPP, 2026.*


*Image 41 and 42: Bokashi processing resulted in both solid and liquid outputs; solid outputs were processed in the aerobic composting tumbler (Image 34) and weighed as part of the composting solids, while liquid outputs were measured using volume and strained to be distributed to recipients as a dilution with irrigation water. Photos by CTUIR DNR FFPP, 2025.*

Initial batches of compost included solid and liquid contributions from the Bokashi method of composting, which creates a product that is slightly acidic in nature. Without corresponding alkaline balancing agents like wood ash, this initial batch of compost was believed to also be slightly acidic in quality. For this reason, project staff selected a variety of blueberry plants to be

planted directly into a 80:20 mixture of project compost : potting soil to understand the quality of the compost product aside from its slightly acidity.

[Compost and liquid outputs metrics pending]

### 4.2.3 Benefits to Soil

Soil is far more than a medium for growing plants. Healthy soil is a living ecosystem that supports plants, animals, microorganisms, water cycles, nutrient cycling, and human communities. The United States Department of Agriculture (USDA) Natural Resources Conservation Service defines soil health as the continued capacity of soil to function as a living ecosystem that sustains plants, animals, and humans. Soil health is determined by the interaction of physical, chemical, and biological properties working together to support productive and resilient ecosystems. Modern agricultural practices, urban development, erosion, overgrazing, compaction, and loss of organic matter have degraded soils worldwide. The United States Environmental Protection Agency (EPA) reports that approximately one-third of the world's soils are moderately to highly degraded. Declining soil health contributes to reduced crop productivity, increased fertilizer dependency, poor water quality, erosion, flooding, and decreased resilience to drought.

Compost is widely recognized as one of the most effective tools available for restoring and maintaining healthy soils. Produced through the controlled decomposition of organic materials, compost returns carbon, nutrients, and beneficial microorganisms to the soil. Scientific research consistently demonstrates that compost improves soil physical structure, nutrient availability, microbial diversity, water retention, erosion resistance, and climate resilience.

Please find additional information on the connection between soil health and compost in Appendix [E: Educational Materials Produced].



### 4.2.4 Benefits to Water

Food waste is heavy, really heavy. That's largely because it is mostly water! One exciting aspect of this project that we were not able to explore fully is the potential for water recovery from food waste.

25 percent of the fresh water supply in the US is used to produce food that is never eaten (Hall, 2009).

[Information from Perca about water recovery potential from food waste and waste water]

*Image [43, 44, and 45 (bottom)]: CTUIR and project staff on the site tour with Perca vermifiltration company in Walla Walla, WA. Perca is a innovative remediation option for treating traditional waste water from various sources as well as water reclaimed from food waste. Photos by CTUIR DNR FFPP, 2026.*



4.2.5 Benefits to Energy

2 percent of energy use in the US is dedicated to growing, manufacturing, transporting, refrigerating, and cooking food that is never eaten – or enough electricity to power 54 million homes for a year (EPA 2026)

Food waste could also have a role to play in generating electricity through the concept of anaerobic digestion to methane capture, which was the subject of Goal 3 of this project. While our project did not have a successful bio-gas generation trial due to extreme temperature fluctuations of our region and a lack of insulated infrastructure, our project was still able to develop an understanding of what would be necessary to make a bio-gas facility successful, and built understanding of the science within the Tribal government and community. The following section 4.4 provides a detailed summary of the pilot trial and the potential for renewable bio-gas using food waste.

**4.4 Bio-gas Generation Potential Summary**

4.4.1 What is "Bio-Gas"?

"Bio-gas" is a catch-all term to refer to combustible gases that include methane and other gases produced from the decomposition of organic material in conditions without oxygen. Much of the existing knowledge of bio-gas, or renewable natural gas, comes from heavily industrialized sources like dairies and feed lots that collect cattle manure to be housed under sealed conditions to allow for the methane to be collected and used for energy, or from landfills that pipe methane from stratifications within the landfill up to be flared (burned) or used for energy, depending on their permitting status.

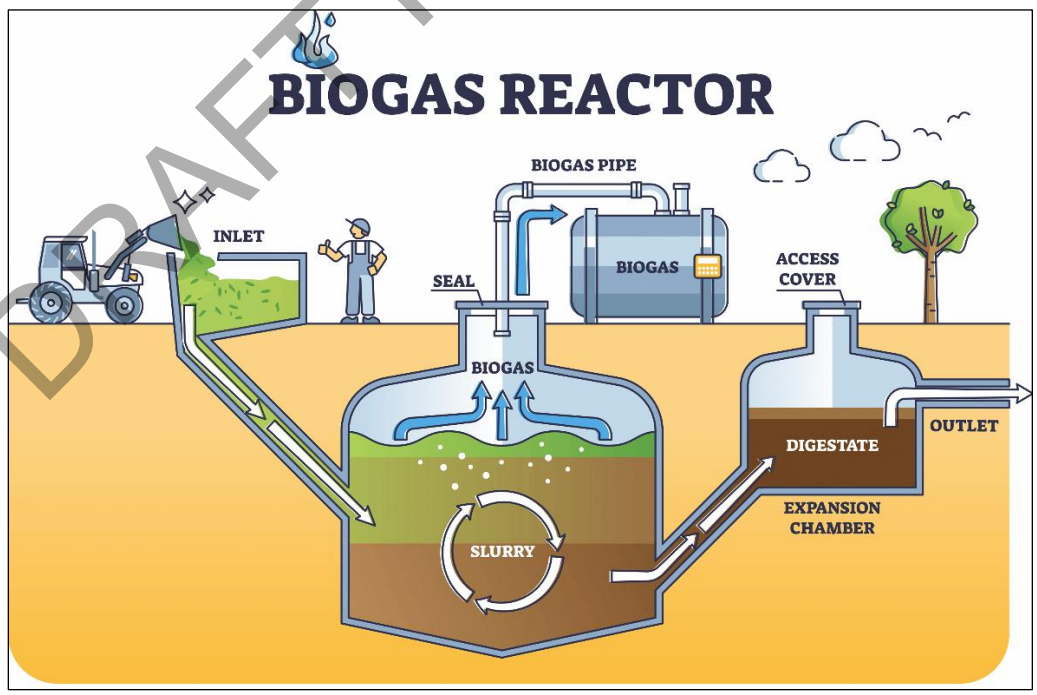


*Figure 30: Diagram of bio-gas process at an industrial scale; by ScieLab 2024, unaltered.*

Much of our community's pre-project exposure to the concept of bio-gas has centered on large confined animal feeding operations (CAFOs) that are numerous in CTUIR's Ceded lands, and perception was not initially positive due to these associations. However, food waste presents a prime and severely underutilized source of biogas generation for Oregon, and presents a robust opportunity because of the energy generating potential of food waste specifically as feedstock, compared to relatively poor feedstock of animal and human manure being used currently as part of existing operations. This includes a wastewater treatment anaerobic digester being used as part of the City of Pendleton's wastewater treatment facility, that generates an undisclosed amount of renewable natural gas per year from human waste sources.

The American Biogas Council (ABC) provides an estimate of existing bio-gas production within the state of Oregon (American Biogas Council, 2024).

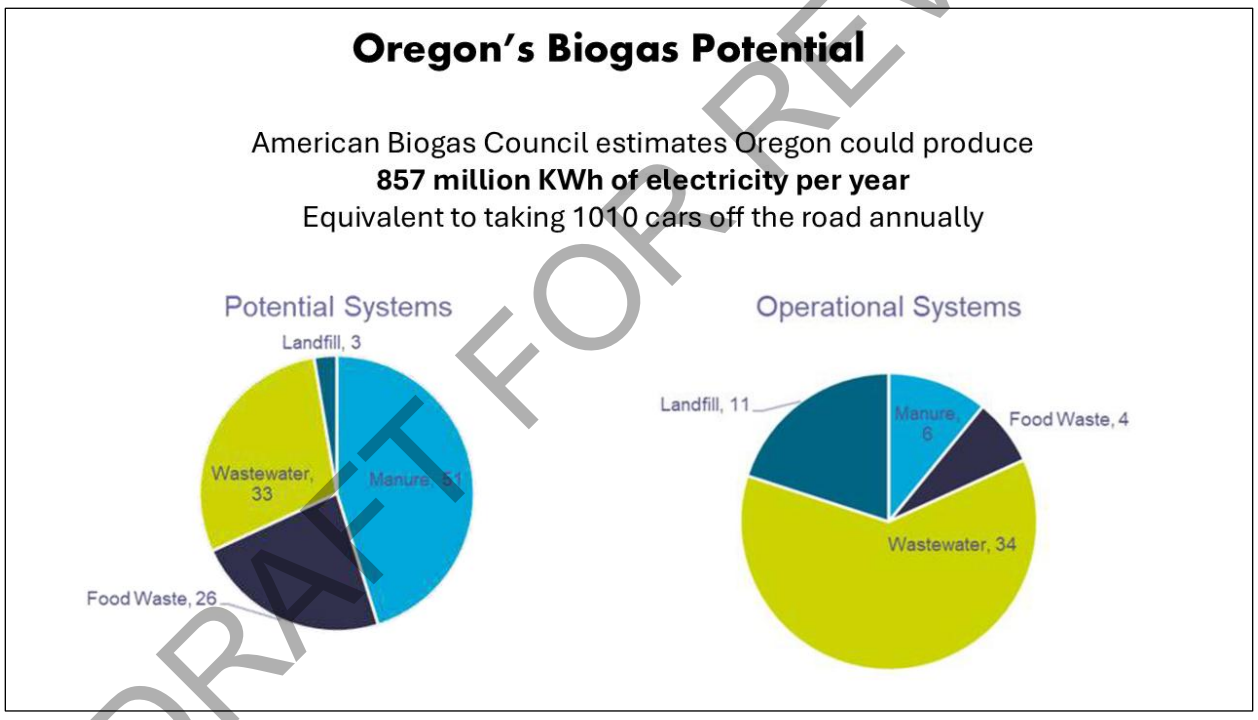



*Figure 31: Estimates of potential bio-gas generation (left) and existing bio-gas generation (right) within the state of Oregon and their associated feedstocks. By American Biogas Council, 2024.*

This shows that most bio-gas within Oregon is currently generated using wastewater (34%), similar to the City of Pendleton's design, as well as from landfills (11%) and from Manure (8%), with food waste feedstocks representing only 4% of existing capacity. This contrasts with estimates on what could potentially be used, with food waste representing 26% of potential bio-gas generation in Oregon. ABC estimates that bio-gas could generate roughly 857 million

kilowatts of energy per year, and could prevent over 1000 passenger car quantities of carbon emissions per year additionally (ABC, 2024).

Our anaerobic digester trial was very illuminating though it ultimately proved unsuccessful at producing a methane gas, for reasons discussed below. In the following section, we provide a timeline for our trial, and provide a retrospective on challenges and potential ways of overcoming aspects of the trial that should be avoided in future designs.

4.4.2 Pre Áq̓paš Planning

Little to no pre-fabricated kits exist for small scale anaerobic digestion, which limited the project's ability to source these easily. While a model from Shenzen Puxin Technology Company Limited was available for purchase online through foreign vendor platforms, the CTUIR procurement process prevented this model from being acquired for use with the project. To adjust for this internal procurement challenge, Biowaste Technologies was able to use an Amazon Change X grant they had secured in supplement of USDA funding to purchase a smaller prefabricated kit with a less optimal design from domestic online vendors. It was this version that became our only larger scale digester trial, and it suffered from design flaws that allowed for the escape of gases and difficultly managing inputs and internal chemistry. This digester was affectionately named Áq̓paš 00 (Awk-pash zero zero), for the Umatilla word for "stomach" and to indicate that it was being conducted outside of original project design.

*Images [46 and 47]: Biowaste Technologies operator DeArcie Abraham builds the Puxin digester kit in anticipation of beginning bio-gas generation trials later in the year. This Áq̓paš 00 had a number of flaws in its design, including insufficient seals in plumbing, awkward input chute, and a lack of ability to adjust internal chemistry easily. Photos by Biowaste Technologies, Feb 2025.*

4.2.3 Starting the Áq̓paš

Once the Puxin kit model had been constructed within the Resource Recovery Center, project staff waited until seasonal temperatures warmed enough to potentially meet the threshold

temperature of 55 °F required for decomposition to produce a methane gas. Temperatures around Celery Feast at the beginning of March reached into the 70's °F with an unseasonally warm spring, and food waste collected as part of the Celery Feast in 2025 was used to begin food waste input into Áḳpaš 00. This food waste was weighed and the water added to produce the input slurry was also recorded, as was ambient air temperature. Because the trial was ultimately unsuccessful, these records have not been included in the project data, but paper records of this data exist with the project materials housed by CTUIR First Foods Policy Program.

*Images [48 and 49]: Food waste input into the Áḳpaš began in Spring 2025 and inputs were all recorded to calculate bio-gas potential. Water was also added to create an airtight layer for food waste to decompose in anaerobic conditions within the digester. With appropriate temperatures, this food waste would decompose to produce first carbon dioxide until oxygen had been used up, then methane that would have been syphoned out. This did not occur however due to many challenges in the digester and infrastructure design. Photos by Biowaste Technologies, 2025.*

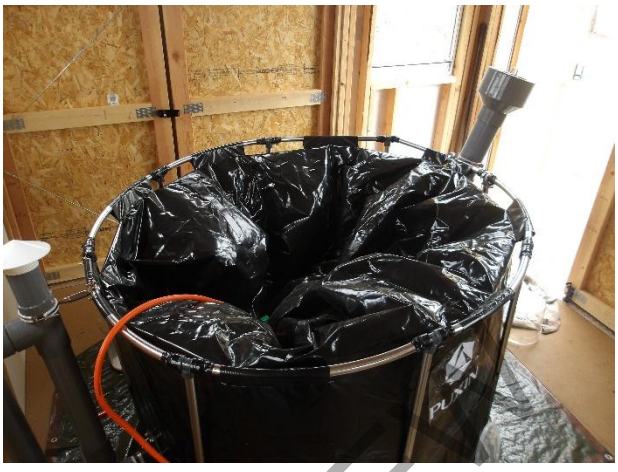
Cattle manure was obtained from the Blue Mountain Community College (BMCC) School of Agriculture's cattle herd, and was used to inoculate the Áḳpaš. Microorganisms found within cow stomachs naturally decomposes organic material in anaerobic conditions to produce the methane gas that has become a focal point for agricultural greenhouse gas emissions. Using as fresh of cow manure as our project could secure, the concept was to capture these microorganisms to inject them into our digester and use the food waste feedstock to create methane in artificial conditions that mimicked a cow's stomach.

*Images [50 and 51]: Cattle manure was collected from BMCC with permission from instructors and stored in airtight containers to preserve living organisms within this manure. Manure was then converted to a slurry form and input into the Áq̓paš at different points throughout the trial to encourage microorganism decomposition of food waste and creation of methane. Photos by CTUIR DNR FFPP, 2025.*

### 4.2.4 Troubleshooting the Áq̓paš

During the trial, food waste and water amounts were input into the digester and recorded, along with ambient air temperature and any gas that was produced. The intention was to better understand how to work with food waste to create bio-gas to supplement the community's energy needs. As it progressed into the summer months, the project team suspected the trial was not performing as it should, and attempts to understand the chemistry within the digester were undertaken. Limited access to testing capacity made this a challenge, and only pH (acidity) could be readily tested due to difficulties access the digester materials internally.

pH was consistently measured as very acidic (pH of 6 or lower) and it was suspected that this may be creating barriers to the ability of microorganisms to effectively convert food waste to gas. Project directors decided to incorporate baking soda in an attempt to balance the internal pH, though it was later determined there were other courses of action, including the addition of wood ash, that could have assisted in reducing acidity but not compromised the agricultural quality of effluent that could have been collected.

*Images [52 and 53]: Biowaste Technologies operator DeArcie Abraham checks the pH values for the effluent collected from the Áq̓paš to determine chemical balance and needs (left). As baking soda was input, gas was produced as pictured (right) but project directors suspect this gas was solely carbon dioxide that resulted from the interaction between the acidic digester contents and the baking soda. Photos by CTUR DNR FFPP, 2025.*

4.2.5 Decommissioning the Áq̓paš

As the trial continued into the summer, it became clear that it would not be successful due to a number of challenges that included digester design, temperature, and lack of expert guidance. In July 2025, the project directors made the decision to decommission Áq̓paš 00 rather than attempt to continue this unsuccessful trial, and to scale down future trials to 5-gallon bucket designs that could be constructed by the project team. A septic pumping truck was commissioned to clear out the contents of the digester, totaling over 300 gallons of food waste and manure slurry.

Anecdotally, the septic pumping employee noted this was the strangest call he had ever been sent out on. Because of this, the project team decided this experience had increased capacity within our local waste management companies to address anaerobic digester troubleshooting needs. These smaller designs were also ultimately unsuccessful at producing a combustible gas, largely due to the temperature fluctuations that prevented long duration temperature stability necessary to convert decomposing food waste from carbon dioxide to methane.

*Images [54 and 55]: Áq̓paš 00 was decommissioned on July 3rd 2025 after three months of unsuccessful trial to generate bio-gas (left). Subsequent Áq̓paš designs focused on smaller vessels in a 5-gallon bucket to better understand the necessary design and recipe for future attempts to be successful. Biowaste Technologies operator DeArcie Abraham shows off her hand-constructed Bucket design Áq̓paš 01. Photos by Biowaste Technologies, 2025.*

4.2.6 Bio-gas Community Workshop with Vahid Biogas LLC

With the unsuccessful trial of Áq̓paš 00, our project team sought expert assistance in identifying and documenting what challenges had thwarted our trial, and how future designs could avoid these barriers. Many attempts to find and contact people in the Pacific Northwest who were knowledgeable about small scale and food-waste focused bio-gas generation was incredibly difficult, and eventually our project found Vahid Biogas LLC and its operator David House.

House had previously authored a how-to guide about bio-gas and agreed to work with our project team to host a community education workshop to explore this energy and resource recovery method with our Tribal community. In December 2025, a workshop was hosted at the Nixyaawii/Mission Longhouse to facilitate community members to learn about bio-gas science and construct their own 5-gallon bucket digesters. It was a small gathering of a dozen community members, but those who attended were extremely enthusiastic and excited to learn and contribute to resource recovery for the community.

Participants were provided with lunch (prior to food waste processing), a copy of House's Complete Biogas Handbook, and their own mini-digester. While the workshop was largely conceptual to provide a scientific understanding of the design and operation of an anaerobic digester, participants excitement to assist the project in future digester trials.


*Images [56 and 57]: Vahid Biogas operator David House helps a workshop participant with their bucket digester construction (left). Food waste from the event was converted to a slurry using a modified kitchen garbage disposal constructed by Biowaste Technologies for the workshop (right). Photos by CTUIR DNR FFPP, 2025.*


*Images [58 and 59]: Once converted into a slurry, food waste and cow manure were combined into 5 gallon buckets (left) and sealed with the constructed lid and gas exhaust hose to collect gas that would result; these mini digesters were sent home with workshop participatnts (right).*

*It was estimated this bucket design would take about a month to fully complete the decomposition that would result in a potentially combustable gas. Photos by CTUIR DNR FFPP, 2025.*

### 4.2.6 Considerations for future bio-gas research efforts

While our Áq̓paš trials were not successful in producing a combustible gas, we learned many essential elements that would be necessary to produce a successful trial. Our project team never gave up on the concept of biogas, but our limited project did not have the infrastructure necessary to reach a successful demonstration. Essential elements that were identified by our trial include:

- Airtight Digester Design
  Any gas (air or combustible) that is able to permeate the digester design will result in challenges. Air entering the design disrupts the creation of methane gas that can only occur in anaerobic conditions without the presence of oxygen. Conversely, gas escaping from the digester will result in unpleasant odor and a loss of potentially valuable combustible gas into the atmosphere. A successful design must be airtight sealed at all plumbing junctions to prevent challenges.

- Temperature Stability
  Microorganisms responsible for converting food waste to methane require a minimum stable temperature of at least 55°F for at least 14 days to transition from producing carbon dioxide with oxygen remaining in food waste to methane. Temperature fluctuations that could not be buffered in our uninsulated or electrified Resource Recovery Center were the largest obstacle encountered by our trials. Successful trials would be able to buffer temperature changes by partially or completely burying digester tanks for a passive design, or be located within facilities that have existing heating and cooling capacities to ensure a steady temperature necessary for methane generation.

- Fresh manure for maximum microorganisms
  Microorganisms that convert food waste to methane are extremely oxygen and cold intolerant, consistent with their natural habitat within ruminant stomachs. Because of this, sourcing inoculant manure requires collecting as fresh of manure as possible to reduce decline in microorganism efficacy. Existing digesters at dairies and feedlots are able to do this due to their proximity to concentrations of cattle. Building relationships with cattle producers could provide access to fresh inoculant material that would reduce changes of microorganisms being rendered ineffective in between exiting the

animal and being input into the digester.

- Insulated design with easy input and output access
  An efficient digester design would not only be airtight but would also allow for maintenance access to plumbing and tanks in the event that troubleshooting was necessary. Our pre-fabricated digester design was a relatively cheap model that broke many components when project team members attempted to access input and output plumbing. A custom design would likely yield a far more superior digester that could be more easily accessed for maintenance and chemical balancing needs.

### 4.5 Project Carbon Emissions and Reductions Calculated

Methane and other combustible gases are potent greenhouse gas emissions and are an area of concern for many programs that aim to reduce atmospheric carbon. Preventing food and other organic materials from ending up in the anaerobic conditions of landfills can help prevent methane escape from undeveloped landfills and carbon dioxide release as flared gas in developed landfills. Transportation of organic materials from their point of collection to their point of disposal also contributes to carbon emissions from materials management sources, and reducing this distance can contribute to reducing carbon emissions. This project includes an exploration of carbon emissions implications associated with this pilot project.

This section provides a brief overview, though full calculations can be found in Appendix A.

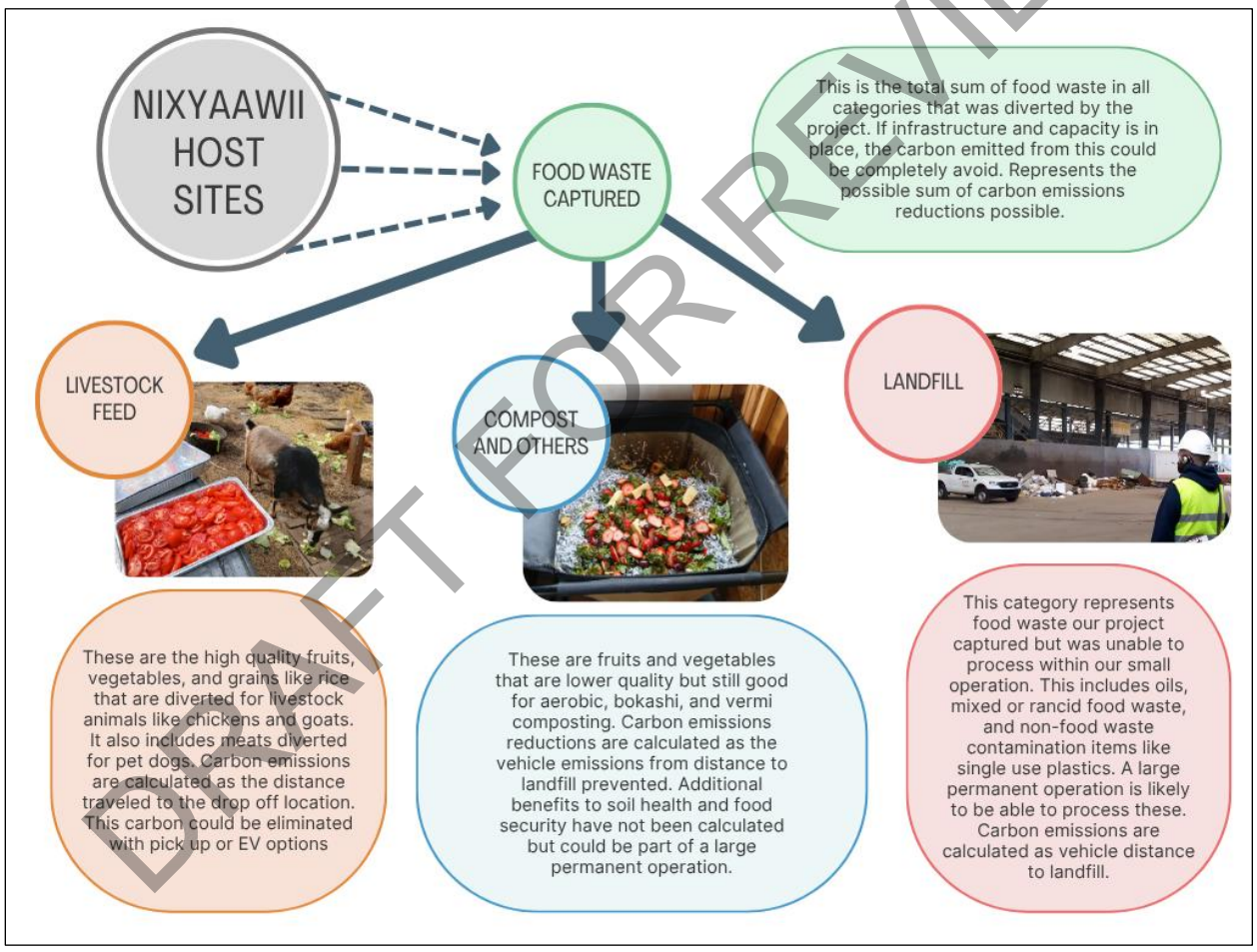



*Figure 32: Visual map of how carbon emissions and reductions will be calculated in Appendix A: Project Carbon Inventory. Infographic by CTUIR DNR FFPP, 2026.*

Generally, carbon emissions from food waste really come from the distance traveled with collection vehicles.

Table 22: Rough Estimates of the Carbon Emissions Created and Prevented by Project

| Food Waste Destination | Frequency and Schedule | Emissions Associated |
|---|---|---|
| Livestock Feed<br><br>FW to Livestock was conducted roughly twice per week during the course of FW diversion | Twice per week = 96 trips per year<br>- 25% of this was picked up = 24 trips per year<br>FW pick up was not included in Carbon Emissions due to existing travel outside project scope<br><br>- 75% delivered by project team = 72 trips per year<br>FW Drop off to local sites was calculated due to the dedicate trips vehicles made to the site | Medium gasoline vehicle traveling 25.8 km (round trip)<br>- 72 trips per year<br>Calculation:<br>25.8 km * 72 trips per year * 117 gCO2e per km<br>= **217, 334 gCO2e per year**<br><br>Over 2 years of the project's food waste diversion, this is an estimated:<br>**434,678 gCO2 emitted for project total** |
| Composting Options<br><br>FW was picked up from host sites roughly 0.5 to 1 km from its processing site at the project shed | Twice per week collection from three sources at 0.5 km; 3 kms traveled per week from three host sites<br>- Pick up was estimated as 75% without vehicle and 25% with vehicle<br><br>One host site was 1 km distance (2 km) total (Seniors Center); 100% of these pick up trips were with a Medium gasoline vehicle twice per week<br><br>* Note: it was the original intent of the project to use an EV bicycle to perform this collection, thereby preventing these emissions from being created | Pick up estimated as 75% without vehicle and 25% with vehicle<br>= 0.5 km * 2 times per week * 3 host sites = 3 km per week<br><br>Over 48 weeks in a year, 144 km traveled total. 25% of these were with a Medium gasoline vehicle, meaning 36 kms per year vehicle travel<br>36 km per year * 117 gCO2e per km<br>= **4,212 gCO2e per year**<br><br>Over 2 years, estimated:<br>**8,424 gCO2 emitted for project total**<br><br>Seniors Center pick up is 100% with vehicle<br>= 2 km * 48 weeks * 117 gCO2e per km<br>= **11, 232 gCO2 e per year**<br><br>Over 2 years, estimated |

| | | |
|---|---|---|
| | | = **22,464 gCO2 emitted** |
| Landfill<br><br>CTUIR collected municipal solid waste is sent to Columbia Ridge Landfill in Arlington, OR = 129 km one way (258 km) | Food waste that could not be reclaimed with composting methods was returned to the municipal solid waste stream to be sent to Columbia Ridge Landfill.<br>Waste pick up is once per week using a heavy industrial truck, with 192 gCO2e per km | Once per week pick up * 48 weeks per year * 258 km * 192 gCO2e per km<br>**= 2,377,728 gCO2e per year**<br><br>Over 2 project years,<br>**= 4,755,456 gCO2 emitted** |
| Emissions Prevented | Carbon emissions saved by preventing food waste from traveling to Columbia Ridge<br><br>Carbon emissions from livestock and compost travel is subtracted from landfill travel as carbon emissions prevented<br><br>This methodology is a rough estimate designed to spark exploration about carbon emissions reductions possible through organics recovery<br><br>These calculations are tentative and can be further refined by carbon market pricing schemes in development | Livestock<br>25.8 km * 119 gCO2e<br>= 3,070 gCO2 per trip<br><br>Compost<br>2 km * 119 gCO2e<br>= 238 gCO2e per trip<br><br>Landfill<br>258 km * 192 gCO2e<br>= 49, 536 gCO2 e per trip<br><br>Rough Savings<br>3,070 + 238 gCO2 e<br>= 3,308 gCO2 e per trip |
| Emissions Prevention Possible | 4,212 gCO2e per year from three Nixyaawii Host Sites<br><br>11, 232 gCO2 e per year from one Nixyaawii Host Site<br><br>217, 334 gCO2e per year from vehicle travel to livestock feed location<br><br>With an electric or non-carbonized vehicle to perform these transportations, carbon that could potentially be saved by project<br>= **232,778 gCO2 emissions per year**<br><br>For an additional potential carbon reduction o**f 465,556 gCO2 emissions over the course of the project.** | |

Livestock: 434,678 gCO2 emitted for project total
Composts: 8,424 gCO2 emitted for project total
Landfill: 4,755,456 gCO2 emitted
Prevented = Landfill – Livestock & Compost = 4,312,354 gCO2 emissions prevented over 2 years

Please find additional information on how this calculation was conducted and factors that affect carbon emissions calculated from waste management and tracking in Appendix A.

## 4.6 Capacity Development and Policy Needs

### 4.6.1 Introduction

This project centered the Tribal community at its heart, and our project activities reflect this prioritization. Lasting behavior change can be difficult to create within a community, however our project was starting from a strong place due to the cultural traditions and household habits within our community before the project began. Our project focused on building expertise within Tribal workforce members as government subcontractors and within the general community through education and engagement activities. This section outlines those efforts in detail.

### 4.6.2 Workforce Development

Rural and Tribal communities often struggle from issues of extraction, both of cultural knowledge and of capacity development. Many staff of the Tribal government are sourced from outside the community, and spend only a handful of years working in the community before moving on to other job opportunities in larger cities. Due to this, projects suffer from interruptions and delays caused by staff turnover, and over time this reduces the overall capacity of the Tribal government services and community. To confront this, our project deliberately chose to invest time and energy into developing existing foundational knowledge found within the Tribal community, and a project manager from the Tribal community was subcontracted to participate with the project team. Our project was proud to work with Biowaste Technologies LLC and its CTUIR enrolled and Mission resident operator DeArcie Abraham.

As part of the project's deliverables, Biowaste Technologies was directed to secure previously unobtained materials management, composting, and community engagement certifications, and to provide summary reports on these certifications. These certifications can be found in Appendix C: Contractor Documents, and summary reports in Appendix H: Other Documents. Through the course of the project, Biowaste Technologies was able to secure:

- US Composting Council 40-hour Compost Operations Training Certificate
- Institute for Local Self-Reliance Community Composting 101 Certificate
- Portland State University's Sustainability and Sustainable Procurement Program
- Tribal Rights Employment Office (TERO) Indian-Owned Business Certification
- Youth Mental Health First Aid from the National Council for Mental Wellbeing

These certifications built capacity within the Tribal community to address materials management, providing both technical knowledge as well as community outreach and education strategies that enhance the ability of Tribal community members to provide services to the Tribal government as project subcontractors. This project also aimed to document the development of our Tribal project manager through reflections offered at the project mid-point and at the end, as well as other with other technical documents our project manager produced. These reflection documents can be found in full in Appendix C: Contractor Documents as well as in Appendix E: Educational Materials, and excerpts are highlighted below:

- Project Mid-Point Reflection

  *"I share the feeling of accomplishment with my community who's engaged so willingly with excitement. That every workshop delivered, every pound of food waste diverted, and every conversation sparked is contributing to long-term change. The journey requires navigating challenges with limited resources, adapting to community needs, and balancing multiple roles. But the momentum continues to build, powered by the commitment to protect the land and honor our responsibilities to future generations.*

  *One of my most valued experiences has been seeing CTUIR programs and community members begin to shift their perspectives. Food waste is no longer seen as trash—it's being recognized as a resource with real value for our soil, our climate, and our culture. That shift in mindset, especially among youth and elders, is a powerful reminder of why this work matters."*

- End of Project Reflection
  [Pending]

*Image [60]: Biowaste Technologies operator DeArcie Abraham (center) at the U.S. Composting Council training in Sonoma County, California. Photo by Biowaste Technologies, 2024.*



### 4.6.3 Community Education

Knowledge and capacity isn't kept with just one person; it requires participation from all corners of our community. For a community scale organics recovery operation to be successful, it will require a critical mass of community members with a firm understanding of why food waste management is important and skills necessary to implement food waste prevention and diversion. To build this capacity within the community, our project offered robust education and engagement activities to begin to instill these skills within our community.

To do this, our project hosted dedicated trainings to promote food waste diversion skills and identify potential barriers that community members feel would be a challenge for their success. Our project also offered booth activities during community events including with Longhouse Feasts, Culture Night activities, and other regularly occurring events happening within our community. Data on food waste perception collected at these events is found in Part 2 of this report, and uniquely developed educational materials produced as part this project can be

found in Appendix E: Educational Materials Produced. The following section is an overview of the types of engagement offered to the Tribal community throughout this project.

Project Hosted Workshops

Typically hosted at the Nixyaawii/Mission Longhouse, these dedicated workshops were aimed at those who provide food service to our Tribal entities, including those who cook for ceremonial Feast events and staff who perform food service professionally. These events often included educational posters and associated "scavenger hunt" activities for raffle prizes, meal preparation designed to perform food waste diversion in real time, and educational games that guide participants through skill building exercises. These hands-on activities were followed by group discussions about participant experiences and potential barriers and opportunities. Typically these events included pre- and post-event knowledge gains assessments to gauge effectiveness of the lessons being conducted. Results of these assessments can be found in Appendix H: Other Documents.

*Images [61 and 62]: Project hosted workshops early in the project timeline offered educational posters and hands-on food waste diversion through group mean preparation. Photos by CTUIR DNR FFPP, 2024.*

*Images [63 and 64]: Later project hosted workshops focused on composting and other organics processing methods, and offered educational games and hands on builds of composters. Photos by CTUIR DNR FFPP, 2025.*

Culture Night Youth Activities

Project partners provided other opportunities for us to instill resource recovery skills within the community through engaging with youth and families during the Family Engagement Program's weekly Culture Nights. In addition to conducting food waste diversion with the meals prepared as part of this program, our project team offered a weekly educational booth and youth "passport" initiative that focused on recycling, composting, and earth science related to materials management. Youth learned to visit this educational booth to participate in the weekly educational activity and earn a stamp for that activity. With 5 stamps, youth could pick from a variety of fun and functional prizes as an incentive to continue their engagement with the project booth. In the End of Project Survey that was conducted, many participants noted their positive experiences with this booth in their responses.

*Images [65 and 66]: Culture Night booths offered a variety of activities and crafts that relate to food waste, composting, and materials management, including interactive games developed by the project team. Photos by CTUIR DNR FFPP, 2024 and 2026.*

4.6.4 Tribal and Federal Policy

Policy is another aspect of our community that this project chose to address. Policy can often create intended and unintended barriers to implementing the kinds of behavior change. This project committed to documenting policy challenges it experienced so it could relay those challenges to future Organics Recovery Needs Assessments and operations implementation. Reporting on specific policies that hindered the project's implementation can be found in the USDA CFWR Project Indicator reporting for the project and is included in Appendix H: Other Documents.

Policy challenges included permitting for the Resource Recovery Center because it would be sited on Tribal Trust land and was over the size restriction for structures not requiring permitting. Presentations on project shed design and intended activities were conducted to a number of Tribal Commissions that regulate land use and development for the reservation, and a permit with the Tribal Planning was completed and filed, and following a resolution of support by the CTUIR Board of Trustees in [late 2024], the project shed that became the Resource Recovery Center was purchased and installed in January 2025. The TPO permit application and BOT resolution for the project shed installation can be found in Appendix H: Other Documents.

*Images [67 and 68]: Project team members and staff from CTUIR Tribal Planning Office are present for the installation of the project shed in January 2025.*

Additional BOT resolutions have been developed as a result of this project, including the Our Sustainable Future initiative, that commits CTUIR resources and staff time to future participation in recycling, food waste management, and single use plastic reduction efforts. Please find that resolution in Appendix G: CTUIR BOT Resolutions

[Resolution to Adopt FWA pending]



## 4.7 Potential Funding and Future Work

### 4.7.1 State Opportunities

Both Oregon and Washington have developing carbon taxing and community investment programs for which food waste diversion initiatives are eligible for offset investment.

- Washington Climate Commitment Act
- Oregon Climate Community Investments Act
- CERTA Food Waste Processing Infrastructure and Equipment

California has long had a cap and trade style carbon reductions investment framework that activity funds existing digesters in the Pacific Northwest. With dedicated accounting that builds on the carbon inventory found in Appendix A, CTUIR could access funds under these state greenhouse gas reduction programs.

#### 4.7.2 Federal Opportunities

Federal materials management programs are typically offered annually or semi annually, and preparation for an application to these programs could include or focus on organics recovery potential.

- EPA Solid Waste Infrastructure and Recycling (SWIFR) grants
- USDA Composting and Food Waste Reduction (CFWR) Program grants
- ANA Economic Advancement Grants for Local Empowerment (EAGLE)

#### 4.7.3 Private and Enterprise Opportunities

Private foundation funds have been used to assist purchasing and procurement of materials used in this project. Other foundations, especially those focused on underserved communities could find this kind of community empowerment attractive.

- Meyer Memorial Trust in Oregon
- Amazon Change X and Web Services grants

### 4.8 Conclusion

[Pending]

### 4.9 References

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