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## “Sense of Place”: Human Wellbeing Considerations for Ecological Restoration in Puget Sound

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### ABSTRACT

Sense of place is increasingly recognized as key to human wellbeing in social-ecological systems. Yet there is limited understanding about how to define and evaluate it for restoration. Here, we examine the connections between sense of place and human wellbeing for Puget Sound in the context of ecological restoration for shellfish harvesting and other shoreline activities. Using a mixed-methods approach, including semi-structured interviews and participatory workshops with tribal and non-tribal residents, we examined sense of place in two regions of Puget Sound. Empirical results show that people’s senses of place are multi-dimensional and derived from: (1) activities in the near-shore; (2) cultural practices and familial heritage; (3) sensory and emotional experiences; and (4) the maintenance and strengthening of social connections. We also found that three conditions play important roles in enabling and fostering place attachment: access, knowledge, and ecological integrity. Improved understanding of a practice-based sense of place is key to creating and enacting successful, resident-supported restoration activities.

### KEYWORDS

cultural ecosystem services; restoration; sense of place; shellfish harvesting; wellbeing

## Introduction

[This place in Puget Sound is] known for its clams, which are important for celebrations and feasts, during funerals, and all occasions; the wellbeing of the shellfish is part of the wellbeing of people, because the cultural-ecosystem is the same.

—Tribal member interviewee

“Sense of place” is a concept that has ignited the imagination of restoration professionals and others involved in ecosystem-based management (EBM). One reason is a desire to incorporate social and cultural values into research programs, particularly where importance of sites extends well beyond any material goods they might provide (Cheng, Kruger, and Daniels 2003; Poe, Norman, and Levin 2014; Russell et al. 2013; Satterfield et al. 2013). A second reason is the recognition that people are part of the ecosystem, and managing coupled socioecological systems with dual goals for improving ecological integrity and human wellbeing is

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now commonplace (Leslie et al. 2015; Levin et al. 2016; Ostrom 2009). While it is generally agreed that a healthy ecosystem is central to overall human wellbeing, and that sense of place is a component of wellbeing, there is a lack of agreement and thus limited understanding about how to define, investigate, and evaluate sense of place for restoration.

On the one hand, sense of place has been associated with features of the biophysical environment (Stedman 2003), including an individual's feelings about biophysical spaces (Steele 1981). These personal feelings about place are broadly described as nonmaterial, aesthetic, and spiritual, and have been operationalized through ecosystem services valuations now commonly used in EBM (Gould et al. 2014; MA 2005; Russell et al. 2013). On the other hand, people's attachments<sup>1</sup> to particular places have been associated not only with their non-material attributes, but also material and social interactions with ecosystems; and these interactions have been said to co-produce or foster a sense of place (Beckley et al. 2007; Eisenhauer, Krannich, and Blahna 2000; Ingold 2000). This distinction is important for two reasons: first, defining sense of place only as the feelings one derives from the features and aesthetics of a place makes it possible to value place at the surface—for example, the glistening ocean views—without concern for environmental quality and social structures and interactions. Second, by overlooking the interactive and relational nature of sense of place, the conditions that make it possible to maintain or improve these connections—for example, access, knowledge and ecological integrity—for a diverse range of people may be neglected and undermined (Wieland et al. 2016).

This study examines the connections between sense of place and human wellbeing for Washington State's Puget Sound residents in the context of shoreline activities, primarily shellfish harvesting, but also other activities (both harvesting and non-harvesting) taking place on or near the water (e.g., fishing, walking, bird watching, kayaking, etc.). Specifically, we examined the following overarching questions: How do different people (grouped as tribal shellfish harvesters, non-tribal shellfish harvesters, and non-tribal non-shellfish harvesters) form and experience place attachments? How does sense of place contribute to wellbeing? How might people's place attachments help prioritize restoration?

Many Puget Sound residents value and harvest shellfish (both commercial and noncommercial). Clams, oysters, geoducks, and crabs have been important to the cultural and economic wellbeing of tribal communities living along the shores of Puget Sound for millennia (Gunther and Haerberlin 1930; Suttles and Lane 1990). These coastal species are considered traditional foods, and the acts of harvesting, preparing, storing, and consuming them are central to Coast Salish cultural continuity and wellbeing (Donatuto, Satterfield, and Gregory 2011; Poe et al. 2014; Turner et al. 2008). Many non-tribal residents of the area also value and harvest shellfish and enjoy associated recreational and cultural benefits of shellfish harvesting (Anderson and Plummer in review; Northern Economics 2009). Yet, shellfish harvesting is only one type of active engagement in nearshore environments, as residents also enjoy other recreational and cultural benefits of Puget Sound, harvesting or otherwise.

In this study, we posited that shellfish harvesting and other active engagements in the nearshore form unique senses of place for individuals or communities, and contribute importantly to the quality of life for many Puget Sound residents. We also posited that place attachments formed and strengthened by nearshore activities—especially shellfish harvesting, but also other immediate interactions with coastal environments—generate support for ecosystem restoration.

## Against abstraction: Operationalizing sense of place

Predominant frameworks evaluating sense of place for EBM limit their focus to non-material aspects of place and the feelings individuals derive from them (e.g., aesthetic, spiritual, and wilderness values). These frameworks for EBM have been largely influenced by an ecosystem services approach, where the attribute “sense of place” is considered an indicator of the (non-material) cultural ecosystem services that nature provides people (Daniel et al. 2012; MA 2005).

Consequently, activities such as shellfish harvesting have not been associated with sense of place or cultural ecosystem services, but relegated instead to recreational or provisioning services (Daniel et al. 2012, but see Chan, Satterfield, and Goldstein 2012 for an exception). Such conventions thus de-link harvesting from culturally experienced sense of place. They may also contribute to a characterization of sense of place as non-material, non-social, and atemporal. Finally, such a lens tends to valorize sense of place using measures that erase the human dimensions initially sought (e.g., cultural and human wellbeing). For example, a prominent index to emerge in recent years is the Ocean Health Index,<sup>2</sup> which defines sense of place as the cultural, spiritual, and aesthetic benefits of a region, yet measures it as number and extent of protected areas and iconic species, using metrics that reflect no interaction between humans and ecosystems. Such approaches, if used in contexts like Puget Sound where shellfish harvesting is an important cultural practice, may actually undermine coastal communities’ sense of place and wellbeing by reducing access owing to exclusions from protected areas and resources (e.g., Ayers, Dearden, and Rollins 2012.)

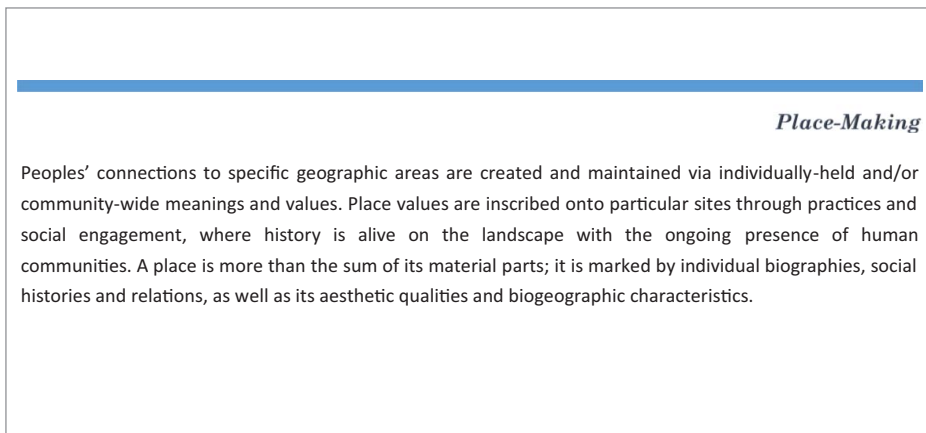
Complicating matters, multiple disciplines use disparate methods to study sense of place. Landscape architects focus on philosophies of design, while archeologists infer histories based on the material properties of a site (Stephenson 2008). Landscape geographers have developed place and landscape values for use in public participatory mapping (e.g., public participatory geographic information system (PPGIS)) (Brown and Reed 2012). Tools developed by resource economists measure hedonic and contingent valuation of place (e.g., increases in property values), or willingness to pay for proximity to an environmental amenity such as viewscapes or recreational sites (deGroot, Wilson, and Boumans 2002). While these methods are useful for translating some ecosystem values into market equivalents, they do not account for the full array of important values and they are particularly poor at explaining the functional, social, and institutional (importantly, access) characteristics of valued places and the cultural services they provide (Satterfield et al. 2013).

The restoration coordinating agency, Puget Sound Partnership (PSP) in Washington state, has examined sense of place through the psychological measure of “place satisfaction,” or judgment about the qualities of a setting (2012 General Public Opinion Survey). This survey (PSP 2012) found that the top reason why respondents value Puget Sound is for its scenic beauty. Although survey questions sought information about respondents’ activities, the results did not reveal how various activities and practices help to form and maintain place attachments nor did the results explain how place attachments contribute to respondents’ wellbeing.

Our concern is that tracking only place satisfaction or protected areas, rather than *practice-based* and *meaning-based* place attachments, can enable a high sense of place as an aesthetic ranking otherwise unlinked to both material conditions (e.g., water quality and environmental health) and social relationships crucial to forming and maintaining sense of place. In doing so,

measures of sense of place risk becoming disassociated with access, knowledge, and ecological health that render place-attaching activities safe and possible (e.g., being in the nearshore, consuming from and physically connecting with its many properties).

To address this concern, we use a *place-making framework* to investigate how different coastal people form and experience place attachments and how this affects their wellbeing and generates care for local environments (see Figure 1). Place-making builds on interdisciplinary methods across anthropology, human geography, and community wellbeing that examine the more complex ways that sense of place is practice-based. The express focus is place as created through an interplay of biophysical and social worlds that build meaning (Beckley et al. 2007; Davenport and Anderson 2005; Kruger and Shannon 2001; Pierce, Martin, and Murphy 2011).



**Figure 1.** Place-making framework.

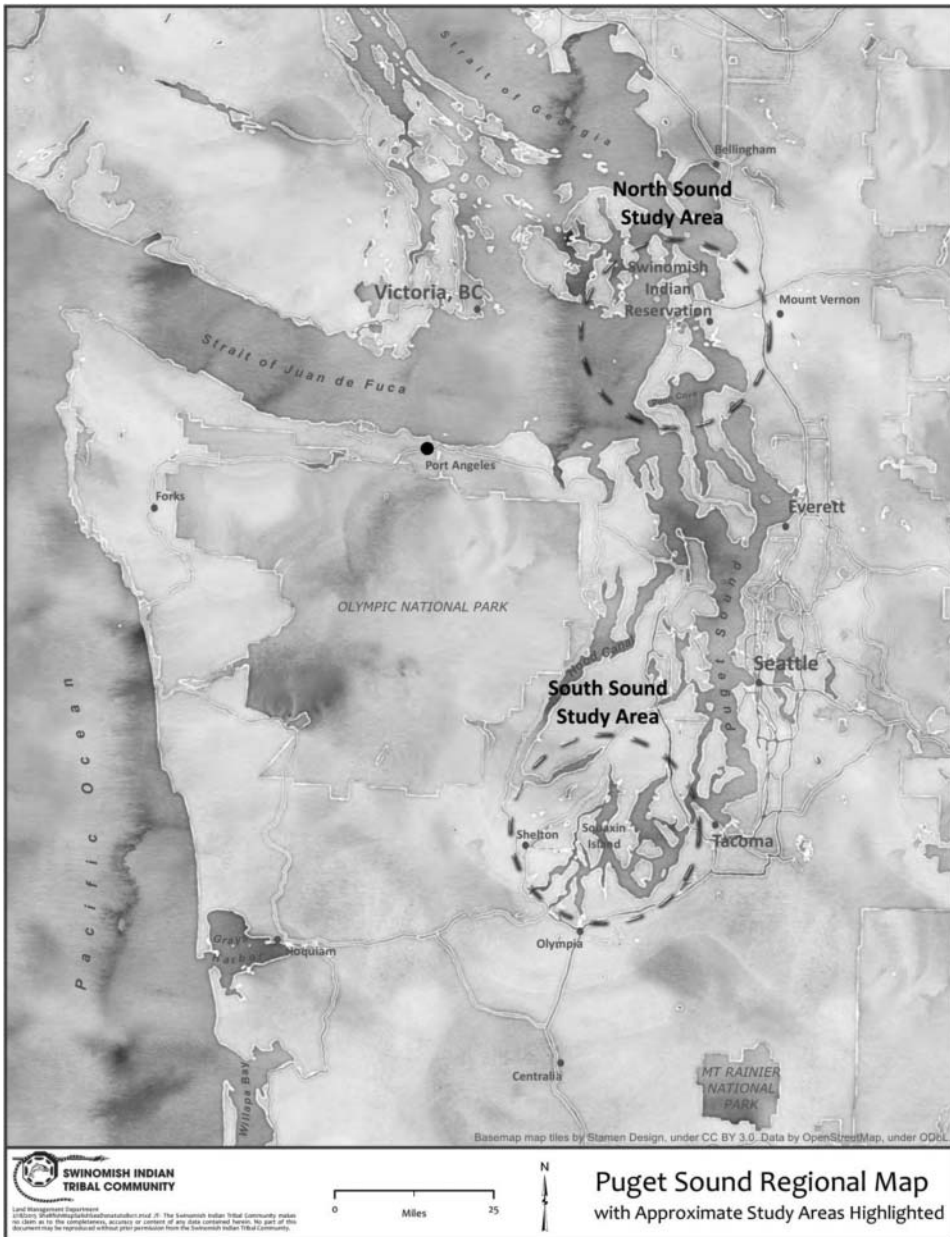
Place-making is heterogeneous and layered with meanings that tend to accumulate across time, often accompanied by site-specific skills, environmental learning, spiritual connections, and social relationships (Ingold 2000; Milton 2002). Tuan's (1975) concept of place provides a starting point: biophysical spaces (such as shorelines, beaches, and bays) become places when they are imbued with meaning through lived experience. Places are made by the interactions people have with nature rooted in particular cultural contexts through social learning (Eisenhauer et al. 2000; Milton 2002). And as Ingold (2000, p. 192) notes: "a place owes its character to the experiences it affords to those who spend time there—to the sights, sounds and indeed smells that constitute its specific ambience. And these, in turn, depend on the kinds of activities in which its inhabitants engage. It is from this relational context of people's engagement with the world, in the business of dwelling, that each place draws its unique significance."

Practice-based place attachments are thus important to a person's and community's sense of belonging, and to the place-specific narratives and histories that form the basis of cultural identity (Basso 1997; Cuerrier et al. 2015; Urquhart and Acott 2013), resulting in stronger care for environments and their management (Eisenhauer et al. 2000). Thus, activities such as shellfish harvesting are understood as far more than simply provisioning activities (e.g., ecosystem services approach), but instead are integral to the way place is made through diverse experiences with nature, and becomes tied to people's sense of belonging, to their

identity and place-based knowledge systems, and to the overall continuity of and work toward a desired life.

## Methods

Applying a place-making framework involved a mixed-method approach, including semi-structured interviews and facilitated workshops with tribal and non-tribal residents in two regions of Puget Sound (the Skagit Estuary “North” and South Puget Sound “South”; see map, [Figure 2](#)). Qualitative research methods, including semi-structured interviews and



**Figure 2.** Study area and regional map.



participatory workshop procedures, have been effective in eliciting sense of place values and meanings (McLain et al. 2013). Within each region, we focused on three population subgroups that we anticipated would hold culturally distinct values of place: (1) members of tribal communities with ties to shellfish harvesting, (2) non-tribal residents who harvested shellfish, and (3) non-tribal residents who did not harvest shellfish, but had a unique tie to Puget Sound.

We used a nonprobabilistic, purposive sample design aimed to include groups of people engaging in different kinds of activities in Puget Sound that were theorized to play a role in place attachment (Miles and Huberman 1994). We identified and contacted potential participants in each of the two tribal communities through the help of a tribal liaison. We also solicited help from local leaders active in the non-tribal communities (e.g., Washington Sea Grant outreach experts, volunteer coordinators, chamber of commerce directors) to identify a list of potential non-tribal interview participants who were either harvesters or had some other unique tie to the study area (e.g., community health experts, public school administrators, beach naturalists, citizen scientists, community-based restoration volunteers, waterfront property owners, recreational users, and boaters who live-a-board in marinas, etc.) (Davis and Wagner 2003). Interview participants were contacted by phone and via e-mail by a researcher to describe the study and invite participation. Interviews were voluntary and confidential using consent procedures approved by the Institutional Review Board for protection of human subjects. Data collection and sharing procedures with the two tribal communities followed agreements established between the tribes and the research agencies, based on principles of free prior and informed consent. The two tribal communities reviewed and approved the results presented here.

We interviewed 8–10 people in each of the three groups (tribal harvester, non-tribal harvester, non-tribal non-harvester) per region (North and South) (total  $n = 55$  interview participants), between April and October 2014. The sample size is considered ample for achieving data completeness and saturation using participatory methods with subject specialists (Guest, Bunce, and Johnson 2006; Rohrbach, Anderson, and Laube 2015). Interviews lasted 45–120 min and were audio recorded, then transcribed, and stored by the research team using a unique code to protect participants' identities.

Questions were largely open-ended to ensure adequate latitude for articulating ideas and meanings (Gould et al. 2015; Miles and Huberman 1994). We used an interview guide based on key components theorized to contribute to a sense of place and place attachment. These included ideas about identity, belonging, shellfish harvesting and other nearshore activities, cultural heritage, family histories, recreation, livelihoods, knowledge transmission, food security and cultural food practices, educational activities, and sociocultural attributes of intertidal ecosystems such as spiritual values, aesthetic qualities, and social relations.

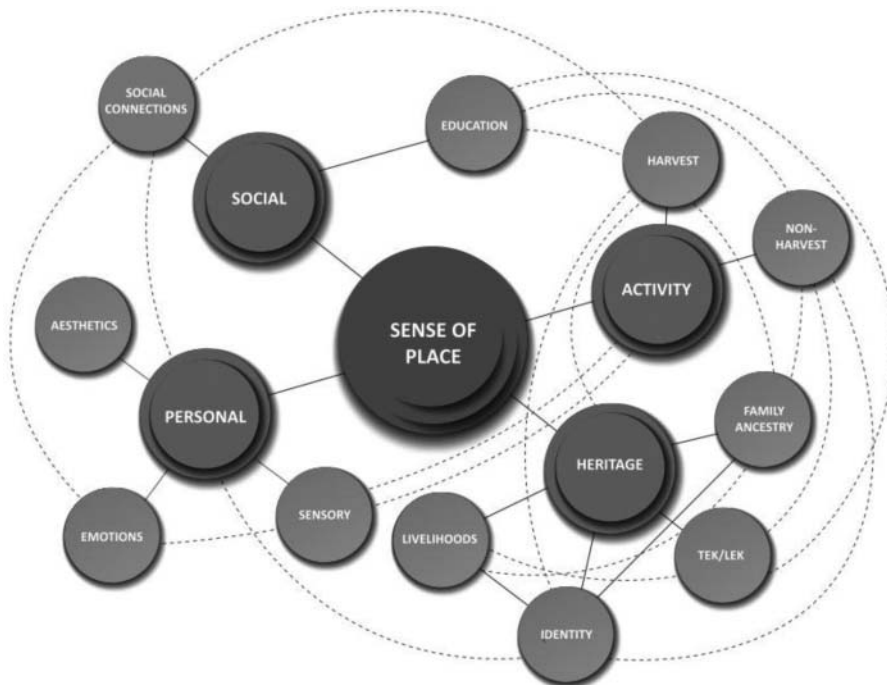
We used qualitative data software to help organize our analysis of the interviews, using an inductive coding (aka “grounded theory”) approach that permitted classification and interpretation derived directly from interviewees' ideas (i.e., “open coding”). This approach is different from theoretical-propositional tests or *a priori* coding schemes, and is instead emergent from local meanings, experiences, and understandings (Corbin and Strauss 2014). Grounded theory coding has been successfully used to categorize place meanings for environmental management in other contexts (Gunderson and Watson 2007; McLain et al. 2013). We created higher and lesser order typologies, or dimensions, with associated attributes (see in “Results” section).

We also conducted two workshops in each of the aforementioned North and South areas (4 workshops total,  $n = 43$  workshop participants) using methods developed largely by social scientists to elicit cultural values for environmental planning using structured decision-making (Failing, Gregory, and Higgins 2013; Gregory et al. 2012). In each region, one workshop comprised tribal members and one comprised “non-tribal” participants. The goals of the workshops were to: (1) verify or “ground truth” the place attachment dimensions and attributes derived from interview data; (2) determine the importance of each of the key dimensions to wellbeing from the workshop participants’ perspectives; (3) begin to develop constructed scales or indices for one or more of the dimensions determined to be most important by workshop participants; and (4) use one or two local restoration projects as scenarios to field test these ideas (e.g., were there ways to modify or improve projects to enhance the quality of place and wellbeing overall). Examples of restoration activities included septic repairs, storm-water runoff mitigation, and estuary restoration to enhance salmon habitat.<sup>3</sup>

## Results

### *Place attachment meanings and practices*

We organize our results in two parts: first, based on analysis from interviews and workshops, we present a locally defined conceptual model of place attachment and its key dimensions (Figure 3); and second, we identify the links between place attachment and



**Figure 3.** Complexity and interconnectedness of the four key place dimensions: Multidimensional sense of place. Solid lines reflect our conceptual model of Sense of Place and the attributes of each dimensions, dotted lines depict some (but not all) of the ways that attributes are cross-linked.



environmental restoration. To the first point, our findings indicate that among varied residents of the Puget Sound region, people's sense of and attachment to place, including its development and maintenance, span at least four key dimensions: (1) harvesting and other place-making activities ("activities"); (2) cultural and familial heritage ("heritage"); (3) personal and emotional experiences ("personal"); and (4) social-relational connections ("social"). These classifications do not however exist as abstract values, rather they are aspects of place that are enabled or disabled given specific social, institutional, and management practices (our second point/finding), specifically conditions of access; protection or restoration of environmental health and integrity; and knowledge about use, access, and conditions.

## **Defining place attachment in the Puget Sound nearshore**

### ***Activities: Place-making on the nearshore***

Shoreline-based activities help forge strong place attachments, be they harvesting or non-harvesting activities that people enjoy and practice at the beaches, on the water, and in other parts of Puget Sound. Shellfishing cultivates place attachments that were central to some people's experiences of wellbeing as it related to specific places, as described by one tribal participant: "To me, there's nothing better than on a day like today to go out to [a specific beach], and as the tide's going out, you build the fire in the pit, and then go down and dig clams." Other types of harvesting, such as fishing, gathering plants, and hunting, were also noted for their importance to place attachments and contribution to wellbeing.

Shellfishing takes place at the beach, often with other people, and generates experiences that go beyond the beach, which travel into kitchens, and then become food for sustenance, festivals, and ceremonies, among other experiences that strengthen a sense of belonging. The enduring importance and breadth of seafood harvesting for Coast Salish tribal communities is detailed here:

When I would go out clam digging, I would always try to bring some clams home, and we would steam the clams and there would be good dinner [...]. With the oysters, and the clams, our people always have them for celebrations, and also for memorials for people. [The] nectar from the oysters is important for the tribal people, I love oyster and clam nectar. Geoduck, our people love geoduck, we love our geoduck sautéed, or fried, or deep-fried and also love it in chowder, and I love the steaks, and I love the chowder too. And fritters, oh my goodness! I love geoduck fritters. Then of course, the cockles, I still really like cockles a lot. I love mussels. My mouth is watering!

The reasons people harvest are to procure food for themselves or others, and also to create opportunities for recreation, to spend time with loved ones and teach children, and in the case of tribal participants, to practice treaty rights.<sup>4</sup> This is so fully the case that often "shellfishing" and "practicing treaty rights" are synonyms, used interchangeably.

In addition to harvesting, we discovered that other shore and water-based activities are place-attaching experiences. Activities and interactions with the beach ranged from exercising, wildlife viewing, relaxing, and artistic endeavors, to boating and camping. Similar to harvesting, the reasons people engage in these activities included recreation and livelihood purposes, as well as family time and opportunities to interact with nature, as illustrated in this non-tribal participant's comments: "I walk along the waters and beaches. It's just a wonderful way to get out, have fun, get exercise and have these encounters with the sea life

and the beach.” Additionally, participants described activities with purposes specific to environmental conservation and restoration work.

### ***Heritage: Cultural and familial biographies and knowledge tied to place***

Family ancestry and cultural heritage tie participants to Puget Sound in many ways, including through personal biographies and livelihoods. Heritage-based place attachments also shape identities for both people and place as well as maintain the local ecological knowledge (LEK) and traditional ecological knowledge (TEK) coupled to particular places.

In reflecting on place attachments and their biographies, tribal participants spoke about their deep historic ancestral ties. Memories include being out on the beach and water as a child, with elders, learning stories that reached back many generations:

Because our way of life of fishing and harvesting, we have good memories to our people. And those memories go not just one generation or two generations, but it goes back many generations, cause we hear the stories of our dad, and he would tell about his great-grandfather, and then we'll hear about how his great-grandfather told this story, and generations upon generations, there's that connection to the land, to the marine waters, that is so important to our characteristics that we carry today as tribal people.

Non-tribal participants, harvesters and non-harvesters alike, also described heritage-based attachments to place. Places where parents and grandparents lived, and where individuals grew up, were described as very important.

Since I was two, I've lived on the water [...] I'm very used to living with the tide going in and going out. [T]hat's where I spent my formative years, and I think it's part of who you are when you have been raised with it. The water is very important to people who really connect with it.

Livelihoods and work histories also help create place attachments, expressed by many as the basis for local identity: “this is a maritime community that is attached with the water specifically through the shellfish.” Many intertidal areas in South Sound are described as working tidelands, and the presence and rhythms of small-scale commercial shellfish activities created part of the character of the shoreline, as well as linked people to its shellfish-working history:

There's no such thing as a waterfront property owner that has this beach view that isn't a working beach [...] out here everything is. At night you see the headlamps on the beach and that's a pretty good indicator, you see the oyster scows or the barges moving around. It's just an opportunity that everybody's taking advantage of.

Both tribal and non-tribal harvesters noted that when your livelihoods and food sources depend on Puget Sound, the concern for ecological health of the natural resources takes on unique importance: “if we don't have clean water then I need to find a new job.”

Personal and community identities are tied to places and water resources of Puget Sound in many important ways. While this is true for both tribal and non-tribal participants, places and resources shape tribal identities in distinct ways. As one tribal participant identified, “we are People of the Water [...] when it comes to our sense of place on these waters, it's very, very strong.” The identity of place also comes from the resources, as another tribal participant described: “shellfish and me are one in the same.” Indigenous place-based identities are intimately tied to cultural practices and resource use. Shellfishing and being at the water enable cultural and place identity. This is a reminder that knowing a place requires that we also know its people.

Place and resources also shape the identities of non-tribal participants. This was especially true for those who descended from multiple generations living in Puget Sound. As one non-tribal participant put it, “I am a South Sound girl,” the shoreline and place are a “part of me.” South Puget Sound is world-renowned for shellfish whose bays are often encoded in shellfish names (e.g., “Tot-ten oysters” and “Little Skookums”) and place names, such as Oyster Bay. This last point illustrates the ways that place itself carries identity, which is in turn internalized to those who live in and associate with the place: “I associate myself with oysters, they’re a part of my identity.”

There are unique heritage-based types of knowledge that stem from interactions with particular places and coastal resources. These LEK and TEK are passed down within families, generated through histories of direct experience and activities, which tend to span many of the place-attachment dimensions identified in this study, but in ways that best fit our heritage-based place attachment concept.<sup>5</sup> Both tribal and non-tribal participants spoke of heritage-based knowledges that accrue while spending time together on beach: “as a child I knew every eddy and undertow.” One non-tribal harvester spoke about the LEK he handed down in his family; pointing to the ocean, the rocks, and the sand, he said: “that is how you teach them, you show them. ‘Ocean’ was one of her first words.”

TEK is often unique to certain families and passed down through multiple generations with deep ancestral ties to a place. For tribal members, intergenerational knowledge transfer is about more than ecological details and technical skills such as how to select and dig clams; rather, specific places hold memories of ancestors and important cultural lessons. TEK can include proper harvest protocols, sacred family teachings, protocols for ceremonies, and the importance of sharing harvests in the community. Spending time together and sharing traditional knowledge in the nearshore ensures the continuance of a way of life and worldview for tribal members. As one tribal interviewee pointed out, “the gathering of the clams is just as important as the cooking... you prepare it the right way and you take care of it in the right way if you are cooking for a ceremony.”

### ***Personal: Sensing place as personal and emotional experiences***

The perceptions, feelings, and interpretations that people have about places form part of their sense of place. We broke this dimension into two constituent parts: aesthetic characteristics/sensory experiences of place, and the emotional feelings and bonds that people maintain with place(s). Among the more common ways that sense of place has been described in the literature is through the aesthetic perceptions of a place, including for example the sense of beauty and wilderness. Indeed, the beauty of Puget Sound is something that people described as making it special. This includes not only the beauty of the water, but also the mountains, forests, and the wildlife. The appreciation of this beauty is felt strongly by all three participant groups (tribal, non-tribal harvester, and non-tribal non-harvester) in our study. Yet some also noted that a broadly perceived surface beauty of Puget Sound can mask some of the ecological health challenges:

People love this area because it’s so beautiful. And because it’s so beautiful, sometimes they don’t see that there are issues—ocean acidification, water quality problems—it seems like it’s so beautiful from the surface.

Interview participants described a range of diverse sensory experiences associated with their special places in Puget Sound. The sensory experiences ranged from some of the more

powerful and personal connections described as smell (e.g., the smell of the low tide), taste (e.g., the flavors of fresh seafood that one harvests themselves), touch (e.g., getting in the mud and feeling rocks under feet), and breathing (e.g., clean, fresh, and moist air) to other bodily sensory experiences such as sights (e.g., sunset views) and sounds (e.g., “murmur of sea”). Many times these senses are experienced in bundles that together create the feel of place, as one non-tribal harvester captured,

A little marine layer, the sound of the waves, the smell, the birds, the seagulls. The seals splashing in the middle of the night when it's dead calm. I mean all of that stuff is part of the experience and part of the specialness and part of what feels like home.

Direct kinesthetic sensory experiences were described by one participant as bringing a closeness or immediacy to her surroundings, a feeling that she was not separated from the water, in the way one might be when viewing the water from afar (e.g., from a house on a hill overlooking the water). Strikingly, the sense of smell seemed to be one of the more powerful ways that participants connected their experiences to sense of place and way of life. One tribal harvester described,

The smell of the bay, that smell of the mud when the tide goes out, that reminds me of clam digging. It doesn't matter where I'm at, if I smell that mud, I'm like, “Oh! Clam digging on a nice summer day!” I really truly think it's the memories tied into a place that make a place special.

Participants' feelings about places were expressed in both pleasant and unpleasant terms. We organized positive or pleasant affective topics into four attributes: enjoyment, sense of peace and calm, emotional bonds, and associated spiritual dimensions. Negative or unpleasant feelings included those related to loss of access, health and safety-related issues for which participants might avoid certain places (e.g., owing to pollution and exposure to toxins), and altered beaches, particularly along developed shorelines.

### ***Social-relational connections***

A preponderance of place attachment phenomena (particularly heritage, but also to a large extent, activities and some personal psychological experiences) are social in nature. Place-based activities and psychological aspects of place also affect social relationships themselves.

Participants spoke about the importance of social functions in the nearshore area—barbeques and sharing (sea)food on the beach, spending time with family and friends exploring natural wonders, and sharing in the enjoyment of the beauty and serenity. Both tribal and non-tribal participants talked about bringing children to the nearshore and associated educational experiences. While these educational experiences differ from the heritage-based knowledges described above (i.e., not TEK or LEK), they are still important learning activities that occur in the nearshore and form the beginning of a relationship to the place. One participant, who is an environmental educator, explained the beneficial social connections that develop through learning activities in the nearshore: “Just being with the kids and teaching, being able to enjoy [the beach] with them and learn with them... just learning together and being able to be close with them.”

Social connections also mediated access for people to beaches and shellfish beds. For example, private beaches and shellfish beds are often considered better than public ones. Many public beaches are considered degraded or difficult to get to because of parking, location, and lack of knowledge or infrastructure.

## Place attachment and ecological restoration for wellbeing

Healthy habitats happen because of a history of people in that place. Conservation tells a cultural story. There are nice places left, but that's because people have been there and care about the place to protect it and steward it. This includes long history, tribal and cultural, as well as newcomers.  
—Non-tribal interviewee

Sense of place is a multi-dimensional aspect of human wellbeing, often engaging more than one place-making experience, including both material and nonmaterial features in complex and interconnected ways (Figure 3). Participants emphasized access, knowledge, and ecological integrity as three main factors that foster and maintain peoples' sense of place. In a series of workshops, we asked participants to evaluate the links between sense of place, wellbeing, and ecological restoration, with an eye toward better understanding if, and how, place attachment can more tangibly drive restoration planning and prioritization in Puget Sound for both ecological and cultural wellbeing. Below we summarize the key linkages discussed between restoration, place attachment, and wellbeing: incorporating local priorities, and building community and knowledge, and connections to place as motivation for restoration and conservation.

### *Incorporating local priorities*

Linking restoration to sense of place attributes generated ideas for improvements to enrich wellbeing, including by incorporating local priorities in restoration planning. Participants discussed the value of locating restoration efforts in areas most impacted (e.g., bays and inlets most exposed to polluted run-off). Invariably, for tribal participants and shellfish harvesters, these included areas most closely linked to harvesting activities. Non-harvesters pointed to the opportunities for restoring derelict waterfront infrastructure that limit public access and diminish positive place attachments, including boat ramps and docks, as well as urban waterfronts. Access was also limited by lack of information and maps to public areas, as well as legal misunderstandings about tidal and beach access adjacent to private property.

Tribal participants emphasized the value of ecological restoration in culturally and historically important locations. Suggestions for enhancing the sense of place attributes of restoration sites included adding information about place histories and cultural uses such as locations of longhouses using signage with local Coast Salish language, and creating opportunities for tribal communities to participate in traditional and intergenerational activities such as clam bakes and beach seining. Suggestions were also made to increase the cultural value of restoration by including important plants in estuary restoration and providing access to them for use in cultural practices such as basket making and ceremonies.

Another priority for harvesters included focusing on quality as well as quantity. Indicators to gauge restoration efficacy that better reflect the importance of shellfishing, for example, could include *types* and *quality* of shellfish, natural reproduction, and beach sediment conditions, not just acres of open shellfish beds.

### *Building community and knowledge*

Participants talked about how restoration builds community and opportunities to learn and share knowledge. Engagement in restoration was described as very positive for social

connections, where people join together to achieve goals. Beach naturalist programs and citizen science activities were given as examples when small groups of people get together on the beach to care for and learn about coastal resources. These experiences were described as creating bonds between people and the places where they collectively worked.

Community involvement was also described as a way for people to learn about the local environment, its history and threats, and thus a way to increase the public's understandings of coastal resources and their value. This was noted as especially important in regions like the Puget Sound, where population and development are increasing. Better understanding of the whole watershed role in coastal health could help promote use of low impact development to protect shorelines. Several participants mentioned that making clear connections between humans and the environment is important—stating that people understand that wildlife need a healthy environment, but many residents do not make the connection that healthy ecosystems are crucial for people too.

### ***Connections to place as motivation for restoration and conservation***

Connections to place create motivation for restoration and conservation. As emphasized in the quote opening this section, people work to restore places and resources because they have been there and they care about the place and its resources and thus they want to protect and steward them. However, participants feared that appreciation for places diminishes when people do not have access to them. Cultural roots in places, and particularly for tribal participants with origin stories tied to clams, were important motivations for investing in restoration.

### **Discussion: Place attachments as a tool to prioritize restoration**

Sense of place is a concept of human wellbeing that has received increased attention in EBM, including in Puget Sound. Notwithstanding the complexity of sense of place, many ecosystem services approaches focus on only one or two of aspects of place—more closely fitting the category we define as the “personal” dimension (e.g., feelings and aesthetic qualities such as scenic beauty). Using this narrow view, sense of place has often been represented as a single “service” that flows from ecosystems to people. As a result, the interactions between social and biophysical dimensions in creating sense of place remain unexamined. Digging deeper into the place connections that people have with the nearshore, we found much more than aesthetic references to its beauty; people think about, feel, and engage with these environments in physically interactive, social, and psychological ways (e.g., harvesting, spending time with family, stewardship).

Strong sense of place developed through activities such as harvesting, kayaking, beach combing, bird watching, and swimming is positively linked to support for restoration. This implies that protecting the access, knowledge, and environmental integrity of places and resources associated with practice-based sense of place is important for public support for coastal restoration. Our results point to various access issues owing to management and policies that can affect practice-based place attachment. A full policy review is beyond the scope of our paper, but here we note a few of the implications from our research for coastal management.

Understanding and improving the conditions (e.g., access, knowledge, and ecological integrity) that enable the multiple forms of place attachments (activity, heritage, social, and



personal) is important for place-making and human wellbeing. Access is a primary enabling mechanism. Access comprises the structures and capacities that make it possible to experience benefits (Ribot and Peluso 2003) and is a central mediating factor in how people make decisions about the benefits they receive (Hicks and Cinner 2014). These structures and capacities include not only the physical routes to arrive at a desired location or procure resources, but also many other factors such as resource tenure, permit restrictions, participation, and information, all of which can be addressed via policy change. In the context of restoration, removing access barriers faced by different groups of people may improve the distribution of sense of place benefits (Wieland et al. 2016). As people perceive and experience more benefits from increased access, their likelihood to support and participate in stewardship also increases (see also Eisenhaur et al. 2000; Wyman and Stein 2010).

Private tideland and shoreline development may limit access in Washington, and thus curtail the opportunities to practice place-making activities. Nevertheless, for both harvesting and non-harvesting participants, protecting and improving existing public beaches and open shellfish beds, knowing the locations of them, and the ability to get to them, is important for practice-based sense of place in coastal areas.

For tribes specifically, treaties reserve the rights to take up to 50% of all shellfish in natural beds regardless of ownership, and *active harvesting* is one way that tribal participants exercise these rights. Nevertheless, if environmental conditions (from development-related habitat degradation, toxic runoff, ocean acidification, climate change, etc.) negatively impact shellfish and water quality, this may impact harvesting activities that are important for place attachment.

Recognizing the ecological, commercial, and cultural importance of shellfish, environmental restoration agencies in Puget Sound have made restoration of shellfish beds a priority action. Our findings suggest the need to continue and expand investments in shellfish and estuary restoration, yet with attention not simply to acres of open shellfish beds as currently measured, but also to *quality* and *types* of shellfish and beach sediment composition, together with access to healthy shellfish beds and beaches. In addition to shellfish abundance and quality, sense of place studies can also be used to prioritize restoration locations in places with cultural, social, and historical ties, including restoring the knowledge and practices associated with those sites.

Strong place attachment is important not only for human wellbeing, but it also motivates ecosystem stewardship. Complex interactions that form a multidimensional sense of place are thus important drivers of stewardship in integrated cultural-ecological systems such as Puget Sound.

## Conclusions

The examination and integration of more complex measures of sense of place is important precisely because of the role of relational- and practice-based place attachments in developing stewardship and restoration ethics. This fuller understanding of sense of place deserves stronger centrality in policy, monitoring, and action. These challenges are increasingly important as coastal places and resources, such as shellfish, face cumulative impacts and uncertainties from shoreline development, chemical contaminants, ocean acidification, increasing temperatures, and sea level rise, among other changes.

From an EBM point of view, better understanding of a practice-based sense of place is key to the success of creating and enacting successful, resident-supported restoration activities. Without a broader understanding of how sense of place is created, maintained, and enriched, environmental managers may inadvertently act in ways that fail to optimize human wellbeing. Our hope is that a better understanding of place-based wellbeing, which recognizes the diverse histories, activities, and values that form sense of place, will improve EBM in the Puget Sound region and beyond by protecting and restoring the inextricably linked health of both social and ecological systems.

## Notes

1. Scholars elsewhere have debated the nuances between the definitions of “sense of place” and “place attachment” (c.f., Farnum et al. 2005 for a summary of those deliberations). While we do not dismiss that there may be different connotations between the two terms, we use them interchangeably here.
2. [http://www.oceanhealthindex.org/Goals/Sense\\_of\\_Place](http://www.oceanhealthindex.org/Goals/Sense_of_Place)
3. More detailed information on methods, sampling strategies, and instruments can be found in the technical report to the funder (Donatuto and Poe 2015).
4. A series of treaties negotiated in 1854–1855 by Isaac I. Stevens, then Governor of Washington Territory, reserved the tribes’ right of taking fish and shellfish at all usual and accustomed areas [see for example, Article V, Treaty with the Dwamish, Suquamish, Etc. 12 Stat. 927 (1855)(Treaty of Point Elliott)]. A landmark decision by U.S. District Judge George Boldt confirmed and enforced these treaty fishing rights [*United States v. Washington*, 384 F. Supp. 312 (W.D. Wash. 1974), *aff’d* 520 F.2d 676 (9th Cir. 1975), *cert. den.* 423 U.S. 1086 (1976)]. And the U.S. Court of Appeals for the Ninth Circuit held that the treaties reserved the right of tribes to take up to 50% of all shellfish in natural beds, whether private or public tidelands [*United States v. Washington*, 167 F.3d 630 (9th Cir. 1998), *cert. den.* 526 U.S. 1060 (1999).]
5. In general, intergenerational knowledge in tribal communities is referred to as TEK, while in non-tribal communities it is called LEK. There is a vast body of literature on TEK and LEK (see Berkes et al. 2000; Charnley et al. 2007; Davis and Wagner 2003). Here, we focus on those types of ecological knowledge that specifically relate to the ways that heritage and knowledge join together in creating place attachments. TEK/LEK share the characteristics of heritage-based local ecological knowledge that is handed down through active teaching on the land, most often taught by relatives.

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