

# Enhancing the Human Wellbeing Vital Signs through Inclusive Engagement

A Report for the Asia Pacific Cultural Center



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**Cover Image:** “Shellfish Gathering with Outdoor Asian” taken by Diane Tilton, WDFW

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## Executive Summary

This report outlines the processes and results from a collaborative multi-year (2021-2023) project focused on inclusively engaging Puget Sound residents in order to enhance the Human Wellbeing (HWB) Vital Signs (VS). The HWB VS are a series of social indicators used to monitor the health and recovery of Puget Sound and are coordinated by the Puget Sound Partnership, a Washington state agency. The HWB VS are primarily monitored by Oregon State University’s Human Dimensions Lab. This project focused on enhancing inclusive engagement among Asian American and Pacific Islander (AAPI) community members in the Puget Sound region, a community underrepresented within current human wellbeing monitoring efforts. This project included establishing new sustainable community partnerships, co-creating knowledge with community partners, and capturing lessons learned to further this community-based monitoring work for the Puget Sound Partnership, and its ecosystem recovery network. A community-based participatory research (CBPR) approach was conducted to co-develop and co-implement this project with the Asia Pacific Cultural Center (APCC) located in Tacoma, WA. This approach included the co-creation of facilitated dialogues (community workshops) (n=166) and implementation of an optional Human Wellbeing Vital Signs Survey (n=76).

Healthy Human Population	Vibrant Human Quality of Life
Air Quality	Cultural Wellbeing
Drinking Water <sup>1</sup>	Economic Vitality
Local Foods	Good Governance
Outdoor Activity	Sense of Place
Shellfish Beds	Sound Stewardship

**Table 1.** Human Wellbeing Vital Signs

Asian American & Pacific Islander Residents’ Health (n=166)
Physical Health
Plants and Trees
Place and Landscape
Fish and Wildlife
Environmental Condition

**Table 2.** Community Dimensions of Health

Overall, the facilitated dialogues demonstrated that the Human Wellbeing Vital Signs were relevant and resonated among participating AAPI community members (Table 1). This was reflected in the workshop responses. For example, Air Quality, Water Quality (includes Drinking, Fresh, and Marine), Local Foods, Outdoor Activity, Sense of Place, and Cultural Wellbeing were common themes among participating AAPI community members’ responses. New Community Dimensions of human health<sup>2</sup> also emerged during the workshops (Table 2). For example, Physical Health, Plants and Trees, Place and Landscape, Fish and Wildlife, and Environmental Condition (general) were common themes

<sup>1</sup> The Human Wellbeing Vital Signs include Drinking Water and the biophysical Vital Signs include Freshwater and Marine Water Quality; however, many community members mentioned “water” in various forms and iterations, so for the purpose of this project these three Vital Signs were merged into one (Water Quality).

<sup>2</sup> Human health was determined to be the primary term used during the workshops (rather than wellbeing). This was an intentional choice made during the workshop co-creation process and was determined to be more relevant to the participating AAPI community members.



among participating AAPI residents’ responses. Many of these new Community Dimensions largely demonstrated cultural, aesthetic, existence, inherent, and recreational values associated with nature’s contributions to human health (Chan and others 2012; Belaire and others 2015; Dickinson and Hobbs 2017; Jones and others 2019; Jiang and Marggraf 2022). Responses also demonstrated the role of place and linkages among places, landscapes or landscape features, and human health (Bieling and others 2014; Jones and others 2019).

<b>Asian American &amp; Pacific Islander Residents’ Human Wellbeing Survey Results (n=76)</b>	
<b>Good Governance:</b>	<b>5.19</b> on a 1-7 scale (strongly disagree to strongly agree). On average, participants largely responded between “somewhat agree” and “agree.”
<b>Local Foods:</b>	<b>1.41</b> on a 1-5 scale (never to frequently). On average, participants largely responded between “never” and “rarely” (1-2 times a season).
<b>Sound Stewardship:</b>	<b>2.95</b> on a 1-7 scale (never to frequently). On average, participants largely responded between “rarely” (1-4 times a year) and “occasionally” (once a month).
<b>Cultural Wellbeing:</b>	<b>3.66</b> on a 1-6 scale (dissatisfied to satisfied). On average, participants largely scored between “neither satisfied nor dissatisfied” and “somewhat satisfied.”
<b>Sense of Place:</b>	<b>5.58</b> on a 1-7 scale (strongly disagree to strongly agree). On average, participants largely scored between “somewhat agree” and “agree.”
	<ul style="list-style-type: none"> <li>• <b>Psychological Wellbeing:</b> <b>3.40</b> on a 1-5 scale (never to frequently). On average, participants largely responded between “occasionally” (once a month) and “regularly” (one a week).</li> <li>• <b>Life Satisfaction:</b> <b>4.47</b> on a 1-5 scale (dissatisfied to satisfied). On average, participants largely responded between “somewhat satisfied” and “satisfied.”</li> </ul>
<b>Outdoor Activity</b>	
	<ul style="list-style-type: none"> <li>• <b>Outdoor Recreation:</b> Most frequently engaged in recreational activities included: gardening/yard work, and use of paved trails or paths.</li> <li>• <b>Nature-based Work:</b> 33% of respondents engaged in nature-based work with 20% engaging in such work 5 hours a week or more.<sup>3</sup></li> </ul>

**Table 3.** Human Wellbeing Survey Results Summary

<b>Regional &amp; Latinx Human Wellbeing Survey Results (2018-2022)<sup>4</sup></b>				
<b>Vital Sign</b>	<b>2018</b>	<b>2020</b>	<b>2022</b>	<b>Latinx</b>
Good Governance	4.13	4.18	4.05	4.81
Local Foods	1.58	1.43	1.42	1.84
Sound Stewardship	3.47	3.14	3.36	2.95
Cultural Wellbeing	Not Applicable due to survey modifications between 2018 and 2020	3.64	3.81	3.73
Sense of Place	5.66	5.57	5.49	5.02
<ul style="list-style-type: none"> <li>• Psychological Wellbeing</li> <li>• Life Satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>• 3.94</li> <li>• Not available</li> </ul>	<ul style="list-style-type: none"> <li>• 4.01</li> <li>• Not available</li> </ul>	<ul style="list-style-type: none"> <li>• 3.98</li> <li>• 4.41</li> </ul>	<ul style="list-style-type: none"> <li>• 3.64</li> <li>• 3.98</li> </ul>

<sup>3</sup> Note that translations of “work” in natural environments may have varied contributing to alternative interpretations of the question, notably among Korean speaking community members.

<sup>4</sup> All data stems from the 2018, 2020, Latinx 2021, and 2022 Human Wellbeing Surveys (Fleming and others 2018; Fleming and others 2021; Justiniano 2021; Harrington and others 2023).



<p>Outdoor Activity</p> <ul style="list-style-type: none"> <li>• Outdoor Recreation</li> <li>• Nature-based Work</li> </ul>	<ul style="list-style-type: none"> <li>• Gardening/yard work, use of paved paths or trails, use of unpaved trails during Summer and Winter were most frequently engaged activities</li> <li>• 19% engaged in nature-based work</li> </ul>	<ul style="list-style-type: none"> <li>• Gardening/yard work, wildlife viewing/birding, using paved paths or trails in Spring and Fall were the most frequently engaged activities</li> <li>• 12% engaged in nature-based work</li> <li>• 69% worked more than 5 hours a week</li> </ul>	<ul style="list-style-type: none"> <li>• Non-motorized water sports (Summer only), wildlife viewing/birding, gardening/yard work, use of paved paths or trails, and use of unpaved paths or trails were the most frequently engaged activities in Summer and Winter</li> <li>• 14% engaged in nature-based work</li> <li>• 77% worked more than 5 hours a week</li> </ul>	<ul style="list-style-type: none"> <li>• Paved paths or trails, picnic/bbq, and unpaved trails in Spring and Fall were the most frequently engaged activities</li> <li>• 36% engaged in nature-based work</li> <li>• More than 70% worked more than 5 hours a week</li> </ul>
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**Table 4.** Regional & Latinx Human Wellbeing Vital Signs Survey Results

Overall, the AAPI survey respondents demonstrated similar patterns of human wellbeing as it relates to the health of Puget Sound when compared to findings from other Human Wellbeing Vital Signs Surveys (Tables 3-4). Participating AAPI community members had similar average responses to most VS questions. For example, AAPI respondents had similar average responses to Local Foods (1.41), Cultural Wellbeing (3.66), and Sense of Place (5.19). Community members’ Cultural Wellbeing was frequently discussed during the facilitated dialogues, notably outdoor community, spiritual/church, and family activities. While largely similar, some stark differences did emerge compared to the other survey findings. For example, AAPI respondents had higher average responses for Good Governance (5.19) and lower average responses to Sound Stewardship (2.95). For example, governance was not a frequently mentioned topic or theme, illustrating (by omission) that governance or lack thereof was not a major environmental topic of concern. All detailed findings and corresponding data visualizations are outlined in the following sections.



## Introduction

Working in close collaboration with the Asia Pacific Cultural Center (APCC) located in Tacoma, WA, notably Executive Director Faaluaaina (Lua) Pritchard (co-author), a community-based research project was co-created in order to enhance the monitoring of human wellbeing in the Puget Sound region through inclusive engagement. The project largely consisted of a series of facilitated dialogues (also referred to as workshops). The workshops were co-created in order to accomplish the project's overarching objectives (Box 1). The overarching approach to this project was a community-based participatory research (CBPR) approach, emphasizing close collaboration, knowledge co-creation, and the use of co-created knowledge (e.g., findings) to inform change (Rand 2016; Wilson and others 2018; Chazan and Baldwin 2021; Ardoin and others 2022; Trimbach and others 2022a), including changes to the monitoring of human wellbeing coordinated by the Puget Sound Partnership and its diverse network of partners.

The researcher reached out to APCC during the project proposal development process with the intention of co-developing the project and co-creating new knowledge to enhance the Puget Sound Partnership's Human Wellbeing Vital Signs. Once APCC approved and consented to participating in the project, the project proposal was submitted and eventually funded. Although the researcher formed an initial project concept and design, APCC had the ability to critique, question, contribute, and refuse (to provide input or participate) during all phases of the project.

Over the course of the project's timeframe, lasting roughly 2021-2023 (with a ~6 month gap due to the researcher changing positions and institutions), the project activities included 10 project planning meetings and 4 community workshops. The workshops themselves ranged from 1.5-2.5 hours in length. Each workshop took place at APCC located in South Tacoma, which included a large community center with varying types and sizes of community gathering spaces. The facilitated dialogues attracted 166 (n) community participants. The workshops were intentionally organized to include the following groups: (1) local AAPI community leaders; (2) Thai community members, including Thai speakers; (3) Korean community members, including Korean speakers; and (4) Vietnamese community members, including Vietnamese speakers. These groups were selected largely based on engagement feasibility, local knowledge, and relationships of APCC, including APCC community liaisons. While each workshop focused on a different group, each workshop included identical agendas that included: ice breaker activity (nature bingo social activity), introductions, why this project?/what are the Vital Signs?, workshop activity and discussion, and wrap-up and optional survey opportunity (Appendix D). Each workshop also included facilitation from Cascadia Consulting Group (Mike Chang and/or Nicole Gutierrez), although this varied by workshop. Near the end of each facilitated dialogue, participants had an opportunity to complete an optional Human Wellbeing Survey (2020 version). A total of 76 (n) workshop participants completed the optional survey instrument. For three of the

### Box 1. Project Objectives

1. enhance knowledge of minority communities' human wellbeing (HWB) in the Puget Sound region
2. expand HWB Vital Sign data, information, and messaging
3. build new community relationships for sustainable long-term collaboration
4. create a protocol detailing how the work, if successful, can be sustained with an agency, program, or other durable funding source



workshops, all materials (handouts, presentation, and survey) were translated in the respective languages of the target communities (e.g., Thai, Korean, and Vietnamese) and interpretation was also provided in-person during the workshops. All workshop participants were provided a \$50 gift card incentive for their participation, regardless of how much they participated or if they completed the survey. The results of the facilitated dialogues and optional survey are outlined in the following sections.



## Facilitated Dialogues

Workshop #	Participants (#)	Surveys Completed (#)	Survey Response Rate (%)	Date	Location	Target Audience
1	21	17	81%	4/14/2022	Asia Pacific Cultural Center, Tacoma, WA	AAPI community leaders
2	12	11	92%	4/4/2023	Asia Pacific Cultural Center, Tacoma, WA	Thai residents
3	32	30	96%	4/18/2023	Asia Pacific Cultural Center, Tacoma, WA	Korean residents
4	101	18	18%	4/26/2023	Asia Pacific Cultural Center, Tacoma, WA	Vietnamese residents
<b>Totals:</b>	<b>166</b>	<b>76</b>	<b>46%</b>			

**Table 5.** Facilitated Dialogue Information

Each facilitated dialogue aimed to achieve the project’s objectives by addressing key topics/questions that included: (1) continued relevance of the Human Wellbeing Vital Signs (Are the Human Wellbeing Vital Signs still relevant?); (2) resonance of the Human Wellbeing Vital Signs (Do the Human Wellbeing Vital Signs resonate among AAPI community members?); (3) variations of human wellbeing, including interpretations, perspectives, and values (Are there variations in human wellbeing among Puget Sound communities, notably AAPI community members?); (4) climate change impact’s on human wellbeing (How is climate change impacting AAPI community members’ human wellbeing?); and (5) places that contribute to human wellbeing (What places contribute to AAPI community members’ human wellbeing? Why?). Using these 5 guiding topics/questions, the workshops were subsequently co-created to focus on the following overarching themes: (1) health; (2) nature’s contributions to health; (3) climate change impacts on health; and (4) places that contribute to health. Each theme was oriented with an emphasis on nature and Puget Sound.

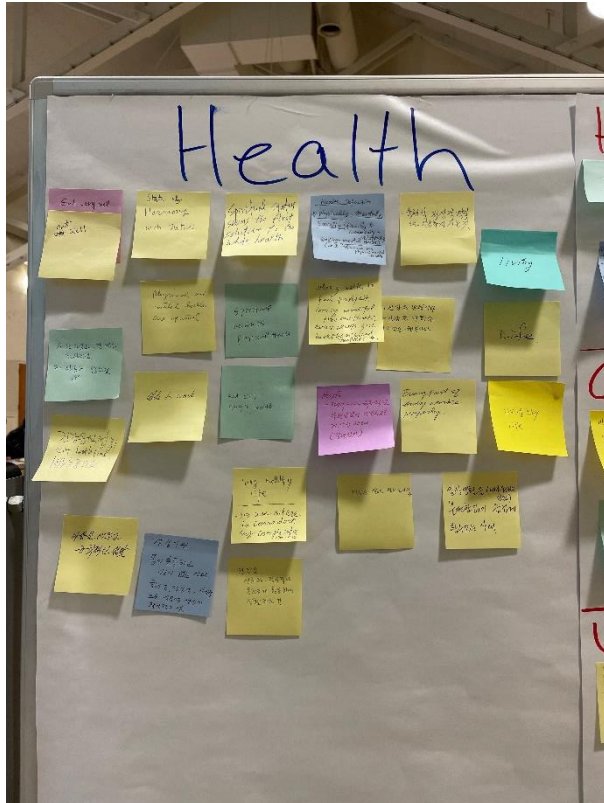
Between 2022-2023, 4 community workshops were held at APCC in Tacoma, WA (Table 5). Each workshop intentionally focused on a different AAPI audience or population. The workshops included culturally and community appropriate refreshments organized by APCC for all participants. The final workshop was organized and integrated into a community event (wedding anniversary for a well-known couple, who also prepared food for the workshop). Table 5 outlines the details of each workshop, including the number of participants and how many surveys were completed at each workshop. During each workshop, each overarching theme was discussed with the participants. Each theme was discussed using guiding questions and each participant had the ability to free-list their responses on provided sticky notes (using provided pens) (Jones and others 2019; Biedenweg and others 2020). Participants could free-list responses or items individually (one response per sticky note) or could lump them together (multiple responses per sticky note). Once participants stopped placing items (typically after 5-10 minutes, depending), the facilitator led a discussion of the theme,





allowing for a rich discussion, that often included questions, challenges, stories, and connections among various responses or emergent response patterns.

Data collected from the workshops included written responses (free-listed sticky note responses) (Figure 1) and workshop audio (partial due to varying room and group sizes and logistics). For the purpose of this report, the written responses were the primary source of data, other than fieldnotes, used and analyzed for this project. For all written responses in Thai, Korean, or Vietnamese, those were externally translated. The responses per overarching theme were analyzed via abductive analysis, blending both deductive and inductive coding (Dubois and Gadde 2002; Timmermans and Tavory 2012; Thompson 2022; Vila-Henninger and others 2022). Deductive codes were based on the



**Figure 1.** Facilitated Dialogue Question Example with Responses

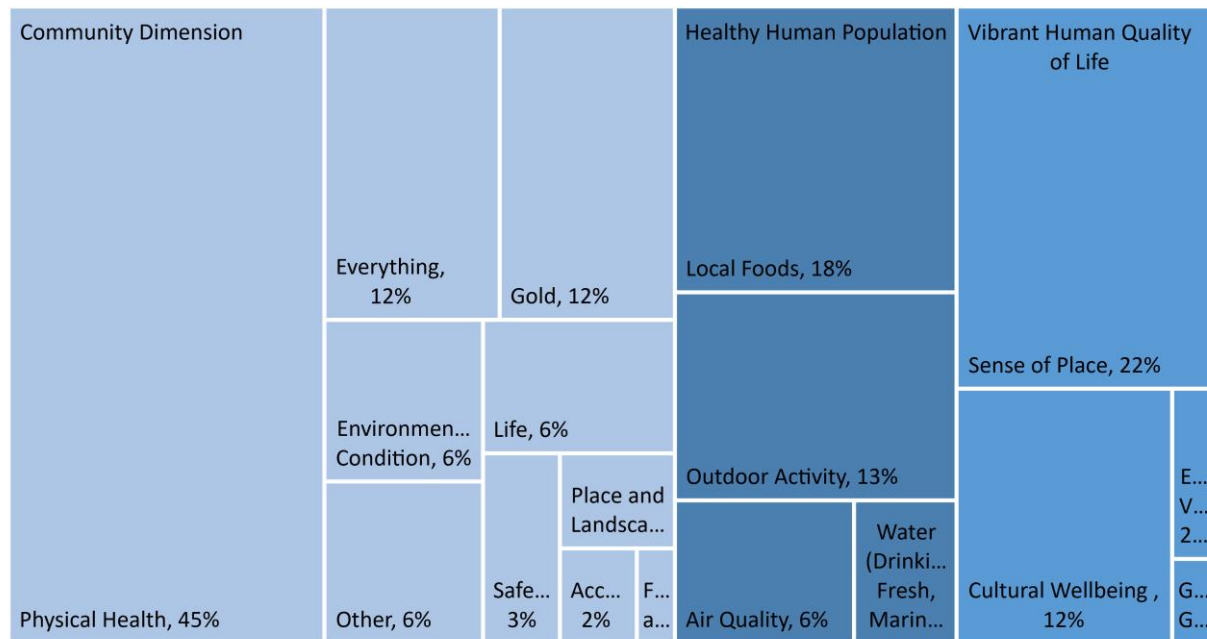
Human Wellbeing Vital Sign categories (e.g., Healthy Human Population and Vibrant Quality of Life) and Vital Sign indicators (e.g., Sense of Place, Air Quality, etc.) with some flexibility with interpretation. For example, if someone responded with water or air, and not “drinking water” or “air quality,” those responses were coded to Water (Drinking, Fresh, Marine) (combining water-based wellbeing and biophysical indicators) and Air Quality. Or if participants mentioned “healthy food” or “eating well,” those responses were flexibly coded to Local Foods, even if no specific local foods were explicitly mentioned; although in some cases local foods were explicitly mentioned, like seaweed or clams. Such flexible interpretations should be taken into consideration when reviewing the results. Inductive codes were based on a grounded coding process, which allowed for shared emergent themes or patterns to arise from participants’ diverse responses. The abductive analysis and coding process was conducted iteratively and cyclically, allowing for revisiting, rethinking of alternatives or linkages, and recoding until saturation and mutually distinct, yet constitutive, codes were created. The

inductive codes were categorized as Community Dimensions of human health and included a diverse range of community-based themes. Once the codes were created and defined in a codebook (Appendix A), the codes were shared with primary project collaborators to gauge their feedback and approval. If any codes or theme was rejected, the codes would be changed or updated; however, that did not take place. Given that responses often included more than one word, sometimes whole sentences or lists, responses were coded more than once; thus, responses likely were coded more than once with linked mutually constitutive codes. A complete list of all codes per workshop theme with responses, percentages of responses per theme, and examples are outlined in Appendix B. The overarching themes (e.g. Health) and associated codes (e.g., Physical Health) are outlined in the following sections. Each section includes the number of participants (n=166) and number of



responses per theme (e.g., responses: 121). Each section also includes a figure aimed to illustrate the percentage of responses coded to each code. Given that responses were often coded to more than one code, the totals are not intended to add up to 100%, but rather aim to reflect code frequency, with codes representing workshop participants’ responses. Although limited, some sections may also include some limited interpretation with links to relevant research.

**Health (n=166; responses: 121)**



**Figure 2.** Community Members’ Dimensions of Health<sup>5</sup>

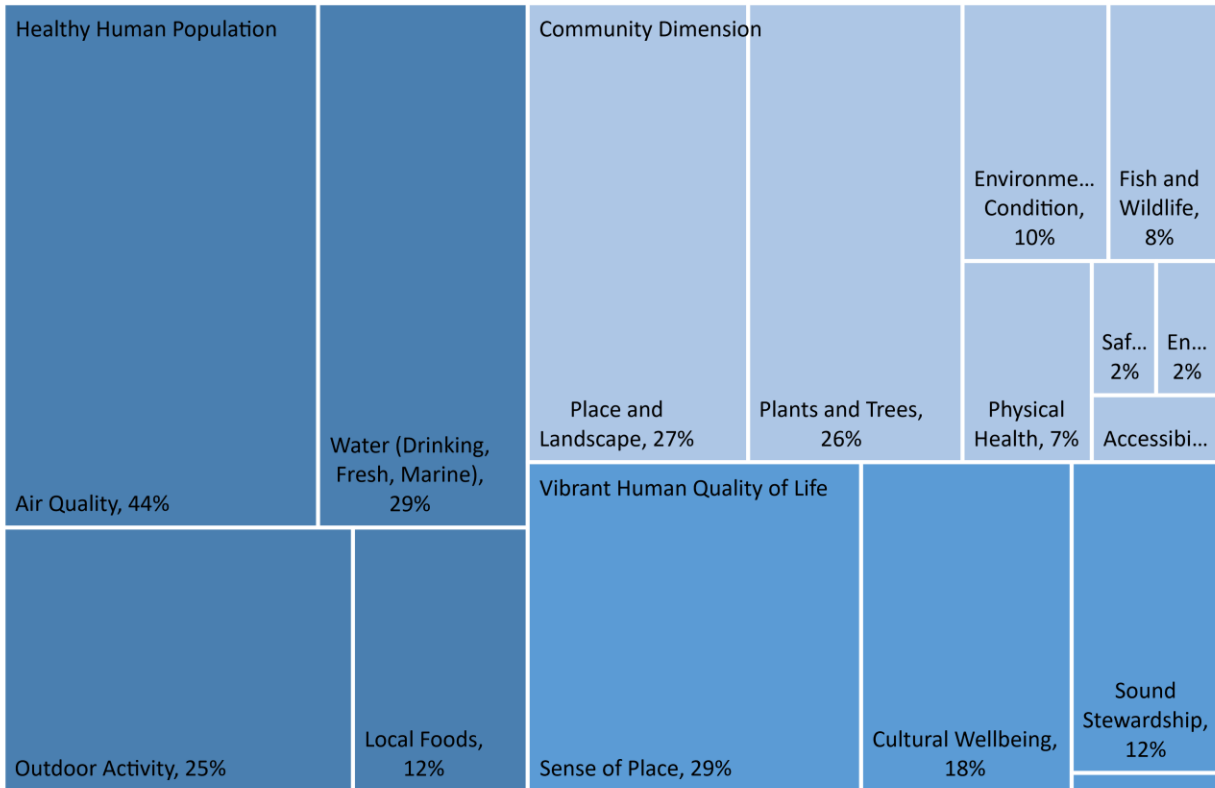
When asked to define health (e.g., what is health?), including nature’s linkages to health, respondents largely responded with community-based dimensions of health (Community Dimension), notably Physical Health (45%). For example, one participant responded with “nutrition,” (Workshop #1 Participant, 4/14/2022). Numerous participants mentioned multiple types of health, that included physical health, in their responses. For example, one participant responded with “To live a healthy life physically, mentally, and spiritually,” (Workshop #3 Participant, 4/18/2023). Participants also often responded with words or phrases, often verbatim, associated with gold, everything, and life. Gold and everything in particular were mirrored among the responses, notably during Workshop #4 among Vietnamese speakers. According to the Workshop #4 interpreter, connections between gold and health are often well-used among Vietnamese speakers, and was actually noted in research elsewhere (McPhee and others 1996). Participants also shared responses that aligned with the Human Wellbeing Vital Signs, notably Sense of Place (22%) (includes references to Psychological

<sup>5</sup> For those Community Dimensions that are difficult to see due to Figure 1 limitations, see Appendix B for facilitated dialogue theme and response tables. Please use this guidance for all report Figures, as not all response themes or percentages may be easily visible due to space issues in the report. Also note, that % outlined in the report Figures are rounded, while the tables located in the Appendices include the original percentages.



Wellbeing and Life Satisfaction) and Local Foods (18%). For example, one participant mentioned that “long healthy life, use nature to calm down my complicated mind,” was a part of health (Workshop #3 Participant, 4/18/2023).

**Contributions (n=166; responses: 130)**



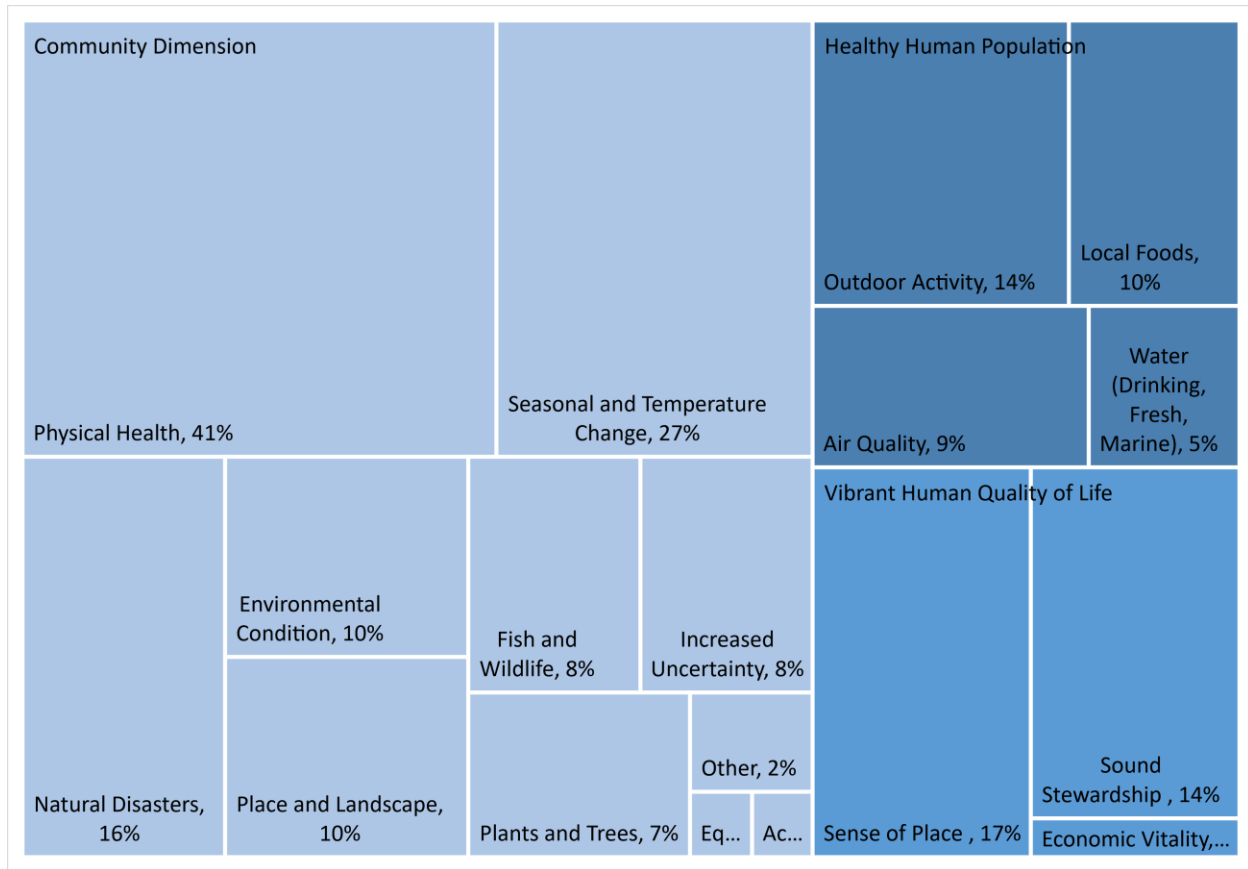
**Figure 3.** Nature’s Contributions to Community Members’ Health

When asked to define how Puget Sound’s natural environment contributes to peoples’ health (e.g., how does nature contribute to your health?), respondents largely responded with dimensions aligned with the Healthy Human Population Vital Signs, notably Air Quality (44%) and Water (or Water Quality) (inclusive of Drinking, Fresh, and Marine) (29%). For example, one participant stated, “air clean, clean water,” (Workshop #1 Participant, 4/14/2022). Participants also shared responses aligned with the Vibrant Human Quality of Life Vital Signs, including Sense of Place (29%). For example, one respondent shared that “we watch the birds activities at home or the parks and they connect us to the rest of the environment,” demonstrating not only Sense of Place, but how Outdoor Activity (e.g., wildlife viewing/bird watching) contributes to their Sense of Place (Workshop #1 Participant, 4/14/2022), as noted elsewhere (Wilkinson and others 2014). Participants also shared responses that did not necessarily reflect the Human Wellbeing Vital Signs. Of these emergent alternative Community Dimensions, Place and Landscape (27%) and Plants and Trees (26%) were the most frequently coded responses. Often these responses demonstrated some connected use or inherent value. For example, one respondent shared that nature contributes to their health by providing opportunities to “walk on the beach at the puget sound” (Workshop #1 Participant, 4/14/2022). Another participant mentioned that “trees that help air quality,” were important



contributors to their health (Workshop #2 Participant, 4/4/2023). Such linkages between place, landscape, and their natural attributes (e.g., trees and plants) have been highlighted elsewhere (Bieling and others 2014; Turner-Skoff and Cavender 2019). Such connections may partly (indirectly) be linked to some of the Vital Sign’s biophysical indicators and greater health of Puget Sound.

### Climate Change (n=166; responses: 125)



**Figure 4.** Climate Change Impacts on Community Members’ Health

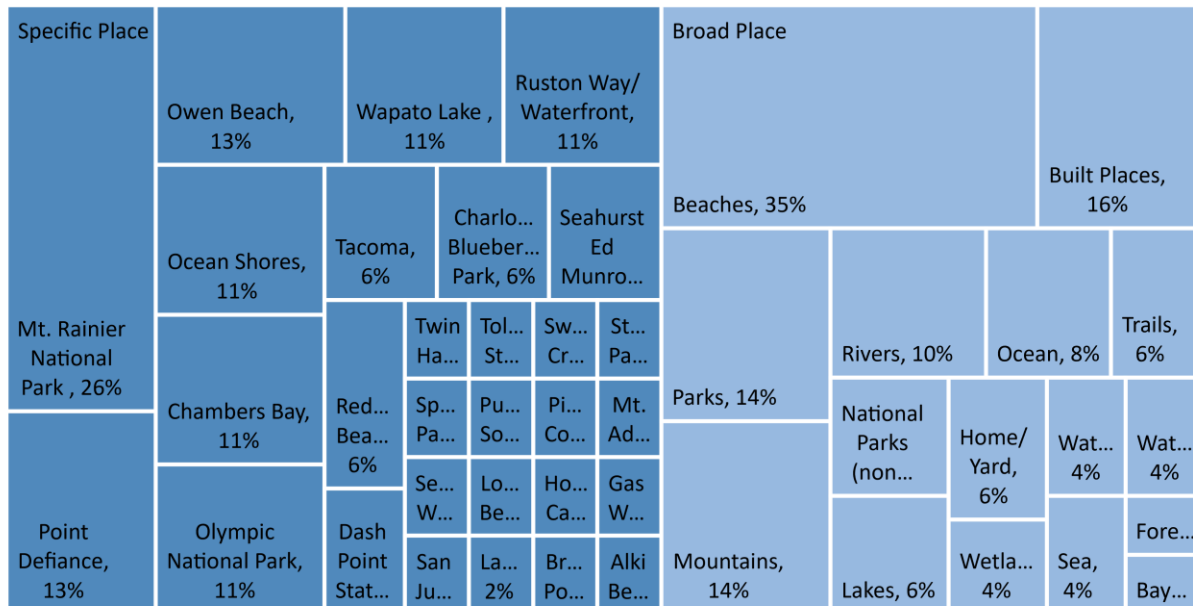
When asked to identify how climate change impacts peoples’ health (e.g., how does climate change impact your health?), workshop participants largely shared responses reflecting new Community Dimensions of health, notably Physical Health (41%), Seasonal and Temperature Change (27%) (examples), and Natural Disasters (16%). For example, one respondent shared that climate change impacts have triggered “allergy reaction more often,” (Workshop #1 Participant, 4/14/2022), while another stated that climate change impacts people getting “more sick, many people get more sick,” (Workshop #2 Participant, 4/4/2023). Some participants also shared responses reflecting the Human Wellbeing Vital Signs, notably Sense of Place (17%) (largely related to Psychological Wellbeing) and Outdoor Activity (14%) (typically the prevention of engaging in recreational activities). For example, one participant shared that climate change impacts their health, including by causing them “stress,” (Workshop #1 Participant, 4/14/2022).



## Place (n=166; responses: 119<sup>6</sup>)

The final theme/question of the workshops focused on place, notably what (natural) places contribute to AAPI residents' health. Place and landscape have been noted to contribute to peoples' health and wellbeing (Bieling and others 2014; Dalglish and others 2017; Egoz and De Nardi 2017; Garcia and others 2020), particularly as peoples' interactions with nature and contributions from nature are emplaced and are associated with people-place relationships (Flueret and Atkinson 2007; Williams and others 2013; Quinn and others 2019; Majeed and Ramkissoon 2020; Jiang and Marggraf 2022). Initially, this activity was going to feature a participatory mapping exercise (Jones and others 2019); however, due to feasibility (e.g., time, technology, and potential participant geographic literacy variations as many may be new residents), the activity was integrated into the free-listing sticky note exercise near the end of each facilitated dialogue. Given that this was not a participatory mapping exercise, participants were given the ability to answer openly (Biedenweg and others 2021). Participants were asked to identify places that contribute to their health and also asked to explain how or why. Given that this was the final question in the series, participants tended to respond less to these questions compared to the others, which was illustrated by the overall lack of responses from participants. Given that the workshops took place in and focused on Tacoma, WA (Pierce County, South Puget Sound), the majority of responses reflected places in that geographic area. The responses are outlined below and include figures and corresponding maps.

### Where? (n=166; responses: 51 (Broad), 47 (Specific))

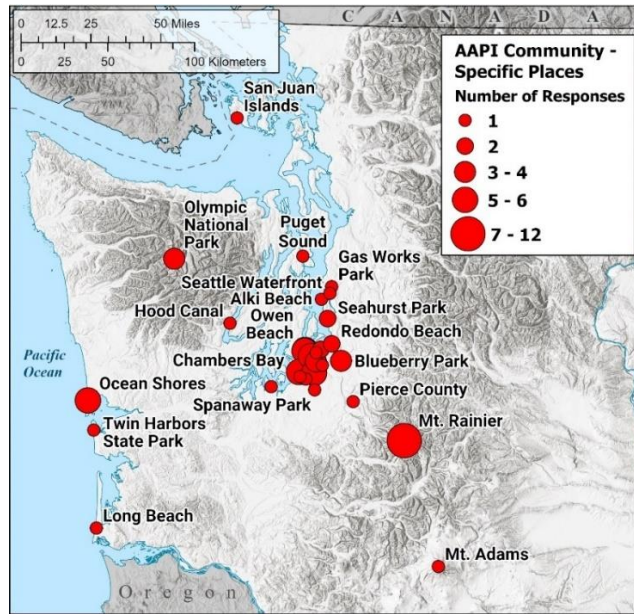


**Figure 5.** Places that Contribute to Community Members' Health

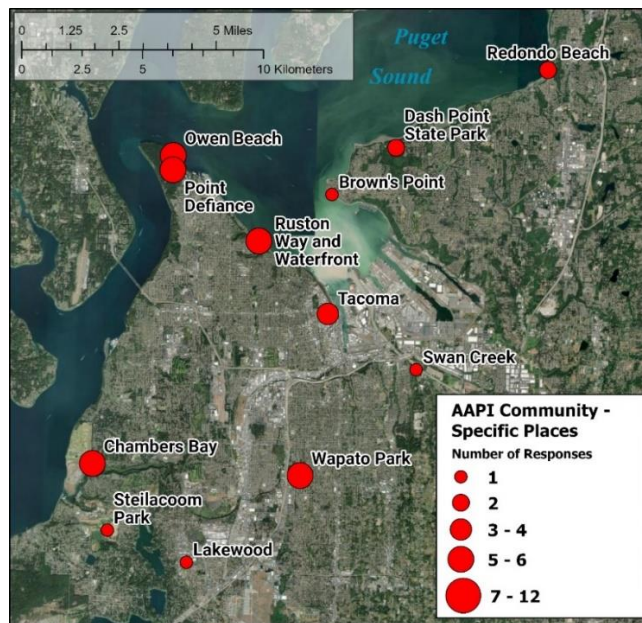
<sup>6</sup> Note that when asked about Place (in general), community members provided 119 total responses. Out of those 119 responses, 98 places were identified, including 47 specific places and 51 broadly defined places. Thus, the total responses listed (98) reflects those actual places mentioned and not the total number of general place responses. Please take this distinction into consideration when reviewing the Place findings.



When participants were asked to identify places in Puget Sound that contributed to their health, respondents provided both broadly defined (52%) and specific (48%) places (Figure 5). The most frequently shared broadly defined places included beaches (35%), built places (16%), and parks (14%). These broad responses were aligned with and reflected the specific places shared. The most frequently shared specific places included Mt. Rainier National Park (26%) (located in Pierce County, WA), Point Defiance Park (13%) (Tacoma, WA), and Owen Beach (13%) (part of Point Defiance Park in Tacoma, WA). While respondents shared places both outside and inside the greater Puget Sound region (Figure 6), the vast majority of places were highly local to Tacoma, WA (Figure 7).



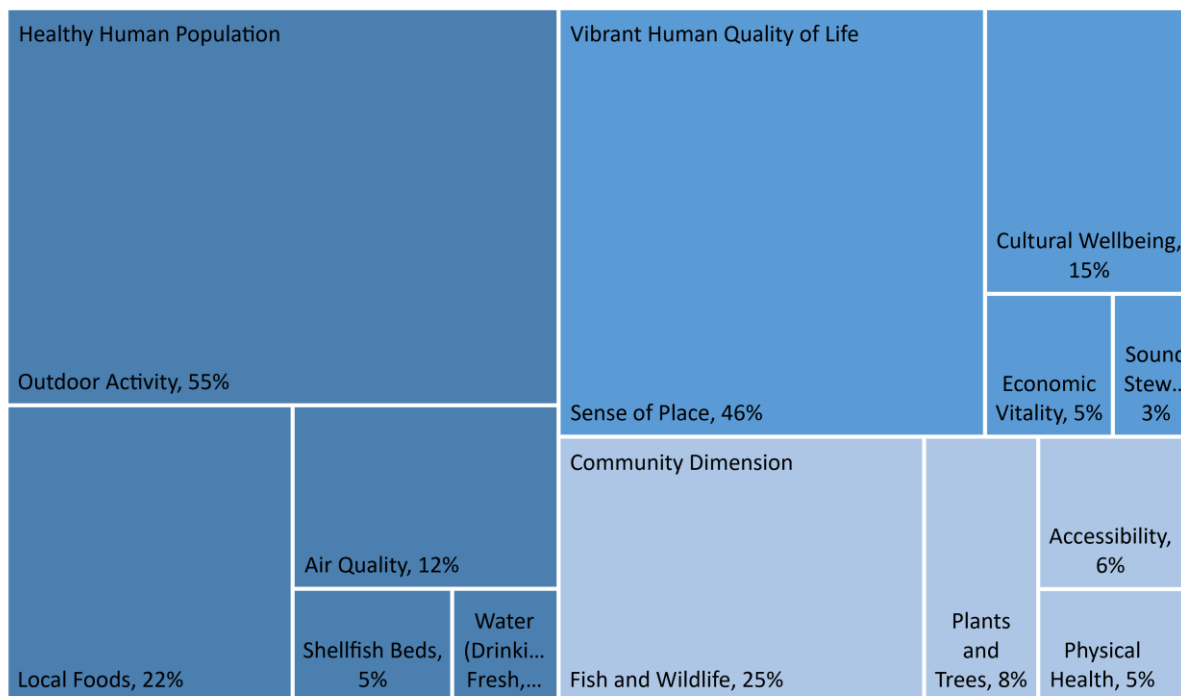
**Figure 6.** Regional Map of Places that Contribute to Community Members' Health



**Figure 7.** Local Map of Places that Contribute to Community Members' Health



**Why? (n=166; responses: 65)**



**Figure 8.** Places’ Contributions to Community Members’ Health

When asked to explain how or why the aforementioned places contributed to community members’ health, respondents largely shared responses aligned with the Human Wellbeing Vital Signs (Figure 8). The most frequently shared responses were coded to Outdoor Activity (55%), Sense of Place (46%), and Local Foods (22%), and Cultural Wellbeing (15%). For example, one respondent shared “Mt. Rainer,” as it provides opportunities “for camping,” (Workshop #3 Participant, 4/18/2023). Another participant shared that “Tolmie State Park,” (near Tacoma, WA) because it provides opportunities for “walking, clam digging, and picnic,”(Workshop #3 Participant, 4/18/2023). While the majority of responses reflected the Human Wellbeing Vital Signs, some participants shared new Community Dimensions, including Fish and Wildlife (25%), Plants and Trees (8%), and Accessibility (6%). For example, one participant shared “Point Defiance Park,” because it offers opportunities to “enjoy walking, see the plants and trees, [and] wildlife,” (Workshop #2 Participant, 4/4/2023).

**Conclusions and Recommendations**

Asian American & Pacific Islander Residents’ Health (n=166)
Physical Health
Plants and Trees
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Fish and Wildlife
Environmental Condition

**Table 6.** Community Dimensions of Health

Through the co-created facilitated dialogues, AAPI community participants (n=166) shared a diverse range of responses that reflected the Human Wellbeing Vital Signs and emergent Community



Dimensions of human health. The workshops revealed that when asked to discuss health, nature's contributions to health, climate change impacts on health, and places' contributions to health, workshop participants largely shared responses reflecting Outdoor Activity, Local Foods, Sense of Place, Cultural Wellbeing, Air Quality, and Water (or Water Quality) (Drinking, Fresh, Marine). While these were the most frequently coded Human Wellbeing Vital Sign-aligned responses, all other already established Vital Signs were also reflected in the responses, including Economic Vitality, Sound Stewardship, Shellfish Beds, and Good Governance. Thus, participants shared responses that reflected all 10 Human Wellbeing Vital Signs, notably those monitored through the regional Human Wellbeing Vital Signs Survey. This response pattern demonstrated that the Vital Signs in their current iteration were relevant and resonated with AAPI workshop participants. The frequency of various Vital Signs during the discussions and emergence of new community-derived Community Dimensions reflected variations in how communities interpret health and the health-nature nexus. The most frequently coded Community Dimensions responses reflected Physical Health, Place and Landscape, Plants and Trees, Fish and Wildlife, and Environmental Condition (Table 6). These particular coded responses demonstrated that participating community members directly connected nature to their physical health, specific places or landscapes, and place-based attributes or non-human beings, like plants, trees, fish, and wildlife. These coded responses also illustrated alternative understandings of how nature more directly impacts peoples' health and the inherent, intrinsic, existence, and/or use values associated with places, landscapes, and the fish or wildlife that reside in those places or landscapes. These linkages have been demonstrated elsewhere, as place, landscape, trees, plants, fish, and wildlife have been observed to contribute to human health and wellbeing (Chan and others 2012; Bieling and others 2014; Turner-Skoff and Cavender 2019). Such linkages were also reflected in the climate change and place discussions; however, participants did face challenges connecting climate change to health, as many referred to examples of climate change during the discussion (e.g., seasonal or temperature changes, natural disasters, and impacts of place, landscape, fish, wildlife, and general environmental conditions) rather than directly or explicitly linking climate change impacts to their health.

Based on the results of the discussion, the workshop results illustrate potential alternatives and recommendations for the Human Wellbeing Vital Signs. Recommendations include exploring potential indicators that focus more on (1) physical health (e.g., available data from WA Department of Health, like those captured by the Environmental Health Disparities Map), (2) plants and trees (e.g., available data on vegetation or tree canopy in the region, like those captured by the Landscape Ecology Modeling, Mapping and Analysis or LEMMA at Oregon State University), (3) place and landscape (e.g., could be integrated into the Human Wellbeing Survey as part of Sense of Place, as done by the Baltic Sea Health Index (Blenckner and others 2021)), and (4) fish and wildlife (e.g., available data on fish and wildlife abundance or recreational opportunities from the WA Department of Fish and Wildlife or could be integrated into the Human Wellbeing Survey as part of Outdoor Activity, Local Foods, Sense of Place, or may be partly captured by some of the biophysical indicators already). While Environmental Condition was also fairly prominent among participants, this was a fairly general or generic code and likely already corresponds to other Vital Signs focused on ecological system improvement. Overall, these emergent Community Dimensions may be potentially explored during the Vital Signs revision process or through the development of a working group focused on further fleshing out these particular themes within the human wellbeing monitoring context coordinated by the Puget Sound Partnership. Given the unique CBPR approach, the project also revealed the potential of CBPR for enhancing community collaborations, including around





monitoring and among non-traditional monitoring or environmental partners, and the potential use of community workshops or community events (likely with some sort of participant incentive) to implement the Human Wellbeing Vital Signs Survey.

### **Limitations**

This project faced multiple limitations that directly or indirectly informed the project and likely its development, implementation, analysis, and results. Limitations included a 6 month gap in the project's timeline, as the researcher changed positions and institutions (Oregon State University to WDFW). This gap in time impacted the project's implementation stage and ability to collaborate with key partners, partly as new subcontracts had to be established with all partners, and timely hire a student research assistant. This time gap also impacted the analysis and dissemination stage as well, as less time was able to be adequately dedicated for analysis and write-up. Other potential limitations included variations in workshop dates/times, variations in outreach efforts per community, variations in priorities between researcher and partners, shifting workshop dates, and language-related issues (e.g., Korean language Human Wellbeing Survey faced some translation issues with some survey questions).



## Human Wellbeing Vital Signs Survey

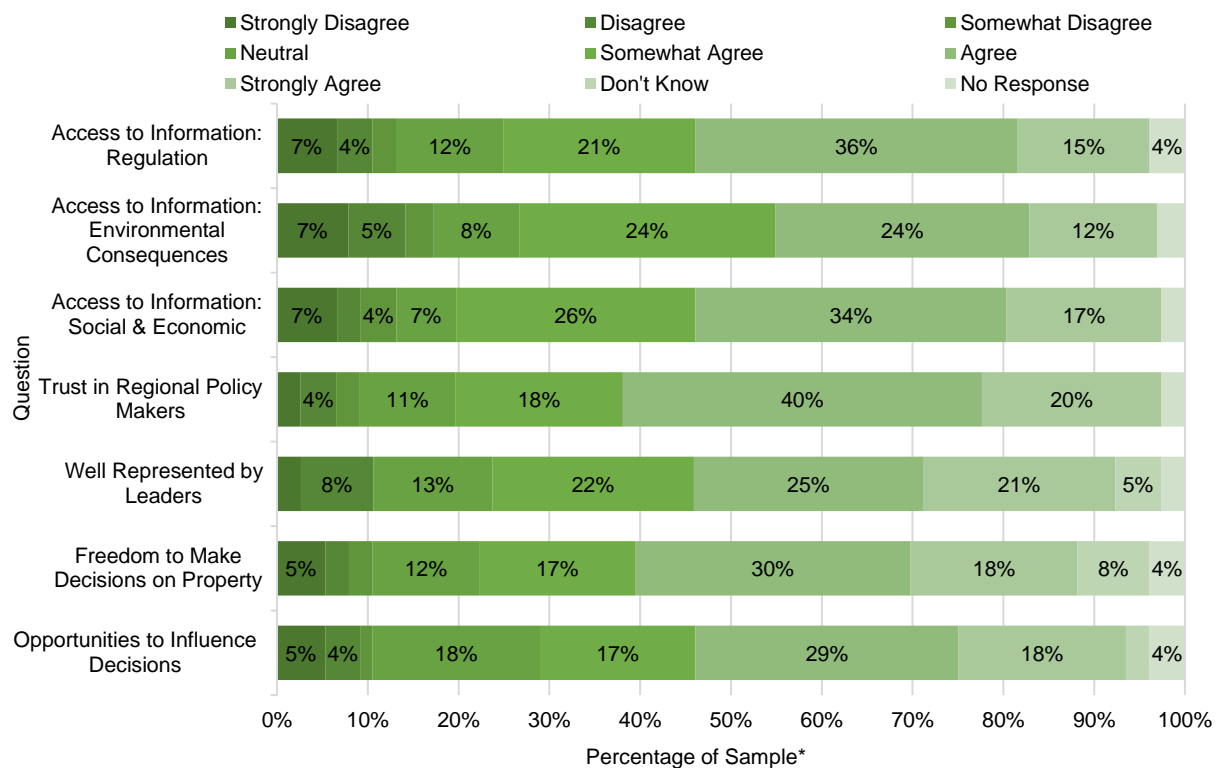
The Human Wellbeing Vital Signs Survey was also conducted as part of the facilitated dialogues. All facilitated dialogue participants had the optional opportunity to complete the survey instrument. Completion of the survey was strongly encouraged near the end of each workshop and was associated with participant incentives; however, individual workshop attendees were not denied an incentive if they decided not to complete the survey. Surveys were distributed in hard copy form to all participants. Surveys were also translated into appropriate workshop community languages, notably Thai, Korean, and Vietnamese. It should be noted that while the translated surveys were provided to the Asia Pacific Cultural Center for review prior to the workshops, some participants did note that the Korean translated surveys were not entirely accurate and may have caused some confusion for respondents (only for some questions and not all). Participating community members were provided writing utensils to complete the surveys as needed. Questions were addressed and assistance was provided to participants during the survey completion time period, also as needed. The overall response rate for the surveys was 46%, with notable variations per workshop, for example only 18% completed the surveys during the Vietnamese community workshop, which was the largest in size, while 96% of Korean community workshop participants completed the survey.

A Cronbach's alpha reliability estimate was calculated in order to test the ability to create indices for specific Vital Signs (those that emphasize average responses). These Vital Signs included: Good Governance, Sound Stewardship, Psychological Wellbeing, Sense of Place, Local Foods, and Cultural Wellbeing. All Vital Signs had a score of 70% or higher, signifying a reliable index. This process was conducted in order to be consistent with how Oregon State University's Human Dimensions Lab processes and analyses the regionally distributed and generalizable Human Wellbeing Vital Signs Survey (Fleming et al 2019; Fleming and others 2021; Harrington and others 2023). Using this information, an index score was created for the appropriate Human Wellbeing Vital Signs. All survey data was processed and analyzed using Statistical Package for the Social Sciences (SPSS 29) and Microsoft Excel. Each Vital Sign and its corresponding results are outlined in the following sections. Please note that the responses solely reflect those of self-selected AAPI community members who willingly participated in the facilitated dialogues and optional survey (n=76).



## Good Governance

Good Governance reflects peoples' level of agreement with how Puget Sound's natural environment is managed and whether or not they feel represented in environmental decision-making in the region. Good Governance reflects transparency, trust, accountability, representation, participation, equity, and inclusivity within environmental management and among government institutions. Good Governance is measured by asking survey respondents to rate their level of agreement or disagreement with statements about the governance of natural resources on a 1-7 point Likert scale.



**Figure 18.** Good Governance Results

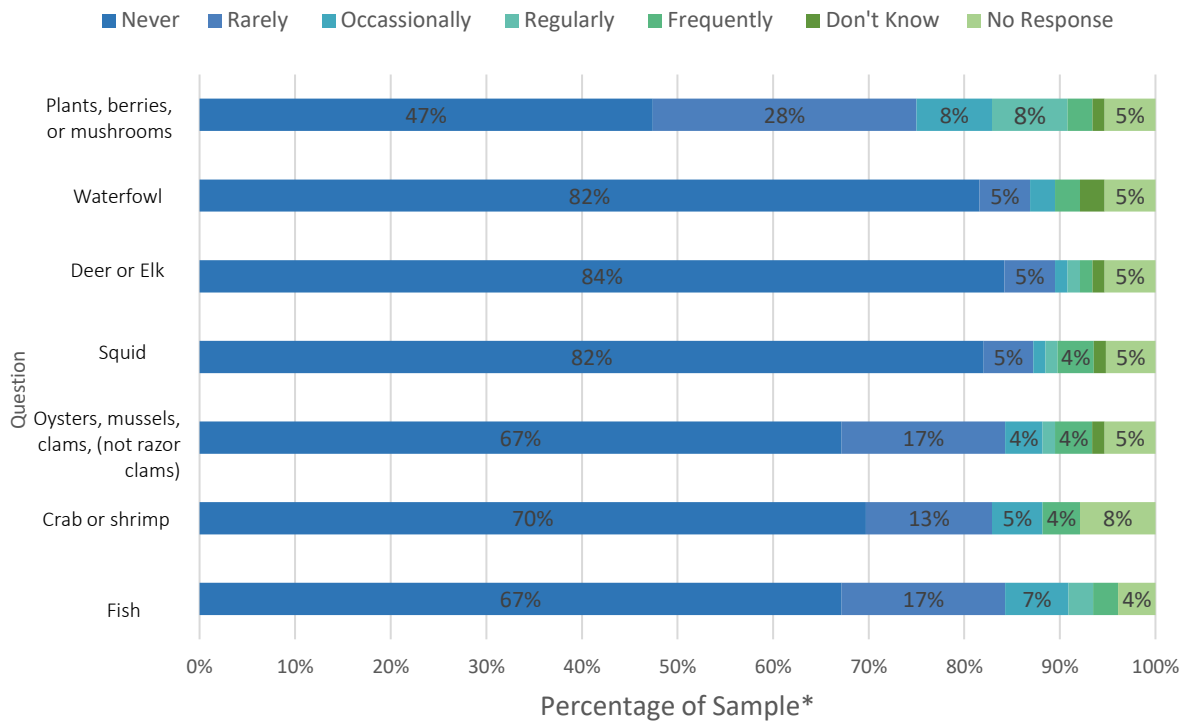
5.19 was the average response among AAPI survey respondents (n=76), which equates to being between “somewhat agree” and “agree”. This is higher than regional averages from 2018 (4.13), 2020 (4.18), and 2022 (4.05), which largely reflected “neutral” responses. This average response was also reflected in the lack of discussion around issues of governance or equity within environmental decision-making during the workshops.

*\*Note: Percentages less than 4% are not labeled for visibility.*



## Local Foods

Local Foods demonstrates the rich variety of local plants, fungi, and animals that are harvested locally in the Puget Sound region. Local Foods measures what and how often people in Puget Sound harvest local foods. Local Foods is measured by asking respondents to rate their frequency of engagement in harvesting activities (e.g., fishing, shellfish harvesting, foraging, and hunting) on a 1-5 point Likert scale.



**Figure 19.** Local Foods Results

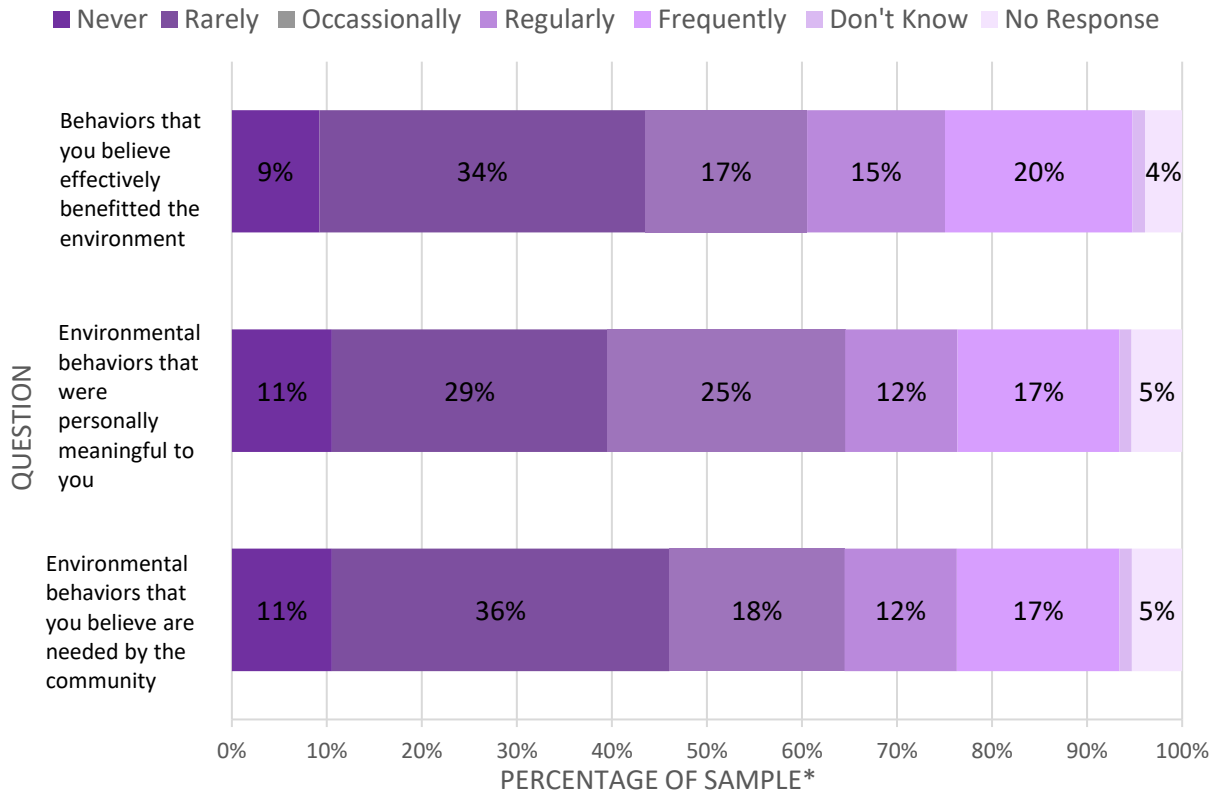
**1.41** was the average response among respondents (n=76), which equates to community members “never” to “rarely” collecting and/or harvesting local foods. This score is fairly consistent with regional averages from 2018 (1.58), 2020 (1.43), and 2022 (1.42); however, direct comparisons cannot be made as the survey changed between 2018 and 2020. Respondents did discuss local foods during the workshops, including the harvesting of fish, shellfish, seaweed, and bracken. The most frequently harvested foods included plants, berries, or mushrooms, fish, and oysters, mussels, clams (not razor clams), while the least frequently harvested foods were deer or elk.

*\*Note: Percentages less than 4% are not labeled for visibility.*



## Sound Stewardship

Sound Stewardship illustrates how frequently residents engage in pro-environmental stewardship behaviors that benefit Puget Sound’s natural environment. Sound Stewardship is measured by asking respondents how often they engage in stewardship activities on a 1-5 point Likert scale.



**Figure 20. Sound Stewardship Results**

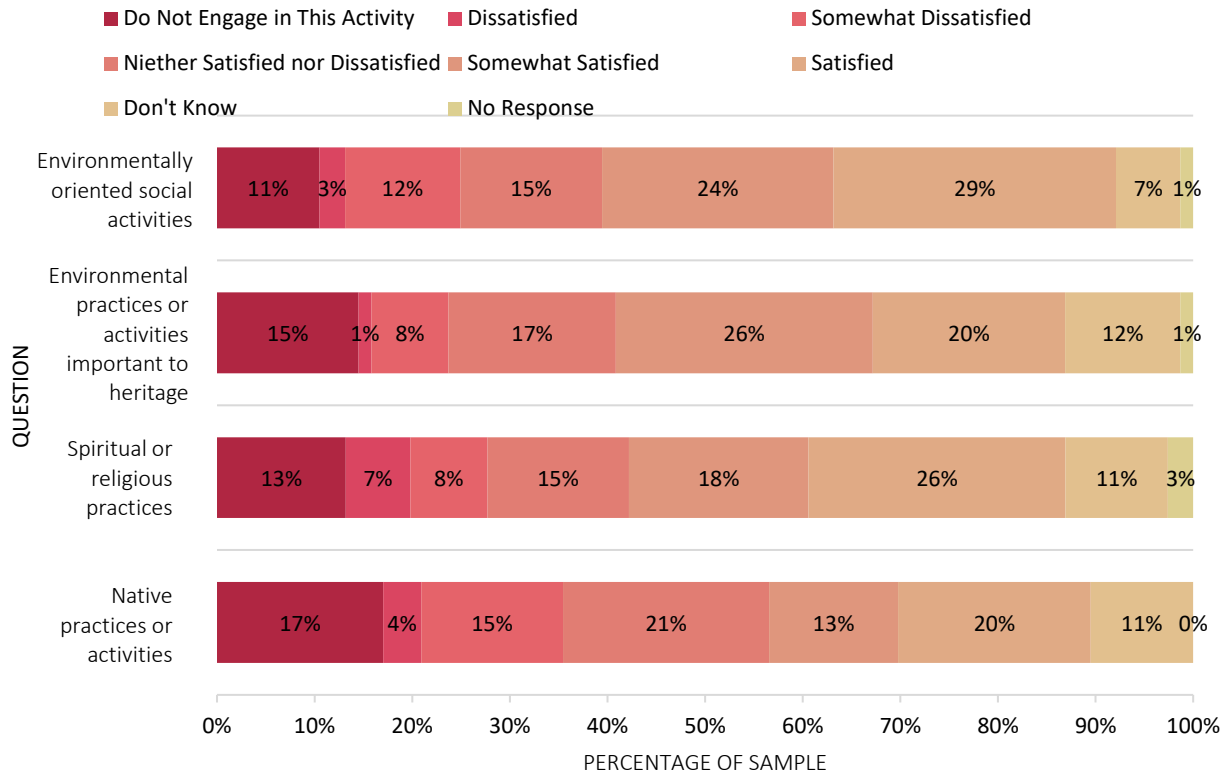
**2.95** was the average response among respondents (n=76), which equates to community members "rarely" to "occasionally" engaging in stewardship activities. This score is slightly lower than regional averages from 2018 (3.47), 2020 (3.14), and 2022 (3.36).

*\*Note: Percentages less than 4% are not labeled for visibility.*



## Cultural Wellbeing

Cultural Wellbeing reflects residents' engagement in meaningful cultural activities and/or traditions in the Puget Sound region. Cultural Wellbeing is measured by asking respondents to rank their level of satisfaction with their engagement in a range of cultural practices on a 1-5 point Likert scale.



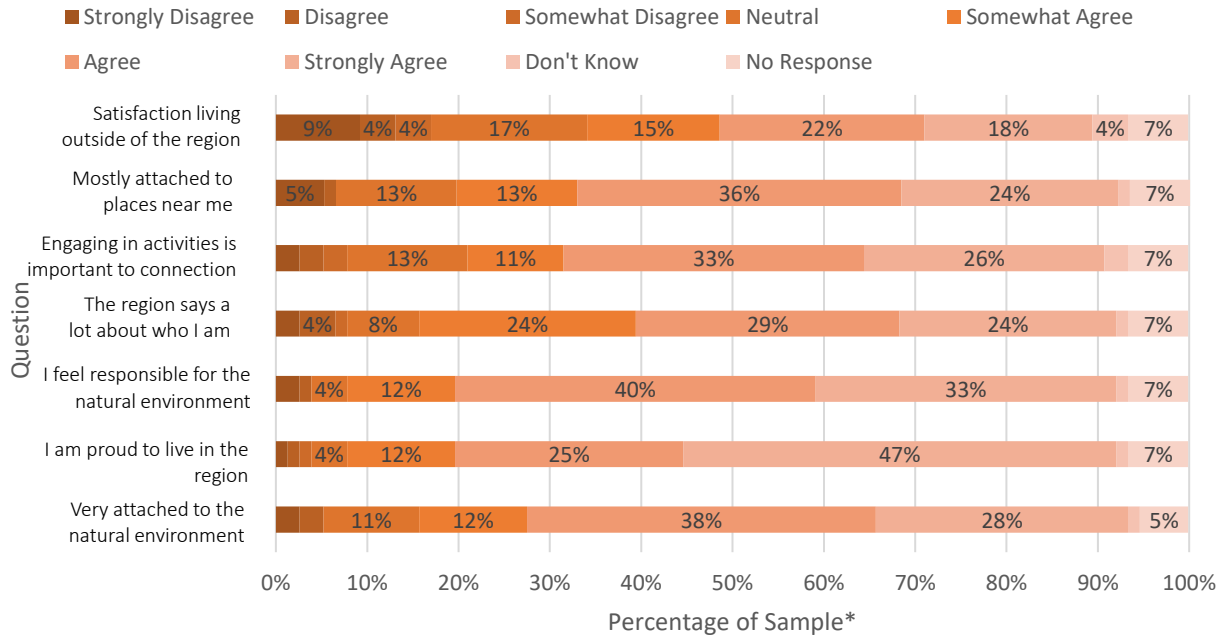
**Figure 21. Sound Stewardship Results**

**3.66** was the average response among participating AAPI residents (n=76), which equates to community members having largely felt “neither satisfied nor dissatisfied” to “somewhat satisfied” with their participation in cultural activities. This score was similar to the regional averages from 2020 (3.64) and 2022 (3.81). This response pattern was demonstrated during the workshops, as many respondents mentioned cultural activities or practices, notably those associated with their religious/spiritual communities, families, or even specific cultural practices (e.g., hula).



## Sense of Place

Sense of Place demonstrates residents’ attachments, identities, and emotional connections to Puget Sound’s natural environment. Sense of Place is measured by asking respondents to rate their level of agreement or disagreement with a series of statements on a 1-7 point Likert scale.



**Figure 22. Sense of Place Results**

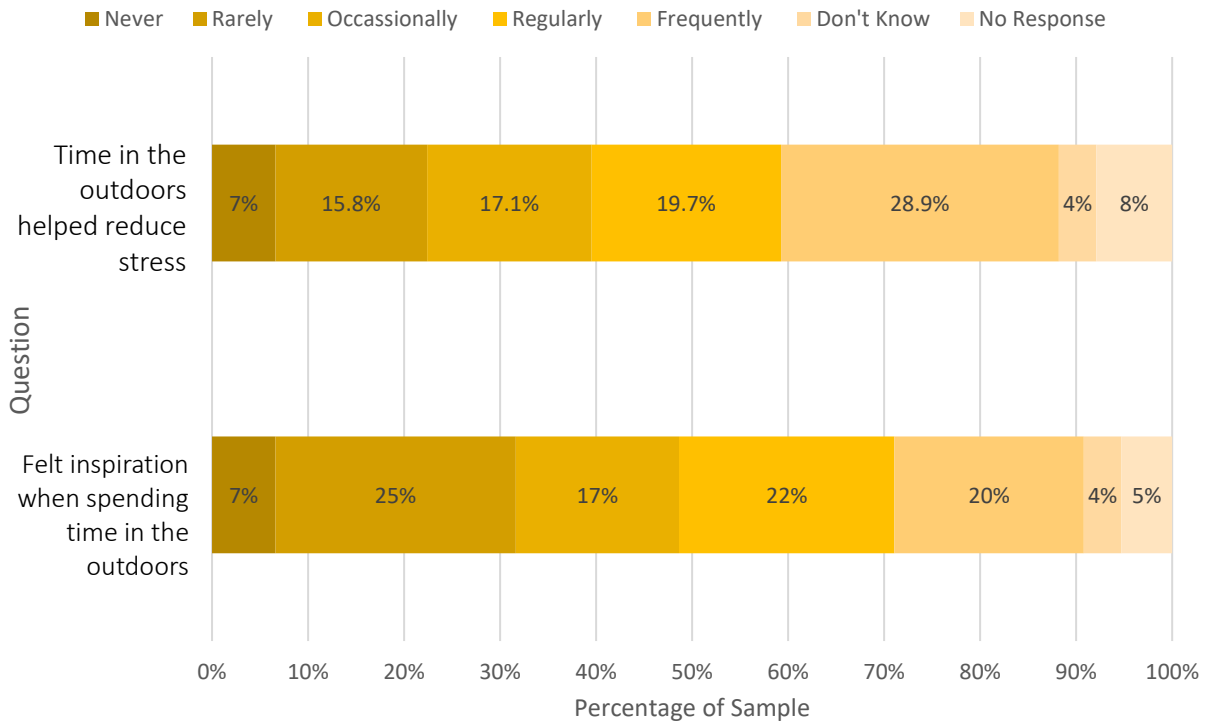
**5.58** was the average response among respondents (n=76), which equates to community members largely feeling like they “somewhat agree” to “agree” to having a sense of place of Puget Sound’s natural’s environment. This is consistent with the regional averages from 2018 (5.66), 2020 (5.57), and 2022 (5.49).

*\*Note: Percentages less than 4% are not labeled for visibility.*



## Psychological Wellbeing

Psychological Wellbeing is a part of the Sense of Place Vital Sign. Psychological Wellbeing reflects residents' emotional and cognitive health in relation to Puget Sound's natural environment. Psychological Wellbeing is measured by asking respondents how often they have experienced stress reduction and inspiration as a result of spending time in nature on a 1-5 point Likert scale.



**Figure 23.** Psychological Wellbeing Results

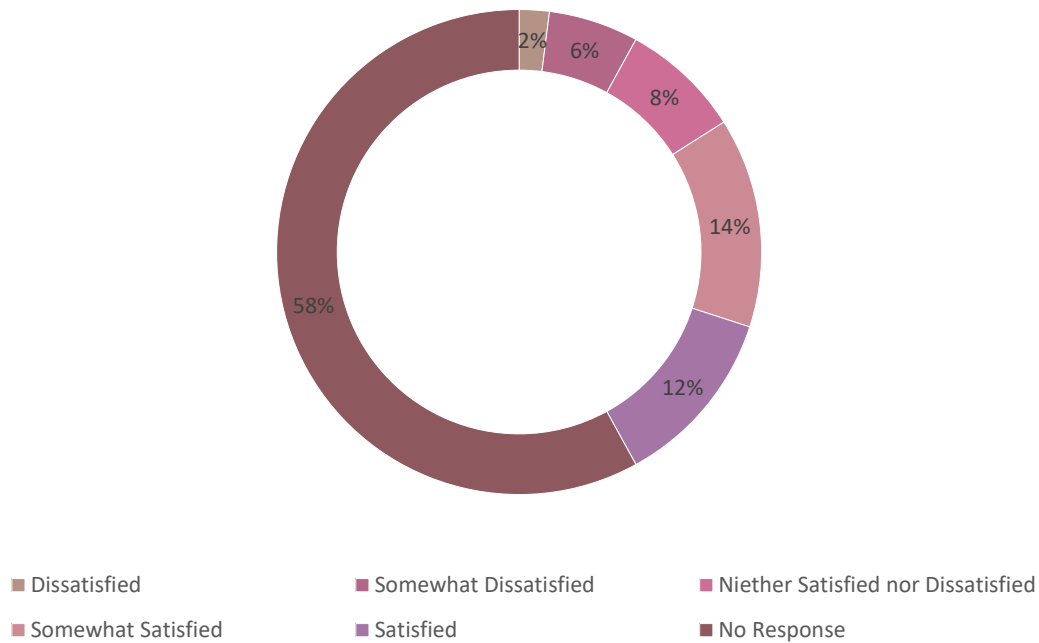
**3.40** was the average response among respondents (n=76), which equates to participants “occasionally” to “regularly” experiencing inspiration or stress reduction from the outdoors. This average is slightly lower than the regional averages from 2018 (3.94), 2020 (4.01), and 2022 (3.98). Attributes or examples of Psychological Wellbeing were discussed often among participants during the workshops; however, those responses were included in the overarching Sense of Place Vital Sign and code.





## Life Satisfaction

Life Satisfaction is a part of the Sense of Place Vital Sign. Life Satisfaction illustrates residents' level of life satisfaction in the Puget Sound region. Life Satisfaction provides a baseline to better understand broad trends in environmental health and residents engagement in outdoor activities. Life Satisfaction is measured by asking respondents how satisfied or dissatisfied they are with their life on a 1-5 point Likert scale.



**Figure 24.** Life Satisfaction Results

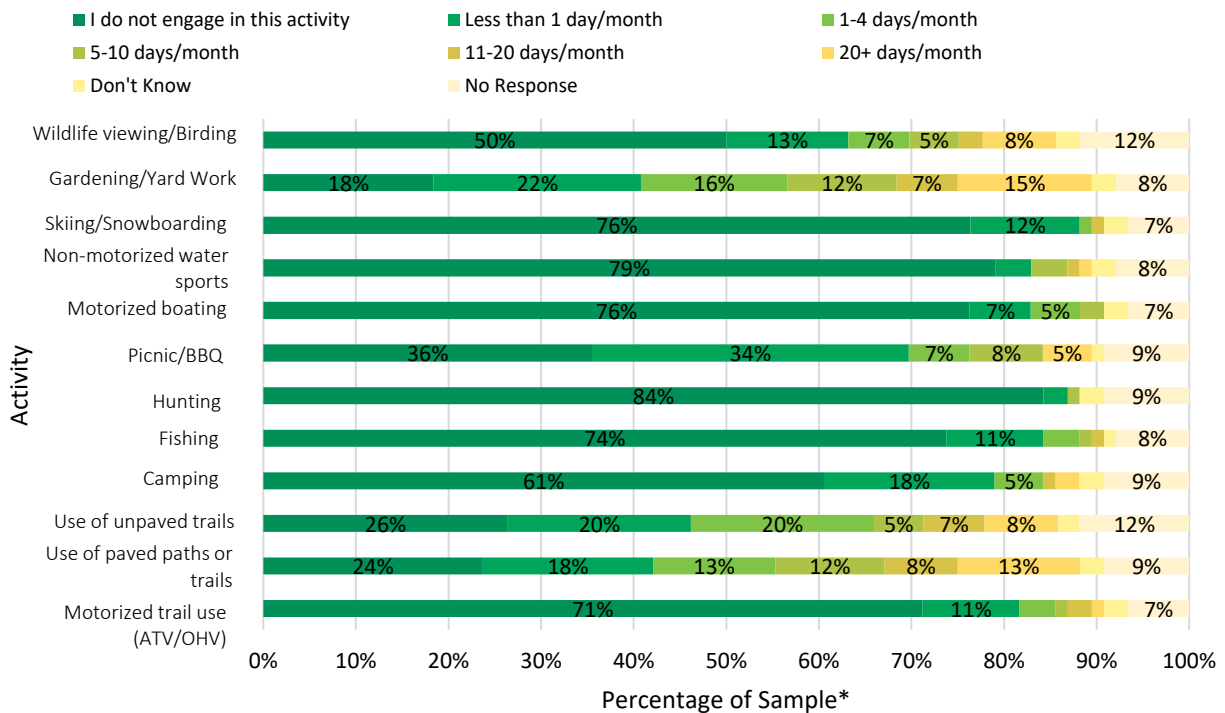
4.47 was the average response among respondents (n=76), which equates to participants feeling between “somewhat satisfied” and “satisfied” with their lives. Participants’ average responses were consistent with the regional average from 2022 (4.41).



## Outdoor Activity

Outdoor Activity demonstrates the frequency of residents' outdoor recreational activities and nature-based work in Puget Sound's natural environment at different times a year (e.g., Fall and Spring). Outdoor Activity provides an opportunity to gauge both activity type and frequency of engagement. We measure Outdoor Activity by asking respondents to assess their engagement and frequency of engagement in 11-12 outdoor activities, including nature-based work (as a separate measure) during two different times (seasons) a year.

### Nature-based Recreation (Fall, about September-November)



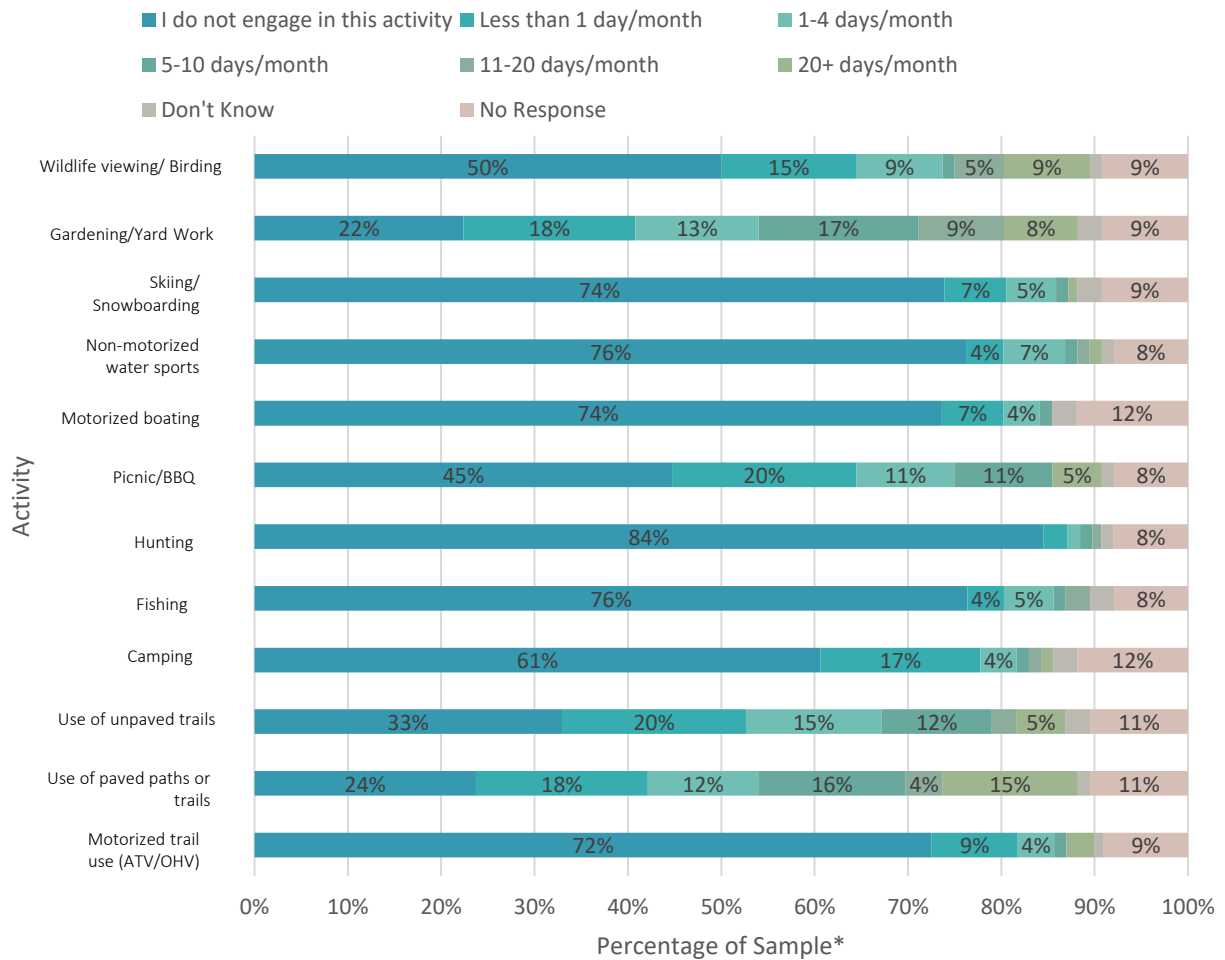
**Figure 25. Outdoor Activity Results**

Participating community members engaged in gardening/yard work, the use of paved paths or trails, the use of unpaved paths or trails, and picnics/bbqs most frequently in the fall months. The activities that participants engaged with the least were hunting and non-motorized water sports.

*\*Note: Percentages less than 5% are not labeled for visibility.*



## Nature-based Recreation (Spring, about March-May)



**Figure 26.** Nature-based Recreation Results

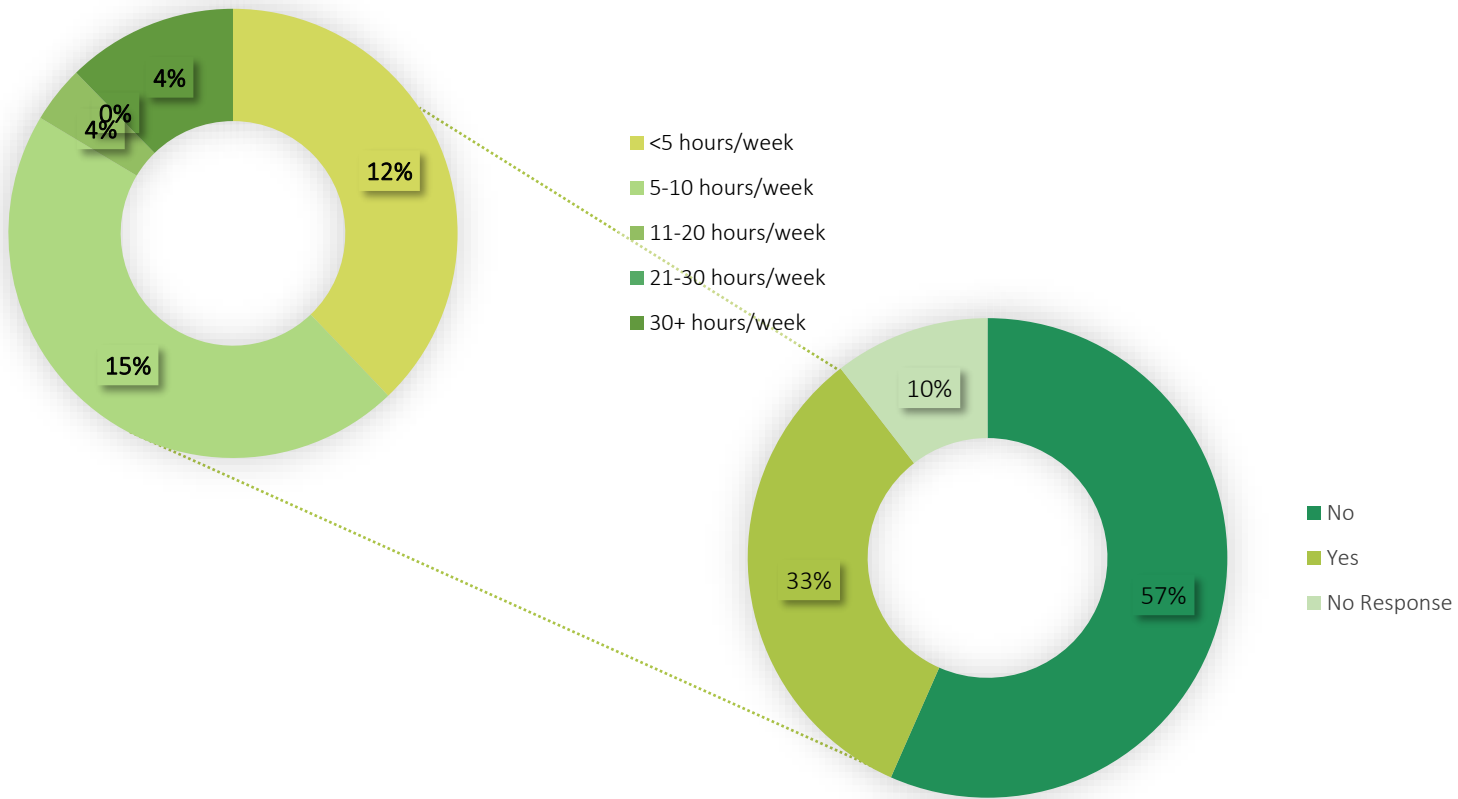
Participating community members engaged in gardening/yard work, the use of paved paths or trails, the use of unpaved paths or trails, and picnics/bbqs most frequently in the spring months. The activity that participants engaged with the least was hunting. This was a consistent response pattern with those outdoor activities engaged in by the same sample during the fall months.

*\*Note: Percentages less than 4% are not labeled for visibility.*



### Nature-based Work

Nature-based Work is part of the Outdoor Activity Vital Sign. Nature-based Work reflects whether or not residents engage in nature-based employment opportunities and how often, including commercial or charter fishing, farming, forestry, habitat restoration, or outdoor recreation jobs. Nature-based Work is measured by asking respondents whether their work includes spending time in the natural environment. For those respondents that do engage in nature-based occupations (“yes”), they are then asked to estimate the number of hours per week.



**Figure 27.** Nature-based Work Results

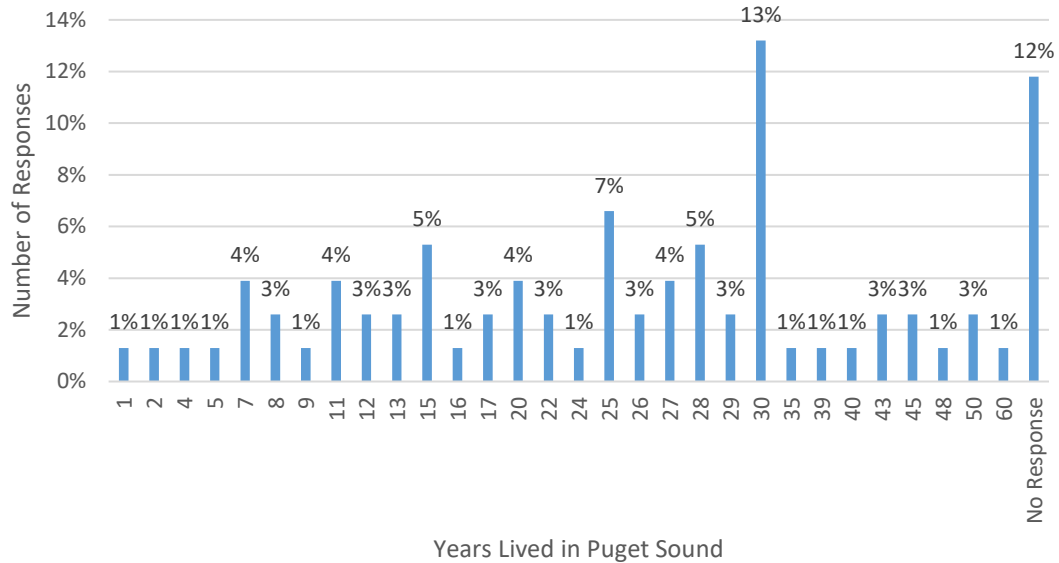
**33%** of community members said their work involved spending time in the outdoors. Of these respondents, **20%** work 5 hours or more a week outdoors. This response was more than the regional ‘yes’ responses from 2020 (12.4%) and 2022 (13.6%).



## Respondent Demographics

The following figures highlight responses stemming from a series of demographic questions included in the Human Wellbeing Survey. Some interpretation is provided for some demographic attributes, but not all. Additional interpretation was solely provided when deemed appropriate to that attribute.

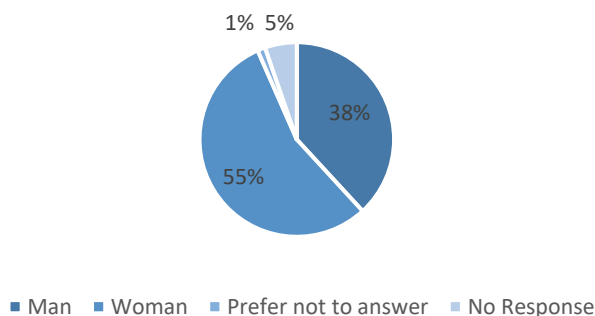
### Years Lived in Puget Sound (n=76; mean: 23.9 years)



**Figure 28.** Years Lived in Puget Sound Results

The majority of survey respondents stated that they have lived in Puget Sound for 20 years or more with the average being 23.9. This is lower to regional survey respondents, including those who responded to the 2022 survey (mean: 34.9 years). This partly reflects the partial intention of the project to engage new residents, notably residents who were not born in the United States and who migrated to the region from abroad, including from Thailand, South Korea, and Vietnam.

### Sex

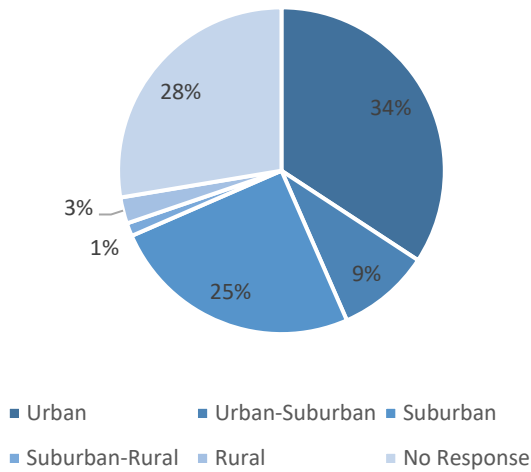


The majority of survey respondents identified as women. This differs from the respondents to the regional surveys from 2020 and 2022, where the majority of respondents identified as men; although it should be noted that the 2022 survey changed the question (gender identity) and potential responses.

**Figure 29.** Respondents' Sex



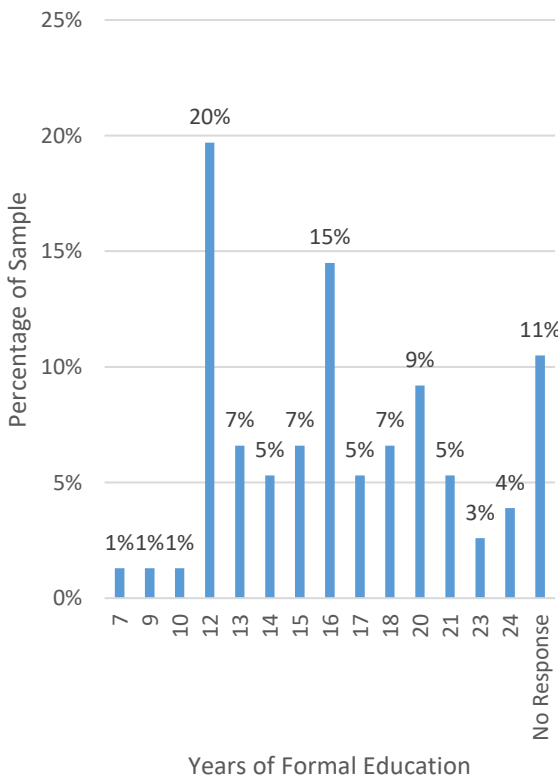
**Area Type**



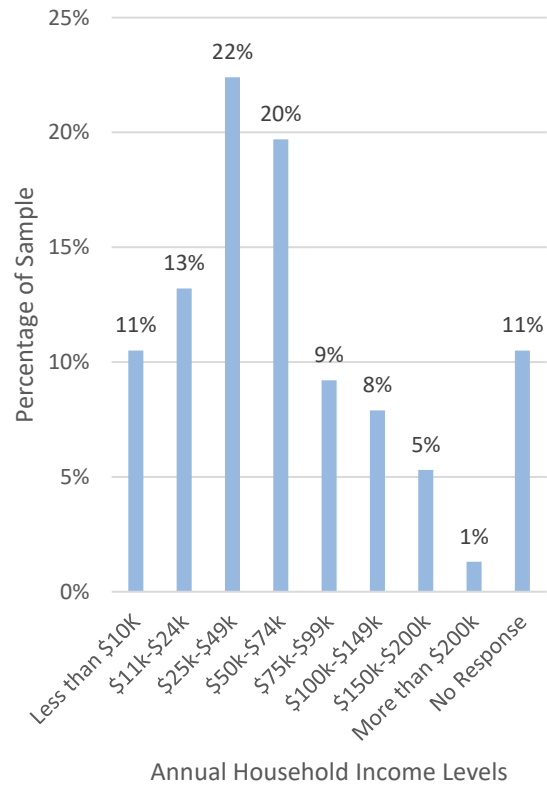
**Figure 30. Respondents' Area Type**

The majority of survey respondents lived in urban (34%) and suburban (25%) areas. This reflects the urban location and focus of the project. This differs from regional survey respondents (2022), who largely comprised rural (38%) and suburban (23%) residents. This pattern is also reflected in the place-based question responses from the facilitated dialogues, which included places that were largely located urban Tacoma and its surrounding suburban areas.

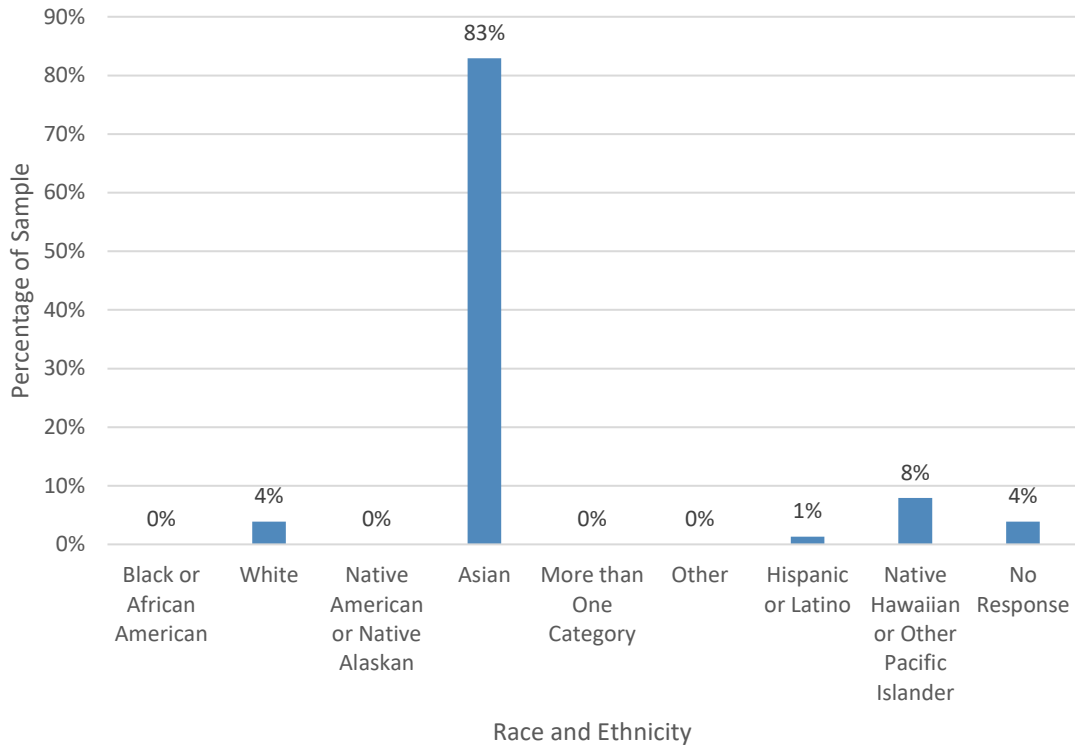
**Figure 31. Respondents' Education**



**Figure 32. Respondents' Income**



## Race and Ethnicity

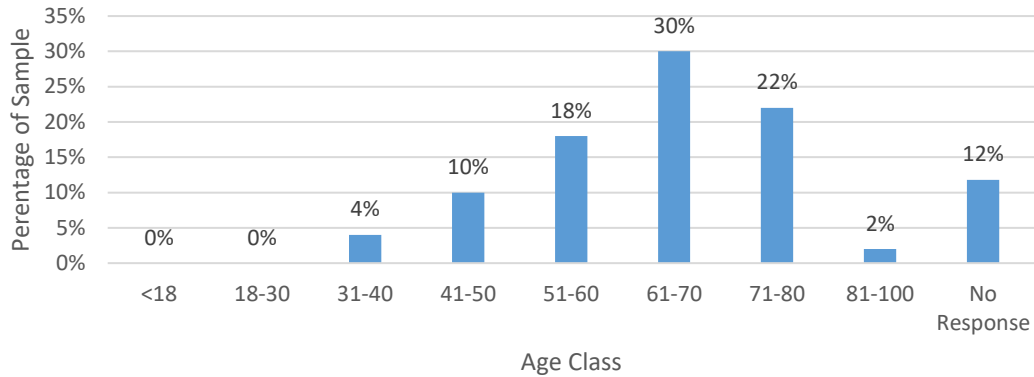


**Figure 33.** Respondents' Race and Ethnicity

The majority of survey respondents self-identified as Asian (83%) and Native Hawaiian or Other Pacific Islander (8%). This response pattern was intentional and was embedded in project design and outreach efforts, including efforts that benefitted from community liaisons and outreach materials translated into Thai, Korean, and Vietnamese languages. This varies from the regional survey, including 2022 (3.1% Asian and 0.5% Native Hawaiian or other Pacific Islander respondents). While Asian, Native Hawaiian, or other Pacific Islander (or Asian American and Pacific Islander, AAPI) residents were a key demographic for this project, it should be emphasized that AAPI residents, like Puget Sound residents more broadly embody multiple simultaneous intersectional identities and/or are not solely part of one or another racial or ethnic (or other form of) community.



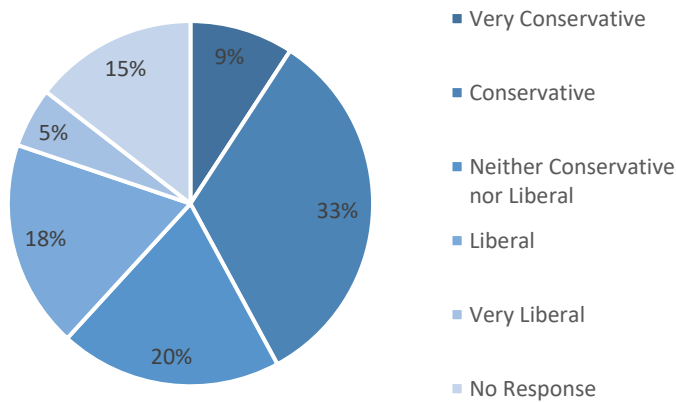
**Age (n=76; mean age: 63 years old)**



**Figure 34.** Respondents’ Age

The majority of survey respondents from the workshops were in the “61-70 years” age class. This majority age class was identical to the majority age class from the regional survey (2022). This pattern likely reflected the workshop times, location, and outreach conducted, among other factors informing workshop participation. This is not reflective of the AAPI population at large in the region, as approximately 21% comprise individuals 60 and over.<sup>7</sup>

**Political Ideology**



**2.73** was the average response among workshop participants who completed the survey. This average response equates to “Conservative,” which is more “Conservative” than the regional survey average response in 2022 (3.32).

<sup>7</sup> Age comparison was made based on WA Office of Financial Management’s Estimates of April 1 population by age, sex, race and Hispanic origin dataset: [Estimates of April 1 population by age, sex, race and Hispanic origin | Office of Financial Management \(wa.gov\)](https://www.ofm.wa.gov/estimates-of-april-1-population-by-age-sex-race-and-hispanic-origin).





## Conclusions and Recommendations

During the facilitated dialogues, AAPI community members were provided an optional opportunity to complete the Human Wellbeing Survey. Out of a total of 166 community members participating in the workshops, 76 completed the survey (46% response rate). Interest and response rates varied by workshop and community, with the higher response rates representing the smaller workshops, including a 96% response rate from the Korean community workshop. This finding demonstrates the potential of CBPR, facilitated dialogues, mixed-methods, or even non-research community events at increasing the reach of the Human Wellbeing Survey effort. This also likely demonstrates the potential of greater community collaborator engagement in monitoring (and recovery more broadly) and the benefit of incentives for participation among community members, as all workshop participants were provided a \$50 gift card for their engagement, regardless of their optional survey completion. This blending of approaches in turn could make the survey and its findings (and larger monitoring effort) more inclusive and representative of AAPI community members.

Asian American & Pacific Islander Residents' Human Wellbeing Survey Results (n=76)
<b>Good Governance: 5.19</b> on a 1-7 scale (strongly disagree to strongly agree). On average, participants largely responded between "somewhat agree" and "agree."
<b>Local Foods: 1.41</b> on a 1-5 scale (never to frequently). On average, participants largely responded between "never" "rarely" (1-2 times a season).
<b>Sound Stewardship: 2.94</b> on a 1-7 scale (never to frequently). On average, participants largely responded between "rarely" (1-4 times a year) and "occasionally" (once a month).
<b>Cultural Wellbeing: 3.66</b> on a 1-6 scale (dissatisfied to satisfied). On average, participants largely scored between "neither satisfied nor dissatisfied" and "somewhat satisfied."
<b>Sense of Place: 5.58</b> on a 1-7 scale (strongly disagree to strongly agree). On average, participants largely scored between "somewhat agree" and "agree."
<ul style="list-style-type: none"> <li>• <b>Psychological Wellbeing: 3.40</b> on a 1-5 scale (never to frequently). On average, participants largely responded between "occasionally" (once a month) and "regularly" (one a week).</li> <li>• <b>Life Satisfaction: 4.47</b> on a 1-5 scale (dissatisfied to satisfied). On average, participants largely responded between "somewhat satisfied" and "satisfied."</li> </ul>
<b>Outdoor Activity</b>
<ul style="list-style-type: none"> <li>• <b>Outdoor Recreation:</b> Most frequently engaged in recreational activities included: gardening/yard work and use of paved trails or paths.</li> <li>• <b>Nature-based Work:</b> 33% of respondents engaged in nature-based work with 20% engaging in such work 5 hours a week or more.<sup>8</sup></li> </ul>

**Table 7.** Human Wellbeing Survey Results Summary

The survey findings reflect that the AAPI survey respondents demonstrated similar patterns of human wellbeing as it relates to the health of Puget Sound compared to the regional survey respondents (Table 7). AAPI community members had similar average responses to many Human Wellbeing Vital Signs. For example, AAPI respondents had roughly similar average responses to Sense of Place (5.58) (compared to 5.49 (2022)), Cultural Wellbeing (3.66) (compared to 3.81 (2022)), and Life Satisfaction (4.47) (compared to 4.41 (2022)). While largely similar, some stark variations emerged compared to the regional survey findings. For example, AAPI respondents had higher average responses to Good Governance (5.19) (compared to 4.05 (2022)) and Sound

<sup>8</sup> Note that translations of "work" in natural environments may have varied contributing to alternative interpretations of the question.



Stewardship (2.94) (compared to 3.36 (2022)). This variation illustrates potential community-based differences in human health as it relates to nature among diverse communities, but also how communities perceive and engage the natural environment in Puget Sound, notably through governance systems or stewardship behaviors. This latter finding highlights the need for greater community inclusion and engagement with human wellbeing monitoring and further demonstrates the need to potentially modify the Human Wellbeing Vital Signs with workshop-derived Community Dimensions of health.

### **Limitations**

The survey instrument faced numerous limitations, one being sampling. While generalizability was not necessarily the intended goal of this project or survey instrument, given the CBPR approach, which is highly context- and community-specific, generalizability can help with interpretation and application of survey results for management or decision-making purposes. One limitation is that the regional Human Wellbeing Survey was updated since the 2020 survey of which this is based, making some comparisons to the 2022 survey somewhat challenging. Given the survey was implemented during community workshops with self-selected participating community members via nonprobability sampling, sampling errors likely exist, producing a sample not representative of the Asian American and Pacific Islander community in Tacoma, Pierce County, or Puget Sound as a whole. While the sample was somewhat representative with regards to sex (local and regional AAPI community members are comprised of more female members than male), the sample was comprised of slightly more older residents; although approximately 34-40% of AAPI residents locally and regionally are over the age of 50. Likely sampling errors include nonresponse error and measurement error. Additionally, the workshops themselves revealed the importance of recognizing intersectionality and the intersectional identities of people, thus, much care and intention need to be taken into consideration when attempting to engage individuals or groups that may self-identify with one group (whether racial, ethnic, linguistic, cultural, place-based, or other), as they also likely self-identify with others simultaneously. Additionally, the workshops also reflected the multiracial or multiethnic families and communities that are entwined with one another in the region, as some participants brought family members or other community leaders who did not necessarily self-identify with the same (limited) racial and ethnic categories used by the U.S. Census and current iterations of the Human Wellbeing Survey.



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## Appendix A. Facilitated Dialogues Codebook

This codebook includes codes solely linked to the facilitated dialogues. This codebook includes codes applied to both sets of facilitated dialogues due to the similarity in overarching themes and questions, including the deductive codes linked to the Human Wellbeing Vital Signs. Some distinct notes are included for those codes associated solely with one set of facilitated dialogues or even community, as the sets of facilitated dialogues did vary. Given that the codebook was shared and used for the analysis for data stemming from APCC workshops and those conducted with Empowering People in Communities (another Tacoma-based nonprofit located in the Hilltop neighborhood), both sets of codes and coding information are included in the table (Table 8). The below codebook includes the following information: (1) code category (Human Wellbeing Vital Sign category (e.g., Health Human Population or Vibrant Human Quality of Life) or community category (e.g., Community Dimension of health/wellbeing); (2) code (short straightforward word or set of words, including those associated with the Human Wellbeing Vital Signs or emergent Community Dimensions; and (3) code description, which includes definitions, keywords (keywords derived from participant responses), examples (participant responses), and code type (e.g., deductive vs. inductive). The codebook reflects the abductive coding process informed by social science literature on abductive coding and analysis (Dubois and Gadde 2002; Timmermans and Tavory 2012; Thompson 2022; Vila-Henninger and others 2022). The codes are also color-coded with the lighter shade illustrating codes aligned with the already established Human Wellbeing Vital Signs and the bolder shade illustrating emergent codes derived from the participating community members.

Code Category	Code	Description
Healthy Human Population	Air Quality	<p>Definition: All references to air and air quality.</p> <p>Keywords: air, fresh air, air quality, breathing, clean air</p> <p>Example: “air quality, bad air makes it harder to breathe”</p> <p>Code Type: Deductive (Human Wellbeing Vital Signs)</p>
Healthy Human Population	Water/Water Quality (Drinking, Fresh, and Marine)	<p>Definition: All references to water and water quality, regardless if water type was described (e.g., drinking, fresh, and marine). Note that most participants did not reference water type at all.</p> <p>Keywords: water, water quality, clean water, fresh water, drinking water, waterways</p> <p>Example: “water quality”</p> <p>Code Type: Deductive (Human Wellbeing and Biophysical Vital Signs)</p>
Healthy Human Population	Local Foods	<p>Definition: All references to local foods, including those prioritized within the Local Foods Vital Sign, but also alternatives that could be included, like seaweed.</p> <p>Keywords: food, fish, shellfish, clams, seafood, mushrooms, seaweed, vegetables, fruits, locally grown produce,</p>



		<p>produce, farms, gardening, harvest (and other references to food or eating)</p> <p>Example: “Different vegetables seem to grow better or worse”</p> <p>Code Type: Deductive (Human Wellbeing Vital Signs)</p>
Healthy Human Population	Outdoor Activity	<p>Definition: All references to outdoor recreational activities, including those prioritized by the Outdoor Activity Vital Sign, but also alternatives that could be included.</p> <p>Keywords: recreation, outdoor recreation, outdoor activities, recreational activities, fishing, gardening, skiing, hiking, walking, biking, shellfish harvest, camping, exercise (and other examples of recreation)</p> <p>Example: “climate change has made it difficult to participate in more outdoor activities due to hail and snow”</p> <p>Code Type: Deductive (Human Wellbeing Vital Signs)</p>
Healthy Human Population	Shellfish Beds	<p>Definition: All references to shellfish and shellfish beds as demonstrated by the Shellfish Beds Vital Sign. May include references to shellfish harvesting and the eating of shellfish.</p> <p>Keywords: shellfish, shellfish harvest, clams, clam digging</p> <p>Example: “Tolmie State Park, walking, clam digging, picnic”</p> <p>Code Type: Deductive (Human Wellbeing Vital Signs)</p>
Vibrant Human Quality of Life	Cultural Wellbeing	<p>Definition: All references to cultural wellbeing, including the prioritized cultural or community practices by the Cultural Wellbeing Vital Sign, but also alternatives that could be included, like those associated with children and families.</p> <p>Keywords: church activities, spiritual practices, religious activities, community, community events, family activities, family events, kids, children, neighbor engagement, neighborhood activities, culture, (examples of) cultural activities</p> <p>Example: “the community connects with nature by utilizing it in to describe its sheer amazing in dances (hula)”</p> <p>Code Type: Deductive (Human Wellbeing Vital Signs)</p>
Vibrant Human Quality of Life	Economic Vitality	<p>Definition: All references to economics, jobs, and work, as demonstrated by the Economic Vitality Vital Sign.</p> <p>Keywords: economy, work, jobs, financial, products</p> <p>Example: “economy”</p>



		Code Type: Deductive (Human Wellbeing Vital Signs)
Vibrant Human Quality of Life	Good Governance	<p>Definition: All references to attributes of good governance, like accessibility, trust, and transparency, as demonstrated by the Good Governance Vital Sign, but also some alternatives.</p> <p>Keywords: laws, policy, government, decision making, and (examples of) good governance or the lack thereof</p> <p>Example: “agency in decision making”</p> <p>Code Type: Deductive (Human Wellbeing Vital Signs)</p>
Vibrant Human Quality of Life	Sense of Place	<p>Definition: All references to attributes of sense of place, including those attributes associated with psychological wellbeing, life satisfaction, and aesthetics, as demonstrated by the Sense of Place Vital sign.</p> <p>Keywords: mental health, proud, relax, emotional health, connection, identity, memories, heritage, home, stress, responsibility, beauty, and (examples of) aesthetic qualities and emotional or mental health</p> <p>Example: “I am proud of living at Puget Sound, beautiful environment, clean air and water, I think I live a decade can compare to live another states”</p> <p>Code Type: Deductive (Human Wellbeing Vital Signs)</p>
Vibrant Human Quality of Life	Sound Stewardship	<p>Definition: All references to stewardship behaviors, including the prioritized attributes or behaviors demonstrated by the Sound Stewardship Vital Sign, including Sound Behavior Index. This includes alternative behaviors associated with stewardship as well, including those that might be more broadly defined by participants.</p> <p>Keywords: cleaning, litter, trash, taking care, help, save</p> <p>Example: “picking up litter, saving trees, mountains, waterways, and wetlands”</p> <p>Code Type: Deductive (Human Wellbeing Vital Signs)</p>
Community Dimension	Accessibility	<p>Definition: All references to access and accessibility, including as accessibility relates to human mobility, public/private transportation, geographic proximity to parks or natural areas, and resources/amenities.</p> <p>Keywords: access, accessibility, transportation, transit, amenities, proximity, mobility, ability, (examples of) all of the aforementioned keywords</p> <p>Example: “good transit system to get people to parks”</p>



		Code Type: Inductive
Community Dimension	Equity	<p>Definition: All references to equity and fairness associated with nature, including when it comes to recognitional, procedural, and distributional equity.</p> <p>Keywords: equity, fairness, equal, consideration, and (examples of) the aforementioned keywords</p> <p>Example: “low income should not equal low standards (e.g., having parking)”</p> <p>Code Type: Inductive</p>
Community Dimension	Physical Health	<p>Definition: All references to physical health, including any references to the physical body.</p> <p>Keywords: physical health, bodily health, sick, pain, disease, medicine, nutrition, body, and (examples of) physical health or ill health</p> <p>Example: “body composition”</p> <p>Code Type: Inductive</p>
Community Dimension	Fish and Wildlife	<p>Definition: All references to fish and wildlife, including insects. Fish and wildlife references include those associated and not associated with food or outdoor activities. Many references to fish and wildlife demonstrate an inherent or existence value associated with non-human beings in nature.</p> <p>Keywords: fish, wildlife, birds, animals, insects, ducks, turtles, squirrels, bees, dogs, cats, chickens, fauna, shellfish, clams</p> <p>Example: “the sound of the birds”</p> <p>Code Type: Inductive</p>
Community Dimension	Plants and Trees	<p>Definition: All references to plants and trees, including specific plants, like flowers or moss. Note that often, responses included both plants and trees.</p> <p>Keywords: trees, plants, flowers, flora, moss, and (other examples of non-tree) plants</p> <p>Example: “trees, plants”</p> <p>Code Type: Inductive</p>
Community Dimension	Place and Landscape	<p>Definition: All references to place and landscape, including references to broad and specific places or landscape features, like beaches or parks.</p>



		<p>Keywords: parks, beaches, mountains, space, wetlands, home, oceans, Puget Sound, forests, rivers, trails, gardens, Mt. Rainier, pastures, sea, and (additional examples of) places and landscapes</p> <p>Example: “parks and nature”</p> <p>Code Type: Inductive</p>
Community Dimension	Safety	<p>Definition: All references to safety and security.</p> <p>Keywords: safety, security, danger, police</p> <p>Example: “clean park to be safe, to walk the street make safe for kids”</p> <p>Code Type: Inductive</p>
Community Dimension	Environmental Condition	<p>Definition: All references to the condition of the natural environment, typically references that are fairly broad or generic, including those associated with cleanliness.</p> <p>Keywords: environment, clean, good, pollution, destruction, negative, loss, and (generic example of) the environmental condition</p> <p>Example: “environment”</p> <p>Code Type: Inductive</p>
Community Dimension	Other	<p>Definition: All references that illustrate some distinct quality or characteristic that does not adequately or easily align with others.</p> <p>No keywords included.</p> <p>Example: “wellbeing lasting transformation”</p> <p>Code Type: Inductive</p>
Community Dimension	Everything	<p>Definition: All references to and the verbatim use of everything. Note that everything was a commonly used response among Vietnamese respondents.</p> <p>Keywords: everything</p> <p>Example: “health is everything”</p> <p>Code Type: Inductive</p>



Community Dimension	Gold <sup>9</sup>	<p>Definition: All references to and the verbatim use of gold. Note that gold was a commonly used response among Vietnamese respondents. According to the workshop interpreter and confirmed by interdisciplinary literature, gold is a common phrase or term used to define health among Vietnamese speakers. This may also be applicable to or associated with everything and life.</p> <p>Keywords: gold</p> <p>Example: “health is gold”</p> <p>Code Type: Inductive</p>
Community Dimension	Life	<p>Definition: All references to and the verbatim use of life. Note that gold was a commonly used response among Vietnamese respondents.</p> <p>Keywords: life</p> <p>Example: “life”</p> <p>Code Type: Inductive</p>
Community Dimension	Increased Uncertainty	<p>Definition: All references to increased uncertainty associated with the impacts of climate change. This code was solely used to analyze the climate change responses.</p> <p>Keywords: uncertainty, unknown, unpredictable</p> <p>Example: “climate change is unpredictable and can be extreme at times”</p> <p>Code Type: Inductive</p>
Community Dimension	Acceptance and Opportunity	<p>Definition: All references to acceptance and potential opportunities associated with the impacts of climate change. This code was solely used to analyze the climate change responses.</p> <p>Keywords: happy, glad, (examples of) new opportunities or experiences</p> <p>Example: “warmer winters, more recreation time outside”</p> <p>Code Type: Inductive</p>

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<sup>9</sup> Note: “Health is gold” is a common Vietnamese health phrase, as represented in other research (McPhee and others 1996), and was used often among Vietnamese-speaking participants.



Community Dimension	Natural Disasters	<p>Definition: All references to natural disasters associated with the impacts of climate change. This code was solely used to analyze the climate change responses.</p> <p>Keywords: natural disaster, flood, heat waves, fire, sea level rise, storms, tornados, hurricanes, draught</p> <p>Example: “hurricanes, tornadoes, snow, rain, flooding, fires, and draught”</p> <p>Code Type: Inductive</p>
Community Dimension	Seasonal and Temperature Change	<p>Definition: All references to seasonal and/or temperature change associated with the impacts of climate change. This code was solely used to analyze the climate change responses.</p> <p>Keywords: temperature, season, winter, summer, weather, heat, cold,</p> <p>Example: “4 seasons are not clear”</p> <p>Code Type: Inductive</p>
Community Dimension	Something Lost or Past	<p>Definition: All references to longing for or examples of the past or something, like a sense of community or belonging, being lost. This code was solely used to analyze the community responses for Hilltop Residents only.</p> <p>Keywords: (examples of) loss or past</p> <p>Example: “back in the 60 and 70 was a community on the hilltop”</p> <p>Code Type: Inductive</p>
Community Dimension	Shared Goals, Interests, and Values	<p>Definition: Definition: All references to shared community attributes associated with common goals, interests, and/or values. This code was solely used to analyze the community responses for Hilltop Residents only.</p> <p>Keywords: (common or shared, including examples of) goals, values, solutions, memories, interests, care, church</p> <p>Example: “common goals”</p> <p>Code Type: Inductive</p>
Community Dimension	Activities and Interactions	<p>Definition: Definition: All references to community activities and interactions that contribute to defining a community. This code was solely used to analyze the community responses for Hilltop Residents only.</p> <p>Keywords: coming together, gathering, events, collaboration, interactions, culture, and (examples of)</p>



		<p>specific activities or interactions, like political/coalition building</p> <p>Example: “events, genuine/nice interactions with people, integrating cultures, relationship with police”</p> <p>Code Type: Inductive</p>
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**Table 8.** Codebook





## Appendix B. Workshop Codes, Responses, and Examples

This table includes codes solely linked to the facilitated dialogues. This table includes codes applied to the Asian American and Pacific Islander Residents’ Workshops co-created and conducted with the Asia Pacific Cultural Center. The table is organized by facilitated dialogues theme or question (in bold and highlighted with a bright color), including: health (e.g., What is health (including as it relates to nature)?), contributions (e.g., How does nature contribute to your health?), climate change (e.g., How does climate change impact your health?), and place (e.g., What places (in nature) contribute to your health? Why?). Each theme (associated with the noted questions) is bolded and includes the number of responses (#) and sample (number of people who responded) (n). The table then also includes each code, response per code, response as percent per code (per overarching theme or question), and an example of each code (per overarching theme or question). The codes are also color-coded with the lighter shade illustrating codes aligned with the already established Human Wellbeing Vital Signs and the bolder or darker shade illustrating emergent codes derived from the community participants. For more information about the codes and their definitions, see Appendix A.

Themes and Codes	Responses <sup>10</sup>	Precent	Examples
<b>Health (n=166)</b>	<b>121</b>		
Physical Health	55	45.45%	“nutrition”
Sense of Place	27	22.31%	“conditions of wellbeing consist of physical and mental condition, environment”
Local Foods	22	18.18%	“nature, food, trees, water, mountain, air”
Outdoor Activity	16	13.22%	“what is health? exercise, walk”
Everything	15	12.39%	“health is everything”
Gold	15	12.39%	“health is gold”
Cultural Wellbeing	15	12.39%	“culture”
Other	7	05.78%	“world”
Air Quality	7	05.78%	“air quality”
Environmental Condition	7	05.78%	“health definition - physically, mentally, socially (family and community relationship), environmental health (it influences physical and mental health)”
Life	7	05.78%	“life”
Safety	4	03.30%	“clean air, clean water, safe/healthy food, safe environment for outdoor activities”
Water (Drinking, Fresh, Marine)	4	03.30%	“water quality”
Place and Landscape	3	02.47%	“nature, food, trees, water, mountain, air”

<sup>10</sup> Please note that responses include those that are multi-coded, meaning one particular response from a participant may be coded more than once, given that their response may have included more than one item or type of content that aligned with more than one code. Given that responses are multi-coded, the code response numbers (under Responses) will not add up to the response totals (e.g., Health, Responses: 121), nor will the percentages add up to 100% (with limited exceptions, like for some place-based codes). This is intentional and part of the abductive analysis.



Economic Vitality	2	01.65%	"economy"
Accessibility	2	01.65%	"being able to do things you would like to do, walking upstairs to running marathons"
Good Governance	1	00.82%	"government"
Fish and Wildlife	1	00.82%	"healthy animals"
<b>Contributions (n=166)</b>	<b>130</b>		
Air Quality	57	43.84%	"fresh air"
Water (Drinking, Fresh, Marine)	38	29.23%	"fresh clean everything - water, air, plants, ocean"
Sense of Place	38	29.23%	"I am proud of living at Puget Sound, beautiful environment, clean air and water, I think I live a decade can compare to live another states"
Place and Landscape	35	26.92%	"park"
Plants and Trees	34	26.15%	"trees, plants"
Outdoor Activity	32	24.61%	"swimming, fishing, and enjoying the Puget Sound"
Cultural Wellbeing	24	18.46%	"the community connects with nature by utilizing it in to describe its sheer amazing in dances (hula)"
Local Foods	16	12.30%	"forest, air, ocean, park (national), seaweed, fish"
Sound Stewardship	16	12.30%	"picking up litter, saving trees, mountains, waterways, and wetlands"
Environmental Condition	13	10%	"clean and nice looking"
Fish and Wildlife	10	07.69%	"we watch the birds activities at home or the parks and they connect us to the rest of the environment"
Physical Health	9	06.92%	"health, clean water and air, beautiful forest and sea/life, physical/mental health, forest provides walking trail, peace, health"
Safety	3	02.30%	"dangerous because of dogs in streets often, hoping there should be strict rules concerning cats and dogs to be kept well by their owners"
Energy	3	02.30%	"I value nature: nature gives us clean energy, water, nature gives us entertainment"
Accessibility	3	02.30%	"educational experiences, outdoor safe access, water sports/activities, animal sightings all allow a break from the normal grind"
Good Governance	1	00.76%	"laws"
<b>Climate Change (n=166)</b>	<b>125</b>		
Physical Health	51	40.80%	"more sickness"
Seasonal and Temperature Change	34	27.20%	"Temperature way too high and low, more fire, animal extinction"
Sense of Place	21	16.80%	"angry, sad, hopeful, desperate"



Natural Disasters	20	16.00%	“hurricanes, tornadoes, snow, rain, flooding, fires, and draught”
Sound Stewardship	18	14.44%	“I feel we need to take care of environment”
Outdoor Activity	18	14.44%	“climate change has made it difficult to participate in more outdoor activities due to hail and snow”
Environmental Condition	12	09.60%	“It destroying the whole earth everywhere”
Place and Landscape	12	09.60%	“impact many parks”
Local Foods	12	09.60%	“Different vegetables seem to grow better or worse”
Air Quality	11	08.80%	“Poor air quality, sets limitations, changes need to be turned around”
Fish and Wildlife	10	08.00%	“It has impacted growing seasons, it is impacting sea life due to the rise in the water temperature”
Increased Uncertainty	10	08.00%	“climate change is unpredictable and can be extreme at times”
Plants and Trees	9	7.20%	“plants, trees, homes”
Water (Drinking, Fresh, Marine)	6	04.80%	“warmer water effects fishes”
Other	3	02.40%	“human”
Economic Vitality	2	01.60%	“problems caused by severe drought (no farming products), severe flooding in the region (economic and health problems for the vulnerable)”
Acceptance and Opportunity	1	00.80%	“concern about our next generations, happy to see more snow”
Equity	1	00.80%	“too hot cause beathing problem, too cold cause pain for old people”
<b>Place (n=166; all Place responses: 199)</b>	<b>98<sup>11</sup></b>		
<b>Specific</b>	<b>47</b>	<b>47.95%</b>	
Mt. Rainier National Park	12	25.53%	“Mt. Rainer, for camping”
Point Defiance	6	12.76%	“point defiance forest, beaches, parks, water”
Owen Beach	6	12.76%	“mt. rainier, point defiance, owen beach”
Wapato Lake	5	10.63%	“take a walk, wapato park, they have everything like bird, duck, swim, lake”
Ruston Way/Waterfront	5	10.63%	“ruston way, mt rainier, hood canal, lakes, rivers”
Ocean Shores	5	10.63%	“steilacoom park, ruston way, long beach, ocean shores, clean air and escape from urban life”

<sup>11</sup> Note that when asked about Place (in general), community members provided 199 responses. Out of those 199 responses, 98 places were identified, including 47 specific places and 51 broadly defined places. Please take this distinction into consideration when interpreting the Place findings.



Chambers Bay	5	10.63%	"chambers bay, ruston beach, dash point"
Olympic National Park	5	10.63%	"olympic national park"
Tacoma	3	06.38%	"tacoma, lakewood, pierce county"
Charlotte's Blueberry Park	3	06.38%	"blueberry park"
Seahurst Ed Munro Park	3	06.38%	"seahurst park, redondo beach, our back yard"
Redondo Beach	3	06.38%	"redondo beach, seahurst park"
Dash Point State Park	2	04.25%	"ocean shores and dash point"
Twin Harbors State Park	1	02.12%	"swan creek (near my house), ocean (owen beach, twin harbor)"
Tolmie State Park	1	02.12%	"Tolmie State Park, walking, clam digging, picnic"
Swan Creek	1	02.12%	"swan creek (near my house), ocean (owen beach, twin harbor)"
Steilacoom Park	1	02.12%	"steilacoom park, ruston way, long beach, ocean shores, clean air and escape from urban life"
Spanaway Park	1	02.12%	"national park, chambers bay (walking, fishing), restaurant (many country food), mt rainier, point defiance park...spanaway park, golf course, wapato park"
Seattle Waterfront	1	02.12%	"wapato park, waterfront in seattle, the mountains"
San Juan Islands	1	02.12%	"san juan islands"
Puget Sound	1	02.12%	"mountain lake, river, I mostly value above all puget sound it the best place for me"
Pierce County	1	02.12%	"tacoma, lakewood, pierce county"
Mt. Adams	1	02.12%	"Mt. rainier, mt adams, enjoy ski, good to hiking"
Long Beach	1	02.12%	"steilacoom park, ruston way, long beach, ocean shores, clean air and escape from urban life"
Lakewood	1	02.12%	"tacoma, lakewood, pierce county"
Hood Canal	1	02.12%	"ruston way, mt rainier, hood canal, lakes, rivers"
Gas Works Park	1	02.12%	"gas work park"
Brown's Point	1	02.12%	"brown point"
Alki Beach	1	02.12%	"alki beach"
<b>Broad</b>	<b>51</b>	<b>52.04%</b>	
Beaches	18	35.29%	"point defiance forest, beaches, parks, water"
Built Places	8	15.68%	"schools, churches, government offices"
Parks	17	13.72%	"park and ocean"
Mountains	7	13.72%	"mountain lake, river, I mostly value above all puget sound it the best place for me"

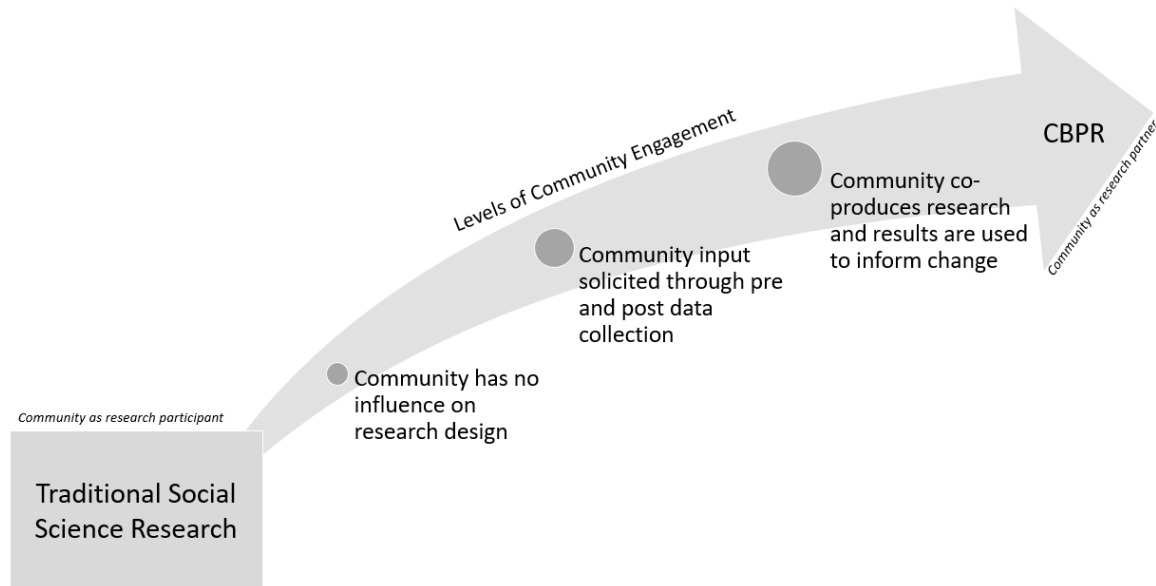


Rivers	5	09.80%	"ocean, rivers"
Ocean	4	07.84%	"park, beaches, olympic park, mount rainier, oceans"
Trails	3	05.88%	"foothills trail"
National Parks (non-specific)	3	05.88%	"national parks"
Lakes	3	05.88%	"ruston way, mt rainier, hood canal, lakes, rivers"
Home/Yard	3	05.88%	"Seahurst park, redondo beach, our back yard"
Wetlands	2	03.92%	"rivers, wetlands"
Waterfront	2	03.92%	"waterfront"
Water	2	03.92%	"point defiance forest, beaches, parks, water"
Sea	2	03.92%	"I like the sea, the zoo, walking along the beach"
Forests	1	01.96%	"point defiance forest, beaches, parks, water"
Bays	1	01.96%	"I like wapato park because it have a lake a lot of tree, grass and important near my house, point defiance because have a bay"
<b>Why</b>	<b>65</b>		
Outdoor Activity	36	55.38%	"mt rainer for hiking"
Sense of Place	30	46.15%	"It's our home, wouldn't want to live anywhere else"
Fish and Wildlife	16	24.61%	"enjoy walking, see the plants and trees, wildlife"
Local Foods	14	21.53%	"fishing, shellfish harvest, beautiful, good air, relaxing"
Cultural Wellbeing	10	15.38%	"where I live, where I work, where I go to church"
Air Quality	8	12.30%	"clean air, fresh air, wild animals"
Plants and Trees	5	07.69%	"I like wapato park because it have a lake a lot of tree, grass and important near my house, point defiance because have a bay"
Accessibility	4	06.15%	"access to nature that is close by"
Economic Vitality	3	04.61%	"near chambers seaside fish area, sometimes work and fishing, walking"
Physical Health	3	04.61%	"I can breathe, I can relax, I can enjoy photos"
Shellfish Beds	3	04.61%	"Tolmie State Park, walking, clam digging, picnic"
Sound Stewardship	2	03.07%	"rivers, wetlands, protect fish, keep clean water, prevent flooding"
Water (Drinking, Fresh, Marine)	2	03.07%	"animals, clean water and air, protected environment"

**Table 9.** Codes, Responses, and Examples



## Appendix C. Research Approach



**Figure 27.** Levels of Community Engagement within Social Science Research (Modified from Michalak and others 2016)

This project applied a community-based participatory research (CBPR) approach (Figure 27) that included co-created facilitated dialogues (also referred to as workshops) (Drimie and others 2021; Milz 2018), fieldnotes, and optional survey instrument to collect data from primarily Asian American and Pacific Islander community members in the Puget Sound region, specifically in the Tacoma, WA area. CBPR is a highly collaborative form of social science research (Horowitz and 2009; Leavy 2017; Minkler and others 2008), largely, but not solely, informed by public health (Israel and others 2005; Minkler and others 2008; Hull and others 2010; Unertl and others 2015; Wallerstein and others 2020). CBPR tends to be a highly individualized approach, as CBPR is context-, community-, problem-, and collaborator-dependent. CBPR also tends to be a responsive approach, often requiring the approach and/or methods to be revised during the research process. As such, CBPR can be challenging to evenly replicate and to adequately create a template for application (Leavy 2017). CBPR is not new to Puget Sound recovery, as it has been applied to help integrate social science (and human wellbeing) into local watershed recovery efforts (Biedenweg and others 2021), used to better include residents' perspectives into Island County coastal management (Trimbach and others 2022a), and advocated for to enhance equity within the Puget Sound monitoring community (Noufi and Sheikh 2022).

CBPR reflects wider trends within higher education (Rock 2022), humanities (Yi 2016), and social sciences (Horowitz and others 2009; Parker and others 2020; Chazan and Baldwin 2021; Ardoin and others 2022) to engage communities or diverse partners more inclusively within research. For example, within the academic discipline of geography, a new subfield of community geography has emerged (Shannon and others 2020), partly in response to the growing need for and application of more community-based research approaches to address shared place-based problems or priorities, including through participatory mapping or even CBPR (Shannon and others 2020; Trimbach and others 2022a). CBPR also aligns with greater calls for more inclusive conservation (Dawson and



others 2021) and environmental research, planning, management, and governance (Williams and others 2018; Egoz and De Nardi 2020; Schell and others 2020; Gurney and others 2021; Batavia 2022; Löfqvist and others 2022; Morales and others 2022; Nay and others 2022). Such approaches allow for greater community input and engagement, which also contributes to recognitional, procedural, and distributional forms of environmental and landscape justice.

CBPR was identified as an appropriate research approach for this project as traditional western social science research methods or approaches often face challenges engaging and representing minority populations, notably those considered historically underserved, excluded, and/or marginalized (Minkler and others 2008; Laganà and others 2013; George and others 2014; Unertl and others 2015; Leavy 2017; Wilson and others 2018). CBPR was identified because it prioritizes relationship building and knowledge co-production (Djenontin and Meadow 2018) with the intention of using the results to inform change, like enhancing knowledge of minority communities' human wellbeing in the Puget Sound region and building new community relationships for sustainable long-term collaboration within the Puget Sound recovery network (Michalak and others 2016) (Figure 5). Through CBPR, community collaborators (e.g., APCC) were viewed and included as equal partners and not subjects as part of this project. Given this approach and its emphasis on collaboration, the various engaged project partners are named or referenced in distinct ways throughout this report. APCC is frequently referred to as a partner or collaborator, the social scientist and report lead author, Dr. David J. Trimbach (Conservation Social Scientist, Washington Department of Fish and Wildlife, WDFW) is frequently referred to as the researcher, and participating AAPI residents are often referred to as community members or community participants; although there may be some variation.

With CBPR as the overarching approach, the project included: the co-development of facilitated dialogues, the co-implementation of facilitated dialogues, survey implementation during the facilitated dialogues, data analysis (qualitative and quantitative), partner review, and dissemination (written materials and presentations, all including partner review). Facilitated dialogues are intentionally created processes focused on supporting diverse groups to address dynamic social-ecological problems by creating “safe” (or “safe enough”) discursive spaces for fostering and developing shared understandings, alternative approaches, and new solutions (Milz 2018; Drimie and others 2022). CBPR was implemented early on in the project during the letter of inquiry/proposal phase. The researcher reached out to various potential project partners in the Puget Sound area, including outside of Tacoma. Project partners included APCC. While this project included APCC, it is important to recognize that this project and collaboration was part of a larger effort that also included collaboration with Empowering People in Communities and Peace Community Center, two Hilltop neighborhood community organizations, partly providing services to Black and African American residents in the Tacoma area. Given that these project partners and communities were identified as distinct with unique community and culturally specific contexts and needs, these projects co-evolved independently. The researcher communicated and engaged APCC throughout this process. Although the researcher formed an initial project concept and design, APCC had the ability to critique, question, contribute, and refuse (to provide input or participate) during all phases of the project, including the proposal development phase. Once funded and formally initiated, the researcher working closely with APCC through a CBPR approach, co-created a series of facilitated dialogues.



The facilitated dialogues were co-created with APCC to focus on the following overarching topics/questions:

1. continued relevance of HWB Vital Signs (e.g., Do the Vital Signs still work?);
2. resonance of HWB Vital Signs among AAPI residents (e.g., How do the Vital Signs connect to you and/or your community?);
3. variations of HWB Vital Sign interpretations, perspectives, and values (e.g., Do the Vital Signs reflect your values? If not, what are alternative understandings or components of HWB?); and
4. locations linked to AAPI residents' HWB (e.g., What locations do you identify, associate, or prioritize with your HWB?).

The above questions were identified as potential mechanisms to help address the aforementioned project objectives. The facilitated dialogues were co-created with APCC through extensive planning meetings (APCC: 10). The researcher took detailed meeting (field) notes per meeting and shared those with the project partners for their input and for transparency. The facilitated dialogues were co-created to include: opening ice breaker activities, attendee and/or researcher introductions



**Figure 28.** Flyer Example

of the ethics review process, all workshop participants completed a signed consent form (that was also translated) at the beginning of each workshop.

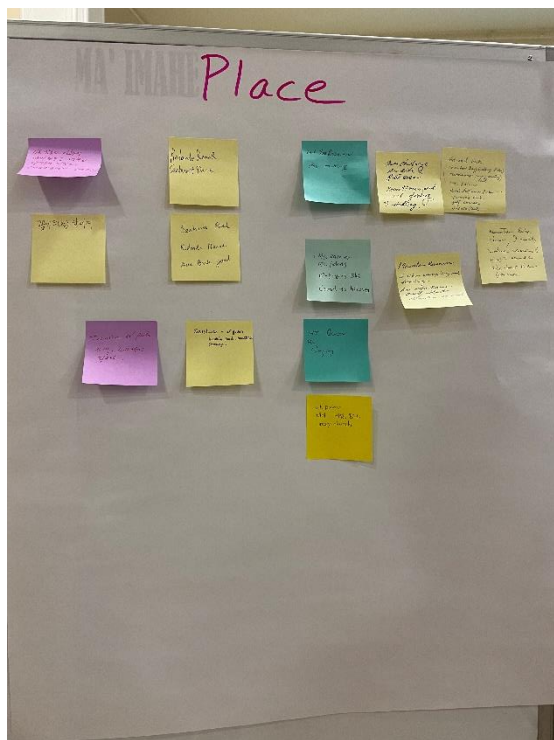
Community participants were elicited through community partners. Community partners took the lead on community outreach and engagement efforts; although flyers and outreach materials were co-created with the researcher and in some circumstances a WDFW graphic designer (all 2023 outreach flyers; Figure 28). Given the reliance on community partners and their relational networks, including ethnolinguistic community liaisons, the participants were elicited through referral sampling (snowball) and respondent-driven sampling (a form of referral sampling), two forms of nonprobability sampling. CBPR often relies on forms of nonprobability sampling by design. Referral sampling is often applied to engage minority or marginalized communities, address sensitive topics, build trust and relationships, and integrate a researcher into an unfamiliar context (Trimbach 2016).





Respondent-driven sampling attempts to address potential sampling bias by ensuring more geographic and internal group (intersectional) representation (Heckathorn 1997). The latter form of sampling was intentionally used in order to ensure diversity among the elicited community members, notably within the AAPI context, which entailed the selection of specific ethnolinguistic communities (large and small) to ensure greater internal AAPI diversity. While referral sampling has its strengths, it also faces limitations like potential sample bias (e.g., self-selection bias). This engagement was done via multiple mechanisms, including specific community liaisons (APCC liaisons for the Thai, Korean, and Vietnamese communities), community partner social media, and co-created flyers (often shared via social media). All outreach and facilitated dialogue materials (e.g., agendas, surveys, presentations, consent forms, workshop materials, etc.) were translated into other languages, as needed (e.g., Thai, Korean, and Vietnamese workshops). All materials were also shared with APCC before the workshops to ensure translations were accurate (although some issues did emerge later).

During the facilitated dialogues, participants had the opportunity to engage in free-listing exercises (Jones and others 2019). Community members were provided prompts/questions (e.g., What is health?) and were provided the ability to free-list as many responses as they desired on provided sticky notes (Jones and others 2019; Biedenweg and others 2020). For those workshops conducted with Thai, Korean, and Vietnamese residents, live in-person interpretation was provided with APCC's assistance and coordination. Participants were provided sticky notes to write their listed responses



**Figure 29.** Response Example

with provided writing utensils. Participants were given 5-10 minutes (or longer) to respond to each prompted question with as many responses as they desired or were able. Participants could walk up and place their sticky note on a shared blank poster board in the workshop space (Figure 29) or have workshop organizers (e.g., researcher, collaborators, and/or facilitators) collect their responses. Following each prompt, a facilitated discussion was led by an external facilitator from Cascadia Consulting Group (Mike Chang and/or Nicole Guitierrez). Participants had a high degree of flexibility, freedom, and openness with their responses. Due to this very open format, variations in dialogue richness and detail emerged depending on group size, timing of agenda items, group dynamics, and other issues. For example, participants oftentimes responded with one word or would write entire paragraphs on a sticky note as their response to the prompt. During each facilitated dialogue, the researcher took fieldnotes, particularly if new topics or questions emerged. Nearly every facilitated dialogue was also recorded (audio recorded) with some exceptions due to room size,

group size, and group volume following group consent. The fieldnotes (meetings and workshops), were reviewed in order to contribute to lessons learned and best practices associated with this approach, which were provided to the Puget Sound Partnership (funder). Near the end of each



facilitated dialogue, participants had an opportunity to complete an optional Human Wellbeing Survey. This was the same survey instrument and version that had been conducted for the 2020 Human Wellbeing Survey and Latinx HWB project, both conducted by Oregon State University's Human Dimensions Lab. Both surveys were used to help monitor human wellbeing among Puget Sound residents in the region for the Puget Sound Partnership. A total of 76 workshop participants completed the optional survey instrument. All facilitated dialogue participants were provided a \$50 gift card incentive for their participation, regardless of how much they participated or if they completed the survey. Since the surveys were embedded into the workshops, participants did have opportunities to ask for clarity, share questions, or request assistance. During and/or after each workshop, the researcher also took additional fieldnotes.

Following the workshops, the facilitated dialogue data (sticky note responses) were organized, translated (if needed), and coded via NVivo qualitative analysis software. The responses were analyzed via abductive analysis, blending both deductive and inductive coding (Dubois and Gadde 2002; Timmermans and Tavory 2012; Thompson 2022; Vila-Henninger and others 2022). Deductive codes were based on the Human Wellbeing Vital Sign categories (e.g., Healthy Human Population and Vibrant Quality of Life) and Vital Sign indicators (e.g., Sense of Place, Air Quality, etc.) with some flexibility with interpretation. For example, if someone responded with "water" or "air," and not "drinking water" or "air quality," those responses were coded to Water (Drinking, Fresh, Marine) (combining water-based wellbeing and biophysical indicators) and Air Quality. Additionally, if respondents mentioned aesthetics or aesthetic qualities and psychological benefits of nature (e.g., "reduces stress"), those responses were coded to Sense of Place, as Sense of Place includes those diverse elements. Inductive codes were based on a grounded coding process, which allowed for shared emergent themes or patterns to arise from participants' diverse responses. The abductive analysis and coding process was conducted iteratively and cyclically, allowing for revisiting, rethinking of alternatives or linkages, and recoding until saturation and mutually distinct, yet constitutive, codes were created. The inductive codes were categorized as Community Dimensions of human health and included a diverse range of community-based themes. Once the codes were created and defined in a codebook (Appendix A), the codes were shared with primary project collaborators (e.g., APCC) to gauge their feedback and approval, if desired or feasible. If any codes or themes were rejected, the codes would be changed or updated; however, that did not take place. Given that responses often included more than one word, sometimes whole sentences or lists, responses were coded more than once; thus, responses likely were coded more than once with linked mutually constitutive codes. A complete list of all codes per workshop theme with responses, percentages of responses per theme, and examples are outlined in table (Appendix B).

Given that the project priority was the facilitated dialogues and relatively low sample size among workshop participants (n=76), descriptive statistics were largely conducted for the survey responses. Quantitative analysis of the survey data was conducted with the Statistical Package for the Social Sciences (SPSS 29) and Microsoft Excel. Further analysis may be conducted depending on need among the Puget Sound Partnership, community partners, and Human Dimensions Lab at Oregon State University. Given that the majority of survey questions focused on scales, Cronbach's alpha, a measure of internal consistency and reliability, was also calculated for all appropriate HWB Vital Signs. These HWB Vital Signs included: Good Governance, Sound Stewardship, Psychological Wellbeing, Sense of Place, Local Foods, and Cultural Wellbeing. A score of 70% or higher is considered a reliable index. This process was conducted in order to be consistent with how Oregon State



University's Human Dimensions Lab processes and analyses the survey data (Fleming and others 2019; Fleming and others 2020; Justiniano and others 2021; Harrington and others 2023). Using this information, an index was created for each Human Wellbeing Vital Sign. This approach is outlined with greater detail in the body of the report.

This approach did face challenges and limitations that directly or indirectly informed the project and likely its development, implementation, analysis, and results. Notable challenges and limitations included a 6 month gap in the project's timeline due to the researcher changing institutions and positions, that hindered any project progress. Other potential limitations included variations in workshop dates/times, variations in outreach efforts per community, variations in or changes in priorities between researcher and partners, shifting workshop dates, and language-related issues. Another key limitation was the high reliance on community partners and liaisons for participant elicitation, which likely informed who the workshop participants and survey respondents were and how or why they participated. Other limitations included the inability to hire of a research assistant within the project timeline, which impacted the division of labor for this project, notably the analysis and dissemination components.











10. Quý vị đồng ý hay không đồng ý tới mức nào với các nhận định sau đây liên quan đến Vùng Puget Sound? Xin khoanh tròn một số cho mỗi câu hỏi:

Nhận Định	Hoàn Toàn Không Đồng Ý		Không Đồng Ý		Phản Hồi Không Đồng Ý		Trung Lập		Phản Hồi Đồng Ý		Đồng Ý		Hoàn Toàn Đồng Ý		Không biết
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Tôi rất gần bó với môi trường tự nhiên ở vùng Puget Sound	1	2	3	4	5	6	7								<input type="checkbox"/>
Tôi tự hào khi sống ở vùng Puget Sound	1	2	3	4	5	6	7								<input type="checkbox"/>
Tôi cảm thấy có trách nhiệm chăm sóc môi trường tự nhiên của Puget Sound	1	2	3	4	5	6	7								<input type="checkbox"/>
Sống ở vùng Puget Sound nói lên rất nhiều điều về bản thân tôi	1	2	3	4	5	6	7								<input type="checkbox"/>
Có thể tham gia hoạt động ngoài trời hoặc thông lệ văn hóa là điều quan trọng để tôi kết nối với Puget Sound	1	2	3	4	5	6	7								<input type="checkbox"/>
Chủ yếu là tôi gần bó với các nơi của Puget Sound ở gần tôi nhất	1	2	3	4	5	6	7								<input type="checkbox"/>
Tôi có thể hài lòng khi sống ở các nơi khác ngoài Puget Sound	1	2	3	4	5	6	7								<input type="checkbox"/>

11. Nói chung, quý vị hài lòng hay không hài lòng với toàn bộ cuộc sống của mình ở mức độ nào? Xin khoanh tròn một số:

Không Hài Lòng	Phản Hồi Không Hài Lòng	Không Hài Lòng Mà Không Bất Mãn	Phản Hồi Hài Lòng	Hài Lòng
1	2	3	4	5

12. Quý vị đã sống bao nhiêu năm ở Puget Sound? \_\_\_\_\_
13. Giới tính của quý vị là gì?  Nam  Nữ  Khác  Không muốn trả lời
14. Câu nào sau đây mô tả đúng nhất về khu vực quý vị đang sống? Xin khoanh tròn một số:
- | Thành Phố | Ngôi Ở | Nông Thôn |   |   |
|-----------|--------|-----------|---|---|
| 1         | 2      | 3         | 4 | 5 |
15. Trình độ học vấn cao nhất nào mà quý vị đã hoàn tất? Xin khoanh tròn một số:
- | Tiểu Học và Trung Học |   |   |   |   |   |   |   |   |    |    |    | Cao Đẳng hoặc Trường Kỹ Thuật |    |    |    | Đại Học hoặc Trường Chuyên Nghiệp |    |    |    |    |    |    |     |
|-----------------------|---|---|---|---|---|---|---|---|----|----|----|-------------------------------|----|----|----|-----------------------------------|----|----|----|----|----|----|-----|
| 1                     | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13                            | 14 | 15 | 16 | 17                                | 18 | 19 | 20 | 21 | 22 | 23 | 24+ |
16. Thu nhập hộ gia đình hàng năm của quý vị là bao nhiêu?  
 Ít hơn \$10,000  \$10,000-\$24,999  \$25,000-\$49,999  \$50,000-\$74,999  
 \$75,000-\$99,999  \$100,000-\$149,999  \$150,000-\$200,000  Nhiều hơn \$200,000
17. Chúng tôi của quý vị là gì? Đánh dấu tất cả mục áp dụng.  
 Da Đen hay Mỹ Phi Châu  Thổ Dân Mỹ hoặc Thổ Dân Alaska  Thổ Dân Hawai hoặc Dân Đảo Thái Bình Dương Khác  Châu Á  
 Da Trắng  La tinh và Tây Ban Nha hoặc La tinh  Khác
18. Quý vị bao nhiêu tuổi? \_\_\_\_\_
19. Quý vị coi mình thuộc kiểu người như thế nào sau đây? Xin khoanh tròn một số:
- | Rất Bảo Thủ | Bảo Thủ | Không Bảo Thủ Mà Cũng Không Tự Do | Tự Do | Rất Tự Do |
|-------------|---------|-----------------------------------|-------|-----------|
| 1           | 2       | 3                                 | 4     | 5         |

Cảm ơn quý vị đã hoàn tất khảo sát này. Nếu quý vị có bất kỳ suy nghĩ bổ sung nào về phúc lợi con người trong khu vực của mình, vui lòng viết các suy nghĩ đó ở đây, nếu cần.

## English Version

**PUGET SOUND HUMAN WELLBEING SURVEY**  
IMPORTANT QUESTIONS TO UNDERSTAND YOUR EXPERIENCES

A STUDY COMPLETED COOPERATIVELY BY:



326 East D Street  
Tacoma, WA 98421



204 Hoveland Hall  
2700 SW Campus Way  
Corvallis, OR 97331



**PUGET SOUND VITAL SIGNS**  
UNDERSTANDING ECOSYSTEM HEALTH

Thank you for participating in this survey of human wellbeing in the Puget Sound, funded by the Puget Sound Partnership. It should take less than 10 minutes of your time. Please complete the brief survey and return it to the researcher using the pre-paid envelope. Participation is voluntary, and your responses are completely confidential.

If you have any questions about the survey, please contact Principal Investigator Kelly Biedenweg by e-mail at [kelly.biedenweg@oregonstate.edu](mailto:kelly.biedenweg@oregonstate.edu).

The results of this survey will be reported in the Puget Sound Partnership's *State of the Sound Report* in 2021. Please visit the following website for more details: <http://www.w.psp.wa.gov/vitalsigns/>

1. How much do you agree or disagree with the following statements related to the Puget Sound Region? Please circle one number for each question:

Statement	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Don't Know
I have plenty of opportunities to influence natural resource decisions in the Puget Sound region if I want to	1	2	3	4	5	6	7	<input type="checkbox"/>
I have the freedom to make personal decisions about how natural resources are managed on my property	1	2	3	4	5	6	7	<input type="checkbox"/>
I feel well represented by the leaders of Puget Sound natural resource management processes	1	2	3	4	5	6	7	<input type="checkbox"/>
I trust regional policymakers to protect Puget Sound's natural resources	1	2	3	4	5	6	7	<input type="checkbox"/>
I have access to enough information regarding the social and economic consequences of how natural resources are managed in the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>
I have access to enough information regarding the environmental consequences of how natural resources are managed in the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>
I have access to enough information regarding the regulatory aspects of how natural resources are managed in the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>

What agencies, policymakers, or institutions were you thinking of when answering the above questions?: \_\_\_\_\_

2. In the past year, about how often did you hunt, harvest, gather, or forage for the following food in the Puget Sound Region? Please circle one number for each item:

Local Food	Never	Rarely (1-2 times a season)	Occasionally (3-5 times a season)	Regularly (6-8 times a season)	Frequently (More than 10 times a season)	Don't Know
Fish	1	2	3	4	5	<input type="checkbox"/>
Crab or Shrimp	1	2	3	4	5	<input type="checkbox"/>
Clams (geoducks, oysters, or mussels (not razor clams))	1	2	3	4	5	<input type="checkbox"/>
Squid	1	2	3	4	5	<input type="checkbox"/>
Deer or Elk	1	2	3	4	5	<input type="checkbox"/>
Waterfowl	1	2	3	4	5	<input type="checkbox"/>
Plants, Berries, or Mushrooms	1	2	3	4	5	<input type="checkbox"/>





3. In the past year, about how often did you engage in stewardship behaviors/activities that you believed benefited the environment? Please circle one number for each question:

Behavior/Activity	Never	Rarely (1-4 times a year)	Occasionally (Once a month)	Regularly (Once a week)	Frequently (Almost every day)	Don't Know
Behaviors that you believe effectively benefited the environment	1	2	3	4	5	<input type="checkbox"/>
Environmental behaviors that were personally meaningful to you	1	2	3	4	5	<input type="checkbox"/>
Environmental behaviors that you believe are needed by the community	1	2	3	4	5	<input type="checkbox"/>

4. Does your work involve spending time in natural environments (e.g. commercial or charter fishing, farming, forestry, habitat restoration, or outdoor-recreation jobs)?

No  Yes

If Yes: About how many hours a week do you perform work that involves spending time in natural environments?

Less than 5 hours/week  5-10 hours/week  11-20 hours/week  
 21-30 hours/week  More than 30 hours/week

5. In the past year, about how often have you felt *inspiration* when spending time in the outdoors of the Puget Sound region? Please circle one number:

Never	Rarely (1-4 times a year)	Occasionally (Once a month)	Regularly (Once a week)	Frequently (Almost every day)	Don't Know
1	2	3	4	5	<input type="checkbox"/>

6. In the past year, about how often has spending time in the outdoors of the Puget Sound region helped you reduce *stress*? Please circle one number:

Never	Rarely (1-4 times a year)	Occasionally (Once a month)	Regularly (Once a week)	Frequently (Almost every day)	Don't Know
1	2	3	4	5	<input type="checkbox"/>

7. In the past year, how satisfied were you with your level of participation in any of the following cultural activities or traditions related to the environment? Please circle one number for each question:

Environmental Cultural Activity or Tradition	Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Satisfied	I do not engage in this activity or tradition	Don't Know
Native Practices or Activities (canoe journey, Tribal center events, potlach, etc.)	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
Spiritual or Religious Practices related to the environment (meditation, prayer, solstice observance etc.)	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Practices or Activities Important to your Heritage (formal or informal family or community events, etc.)	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>
Environmentally oriented Social Activities (environmental clubs, festivals, outdoor events, etc.)	1	2	3	4	5	<input type="checkbox"/>	<input type="checkbox"/>

10. How much do you agree or disagree with the following statements related to the Puget Sound Region? Please circle one number for each question:

Statement	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Don't Know
I am very attached to the natural environment in the Puget Sound region	1	2	3	4	5	6	7	<input type="checkbox"/>
I am proud to live in the Puget Sound region	1	2	3	4	5	6	7	<input type="checkbox"/>
I feel responsible for taking care of Puget Sound's natural environment	1	2	3	4	5	6	7	<input type="checkbox"/>
Living in the Puget Sound region says a lot about who I am	1	2	3	4	5	6	7	<input type="checkbox"/>
Being able to engage in outdoor activities or cultural practices is important to my connection to the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>
I am mostly attached to parts of Puget Sound that are nearest to me	1	2	3	4	5	6	7	<input type="checkbox"/>
I could be satisfied living in other places outside the Puget Sound	1	2	3	4	5	6	7	<input type="checkbox"/>

11. In general, how satisfied or dissatisfied are you with your life overall? Please circle one number:

Dissatisfied	Somewhat Dissatisfied	Neither Satisfied nor Dissatisfied	Somewhat Satisfied	Satisfied
1	2	3	4	5

12. How many years have you lived in the Puget Sound? \_\_\_\_\_

13. What is your sex?

Man  Woman  Other  Prefer not to answer

14. Which of the following best describes the area you live in? Please circle one number:

Urban	Suburban	Rural
1	2	3

15. What is the highest level of education you have completed? Please circle one number:

Elementary and High School								College or Technical School				Graduate or Professional School												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

16. What is your annual household income?

Less than \$10,000  \$10,000-\$24,999  \$25,000-\$49,999  \$50,000-\$74,999  
 \$75,000-\$99,999  \$100,000-\$149,999  \$150,000-\$200,000  Greater than \$200,000

17. What is your race? Mark all that apply.

Black or African American  Native American or Native Alaskan  Native Hawaiian or Other Pacific Islander  
 Asian  White  Hispanic or Latino  Other

18. What is your age? \_\_\_\_\_

19. Which of the following do you consider yourself? Please circle one number:

Very Conservative	Conservative	Neither Conservative nor Liberal	Liberal	Very Liberal
1	2	3	4	5

8. About how many days per month on average did you participate in the following recreation activities in the Puget Sound region this past fall (about September - November)? Please circle one number for each question:

Outdoor Activity	I do not engage in this activity	Less than 1 day per month	1-4 days per month	5-10 days per month	11-20 days per month	More than 20 days per month	Don't Know
Motorized Trail Use (e.g. ATV or OHV Riding)	1	2	3	4	5	6	<input type="checkbox"/>
Using Paved Paths or Trails for Walking, Running, Biking	1	2	3	4	5	6	<input type="checkbox"/>
Using Unpaved Trails for Walking, Running, Biking, Horseback, Hiking, Backpacking	1	2	3	4	5	6	<input type="checkbox"/>
Camping (Car or Back Country)	1	2	3	4	5	6	<input type="checkbox"/>
Fishing	1	2	3	4	5	6	<input type="checkbox"/>
Hunting	1	2	3	4	5	6	<input type="checkbox"/>
Picnic or BBQ	1	2	3	4	5	6	<input type="checkbox"/>
Motorized Boating	1	2	3	4	5	6	<input type="checkbox"/>
Non-Motorized Water Sports (e.g. Kayak, Surf, Sailing, Swimming, Scuba)	1	2	3	4	5	6	<input type="checkbox"/>
Skiing/Snow Boarding or Snowshoeing	1	2	3	4	5	6	<input type="checkbox"/>
Gardening or Yard Work	1	2	3	4	5	6	<input type="checkbox"/>
Wildlife Viewing/Birding	1	2	3	4	5	6	<input type="checkbox"/>

9. About how many days per month on average did you participate in the following recreation activities in the Puget Sound region this past spring (about March - May)? Please check one box for each question:

Outdoor Activity	I do not engage in this activity	Less than 1 day per month	1-4 days per month	5-10 days per month	11-20 days per month	More than 20 days per month	Don't Know
Motorized Trail Use (e.g. ATV or OHV Riding)	1	2	3	4	5	6	<input type="checkbox"/>
Using Paved Paths or Trails for Walking, Running, Biking	1	2	3	4	5	6	<input type="checkbox"/>
Using Unpaved Trails for Walking, Running, Biking, Horseback, Hiking, Backpacking	1	2	3	4	5	6	<input type="checkbox"/>
Camping (Car or Back Country)	1	2	3	4	5	6	<input type="checkbox"/>
Fishing	1	2	3	4	5	6	<input type="checkbox"/>
Hunting	1	2	3	4	5	6	<input type="checkbox"/>
Picnic or BBQ	1	2	3	4	5	6	<input type="checkbox"/>
Motorized Boating	1	2	3	4	5	6	<input type="checkbox"/>
Non-Motorized Water Sports (e.g. Kayak, Surf, Sailing, Swimming, Scuba)	1	2	3	4	5	6	<input type="checkbox"/>
Skiing/Snow Boarding or Snowshoeing	1	2	3	4	5	6	<input type="checkbox"/>
Gardening or Yard Work	1	2	3	4	5	6	<input type="checkbox"/>
Wildlife Viewing/Birding	1	2	3	4	5	6	<input type="checkbox"/>

Thank you for completing this survey. If you have any additional thoughts on human wellbeing in your area, please write them here, as needed.



## Appendix E. Selected Facilitated Dialogues Content

### Nature and Health Workshop Agenda, English Version<sup>12</sup>

Organized by: the Asia Pacific Cultural Center, Washington Department of Fish and Wildlife, and Cascadia Consulting Group

Funded by: the Puget Sound Partnership

- **Ice Breaker Activity (5 minutes) (Lua lead)**
- **Introductions (5 minutes) (Lua start)**
- **Why this project? What are the Vital Signs? (5 minutes) (David lead)**
- **Workshop Activity and Discussions (45-60 minutes) (Cascadia lead)**
  - Respond to the following questions in groups or as individuals
    - Also, use as many or as little sticky-notes as you'd like. Please feel free to ask questions and/or discuss your responses with others, including the organizers.
    - Health: What does the Puget Sound's environment contribute to your health?
    - Connection: How does your community connect to nature?
    - Values: What do you value in nature?
    - Climate Change: Based on your experience, how has climate change impacted nature? Based on your experiences, how has climate change impacted your health? How do you feel about these changes?
    - Place: What places (in Puget Sound) do you value? Why do you value them? Use the interactive map provided to respond to this question.
    - Vital Signs: Do the Vital Signs reflect your responses? Do the Vital Signs reflect your values? Do the Vital Signs reflect your community?
  - Large Group Discussion
- **Wrap-Up and Survey Opportunity (15 minutes) (Cascadia lead wrap-up, David lead survey)**
- **Thank you!** If you have any follow-up questions related to the workshop and workshop next steps, please contact Dr. David Trimbach from the Washington Department of Fish and Wildlife at [David.Trimbach@dfw.wa.gov](mailto:David.Trimbach@dfw.wa.gov).

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<sup>12</sup> Agendas were selected because their content mirrors the presentations that were also visually used to structure the workshops and discussions. Notable content includes the series of discussion topics/questions listed under "Workshop Activity and Discussions," per workshop agenda.

