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Exploring Sense of Place and Environmental Behavior at an Ecoregional Scale in Three Sites

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Abstract This article reports on three case studies that explore the person-place relationships that occur on an ecoregional scale and whether and how those place connections relate to residents undertaking action on issues about which they report being concerned. The research was conducted in three ecoregions of high priority for conservation: the Galapagos Islands (Ecuador), the Klamath-Siskiyou (northern California/southern Oregon in the United States), and the Chesapeake Bay (eastern coast of the United States). Data were collected through surveys (n=330, n=248, and n=320, respectively), interviews (n=32, n=29, and n=21), and ethnographic study. Across the three ecoregions between one-fifth and one-quarter of residents indicated that their place connections occurred at an ecoregional scale. Among those who reported taking action—or when prompted to report at what scale they would take action—respondents indicated a scale of action roughly reflective of the scale at which their place connections occurred.

Keywords Ecoregion · Sense of place · Environmental behavior · Scale

In 2012, a group of scientists made a sobering prediction: our planet is approaching a tipping point. By the year 2050, we may face mass extinctions and dramatic global-scale changes not seen since the glacial recession more than 12,000 years ago. By 2025, the human population will be using more than 50 % of the Earth's land surface, severely impacting the planet's abilities to provide clean water, clean air, basic biogeochemical flows, and other ecological processes essential to life on Earth (Barnosky *et al.* 2012).

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Because of the scope and scale of the challenges that we are facing, scientists and policymakers are searching for high-impact, targeted approaches to environmental conservation (Brooks *et al.* 2006). Nongovernmental organizations (NGOs) and government agencies have shifted toward large-scale efforts, developing massive collaborative strategies grounded in conservation biology and landscape ecology (Brooks *et al.* 2006; Redford *et al.* 2003). Many are emphasizing the importance of networked sites and collective efforts for greater impact (Weins *et al.* 2001). These approaches are guided by the notion that big problems require ambitious, well-coordinated solutions.

Although the number of NGOs and agencies pursuing these approaches has risen exponentially, related scholarship has remained relatively tightly focused on the ecological and biophysical implications of conservation at larger scales. This article attempts to broaden the conversation by exploring social aspects of large-scale approaches to biodiversity conservation.

Biodiversity Conservation at the Ecoregional Scale

One conceptualization of the large-scale conservation paradigm focuses on the concept of an ecoregion. An ecoregion is "a relatively large unit of land or water [with] a distinct assemblage of natural communities, sharing a large majority of species, dynamics, and environmental conditions" (Dinerstein *et al.* 2000:15). Ecoregion conservation employs principles of landscape ecology to address expanded spatial scales and 50- to 100-year time frames. This approach is believed to offer greater opportunities for protecting a wider range of species and representative habitat types and is designed to conserve biodiversity at the ecosystem, species, and genetic levels (Dinerstein *et al.* 2000; Groves *et al.* 2000). With limited temporal and financial resources, such an

approach is appealing, particularly within high-priority, threatened ecoregions (Brooks *et al.* 2006; Redford *et al.* 2003).

Although numerous strategies have been outlined for pursuing ecoregion-type conservation, each begins with defining and prioritizing areas for conservation (Brooks *et al.* 2006). Teams of local and nonlocal experts, mostly with backgrounds in the biophysical sciences, define ecoregional boundaries based on dominant vegetation types or distinctive marine or freshwater biota and ecosystem types (Groves *et al.* 2000). In addition, prioritization frequently considers highly diverse areas that are without adequate protection or that may be particularly threatened by social or political turmoil (Brooks *et al.* 2006).[1]

Social Aspects of Ecoregion Conservation

Ecoregion conservation often emphasizes ecological considerations grounded in the biophysical sciences to guide selection of priority areas, shape interventions, and develop planning processes geared toward desired species, habitat, and ecological outcomes (Brooks *et al.* 2006; Redford *et al.* 2003). Although these criteria are critical to informing biodiversity conservation, social scientists express concern that the approach furthers the notion that people are separate from ecosystem processes, rather than conceptualizing integrated social-ecological systems. Yet, research and practice suggest that failing to consider social factors can impede success in the short and long term because ultimately, "conservation interventions are the product of *human* decision-making processes and require changes in *human* behavior" (emphasis original, Mascia *et al.* 2003: 649). Social scientists emphasize the necessity of considering human implications of ecoregion conservation in a way that reaches beyond token inclusion in the stakeholder collaboration process (Brosius and Russell 2003), calling for conservation approaches "in which the complexity of the social is given as much attention as the complexity of the biological" (West and Brockington 2006:614).

Conservation organizations and agencies often do discuss the importance of community involvement in ensuring sustainability of conservation efforts. The Nature Conservancy acknowledges, for example, that "Conservation action is inevitably undertaken in a social context" (Weins *et al.* 2001:14). Yet, despite NGOs' and agencies' efforts to consider social aspects of conservation, critics suggest that ecoregion conservation's top-down approach may be minimally sensitive to local perspectives, questionable in efficacy, and lacking transparency. Peterson *et al.* voice concern that participation and community engagement in large-scale conservation scenarios reflects a transactional approach where "local communities' needs, concerns, and sentiments get reduced to 'interests' to be bargained and balanced at the table" (2008:7). Conservation organizations have been accused of using the rhetoric of stakeholder collaboration as a substitute for meaningful participation, and Brosius and Russell suggest "it would be a mistake to assume that the centrality of participatory rhetoric in fact represents a commitment to authentic community involvement in the design or implementation of conservation initiatives" (2003:43).

When local communities are absent from the conservation process, efforts to conserve spaces and species may be marginally successful: Enduring and robust biodiversity conservation requires active engagement and commitment of people who live in and interact with those places. One critical aspect of including people in conservation is to encourage direct involvement with places through civic engagement, addressing environmental issues, and other socially oriented activities that connect people's everyday lives to the places where they live. Through these kinds of activities, people begin to develop deeper, stewardship-based relationships with places. Geographer Tuan described this by saying, "What begins as undifferentiated space becomes place as we get to know it better and endow it with value" (1977:6). Thus, developing an understanding of people–place relationships and engaging local perspectives in conservation—from inception through implementation—has implications for the success not only of community cohesion, but also for conservation outcomes (McShane *et al.* 2011; Peterson *et al.* 2008).

Research Questions and Theoretical Grounding

Motivated by this framing, the research reported herein addresses a critical, but often understudied, aspect of incorporating local people's connections to and understanding of their places into conservation efforts. This study explores social and community-based perspectives that can help inform ecoregion conservation by providing a platform on which conservation initiatives can build. The study examines ecoregional residents' place connections, the scale at which those residents feel connected to their places, and the actions that they may take to conserve or protect their places. The study was guided by three research questions:

1) Do residents develop a sense of place at an ecoregional scale?
2) What are the elements and characteristics associated with forming an ecoregional-scale sense of place?
3) What, if any, are the relationships between an ecoregional-scale sense of place and taking place-related action?

[1] Many high-priority ecoregions are in (or subsume) areas that are the subject of local, national, and international debates for economic, political, social, and resource-related reasons (e.g., the Congo, the Galapagos, the U.S. Pacific Northwest, Indonesia).

As anthropologist Clifford Geertz notes: "No one lives in the world in general. Everybody . . . lives in some confined and limited stretch of it—'the world around here'" (1996:262). The question in this study then becomes: What is the scale of that 'world around here'?

Sense of Place and Place-Related Action

To address questions of scale—and how place and scale affect everyday experience—this study is situated in the vast and growing place literature, which is based in geography, anthropology, sociology, psychology, and natural resources, among other fields (cf, Altman and Low 1992; Ardoin 2006; Lewicka 2011; Manzo and Devine-Wright 2013; Trentelman 2009; Williams 2008). These wide-ranging interdisciplinary place studies—which span epistemological orientations and demonstrate a range of approaches—collectively attempt to better understand how people's relationships with places form, become strengthened or disrupted, and may motivate place-protective behaviors (Lewicka 2011; Trentelman 2009).

Place studies often attempt to measure the complex, overlapping conceptualizations of person–place relationships, such as place identity, place attachment, place dependence, and sense of place (Lewicka 2011; Altman and Low 1992). This study conceptualizes sense of place as comprised of psychological, sociocultural, biophysical, and political-economic dimensions (Ardoin *et al.* 2012)—a perspective building on empirical place research (e.g., Shamai 1991; Stedman 2003; Scannell and Gifford 2010).

Based on the belief that people are motivated to protect places with which they have personal, meaningful relationships, practitioners and researchers have suggested that positive place attachments may relate to undertaking conservation, pro-environmental, and place-protective behaviors (Stedman 2002). However, empirical research is inconsistent, perhaps because of the complexity of factors affecting environmental behavior (Heimlich and Ardoin 2008). Although some studies demonstrate a link between positive sense of place and conservation or place-protective behaviors (e.g., Stedman 2002; Scannell and Gifford 2010), others suggest that mediating variables or structural barriers may complicate a direct relationship between sense of place and behavior (Lewicka 2005). These mixed results suggest that this study can contribute to both the place and conservation literatures by adding the element of scale to considering how place connections relate to conservation strategies and behavior.

Scale is often challenging for environmental research (Reid *et al.* 2006), and place studies are no exception (cf, Hidalgo and Hernández 2001). Cuba and Hummon (1993:112) noted this challenge, saying that "integrative scholarship [in place research] has been limited by a critical lack of studies that simultaneously examine *identification with places of different scale, ranging from the dwelling place to the community and the region*" (emphasis original). A decade later, Lewicka (2011:211) described the continued dearth of empirical research on the relationship of place and scale: "the majority of researchers … focus on one place scale only and avoid comparisons of attachments to different place scales." In particular, her review of 40 years of research on people–place relationships notes a lack of attention to the regional scale, positing that regions are challenging units of attachment because of their "fuzzy borders and diffused identity" (2011:212). Noting a similar reticence to engage with larger-scale places, critical theorist Heise writes, "Ecologically oriented discussions of place . . . tend to rest on the assumption that only a relatively small and directly experiencable spatial and communal framework will yield affective attachments and ethical communities" (2008:45). Heise (2008) suggests that this small-scale focus is incomplete as global flows create ever-more porous connections among local and extra-local places.

This study explores these underexamined scales—large and small—and addresses varying assertions regarding connections among sense of place, scale, and behavior. As such, I examine which assertions hold true, at least for the residents and ecoregions in my sample. I also attempt to explore a gap in the place literature by developing instruments that address under-theorized concepts related to place dimensions and scale (Ardoin *et al.* 2012).

Research Design

From June 2004 through September 2007, I undertook exploratory mixed-methods research in three ecoregions: the Klamath-Siskiyou of northern California and southern Oregon (U.S.), the Chesapeake Bay of the Mid-Atlantic East Coast (U.S.), and the Galapagos Islands (Ecuador). I used a modified grounded theory approach (Strauss and Corbin 1998), guided by the research questions, with the intention of allowing emergent themes to arise from the data and experiences in each site.

Site Selection

The sites were chosen to produce contrasting results for predictable reasons, with the intention that the diversity might provide insight into factors associated with an ecoregional-scale sense of place (Yin 1994). Concurrently, because of the desire for efficiency balanced with some depth in each sites, I limited the study to three sites and used an information-oriented selection process, attempting to "maximize the utility of information from small samples and single cases" and selecting cases "on the basis of expectations of their information content" (Flyvbjerg 2004:426). Finally, to bound the

research and ensure that cases were "roughly matched on . . . broad dimensions" (Collier 1993:112), I considered only ecoregions previously delineated by major conservation organizations and/or government agencies and deemed of high priority for protection.[2]

With these goals, I sought variability across a range of criteria, including: geographical distinctiveness of the ecoregion's boundaries; historical sense of the area being a region; political boundaries and cohesiveness; overall population; geographic size of the area; cultural, racial, and ethnic diversity of residents; resource use; and economic development levels. These criteria were predicted to be important by the literature (e.g., Eisenhauer *et al.* 2000; Hay 1998; Altman and Low 1992; Theodori and Luloff 2000), as well as based on initial exploratory research (see Table 1).

Even by overlaying these criteria with the case-study selection considerations, more than a dozen ecoregions worldwide may have been appropriate to include. At that point, final selection relied on feasibility, diversity, and resource availability. Thus, the learning derived from the three study sites is intended as a limited examination of these previously underdeveloped concepts (the nexus of sense of place, scale, and environmental behavior) and would benefit from further exploration elsewhere. For this initial study, however, the diversity provided by these sites seemed sufficient to proceed with an exploration of the research questions as described.

Data Collection and Analysis

I collected data through semi-structured interviews with 82 individuals to explore residents' place connections as well as environmentally and place-related behaviors. In addition, my research team conducted 712 in-person surveys across the three ecoregions (see Table 2). This article focuses on overarching findings from the three sites emphasizing the survey data and using illustrative quotes from the interviews to exemplify key perspectives. I also spent between 6 and 12 months living in each of the sites, participating in community activities and conducting ethnographic research; therefore, both the formal and informal interactions with community members inform the framing and interpretation of data presented.

Surveys

The survey instruments and sampling strategies were designed to gather perspectives from ecoregional residents on the source, extent, and scale of place connections; environmental behavior; outdoor activities; and demographic characteristics. The instruments addressed aspects of place identity, dependence, attachment, and the four dimensions of place—psychological, sociocultural, biophysical, and political-economic (Ardoin *et al.* 2012). Many of the 75 survey items were based on studies by Stokols and Shumaker (1981); Proshansky *et al.* (1983); Williams and Roggenbuck (1989); Bricker and Kerstetter (2000); and Halpenny (2006).

I developed a sense-of-place and scale-of-place index for each ecoregion. The number and specifics of items comprising indices varied by ecoregion based on geography, political borders, population density, and other factors; as such, the indices are not directly comparable across ecoregions (see Table 3).

The number of items in the sense-of-place indices ranged from 27 to 33; all three indices were highly reliable (Cronbach's alpha>0.8; George and Mallery 2005). The indices employed a scale of 1 to 5, with 1 representing a negative sense of place and 5 representing a positive sense of place.

I rescaled and combined seven survey items to create a scale-of-place index for each ecoregion; all three indices had an acceptable level of reliability (Cronbach's alpha>0.7; George and Mallery 2005). I used the scale-of-place index to categorize respondents by the scale of their place connections, where 0.00 to 0.33 represent a local scale of place; 0.34 to 0.66, a mixed/medium scale of place; and 0.67 to 1.00, an ecoregional scale of place.

Within the two larger ecoregions—the Chesapeake Bay and the Klamath-Siskiyou—I used a stratified random sampling procedure (Babbie 2007) to select census blocks and tracts for sampling from across the ecoregion. The first stratum was urban/rural, as the literature suggests that mechanisms such as amount of interaction with the natural world, outdoor recreational opportunities, number and strength of social attachments, distance of daily activities, and other density-related aspects may affect place-connection and scalar characteristics. The second stratum addressed socioeconomic status (SES) as a proxy for other potentially important variables (e.g., education, frequency of travel outside of the place) in developing place connections as well as a larger-scale sense of place. This stratum was operationalized using a formula combining education and income data within each of the urban and rural sites.

Census records were used to develop the sampling frame based on density and SES. A random selection process was used to narrow to several high- and low-density sites and, then, in light of logistical considerations, the survey-administration areas were chosen from among those sites.[3] In Galapagos, the three main inhabited islands each have an "urban" area; surveys were conducted with residents in those sites.[4]

[2] Brooks *et al.* 2006 discuss prioritization schema for ecoregion protection.

[3] In the Chesapeake Bay, selected sites were Baltimore, Maryland; Salisbury, Maryland; St. Mary's, Maryland; and Lancaster, Pennsylvania. In the Klamath/Siskiyou, sites included Crescent City, California; Yreka, California; Medford, Oregon; and Roseburg, Oregon.

[4] The three sites were Puerto Ayora, Santa Cruz; Puerto Villamil, Isabela; and Puerto Baquerizo, San Cristobal.

Table 1 Site selection criteria

	Galapagos	Klamath-Siskiyou	Chesapeake Bay
Location	1,000 km off the coast of Ecuador	Pacific Northwestern United States, straddling southern Oregon and northern California	Central Mid-Atlantic Region, encompassing the District of Columbia and parts of six states (Virginia, Maryland, West Virginia, Pennsylvania, New York, and Delaware)
Population (Approx. as of 2004)	30,800	900,000	16.6 million
Area	8,000 km^2	50,300 km^2	103,000 km^2
Ecological characteristics	Marine and coastal environments. High levels of species endemism.	Marine, coastal, and mountainous environments. Highly productive riverine ecosystems.	Marine, coastal, and mountainous environments. Highly productive estuary.
Environmental concerns	Invasive species, overfishing, increasing urbanization and tourism	Logging, habitat conversion related to development, water quality and quantity	Human population growth and accompanying sprawl; overfishing; agricultural runoff

In the more densely populated areas of the Chesapeake Bay and Klamath-Siskiyou sites, the research teams used a "random walk" technique beginning in the selected blocks or tracks starting from randomly selected houses. In more rural areas (including the entire Galapagos ecoregion) where "random walks" among households were infeasible for logistical and safety reasons, research assistants conducted surveys at central locations frequented by residents.

Interviews

I developed the interview guide based on data collected during initial visits to each of the ecoregions and grounded in a review of place-related studies, including place attachment, place identity, and sense of place more broadly (e.g., Eisenhauer *et al.* 2000; Hidalgo and Hernández 2001; Twigger-Ross and Uzzell 1996; among others). I also considered the environmental behavior literature (e.g., Heimlich and Ardoin 2008) to inform items about interviewees' engagement with environmental action within the community or ecoregion (see Table 4).

To select interviewees, I developed a table of criteria of key interviewee characteristics across which I sought to diversify. The characteristics included: age; sex; length of residence in ecoregion; geographic spread, including urban, suburban, and rural; occupation/profession and connection with the landscape (e.g., natural resource or environmentally related professions); historical/family connection to the ecoregion; stage in life cycle; well-known within the ecoregion as being an "expert" on that place; highly motivated related to environmental behavior (or not); and so on. Building on these criteria and using a combination of snowball and purposive sampling methods, I sought key informants within each ecoregion who might speak to their personal experiences of place, environmentally related behavior, and conceptualizations of scale.

I contacted potential interviewees by email to explain the research. For those who agreed to be interviewed, we arranged meetings in public places (e.g., coffee shops, libraries) or in

Table 2 Study participants

	Galapagos	Klamath-Siskiyou	Chesapeake Bay
Surveys			
Participants	330	248	320
Sex	Female: 50.5 %	Female: 54.3 %	Female: 55.1 %
	Male: 49.5 %	Male: 45.7 %	Male: 44.9 %
Mean age	32.5	50.2	49.5
Mean length of residence	18.6 years	20.8 years	22.6 years
Approximated mean income	$8,348	$37,553	$77,725
Interviews			
Participants	32	29	21
Sex	Female: 13	Female: 11	Female: 6
	Male: 19	Male: 18	Male: 15
Age range	18 to 78	36 to 87	27 to 75
Length of residence	1.5 years to entire life	5 years to entire life	6 years to entire life

Table 3 Sample items: sense-of-place and scale-of-place indices

Sense-of-place index[a]
I have an extensive network of family and/or friends here.
I have a good job here.
I think the landscape is beautiful.
I like the range of outdoor activities that are available to me here.
I like the area's biodiversity or mix of plants, animals, and landscapes.
I feel like this place is part of me.
I identify strongly with this place.
I am very attached to this place.
Scale-of-place index[b]
When you've been talking about your feelings about this place, are you thinking more of your place as being [town/Baltimore City], [small region/Greater Baltimore Area], or [large region/Cheseapeake Bay region]?
Culturally, do you feel more connected with [town/Baltimore City], [small region/Greater Baltimore Area], or [large region/Cheseapeake Bay region]?
Ecologically, do you feel more connected with [town/Baltimore City], [small region/Greater Baltimore Area], or [large region/Cheseapeake Bay region]?

[a] Items rated on Likert-type scales [1 to 5]

[b] All scale items were rescaled to create a 0-to-1 score

locations relevant to their place or work (e.g., fishing boats, docks, forestry operations, outdoor schools). With permission from interviewees, I audio recorded the 82 interviews, which ranged in length from 1 to 4 h. I analyzed the transcriptions using NVivo 7 and the constant comparison method, allowing coding categories to emerge from the data inductively, revising the categories iteratively as new structures emerged (Lincoln and Guba 1985).

Findings and Discussion

Sense of Place and Scale

The first research question explored residents' sense of place—its development, strength, and valence as negative, neutral, or positive. Among all three sites, residents had quite strong, positive place connections with the average scores on the sense-of-place items being well over the neutral 3 midpoint. (These were measured on a Likert-type scale of 1 to 5, with 3 being neutral, as described in the Surveys section of the Research Design) (see Table 5).

Although direct comparisons among scores from the three ecoregions were not intended (see Surveys), the strength of sense of place among respondents in each ecoregion were generally consistent with other studies using similar measures. For example, in Halpenny's (2006) study of visitors to Point Pelee National Park in Ontario, a single-question place attachment item had an average score of 3.49 on a 5-point Likert-type scale (where 5 indicated the strongest positive attachment; N=355). In Bricker and Kerstetter's (2000) study of recreationists' sense of place along the South Fork of the American River in California, they used 15 items similar to those used in this and Halpenny's study to create a place attachment scale; the average score was 3.1 out of 5 (N=1,226).

For additional analysis, I categorized respondents by the valence of their sense of place, where 1 to 2.49 represent a negative sense of place; 2.5 to 3.49, a neutral sense of place; and 3.5 to 5.0, a positive sense of place. The data were positively skewed in each ecoregion (see Table 6), with the majority of respondents having a positive sense of place. Perhaps the respondents have reason to feel so positively about their places: the sites in this study are all renowned for their remarkable natural settings and ecosystems. In Galapagos, in particular, the vast majority (93.3 %) of responses indicated strongly positive place connections, consistent with its worldwide reputation for unique assemblages of plants and animals and iconic landscapes.

Although it is possible that the predominantly positive findings may be due in part to social desirability bias from in-person survey administration, comparisons with other place studies (including Halpenny 2006; Bricker and Kerstetter 2000, discussed above) suggest consistency among findings. In Lewicka's review of the place attachment literature, she notes that "abundant research results indicate that attachment to numerous places continues to be strong" and that "scores on various place attachment scales fall well above the arithmetic average" (2011:209). Moreover, the ethnographic and interview data upheld these positively skewed survey results, further supporting the findings' validity.

Table 4 Sample interview topics

Length of and motivation for residence
Perception of the boundaries of "here"
Basis of place connections (e.g., job, property, family, hunting/fishing, growing food, interest/involvement in politics)
Connections to other areas
Changes (social and ecological) occurring in place; involvement in efforts to prevent those changes; motivation for involvement; barriers to involvement
Involvement in (environmentally or social/community-related) action elsewhere in ecoregion; motivation for involvement

Table 5 Sense-of-place index scores

Site	n	Mean	Median	SD
Galapagos	330	4.24	4.33	0.49
Klamath-Siskiyou	248	3.84	3.93	0.64
Chesapeake Bay	320	3.64	3.64	0.67

Scale of 1 (negative sense of place) to 5 (positive sense of place)

Table 6 Percentage of respondents in each sense-of-place category

Site	n	Negative (1 to 2.49)	Neutral (2.5 to 3.49)	Positive (3.5 to 5.0)
Galapagos	330	0.3 %	6.4 %	93.3 %
Klamath-Siskiyou	248	4.0 %	20.2 %	75.8 %
Chesapeake Bay	320	6.3 %	31.6 %	62.2 %

After developing a baseline understanding of the strength and valence of residents' place connections, I explored the scale of those connections—specifically, whether they occurred at an ecoregional scale. At least some respondents in each site had a connection to place that manifested at the ecoregional scale (see Fig. 1); in both Galapagos and Klamath-Siskiyou, the proportions of respondents with an ecoregional scale sense of place were greater than the proportions of respondents with a local scale sense of place.

Mixed- or Medium-Scale Sense of Place

In each of the three sites, the largest percentage of responses was in what was classified as the "mixed" or "medium-scale" category. This category included two types of responses: (1) *medium*, or those individuals who indicate a place connection at a scale somewhere between the local and ecoregional scales, and (2) mixed, or those who indicate place connections at multiple scales.

In Galapagos, the mixed/medium scale most often reflected "mixed" responses such that respondents at times indicated connections at a smaller, more localized scale and at other times indicated connections at a larger, more ecoregional scale. Human settlements in Galapagos are restricted to only 2 % of the archipelago's landmass, and most people live in relatively dense areas with boundaries marking the edge of national parkland, to which even residents can only travel with a certified naturalist guide. Therefore, the surveys offered respondents only two scale options: town and ecoregion. Understandably, many respondents provided inconsistent answers, at times indicating a connection at an ecoregional scale while at others indicating a connection to their town. Those respondents that consistently indicated strong place connections at both the local and ecoregional levels were described as having a "mixed" scale of place.

In the other two sites, survey respondents were offered the option of selecting a scale occurring between the levels of town and ecoregion, including neighborhood, town/city, county, small region, or large region (or some combination thereof as applicable to the area in which a respondent lived). Thus, individuals from the Chesapeake Bay and Klamath-Siskiyou whose responses were classified as "mixed/medium" may reflect one or both of two phenomena: a predominance of responses at multiple scales of place and/or a predominance of responses at the intermediary scale(s).

Ecoregional-Scale Sense of Place

About one-third (35.5 %) of the survey respondents in Galapagos felt connected at an ecoregional scale. In interviews, many residents used language evoking sentiments of connection with Galapagos as a whole: they spoke of "loving" Galapagos, "feeling rooted" in Galapagos, thinking that Galapagos was "beautiful," and believing emphatically that Galapagos was visibly and dramatically different from the mainland. One resident suggested that Galapagos felt like its own country: "I don't feel at all Ecuadorian. I definitely feel like a Galapagueño. When I go to the mainland, I feel like a foreigner there." Hay (2006) suggests this is a common sentiment expressed by island dwellers, consistent with theories of island identity that emphasize the "hard edges" of island ecosystems (e.g., Péron 2004). Thus, Galapagos residents may more easily develop a distinctive sense of place at a large (e.g., ecoregional) scale based on geographic factors that also impact island-related social conditions.

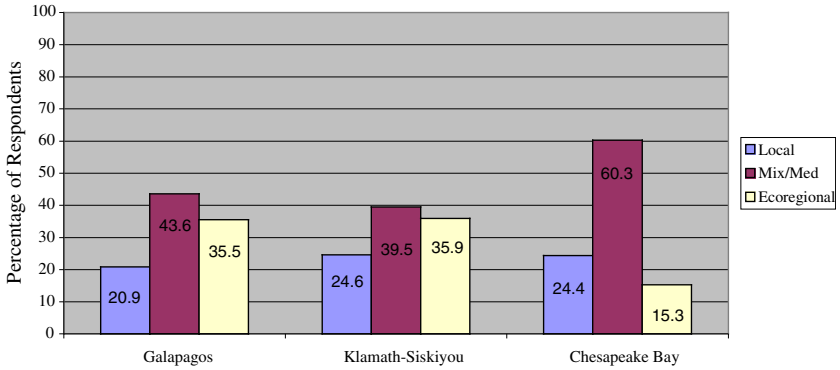

Fig. 1 Percentage of respondents in each scale-of-place category

In the Klamath-Siskiyou, as in Galapagos, responses from about one-third of the surveys (35.9 %) indicated ecoregional-scale place connections. For some respondents, the reasons may be ideologically based: Klamath-Siskiyou has a sociocultural history of being a region, thanks in part to the mythical State of Jefferson, which grew from an 1850s political movement with the desire to form its own state. Notably, the boundaries of this "state" map align with those of the ecoregion. This regional continuity seems to permeate the mindset of many Klamath-Siskiyou residents, as evidenced by the art and literature of the region, and may facilitate conceptualization of the Klamath-Siskiyou at an ecoregional scale.

Geographical differentiation may also be important, particularly on the ecoregion's northern border, where visible changes are stark: driving south on Interstate 5, one quickly passes from the lush Willamette Valley into the Klamath-Siskiyou's rugged, dry mountains. One interviewee explained:

> ". . . . I think of Southern Oregon as a working area and an environment that's different from the rest of the Pacific Northwest. . . . There's a lot less rain and it's hotter and drier and less humid."

In the Chesapeake Bay, respondents less commonly discussed the overall region, and a much smaller proportion of respondents (15.3 %) indicated a place connection on an ecoregional scale. For those who did, that larger scale was more often related to political than ecological boundaries. The few who related strongly and specifically to the ecoregional scale worked professionally at that scale and credited their work with nurturing and enhancing their ecoregional connection.

When referring to the character of the Chesapeake Bay ecoregion, many interviewees specifically emphasized the areas of the ecoregion bordering the Bay itself, although that part of the ecoregion comprises a relatively small proportion of the overall landscape. Interviewees spoke of Bay culture such as skipjacks,[5] crabbers, and watermen; few discussed urban residents in Washington, DC, or Baltimore, or farmers along the Susquehanna River. One interviewee who had recently returned after many years living away from the region said:

> "To me, [the Chesapeake Bay] is the skipjack and the sunset. You know, sitting around a table like this with some friends and a beer and some steamed crabs. Oysters in the fall. The reflected color of fall leaves in the water. The sailboats. The Canada geese flying in . . ."

Ethnographic findings supported interview data, suggesting that such perceptions of watermen and Bay culture are common and reinforced through media reports, marketing campaigns, art, music, literature, and other cultural artifacts in the ecoregion.

Overall, approximately one-third of residents in Klamath-Siskiyou and Galapagos expressed ecoregional-scale connections, and in Chesapeake Bay, the percentage dropped to about half of that (15 %). Interestingly, and perhaps not surprisingly, the largest ecoregion (by geography and population) has the smallest percentage of people who related to the ecoregional scale. The Chesapeake Bay ecoregion is not only vast, but also is geographically somewhat indistinct from neighboring ecoregions. The boundaries are porous and not easily visible. This is in contrast to the other two ecoregions with more visible, distinctive boundaries and historical, ecoregion-wide identities.

Examining Sense of Place across Scales

One-way ANOVAs were used to explore differences in averages of the sense-of-place index among the scale groups within each site; that is, I considered whether the average sense-of-place scores for individuals with place connections at the local, mixed/medium, and ecoregional scales differed significantly from each other (see Table 7). In Galapagos, no significant differences appeared in terms of average sense of place among the three scale-of-place groups. In the Chesapeake Bay, those with mixed/medium-scale place connections possessed a significantly different (i.e., slightly more positive) sense of place than those with ecoregional-scale connections. However, neither of the averages for those two categories differed significantly from that of the local-scale category.

Notably, Klamath-Siskiyou respondents with a local-scale place connection had a significantly lower (i.e., slightly less positive) average sense of place than respondents in the larger scale-of-place categories. In general, these findings indicate that the valence of sense of place among those who describe a connection to place at a more localized scale is either no different from or less strong than that of people with a mixed/medium or ecoregional scale. As such, the findings challenge notions that (eco)regions offer scales inappropriate for attachment because of the inability for direct interaction (e.g., Tuan 1975; Orr 1992) and indistinctive borders (Lewicka 2011). Rather, the findings suggest that the sense of place experienced by individuals whose connections occur at a mixed/medium or ecoregional scale are just as positive as—and in the sense of Klamath-Siskiyou, perhaps more positive than—those with smaller-scale (local) connections.

Factors Associated with a Sense of Place at an Ecoregional Scale

Once it was determined that some respondents did indeed express a feeling of connection to place at an ecoregional

[5] Skipjacks are traditional Chesapeake Bay fishing boats.

Table 7 Average sense-of-place scores in each scale-of-place category

Site	n	Local	Mixed/Medium	Ecoregional	One-way ANOVA
Galapagos	330	4.26	4.23	4.24	F=0.085; df=2,327; p=.919
Klamath-Siskiyou	248	3.56	3.92[a]	3.93[a]	F=7.788, df=2,245, p=.001
Chesapeake Bay	320	3.53	3.74[b]	3.41	F=6.607, df=2,217, p=0.002

[a] Significantly higher than local-scale (Klamath-Siskiyou)

[b] Significantly higher than ecoregional-scale (Chesapeake Bay)

scale, and that sometimes the connection to place among these respondents was higher than among respondents with a local scale of place, the next question pursued was what might be associated with developing a sense of place at that scale. Several key factors were found to be consistently related to an ecoregional-scale sense of place (see Table 8). The most striking factors included education, occupation, having heard the place referred to by name or as an "ecoregion," and the political boundaries.

Education

Education was the only survey-derived factor that was consistently, across all three sites, associated with possessing a larger-scale sense of place.[6] Individuals with higher reported levels of formal education were more likely than those with less education to possess a sense of place at a larger (mixed/medium or ecoregional) scale. This finding is consistent with perspectives put forth by Tuan (1974), Giddens (1991), and others who describe phenomena of cosmopolitanism and globalization—which are accompanied by increasing education and mobility—as having the potential to shift people's place connections from smaller to larger scales. With this shift, individuals may become less dependent on specific locales and places.[7] Relatedly, through formal education, residents may be exposed to geographical and environmental concepts that provide a platform for conceptual understanding of larger-scale ecosystem processes.

Occupation

Another important factor was occupation. In general, those who worked at the ecoregional scale were more likely to express ecoregional-scale place connections. In Galapagos, survey respondents who indicated that they worked in the tourism sector, which requires them to work throughout the region, were significantly more likely to have an ecoregional-scale sense of place (χ^2=37.535; df=2; p=.000) than those working in other sectors. This was not true in the other two ecoregions: in neither the Chesapeake Bay nor Klamath-Siskiyou was a particular occupation significantly associated with possession of a larger-scale sense of place (χ^2 ranged from 0.273 to 4.038; p>.05 and χ^2 ranged from 0.049 to 3.360; p>.05, respectively).

Interview data supported this finding. In the Chesapeake Bay, a Virginia Department of Environmental Quality employee said:

> "I've been fortunate to visit personally [different parts of the region]. It all feels like family. It's like visiting one set of cousins and then the other set of cousins. I really credit my [larger-scale] connection with organizing … citizen public hearings that moved around [the Chesapeake Bay]."

In Galapagos, a fisherman's cooperative leader said, "This is the part [of Ecuador]—Galapagos—that I identify with. Not just [the town of] Puerto Ayora, but the Galapagos as a whole . . . because this is my livelihood . . . I travel for work—fishing. I am not damaging the marvelous things of Galapagos. That's what attracts me to it."

Area Referred to by Name or as an Ecoregion

On the survey, respondents were asked whether they had heard their area referred to as an "ecoregion" and, in the Chesapeake Bay and Klamath-Siskiyou, whether they had heard their area referred to by name (i.e., as the "Chesapeake Bay" or the "Klamath-Siskiyou"). In Galapagos, the latter was not asked as it did not make sense in that site, since it can be assumed that all survey respondents would have heard the area referred to as "Galapagos" as the name reflects actual political boundaries.

In both the Chesapeake Bay and the Klamath-Siskiyou, those responding positively to these two questions were more likely to indicate larger-scale place connections. The

[6] In Klamath-Siskiyou and Galapagos, the relationship was significant (χ^2=23.501; df=4; p=.000 and χ^2=15.537; df=4; p=.004, respectively). In the Chesapeake Bay, the relationship approached significance (χ^2=8.940; df=4; p=.063).

[7] See Stedman and Ardoin (2013) for further discussion of localism, cosmopolitanism, and its relation, in particular, to the place-based education movement.

Table 8 Key factors associated with ecoregional sense of place (Qualitative data findings in *italics*)

Galapagos	Klamath-Siskiyou	Chesapeake Bay
[a]Education	[a]Education	[b]Education
[a]Work in tourism sector	*Work at ecoregional scale*	*Work at ecoregional scale*
	[a]Referred to by name	[a]Referred to by name
	[b]Referred to as "ecoregion"	[a]Referred to as "ecoregion"
	Political boundaries	*Political boundaries*
		[a]Amount of travel away from ecoregion
[a]Income		

[a] Findings derived from survey data and significant at $p<.05$ based upon chi-square statistics

[b] Survey finding, approached significance as noted

relationship between scale of place and having heard areas referred to by name was significant in Chesapeake Bay and Klamath-Siskiyou.[8] The findings were more mixed with regard to the question about areas being referred to as ecoregions: the relationship with larger-scale sense of place was significant in Chesapeake Bay and approached significance in Klamath-Siskiyou.[9] Having heard the term "ecoregion" may be an important factor in facilitating perception of one's place on this scale, yet in Galapagos, having heard the area referred to as an ecoregion had no significant relationship with possessing an ecoregional-scale sense of place.[10]

Tuan (1974) asserts that geographically and cognitively defined spaces are more conducive for creating meaning and, subsequently, attachment. These findings support that assertion: In Galapagos, where the ecoregion itself is geographically and politically clearly defined, having the additional demarcation of "ecoregion" may not be particularly helpful. However, in the other two sites, the suggestion that the area may be conceived of as an integrated unit unified by virtue of a contiguous ecological system may encourage conceptualization of the place at an ecoregional scale.

Political Boundaries

The extent to which respondents connected with, visualized, and responded to political boundaries was also an important variable associated with scale of place connections. Interview data in two of the three ecoregions (Chesapeake Bay and Klamath-Siskiyou) suggested that allegiance to and awareness of political boundaries may influence the scale of people's connections. Individuals whose perspective was focused on state-level boundaries seemed more likely to connect at a scale smaller than the ecoregion and, by extension, less likely to connect at an ecoregional scale. That this finding should emerge from the Chesapeake Bay and Klamath-Siskiyou sites, but not the Galapagos ecoregion, is not surprising. The two U.S. ecoregions cross state lines, whereas the Galapagos ecoregion is confined to a single, unified state.

In the Chesapeake Bay, interview respondents discussed state boundaries more than in the other sites, perhaps because the ecoregion includes six politically diverse states and the District of Columbia. Frequently respondents expressed a rivalry between Maryland and Virginia, the two states central within the ecoregion and possessing bayside frontage. The intensity of emotions tied to state boundaries and the challenges posed by ecoregional boundaries overlapping state boundaries is evident in this comment from a farmer on the Eastern Shore of Virginia, part of the contiguous Delmarva (Delaware, Maryland, and Virginia) Peninsula:

> "I'm really into state's rights and think that people should be able to govern themselves locally. I think that people should be in control of their own destiny and it's not right for me in Virginia to say something to somebody in Maryland who I may not fully appreciate—I may not understand what's going on there both culturally, socially, politically."

Travel Away from Area

Similar to notions of political boundaries, the literature suggests that traveling away from a place and then returning may change people's relationship with a place (Gustafson 2009), at times allowing people to better visualize the borders of a place, understand the uniqueness of the local landscape and wildlife, appreciate the local culture, and perhaps become more interested in engaging with local activities (Case 1996). Thus, one might imagine that more frequent travel away from one's place could be associated with a more positive sense of place and larger-scale understanding of place-within-context.

This study's findings indicated that amount of travel away from "here" was indeed significantly related to an ecoregional-scale sense of place, but only in the Chesapeake Bay—the largest and least geographically distinctive site

[8] Chesapeake Bay: $\chi^2=6.374$; df=2; $p=.041$; Klamath-Siskiyou: $\chi^2=11.29$; df=2; $p=.004$.

[9] Chesapeake Bay: $\chi^2=12.899$; df=2; $p=.002$; Klamath-Siskiyou: $\chi^2=5.28$; df=2; $p=.071$.

[10] In Galapagos, the relationship between the scale-of-place index and having heard the area referred to as an ecoregion was not significant ($\chi^2=3.595$; df=2; $p=.166$).

(χ^2=17.9; df=6; p=.006). In the other two sites, travel away from the place was not significantly related with the scale at which people felt connected to their place; this may be due to the smaller size of the Galapagos and Klamath-Siskiyou regions. Residents of smaller ecoregions may not need to travel away to appreciate and understand their place because the smaller nature of their area makes it easier to comprehend the boundaries of the ecoregion and lends itself to a more cohesive culture that is easily identifiable as distinct and invaluable.

Relationship Between Ecoregional-Scale Sense of Place and Environmental Action

The third research question explored associations between environmental behavior and ecoregional-scale sense of place. The survey first asked respondents to indicate their level of concern regarding a list of environmental and planning-related issues commonly cited by the news and other residents as local concerns. Next, respondents were asked to free list their top three personal concerns for the area. Many of these related to the environment, likely prompted by the previous question. Both of these items were intended to prime respondents to consider a variety of potential threats to their place and other area-related issues upon which they may have acted in the past or upon which they may take action in the future.

Taking Action

After asking respondents to consider a variety of concerns that were potential threats to their place, I asked respondents whether they had taken action to address those or other concerns. In each site, no more than half of the responses were affirmative: 42.9 % of Galapagos respondents reported having taken action (n=330), 41.1 % in Klamath-Siskiyou (n=248), and 50.2 % in Chesapeake Bay (n=320).

I examined the scale of place connections of respondents who had taken action. In Galapagos, individuals with a larger scale sense of place (i.e., mixed/medium or ecoregional) were significantly more likely to be involved in taking action than those with a local-scale sense of place (see Table 9). A similar relationship exists in the Klamath-Siskiyou, although the relationship only approaches significance. In Chesapeake Bay, the preponderance of individuals reporting action fall into the mixed/medium category. The pattern across all three sites is interesting to note: Individuals falling into the mixed/medium and ecoregional categories were more likely to report having taken action to address their concerns.

When interpreting these results, it is important to consider respondents' education. A direct examination of education level and having taken action indicates that the two are significantly related in all three sites.[11] Because education was also associated with possession of a larger-scale sense of place, it is difficult to parse whether the relationship between mixed- and ecoregional-scale place connections and a greater likelihood of taking action represents a direct relationship between scale and action, or whether the direct relationship is between education and action, with the scale mediating that relationship. The findings suggest the latter as the relationship between education and action was significant in all three sites, while the relationship between scale of place and action was significant only in Galapagos (and approaching significance in Klamath-Siskiyou).

Perceiving one's place at a larger-than-local scale may facilitate understanding of how an individual action may combine with others to create broader change, particularly in a place where the effects of action may be more visible such as an island ecosystem (Hay 2006). These nuances and potential relationships need to be explored through further research.

Types of Actions Taken and Reasons for Action

Perhaps most striking when considering actions taken is how similar the percentages reporting certain actions are for the U.S.-based sites, Chesapeake Bay and Klamath-Siskiyou (see Fig. 2). In both, the most frequently reported actions were talking with family and friends and volunteering time to address an issue of concern. The findings diverge slightly in the next two categories: donating money to address an issue or attending rallies. Notably, attending rallies is the most frequently reported action in Galapagos, followed by talking with friends. These findings reflect differences in the sites: in Galapagos, rallies frequently take place on the main streets of town, an avenue for demonstrating opposition to or support of a policy or action. In the U.S., making charitable donations and volunteerism are cultural norms (Charities Aid Foundation 2011).

Across the three sites, the most commonly cited reason for respondents who had not taken action (Chesapeake Bay N=152; Klamath-Siskiyou N=139; Galapagos N=180) was lack of time (51 %; 45 %; and 35 %, respectively). The consistency among sites and dropoff in responses, beyond this top reason,

[11] Education level, consolidated into three categories (primary and intermediate; secondary and technical; and university or more), was examined related to whether respondents had reported taking action. Pearson's chi-square indicated a significant relationship between education and taking action among residents of all three ecoregions, such that the more formal education a respondent had, the more likely that person was to report having taken action to address concerns related to his/her place. (Galapagos: χ^2=18.235; df=2; p=.000; Klamath-Siskiyou: χ^2=17.025; df=2; p=.000; and Chesapeake Bay: χ^2=51.780; df=2; p=.000).

Table 9 Taking of action by scale of place connections

Site	n	Local	Mixed/medium	Ecoregional	Statistics
Galapagos	141	11.4 %	49.7 %	39.0 %	χ^2=13.830; df=2; p=.001
Klamath-Siskiyou	97	15.5 %	44.3 %	40.2 %	χ^2=5.665; df=2; p=.059
Chesapeake Bay	159	22.0 %	59.7 %	18.2 %	χ^2=2.470; df=2; p=.291

is remarkable: the next most commonly selected responses fall to 15 % and below (see Fig. 3). This is reflective of what other studies on volunteering and community engagement have found: that people commonly cite lack of time as the primary reason for not becoming involved in undertaking environmental actions and community activities (Sundeen *et al.* 2007).

Scale of Place and Scale of Actions Taken

A series of items explored the scale at which respondents had taken action, including whether the scale at which respondents had taken action (or were likely to take action) was associated with their scale of place connections.

First, I asked respondents at which scale they had taken action (or, if they reported not having taken action, I asked, if they *were* to take action, at what scale they would be most likely to do so). The response levels from which they could choose included (as appropriate by site) neighborhood, town, county/island, region, national, or international.

In all three sites, frequencies of reported scales of action varied (Fig. 4). In Galapagos, the island level was most frequently reported; in Klamath-Siskiyou, the town level; and in Chesapeake Bay, the neighborhood level. It is interesting to note that, among these three sites, individuals inhabiting the largest ecoregion (Chesapeake Bay) most often reported taking action at the smallest scale (neighborhood) and vice-versa.

Next, I considered the scale at which respondents acted or would act in relation to the scale at which they connected with their place. In general, across all three ecoregions, as respondents' scale of place became larger, they were significantly more likely to take action at larger scales (Table 10). In Galapagos, for example, those with local and mixed/medium-scale place connections were significantly more likely to report having taken action (or being willing to take action) at the neighborhood scale and, similarly, those with an ecoregional-scale sense of place were significantly more likely to have taken (or be willing to take) action at the regional scale, suggesting that respondents' scale of place connection was reflected in the scale at which they reported taking action. This same pattern was evident in the Klamath-Siskiyou: Those with mixed/medium- and ecoregional-scale connections were significantly more likely than those with local-scale connections to have taken action (or be willing to take action) at the regional level; a parallel relationship approached significance with regard to the national scale. Finally, in the Chesapeake Bay, those individuals with an ecoregional-scale sense of place were significantly more likely than those with mixed/medium- or local-scale senses of place to take action at the larger scales—county, regional, national, and international scales.

Reasons for Scale of Action

On the survey, I asked respondents why they had chosen a particular scale of action (see Fig. 5). Reasons given were relatively consistent across sites, with the largest percentage of respondents in all three sites selecting, "I think I can have the greatest impact at that scale." This was consistent with interview responses, as well as with the literature (e.g., Sommerville *et al.* 2009; Lukacs and Ardoin 2014). A

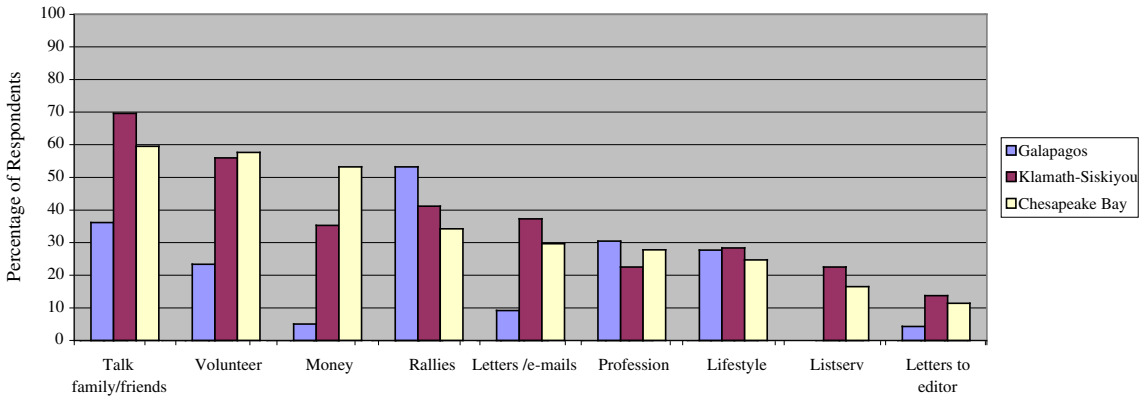

Fig. 2 Types of actions taken

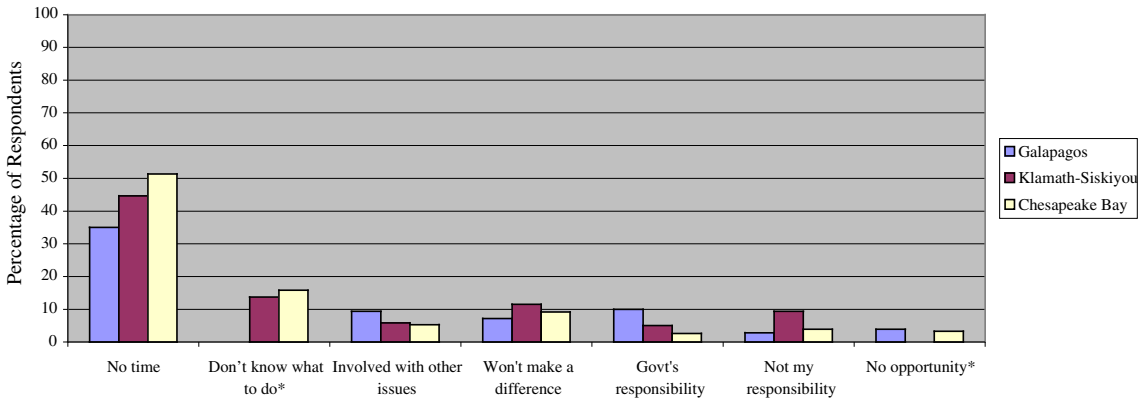

Fig. 3 Reasons for not taking action

Chesapeake Bay waterman described the importance of taking action at an ecoregional scale and how, even though these efforts require a great deal of time and take him away from his daily work, they are important because of the eventual local-scale impacts:

> "[My wife and I and six other fisherman would] go to meetings. I mean, we'd been to DC [about a 4-h drive]. … We had three different meetings with three different people about fishing regulations. … The regulations were just killing us, you know. … We were just gonna tell 'em how we felt and what it was doing to our fishing and our charger business and, well, it's a ripple effect, really. I mean, if I don't fish, people don't stay in Randy's motel, they don't eat in his restaurant. … They don't go in Margaret's [store] and buy a sandwich, or something like that, you know."

A Galapagos resident described the palpable commitment of people to their community, based on the impact they think they can have:

> "Before I moved here, I met some other people who were living in Puerto Ayora and they were all discussing the need for a new school out here and were willing to band together and really fight for it. That interest in being active in the community, and willingness to fight for what you want to see in your community, really impressed me. On the mainland, people didn't seem as willing to fight for their community . . . weren't as motivated to protect it or to make it the kind of place they'd want to live. In Galapagos, there's a strong feeling of social action and community activism."

Conclusion: Limitations, Future Research, and Implications

Considering this research within the context of several limitations is important. First, although this article presents findings from three diverse ecoregional contexts, it is not intended to be directly comparative among sites, nor is it intended to suggest that these sites are representative of ecoregions more broadly. As noted, while these sites were deliberately selected, a number of other ecoregions could also have offered helpful insights. The intention was to draw from an exploratory process in three varied ecoregions thus contributing to a productive dialogue.

Second, within sites, the individuals interviewed and surveyed were not intended to be representative of all ecoregional

Fig. 4 Scale of actions taken

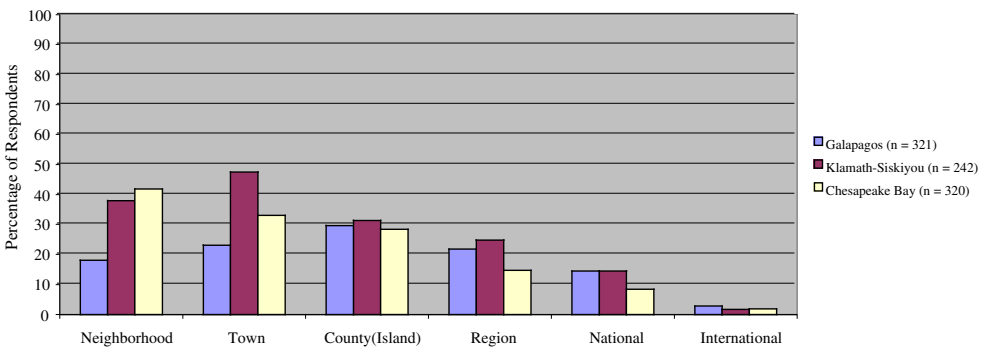

Table 10 Scale at which actions were taken/would be taken by scale of place

Scale	Galapagos	Klamath-Siskiyou	Chesapeake Bay
Local	Neighborhood		
Mixed/Medium	Neighborhood	Regional (National)	
Ecoregional	Regional	Regional (National)	County, regional, national, international

Includes statistically significant relationships ($p<.05$) based on Pearson's chi-squared tests. Items indicated in parentheses approached significance ($p<.1$)

residents. Interviewees were selected to provide a range of perspectives on place connections, concerns, and environmental behavior at a range of scales. Therefore, the findings only represent the individual participants and their perspectives at the time of the study, within the bounds of the study parameters. The surveys in particular are imperfect in their ability to represent complex issues in a structured and necessarily superficial manner. Yet the findings offer an initial foray into an area that, to this point, has been underexplored.

Finally, as noted in the qualitative data, context is key when discussing individuals in place. The way in which questions are asked and the context in which places are considered have great bearing on individuals' responses. Therefore, the findings should be considered within the context as described. The study was designed within the context of existing research and, thus, takes a particular perspective on what influences residents' place connections, scale of place, and environmentally related behaviors. Certainly, there are myriad other variables affecting respondents' place connections, environmental behaviors, and perceptions of scale, which are difficult to capture in the instruments used here. Yet, this exploratory research provides an initial step toward encouraging more robust discussion around scale (cf, Lewicka 2011), an area necessitating additional study.

Future Research

Previous sections note areas for future research; this section highlights those relevant for conservation policy and practice. This study explored an area that many note is underexamined in the place literature: the scale of place connections and, in particular, the (eco)regional scale. Yet it barely scratches the surface of the complex interactions among the factors explored and how they may affect residents' scale and strength of place connections. For example, the interplay among the variables of occupation, income, and education is complicated. This study, while highlighting the correlations, provides groundwork for future studies to further explore which variables may take precedence and under what conditions.

A second area relates to the need to better define the "mixed/medium" scale. Lewicka (2011) documents an overall dearth of research into scale and, when addressed, her evidence suggests an emphasis on scale as conceptualized in a political-economic (e.g., neighborhood, town, state, region, nation), rather than ecological (e.g., sub-watershed, watershed, ecoregion), form. Therefore, more precise instrumentation and language are needed to articulate and operationalize the scale occurring between the local and ecoregional. This area also requires further research to explain the difference between the two terms ("mixed" and "medium"), as well as their relationship to the local and ecoregional levels, and to develop more sensitive measures to parse between the two.

Another area for further exploration relates to whether an individual must form a strong place connection at a more localized scale before developing larger-scale place connections. This is of interest not only in this study, but also elsewhere in the place, environment, education, geography, and political economy literatures (e.g., Heise 2008; Greenwood 2012; Massey 1994; Somerville *et al.* 2009; Stedman and Ardoin 2013). The discrepancy between this

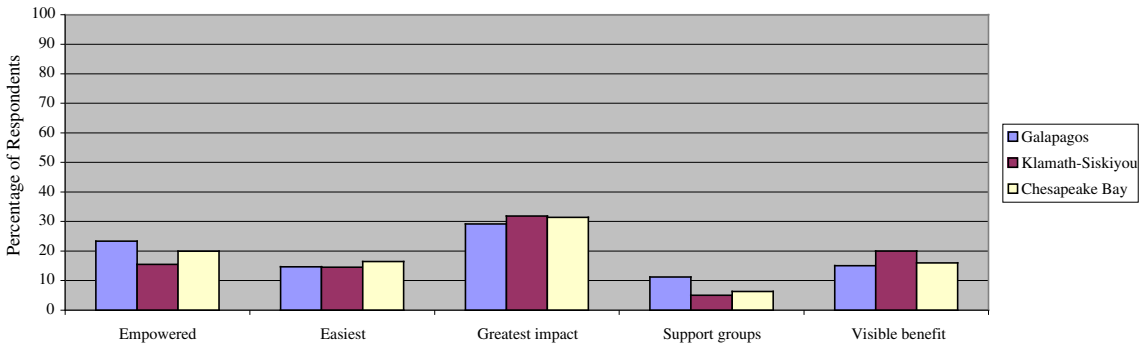

Fig. 5 Reasons for scale of action

study's findings (that local connections are not necessarily more positive) and what is often assumed suggests the opportunity to further explore the relationship between scale of place connections and sense of place. Further research would hold implications for place-based education and other social strategies related to environmental conservation, in particular those that encourage pro-environmental behavior.

Conclusions and Implications

This study's primary contribution lies in its attempt to illuminate whether and how place connections develop at an ecoregional scale—an area of interest when considering ecoregion conservation specifically, but also biodiversity conservation at any scale desiring to engage local people meaningfully. The study also considers the association of this concept with residents' active engagement in efforts to protect and improve their places.

Indeed, some residents do seem to develop a sense of place at an ecoregional scale; this was demonstrated in all three sites, despite differences in the "hardness" or "softness" of ecoregional boundaries, population sizes, geographical types, and other variables. Factors associated with this ecoregional-scale sense of place include the educational level as well as the scale of one's occupation. In a less consistent manner, other factors associated with an ecoregional-scale sense of place included income; having heard the area referred to as an ecoregion; and amount of travel away from one's ecoregion.

When examining sense and scale of place, it is interesting to note that, in contrast to what is suggested in much of the literature emphasizing the primacy of local connections (e.g., Hay 1998; Tuan 1975; Orr 1992), having a more local-scale sense of place was not necessarily associated with having a stronger sense of place. A significant relationship between scale of place and strength of sense of place was found in only one site (Klamath-Siskiyou), and in that instance, the relationship was such that individuals with larger-scale place connections actually demonstrated a stronger sense of place.

With regard to becoming engaged in place-related action, individuals with local, mixed, and ecoregional-scale place connections were equally likely to take action (or not) related to issues threatening their place. Of those who did take action, the relationship was generally significant between scale of place connections and the scale of actions: those with smaller-scale place connections were more likely to take action at a smaller scale and those with larger-scale place connections were more likely to take action at a larger scale.

For conservation organizations, these findings suggest opportunities for engaging residents at both local and ecoregional scales, although the same actions might not be compelling for individuals with smaller- and larger-scale place connections. An opportunity exists to develop avenues for involving residents in actions that bridge spatial and temporal scales such as civic engagement projects, citizen science activities that may include a migratory species that crosses local and regional boundaries, and policy initiatives that involve thinking collaboratively with multiple jurisdictions about longer-term initiatives.

These findings also suggest the need to develop a deeper, more nuanced understanding of ecoregional communities so that conservation initiatives build on local place values and connections. This could facilitate more open, effective engagement of residents in dialogue about conservation efforts from early stages of the ecoregion conservation process. To this end, it is essential for NGOs and agencies to recognize the complexity of the social landscape in areas where ecoregion conservation measures are being proposed and implemented. Also essential is recognizing that communities are not monolithic: Individuals possess a range of life histories and place connections. The socioeconomic assessment must go beyond an exploration of "economic" factors to include the "socio"—more deeply engaging with questions of culture, social structures, and residents' multidimensional affective, cognitive, and evaluative relationships with their places. Conducting in-depth research, including ethnographic elements and emphasizing qualitative data that privilege local voices and perspectives, during early stages of conservation planning is critical.

These findings are intended to help inform more thoughtful strategies for involving people in ecoregion conservation, which is often pursued as a top-down approach. The opportunity exists, and indeed it may be imperative, to create strategies from the ground up, recognizing the complex interwoven place relationships that already exist and form the basis for powerful connections among diverse, thriving ecosystems and human health and wellbeing. Biodiversity conservation has the opportunity to authentically and thoughtfully work within the existing social landscape. In this way, conservation can honor local people and provide opportunities for meaningful action building on existing place connections, as well as people's desires for a safe, economically secure, and biologically diverse environment.

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