# Protocol for the Integration of Human Dimensions into Implementation Strategy Starter Packages

**Lead author:** Dr. David J. Trimbach

**Contributors:** Dr. Kelly Biedenweg, Dr. Trina Wellman, Leah Kintner, Dr. Kari Stiles, Emilie Franke, Mike Johnson, SSAC

**Overall goal and intent of this protocol:** The goal of this protocol is to provide guidance supporting the integration of human dimensions (HD) into Implementation Strategy Starter Packages (hereafter referred to as "Starter Packages").

Implementation Strategies (ISs) are plans for accelerating progress toward the 2020 ecosystem recovery targets for the Puget Sound Vital Signs (VSs). ISs describe current context, rationale, logic, and proposed mechanisms for meeting VS indicator recovery targets. ISs are collaboratively developed by experts with local and regional input.

The Starter Package Guidance (hereafter referred to as the "guidance") outlines guidance for Starter Package development. The goal of a Starter Package is to compile background information and best available science needed to complete situation analysis, identify key uncertainties, assess effectiveness of recovery actions and programs, identify and prioritize recovery approaches. This protocol supports the guidance and focuses on the HD of recovery.

## FULL INTEGRATION OF HD INTO STARTER PACKAGES CAN HELP:

1. inform guidance, Starter Packages, IS development, and overall IS efforts;
2. identify where/how HD can be included in the Starter Package development process;
3. identify potential HD experts, partners, and resources by IS;
4. consider the roles and benefits of social science, HD, and human wellbeing in recovery;
5. consider equity as an aspect of IS Starter Packages and ecosystem recovery; and
6. integrate HD as an aspect of IS and broader ecosystem recovery efforts.

**Regional context:** The Puget Sound Partnership (hereafter referred to as "the Partnership") supports the integration of HD in its recovery efforts and recognizes the key role of social science and HD (see Appendix A). This recognition is illustrated by the following: (1) development of and reporting on Human Wellbeing Vital Signs as measures of ecosystem health and recovery (Appendix B); (2) adoption of a social-ecological systems (SES) model for recovery (Appendix F); (3) inclusion of HD in the Partnership's Action Agenda; (4) inclusion of human wellbeing in planning (Appendix I); and (5) integration of HD into Starter Packages. The integration of HD will ensure a more comprehensive, diverse, inclusive, and equitable approach and discussion to recovery. Better integration will also ensure multiple recovery benefits.

**Using this document:** This document partly mirrors the guidance with the intention of protocol-guidance integration; however, this document can also be used as a stand-alone guide. This document focuses on (1) understanding social science and HD and (2) directly integrating HD into Starter Packages. Additional detailed insights can be found in the Appendices.

# TABLE OF CONTENTS

**Section 1. Understanding Social Science and HD for IS Starter Packages ..... 3**

Section 1.1. What is social science? ..... 3
Section 1.2. Why does social science matter? ..... 4
Section 1.3. What is a social-ecological system (SES)? ..... 5
Section 1.4. What is human dimensions (HD)? ..... 6
Puget Sound Vital Signs ..... 7
Section 1.5. What is human wellbeing (HWB)? ..... 8
Section 1.6. How diverse are the social sciences? ..... 9
Section 1.7 What is Economics and 1.7a. What Can Economics Address ..... 10
Section 1.8. What methods are used in the social sciences? ..... 11
Section 1.9. What can social science address? ..... 12
Section 1.10. What are potential barriers to integrating social science? ..... 13
Section 1.11. How has the Puget Sound Partnership integrated social science? ..... 14
Section 1.12. What are the differences between social approaches and social science? ..... 15
Section 1.13. What is Structured Decision Making ..... 16

**Section 2. Integrating HD into Implementation Strategy Starter Packages ..... 17**

Section 2.1. HD and Implementation Strategies ..... 17
Section 2.2. Guiding Overarching Questions for HD Integration ..... 17
Section 2.3. Integrating HD into IS people and processes ..... 18
Section 2.3.1. Integrating HD partners into IS ..... 19
Section 2.3.2. Who are potential HD partners for IS? ..... 22
Section 2.4. Integrating HD Content into the IS Starter Package ..... 23
Section 2.4.1. Integrating HD into Phase 1: Pre-IS preparation ..... 23
Step 1. Recruit HD partners for an Interdisciplinary Team
Step 1.1. Develop criteria for HD partner Interdisciplinary Team membership
Step 1.2. Invite potential HD partners as Interdisciplinary Team members
Step 1.3. Begin to identify specific HD expertise needed and establish potential subgroups
Step 2. Starter Package: Making use of HD knowledge about current conditions and strategies
Step 2.1 Starter Package content development process
Step 2.2 Starter Package content and information source recommendations
Section 2.4.2. IS HD content development-IDT and partner workshops ..... 27
Step 3. IDT Workshop 1-Foundations for including HD
Step 4. IDT workshop 2-situation analysis that includes HD
Step 4.1 HD Subgroup workshops (optional)
Step 5. IDT workshop 3-HD integration into strategy prioritization and logic development
Step 5.1 Subgroups-HD integration into the development and refinement of results chains
Step 6. IDT workshop 4-Review HD-integrated results chains and recovery schematic
Step 7. Integrating HD into the Technical workshop
Step 7.1 Workshop to review key HD-relevant uncertainties, research, and monitoring needs
Step 8. Broader HD partner workshop
Step 8.1. Work sessions to identify priority policy changes, activities, or programs
Step. 8.2. Workshop for human wellbeing review
Step 8.3. Estimate costs
Step 8.4. Describe adaptive management priorities and processes
Section 2.4.3. Phase 3: Finalizing HD content, review, and endorsement ..... 33
Step 9. IDT workshop 5-HD-integrated synthesis

**Broader Management Conference Briefings ..... 34**
**References ..... 35**
**Outline of Appendices ..... 40**

**Recommended Citation:** David J. Trimbach, Kelly Biedenweg, Trina Wellman, Emilie Franke, Leah Kintner, Kari Stiles, Mike Johnson, and Social Sciences Advisory Committee. 2020. Protocol for the Integration of Human Dimensions into Implementation Strategy Starter Packages. Puget Sound Partnership: Tacoma, WA.

# UNDERSTANDING SOCIAL SCIENCE and HUMAN DIMENSIONS for IMPLEMENTATION STRATEGY STARTER PACKAGES

# SECTION 1. UNDERSTANDING SOCIAL SCIENCE AND HD FOR IS STARTER PACKAGES

## SECTION 1.1. WHAT IS SOCIAL SCIENCE?

Social science consists of the academic body of theory, knowledge, and research methods aimed at understanding social systems. The foundational social sciences based on empirical study include anthropology, economics (see Appendix N), geography, political science, psychology and sociology. Social science helps us understand and address the social or human dimensions (HD) of natural resource management and ecosystem recovery, including human wellbeing. Like other sciences, social science also relies on validity, reliability, representativeness, and generalizability; however, there are variations in interpretation and usage (see Appendix L).

Social science can help better understand and address a range of HD, including human-environment values, beliefs, attitudes, preferences, expectations, and interactions and can improve, "the likelihood of achieving and sustaining outcomes or impacts desired," among diverse partners (Decker et al. 2012, p. 7). Within the context of the Partnership, social science is operationalized as a constituent component of human dimensions (see Figure 1), which also includes management and communications (see Section 1.4). For full Partnership HD terminology, see Appendix C. For more information related to economics and integration of economics, see Appendix N.

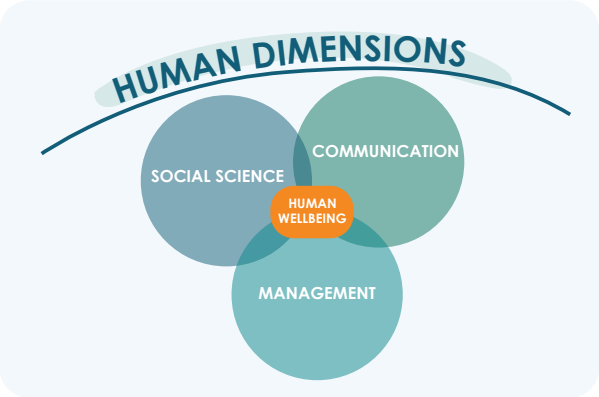


Figure 1. Human Dimensions Operationalized

EXAMPLES OF
### SOCIAL SCIENCE

1. Economic valuations of ecosystem services (like water filtration)
2. Understanding how governance or political processes shape environmental decision-making outcomes
3. Examining what shapes human behavior as it affects and is affected by the environment

## SECTION 1.2. WHY DOES SOCIAL SCIENCE MATTER?

Social science matters because it provides innumerable benefits and advantages for ecosystem restoration efforts **(see Sidebar 1).** Social science provides concepts, methods, theories, toolkits, and approaches necessary to understand, address, and integrate HD and Human Wellbeing (HWB) into ecosystem recovery, including through ISs. Social science can also inform and contribute to social-ecological systems approaches and models, as is used by the Partnership (see Appendix B). Scholars and practitioners alike increasingly recognize the importance and potential contributions of social science in conservation, fisheries and wildlife, ecology, environmental studies, and natural resource management, among other fields (Bennett et al. 2017; Lauber and Decker 2012; Ford et al. 2015; Guerrero et al. 2018; Redman et al. 2004; Robinson et al. 2012; Wellman et al. 2014). Social science broadly provides social, behavioral, political, economic, spatial, historical, cultural, and psychological lenses that can be used to magnify a wide variety of HD or human aspects of ecosystem restoration. Trimbach (2018) notes that, "social science can reveal and/or address the social aspects or HD of ecosystem restoration, including, but not limited to: social-ecological tradeoffs; management practices and governance; stakeholder engagement; diverse values, identities, and interests; local context and setting; and social equity," (p. 8). According to Decker et al. (2012), social science can provide useful information and, "knowledge of human values, beliefs, attitudes, preferences, and expectations," about social-ecological interactions and can help improve, "the likelihood of achieving and sustaining outcomes or impacts desired by stakeholders," (p. 7). Wellman et al. 2014, provide some key highlights of the role social science has played in ecosystem restoration efforts in the Puget Sound region. Through social science integration, coordinated ecosystem restoration efforts can better understand and integrate these HD, including HWB, into decision making, programs, projects, planning (e.g., IS efforts), policies, and on-the-ground actions. Social science can be integrated within social-ecological (research) efforts through various dimensions, including: (1) conceptual (considers social and ecological system components and the two-way interactions within social-ecological systems); (2) methodological (incorporates multiple frameworks, tools, theories, and methods); (3) disciplinary (includes approaches and content from multiple disciplines); and (4) functional (integrates diverse stakeholders, practitioners, and researchers that assist with bridging science, policy, and practice) (Guerrero et al. 2018).

### SIDEBAR 1. SOCIAL SCIENCE CONTRIBUTIONS

"…social scientists can explain how and why people affect the environment, how the environment affects human wellbeing and quality of life, what kinds of policies do and do not work to change human behavior, and which social systems are best adapted to sustaining natural resources. (Wellman et al. 2014, p. 299)"

### EXAMPLE

*Social science continues to be considered important to and integrated into the United States National Estuarine Research Reserve System. Social science (Robinson et al. 2012) has been used to understand through a case study analysis how this integration process is going and what successes, challenges, and best practices may be for effective social science integration. This protocol and its associated tasks are also an example of social science integration and its recognized importance within ecosystem recovery efforts within the Puget Sound region.*

# SECTION 1.3. WHAT IS A SOCIAL-ECOLOGICAL SYSTEM (SES)?

Human beings are an integral part of the ecosystem. The notion that humans are a part of and not apart from ecosystems, illustrates a linked social-ecological systems (SES) understanding of human-environment relations and interactions **(see Sidebar 2)** (Redman et al. 2004). SES broadly includes natural resources, natural resource users, and their interactions (Stern 2018). Human societies maintain complex reciprocal relationships with the natural environment and engage in an array of human-environment interactions. According to Harguth et al. 2015, "in a SES, subsystems such as a resource system (e.g. a coastal fishery), resource units (fish), users (fishermen), and governance systems are all relatively separable but interact to produce outcomes at the SES level," (p. 1).

## SIDEBAR 2. SOCIAL-ECOLOGICAL SYSTEMS (SESS) CAN BE DEFINED AS:

1. A system of interacting biophysical and social factors;
2. A system defined at multiple organizational, spatial, and temporal scales;
3. A system including a set of regulated resources (e.g. cultural, natural, social-economic); and
4. A system that is dynamic, complex, and continuously adapting (Redman et al. 2004).

## EXAMPLE

***Examples:*** *SES is reflected in the Partnership's SES conceptual model (Appendix F) for ecosystem recovery. The model illustrates the importance, need, and potential application of social science and HD integration into recovery efforts. The SES model reflects the interconnectedness of human behaviors, recovery actions, biophysical condition, human wellbeing condition, ecosystem services, and external drivers (p. 4).*

# SECTION 1.4. WHAT IS HUMAN DIMENSIONS (HD)?

Social science can help us understand the HD of ecosystem recovery. HD include the full spectrum of ways in which people relate to the environment including actions and behaviors that affect the health of the Puget Sound as well as the ways in which people benefit from engagement with the natural environment of Puget Sound (see Appendix C). HD reflect the complex reciprocal relationship and interactions between humans and the environment, including interactions connected to all things social, cultural, linguistic, behavioral, political, economic, psychological, and geographic (Beeco and Brown 2013; Biedenweg 2016; Biedenweg et al. 2014; Briske et al. 2011; CMP 2016; King et al. 2015; Lauber and Decker 2012; McDowell and Koppes 2017). The application of HD in ecosystem recovery takes many forms, which include considering, monitoring, and measuring human wellbeing as an aspect of ecosystem health and vitality. For an introduction to Puget Sound HD, see: Birkeland et al. 2015.

## EXAMPLE

*(1) Human behaviors that negatively impact the environment, (2) the implementation of fish consumption advisories aimed at reducing fishing in specific locales and fish consumption health risks, (3) the relationship between shellfish harvesting and sense of place (Poe et al. 2016), and (4) aspects of human wellbeing related to the natural environment, such as stewardship, sense of place, or good governance; (5) The North American Bird Conservation Initiative in collaboration with Virginia Tech launched an interactive HD success stories website, that seeks to better illustrate the wide range of HD of bird conservation efforts (see their site here); (6) The U.S. Federal government maintains a multi-agency-sponsored website dedicated to the human dimensions of natural resource management, that includes tools, resources, data, and publications (see their site here).*

# PUGET SOUND VITAL SIGNS

Figure 2. Puget Sound Vital Signs

## SECTION 1.5. WHAT IS HUMAN WELLBEING (HWB)?

Human wellbeing is a major example and representation of the HD of ecosystem restoration and environmental management (Biedenweg 2016; Biedenweg et al. 2014; Breslow et al. 2016). Human wellbeing (HWB) refers to an interdisciplinary perspective on what allows humans to thrive in relation to the environment. It includes human values and familiar topics such as physical and psychological health, as well as governance, social, cultural, and economic wellbeing (Biedenweg 2016; Jones et al. 2016; Faith 2015; Ford et al. 2015). Within the context of Puget Sound recovery, human wellbeing relates to people's engagement with the natural environment of Puget Sound, as reflected in the Partnership's Human Health and Quality of Life goals and associated Vital Signs (see green and orange in the Vital Signs handout on page 8) (**Figure 2**). The HWB Vital Signs (HWB VS) are social measures that illustrate the human or social aspects of ecosystem health and wellbeing in the Puget Sound region. The HWB Vital Signs were developed through a community-based process, that allowed communities to highlight what HD or aspects of wellbeing matter to them in the Puget Sound region. Through social science case studies (Biedenweg et al. 2014) and the integration of regional experts, the 11 HWB Vital Signs were designated as shared social measures of human wellbeing by the Puget Sound Partnership. The Economic Vitality VS was the first to be addressed and integrated into the Partnership VS efforts (see **Sidebar 3;** for more information on economics and integration of economics, see Appendix N**)**. The other (non-Economic Vitality) HWB VS were initially tested through a regional pilot study and the first regional HWB VS Survey was implemented among Puget Sound residents in 2018 (see Fleming and Biedenweg 2019, Appendix M). The HWB VS Survey results will inform the Partnership's Vital Sign work and can be used to inform the ecosystem recovery efforts among LIOs and Implementation Strategies (see Appendix M).

### SIDEBAR 3. ECONOMIC VITALITY VS

The Economic Vitality HWB VS was the first to be measured and tells us how well natural resource industries (e.g.: timber, fisheries, agriculture, commercial shellfish, tourism, and recreation) in the Puget Sound are doing economically over time.

### EXAMPLE

*The Puget Sound Vital Signs include numerous of human wellbeing, as illustrated by the various Vital Signs and their respective indicators. Economic Vitality is one designated HWB VS, that includes 3 indicators, including: (1) employment in natural resource industries; (2) natural resource industry output; and (3) percent of GDP (gross domestic product) in natural resource-based industries to total GDP. Additional information related to the integration of economics into Implementation Strategies, see Appendix N. Additional HWB VSs are described in Appendix B.*

# SECTION 1.6. HOW DIVERSE ARE THE SOCIAL SCIENCES?

Social science is a body of theory, knowledge, and research methods that consists of a diverse array of academic disciplines and fields. Social science contributes to how HD and HWB are understood, addressed, researched, and monitored within ecosystem recovery efforts. Social science can be conflated as a singular field or body; however, social science is diverse. While some social science disciplines overlap and maintain or cognates (shared focus areas), each discipline entails its own history, foundational concepts, key scholars, theories, methodologies, philosophies, approaches, norms, and vocabularies **(see Sidebar 4)**. This diversity can be intimidating or a challenge. While disciplines vary, collectively this broad amalgam of fields can offer data, concepts, theories, methods, and insights that can greatly impact and add value to ecosystem recovery efforts (Bennett et al. 2017). Additionally, social science fields and practitioners often work collaboratively through interdisciplinary efforts. Such work is particularly reflected within ecosystem recovery and natural resource management research and projects (Wellman et al. 2014). The non-exhaustive diagram (Figure 3) reflects the potential social science fields that may likely be integrated or used in efforts to integrate HD and HWB into IS Starter Packages. **Figure 3** highlights larger social science disciplines; however, environmentally-specific fields also exist (e.g.: environmental studies, environmental science, and political ecology) and these noted disciplines often contain subfields that are tailored for conservation and environmental research (e.g.: environmental anthropology, environmental economics, human-environment (interactions) geography, and environmental psychology) (Bennett et al. 2017). These fields are divided up into three overarching categories, which include (1) classic, (2) applied, and (3) arts and humanities. Note that different social scientists may understand these divisions differently or may integrate various fields within their particular field (e.g.: legal geography). For a detailed examination of varying social science fields and their potential benefits, see Bennett et al. 2017.

## SIDEBAR 4. GEOGRAPHY & PSYCHOLOGY

Geography can help us understand the spatial dimensions of human-environment or -place interactions and relationships across scales. Psychology can help us understand what factors influence how individuals make decisions to support or implement specific IS activities.

| CLASSIC SOCIAL SCIENCE | APPLIED SOCIAL SCIENCE | ARTS & HUMANITIES |
|---|---|---|
| • ANTHROPOLOGY<br>• ECONOMICS<br>• GEOGRAPHY<br>• HISTORY<br>• POLITICAL SCIENCE<br>• PSYCHOLOGY<br>• SOCIOLOGY | • COMMUNICATION<br>• DEVELOPMENT<br>• EDUCATION<br>• LAW<br>• PUBLIC HEALTH<br>• SOCIAL WORK<br>• PUBLIC ADMINISTRATION<br>• URBAN PLANNING | • ARTS<br>• HUMANITIES<br>• PHILOSOPHY |

Figure 3. Social science fields (altered from Bennett et al. 2017)

**EXAMPLES**

*When addressing Shoreline Armoring (IS and VS), different social science fields can play a role and can contribute varying information or data. (1) Law (Applied Social Science) can illustrate current legal issues, debates, and challenges associated with shoreline armoring management and regulations in the State of Washington (see DeLappe 2009). (2) Interdisciplinary social science can highlight private homeowner decision-making to better understand shoreline management (see Scyphers et al. 2015) and can reflect on the various HD of shoreline change (see Paterson et al. 2014).*

## SECTION 1.7. WHAT IS ECONOMICS?

Economics deals with the production, distribution, and consumption of goods and services, both market and non-market. In its most simple and concise definition, economics is the study of how society uses its limited resources. There is never enough labor or land or water to do all the things that individuals might wish. Because resources are scarce, it is necessary to make choices about how society will use what is available. We make choices, both individually and collectively, about the amount of money to devote to schools, roads, libraries, natural resource protection programs, etc. These choices are often based on complex trade-offs; thus, value is revealed in decisions about how individuals and society collectively choose to allocate these resources. Northern Economics, Inc. working in collaboration with Oregon State University and Puget Sound Partnership created an Economics Guidance document to complement the protocol and its appendices. The Economics Guidance document can be found in Appendix N.

## SECTION 1.7.A. WHAT CAN ECONOMICS ADDRESS?

Economics is one of many social sciences that can provide research to enable more accurate predictions of human responses to environmental policies, for example, and ideally result in improved ecosystem recovery across geographic scales. Ecosystem management and restoration decision making requires information that ranges widely from land-use impacts on natural resources to economic implications of changes to terrestrial and aquatic ecosystems. Environmental economists quantify the economic values of ecosystem goods and services as decision making tools for assessing social and ecological trade-offs. Economics can also help inform the development of incentive programs such as taxes and environmental service trading programs. Cost-effectiveness analysis can aid in decisions about which action alternative will provide the most benefit for the lowest cost. Benefit cost analysis can help assure that the most efficient solutions to ecosystems recovery are selected. And generally, economic criteria can aid in structured decision making by planners, managers and policy makers. The Economics Guidance document can be found in Appendix N.

### EXAMPLE

*A benefit cost analysis was conducted for Island County (Cote and Domanski 2019) to determine the benefits and costs of different shoreline protection strategies. The estimated private costs (e.g. installation cost), private benefits (e.g. shoreline access, land value), and public benefits (e.g. habitat for wildlife) vary across different shoreline protection strategies. This benefit cost framework can help property owners make decisions about shoreline protection strategies.*

# SECTION 1.8. WHAT METHODS ARE USED IN THE SOCIAL SCIENCES?

Social science encompasses and utilizes a variety of methods. Methods tend to refer to tools, techniques, and research practices (actions) that social scientists employ to collect or generate data and information. Social science methods include a diverse array of tools and techniques (**Figure 4**) that researchers use to acquire data and knowledge or answer questions (Bennett et al. 2017; Della Porta and Keating 2008; Leavy 2017). Methods can be categorized by type, including, but not limited to: Qualitative, Quantitative, Participatory, Evaluative, and Spatial (**Figure 4**). Note that the methods illustrated in the figure (**Figure 4**) are only a selection of tools, techniques, and even categories of methods used by social scientists. Research methods often vary depending on discipline (**see Section 1.4**) and framework (see Appendix L); although, many methods overlap among disciplines. For example, surveys and interviews are used as a method within social psychology and geography. For additional information on social science methodologies, see Della Porta and Keating 2008 and Bennett et al. 2017.

| QUALITATIVE | QUANTITATIVE | PARTICIPATORY | EVALUATIVE | SPATIAL |
|---|---|---|---|---|
| • CASE STUDIES<br>• INTERVIEWS<br>• FOCUS GROUPS<br>• PARTICIPANT OBSERVATION<br>• DISCOURSE/ TEXTUAL ANALYSIS<br>• ETHNOGRAPHY<br>• IMAGE ANALYSIS<br>• COGNITIVE MAPPING | • SURVEYS<br>• COST-BENEFIT ANALYSIS<br>• MODELING<br>• ECONOMIC VALUATION<br>• ECONOMIC IMPACTS<br>• COGNITIVE MAPPING | • COMMUNITY-BASED PARTICIPATORY RESEARCH (CBPR)<br>• ARTS-BASED METHODS<br>• ACTION RESEARCH | • MONITORING AND EVALUATION<br>• POLICY ANALYSIS<br>• CASE ANALYSIS | • GEOGRAPHIC INFORMATION SYSTEMS (GIS)<br>• COMMUNITY-BASED MAPPING<br>• 3-D MAPPING<br>• LIDAR<br>• GLOBAL POSITIONING SYSTEMS (GPS) |

Figure 4. Social Science Methods (altered from Bennett et al. 2017)

## EXAMPLES

*(1) When addressing Toxics in Fish (TIF) (IS and VS), different social science methodologies can play a role and can contribute varying perspectives to better understanding the HD of TIF. Public health researchers used surveys to understand how Asian American fish consumption practices, perceived fish consumption risks, and fish consumption advisory adherence (and effectiveness) (see Perez et al. 2012). (2) In order to understand and obtain data related to the HWB Vitals, a survey was developed and implemented among Puget Sound residents (see Fleming and Biedenweg 2019, Appendix M). (3) Working with the Land Development and Cover IS, the lead author of this protocol helped create a survey to better understand critical areas and ecosystem services among local environmental planners (see Appendix Q).*

# SECTION 1.9. WHAT CAN SOCIAL SCIENCE ADDRESS?

Social science can address an array of HD as broadly illustrated through social phenomena, social processes, and individual attributes (Bennett et al. 2017, p. 3) (**Figure 5**). Social science can also address and help better understand, measure, monitor, and research HWB, as illustrated by the HWB VSs. For an overview of social science within the context of Puget Sound ecosystem recovery, see Wellman et al. 2014.

| SOCIAL PHENOMENA | SOCIAL PROCESSES | INDIVIDUAL ATTRIBUTES |
|---|---|---|
| • CULTURE & WORLDVIEW<br>• DEMOGRAPHICS<br>• ENGAGEMENT &<br>• STEWARDSHIP<br>• GOVERNANCE<br>• IDEAS & NARRATIVES<br>• MARKETS<br>• NORMS<br>• POLITICS & POWER<br>• POLICY & LAW<br>• SENSE OF PLACE<br>• SHARED IDENTITIES<br>• SOCIO-ECONOMICS | • COMMUNICATING & MARKETING<br>• DECISION MAKING<br>• DEVELOPMENT<br>• EDUCATING<br>• MANAGEMENT<br>• SOCIAL ORGANIZATION | • BEHAVIORS<br>• ETHICS<br>• KNOWLEDGE<br>• PERCEPTION &<br>• PREFERENCES<br>• VALUES & BELIEFS |

Figure 5. Social science topic areas (altered from Bennett et al. 2017)

## EXAMPLES

*(1) When addressing Toxics in Fish (TIF) (IS and VS), social science can help address a wide array of TIF-relevant HD, including perceptions of fish consumption health risks and benefits (see van Dijk et al. 2011) and the economic impacts of fish consumption advisories (see MacNair and Desvousges 2007). (2) Social science can address issues of diversity, equity, and inclusion in relation to the environment. Washington-based organization Front and Centered conducted a community-driven project with communities of color to better understand the inequitable impacts of pollution and climate change in the Puget Sound region (see Front and Centered 2017). (3) Social science can highlight the relationships between the practice of shellfish harvesting and sense of place among tribal and non-tribal communities in the Puget Sound region, illustrating how people's multidimensional sense of place is informed by: nearshore activities; cultural practices and heritage; emotional and sensory experiences; and reproducing and strengthening social relationships (see Poe et al. 2016).*

# SECTION 1.10. WHAT ARE POTENTIAL BARRIERS TO INTEGRATING SOCIAL SCIENCE?

Substantial barriers or obstacles remain to understanding and integrating social science into ecosystem recovery (Robinson et al. 2012). It is important to recognize potential barriers with the intention of addressing them if and/or as they arise. In their analysis of social science integration among National Estuarine Research Reserves, Robinson et al. (2012) argue that social science integration is largely informed by (1) confidence in social science incorporation capabilities among environmental management practitioners and (2) perceived value and benefits of social science in practitioners' work, among other recognized barriers. For a more detailed examination of barriers see Robinson et al. 2012. Robinson et al. (2012) also highlight specific challenges as derived from their research. These challenges or barriers include: (1) time constraints; (2) lack of financial resources for social science; (3) lack of social science knowledge and expertise; (4) lack of understanding or acceptance of social science research by some practitioners; and (5) lack of projects or practical examples of social science integration (p. 1007). While barriers may vary and may not be entirely addressed, by recognizing these barriers, it may help overcome social science integration issues or challenges. This protocol is meant to address these barriers by providing a relatively concise document that will help potentially alleviate time constraints, a lack of social science knowledge, understanding, and/or acceptance, among other barriers.

## EXAMPLE

*Your IS team or group is tasked with developing a Starter Package; however, your limited project timeline, lack of funding or capacity, and lack of social science knowledge or engaged social scientists present perceived barriers to integrating social science into your Starter Package and/or IS development process. For assistance in addressing some of these barriers, see other subsections of Section 1 and Section 2 of this protocol.*

# SECTION 1.11. HOW HAS THE PUGET SOUND PARTNERSHIP INTEGRATED SOCIAL SCIENCE?

The Partnership since its formation has long advocated for the integration of social science in ecosystem restoration in the region (see Appendix A). The Partnership's efforts illustrate a wider shift within restoration to recognize and integrate social science into restoration planning and research (MEA 2005; CMP 2016). Social science integration has taken many forms through the Partnership's ongoing science-driven efforts. Social science is represented in the diverse science perspectives provided by the Science Panel and Social Science Advisory Committee (SSAC; advisory committee to the Science Panel). The SSAC is the primary social science guiding body and offer well-vetted HD integration questions (**Box 1**). Social science also contributes to the Partnership's focus on human wellbeing, as illustrated by the designated HWB Vital Signs (Biedenweg 2016), or metrics of ecosystem health that includes social metrics. Social science also contributes to the Partnership's integrated ecosystem recovery conceptual model (Appendix F) that emphasizes social-ecological systems. (see Appendix B). Social science is also reflected in a wide variety of ongoing projects at both regional (IS) and local (Local Integrating Organizations) levels of ecosystem recovery, including those focused on better understanding the collaborative governance structure of the Partnership and its array of partners (Koontz and Thomas 2018; Sayles 2018).

## BOX 1. HD INTEGRATION QUESTIONS:

1. Where is human behavior the root cause of barriers or challenges to recovery?
2. Which actions could have impact – positive, negative, mixed, or unknown – on human wellbeing (HWB)?
3. Where do current social, economic, or political conditions offer opportunities to advance recovery for HWB and/or the environment?
4. Is language used respectfully and inclusive of multiple stakeholders?
5. Is equity being considered in recovery approaches and actions?
6. Is there a fair distribution of risks and benefits?

## EXAMPLE

*Social-ecological systems refer to the integration of humans and nature into one complex, unified system. The social-ecological framework can help us understand how governance systems, people within a resource system, resource systems, and resources all come together to create the specific geographic context of situations. The framework also provides context for understanding influences from external ecological or human factors (for example, climate change, population change, or economic development).*

## SECTION 1.12. WHAT ARE THE DIFFERENCES BETWEEN SOCIAL APPROACHES AND SOCIAL SCIENCE?

Social science is often confused or conflated with what the Partnership calls social approaches (previously called social strategies). Social approaches include various approaches to engaging, informing, or integrating communities into ecosystem recovery efforts). While social science contributes to social approaches, they are not the same. Social approaches refer to methods and actions that focus on human attitudes and behaviors in a chain of outcomes toward some natural resource objective; while social science informs and can research social approaches, including the limitations, challenges, and best practices of various social approaches. Examples of social approaches include social marketing, education, and outreach. For a more detailed description, see Appendix G.

### EXAMPLE

*Social approaches may include different types of community outreach initiatives or programs; while social science may offer data, findings, and research to inform what types of community outreach initiatives or programs work the best for the specific target communities. Social science can also help understand stakeholders' behaviors and values, which can better inform potential outreach, education, or social marketing planning, implementation, and overall expectations.*

## SECTION 1.13. WHAT IS STRUCTURED DECISION MAKING?

Structured Decision Making (SDM) is a decision-making framework that helps organize and analyze a problem with the goal of making clearer, more transparent, and better informed decisions. SDM integrates the principles of Decision Analysis and Multi-attribute Utility Theory, insights from Behavioral Decision Theory, Psychology, and Economics. SDM allows a decision-maker to transparently evaluate, translate, and communicate predicted outcomes of actions to key partners or stakeholders. SDM seeks an explicit quantitative assessment of the trade-offs and consequences amongst a bundle of potential actions, allowing for a review of alternatives. SDM can employ a wide range of tools that can assist the facilitation of the SDM-informed decision-making process. It is generally based on a -step-by-step process that includes: (1) clarify context; (2) define objectives and measures; (3) develop alternatives or options; (4) estimate consequences and evaluate Trade-offs; and (5) implement, monitor, and review. For more SDM and/or DASEES details, please see Appendix O.

### SIDEBAR 5. DASEES AS A SUPPORT TOOL

Decision Analysis for a Sustainable Environment, Economy and Society (DASEES) is a free, web-based SDM support tool designed by the EPA. DASEES is one of few tools that provides a user-friendly interface to work through SDM's five-step process.

### EXAMPLES

*Island and Snohomish-Stillaguamish Local Integrating Organizations (LIOs) have used SDM via the DASEES tool to make Near Term Action (NTA) funding decisions. This process has allowed them to link recovery objectives with NTAs and prioritize NTAs. Northern Economics, Inc. working with the Habitat Strategies Initiative used SDM to conduct a benefit cost table.*

**END OF SECTION 1**

# SECTION 2. INTEGRATING HD INTO IMPLEMENTATION STRATEGY STARTER PACKAGES

## SECTION 2.1. HD AND IMPLEMENTATION STRATEGIES

Implementation Strategies seek to address and help accelerate progress toward the Vital Sign targets. ISs address and/or highlight: stressors, drivers, actions, barriers, uncertainties, priorities, partners, audiences, contexts, programs, and policies. HD integration can provide a social-ecological systems framework to ISs and address the wide array of HD that connect or intersect with the IS and Vital Sign, including the HWB VSs. HD integration can also contribute and support effective IS adaptive management.

## SECTION 2.2. GUIDING OVERARCHING QUESTIONS FOR HD INTEGRATION

Use Section 1 and all Appendices of this protocol and the following five questions (**see Box 2**) to guide HD integration throughout IS Starter Package development. These questions were developed by the Social Science Advisory Committee (SSAC) and have been used to review, assess, and integrate social science into previously constructed IS and IS Starter Packages. These questions also illustrate the interrelatedness of social science, HD, HWB, and equity within ecosystem restoration. These questions can be a consistent reminder and reference point of HD and how HD relates to an IS and IS Starter Package. These questions will be most pertinent during the initial Core Team and IDT formation discussions, IS Starter Package development discussions, IDT workshops, and Starter Package finalization stage.

### BOX 2. HD INTEGRATION QUESTIONS

1. Where is human behavior the root cause of barriers or challenges to recovery?
2. Which actions could have impact – positive, negative, mixed, or unknown – on human wellbeing (HWB)?
3. Where do current social, economic, or political conditions offer opportunities to advance recovery for HWB and/or the environment?
4. Is language used respectfully and inclusive of multiple stakeholders?
5. Is equity being considered in recovery approaches and actions?
6. Is there a fair distribution of risks and benefits?

### EXAMPLE

*During Core Team and Interdisciplinary Team (IDT) formation, refer to questions 4. and 5. in order to identify and include the variety of stakeholders and/or partners needed to more equitably and effectively address the IS and Vital Sign. During Starter Package content development (at all stages, including during IDT workshops), refer back to all questions to ensure that HWB (e.g.: Vital Signs or content indirectly associated with the Vital Signs), human behaviors, contextual conditions, diverse stakeholders and/or partners, and equity are addressed within the Starter Package materials.*

## SECTION 2.3. INTEGRATING HD INTO IS PEOPLE AND PROCESSES

In addition to asking and addressing the HD integration questions, one key action that can assist in integrating HD into the initial IS stages and process, is ensuring that HD are integrated into the IS people and development processes. By including participants and partners with HD experience or expertise (e.g.: non-natural resource or environmental managers and planners) within the teams and groups involved in the IS development process, the IS and IS Starter Package will be more likely to address and reflect the HD of the IS. This action also illustrates and attempts to partly answer or address HD integration questions 4 and 5, both of which relate to diversity, equity, and inclusion (see Appendix J). Integrating HD partners will help increase functional diversity and boundary spanning within the IS (Appendix J).

# SECTION 2.3.1. INTEGRATING HD PARTNERS INTO IS

Integrating HD necessitates the inclusion of HD-relevant stakeholders or any HD partner (for a list of potential HD partners, see Appendix E) who may be knowledgeable of, experienced in, affected by, or able to affect the HD of a particular IS Starter Package component (e.g.: stressor, program, policy, actions, etc.) or its target Vital Sign (Decker et al. 2012). HD partners or participants may vary depending on the IS and Vital Sign. Broadly, potential HD partners will likely include: social scientists, practitioners, community groups or organizations, and/or lay community members at large in the IS process via the Team structure (Appendix E). This will vary depending on the IS, IS Core Team's vision for the IS under development, and the IS development process. As many IS develop under the purview of individuals with varying levels of social science knowledge and HD literacy and expertise, the direct inclusion of social scientists, practitioners, community groups or organizations, and/or community members (some of which may be experts in their own distinct perspective of field) may be beneficial to directly solicit the engagement and inclusion of HD partners. Prior to engaging HD partners, take stock of what HD experts may already be involved in the IS team(s) and/or process. Additionally, groups should ensure that the HD partners, specifically those representing marginalized groups such as tribal governments, immigrant communities, and/or environmental justice organizations, are not superficially or peripherally included as tokenized participants, but rather as a full and equal part of the IS team(s) and group, as this may inform or influence their level of engagement, commitment to the IS, input, and/or perceptions of fairness (for more information on equity and tokenism within groups, see Appendix J). This inclusion can take many forms and each IS effort may decide on different routes or organizational forms (e.g.: members, roles, etc.) to take based on their own IS and/or group needs, interests, perspectives, limitations, knowledge, and capacities. Additional HD partner considerations include: the levels of participation and capacity of HD partners to partially or fully engage in the IS; how many HD partners are necessary or pertinent to the IS under development; and who (what kind of HD partner(s)) is needed or most pertinent for the IS and the IS' HD needs and/or connections. For example, an IS may decide to include an HD partner as part of the Core Team or IDT, while another may decide to create a HD Subgroup or solely engage HD components or inputs through the inclusion of Broader Partners or Public Review. This inclusion could include one or more of forms, as outlined in the list of recommendations below, which are highlighted by IS teams/groups. This flexible, open, and multi-route approach to HD integration is illustrated in the following list and in **Figure 6**.

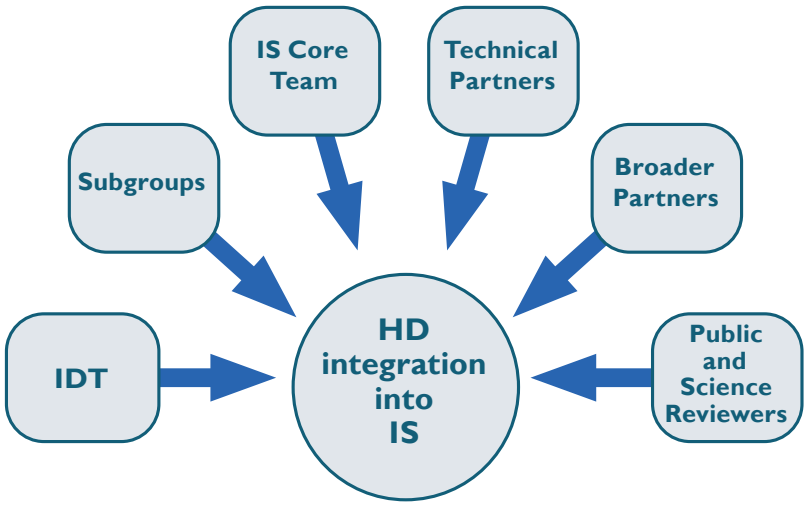


Figure 6. Integrating HD Partners into IS Integrating

## 1. IS CORE TEAM (OVERSIGHT GROUP)

a. Recommendation 1: A Human Dimensions (HD) participant(s) can be included in or provided any of the identified IS development roles or participants. Roles include: IS Lead, SD Lead, or IC.

***Example:*** *IS Core Team, depending on initial members, HD knowledge, and/or affiliations can recruit HD partner(s) with pertinent HD knowledge, experience, and/or expertise. This will range depending in the IS. Toxics in Fish IS may solicit Core Team participation among local foods HD experts and/or Shoreline Armoring IS may solicit Core Team participation among local shoreline armoring outreach and education practitioners who have engaged coastal communities and homeowners.*

b. Recommendation 2: HD Champion (HDC)

i. HDC (like Indicator Champion): technical and/or content expert, who leads the assessment of the status and trends of the IS in relation to the HWB Vital Signs. HDC can be the primary lead and contact for ensuring the HD integration within the IS development, which can take various forms, from assisting with bringing more HD experts or participants to the table, developing or coordinating the developing of HD tools/resources for Starter Package development, ensuring the IS Starter Package is reviewed by the SSAC, and HD review of Starter Packages. Depending on the IS and specific HD needs or connections, the HDC could potentially be a members of a IS-relevant stakeholder community (e.g. tribal government or community members, immigrant community member or advocate, environmental justice advocate).

1. HDC can also pinpoint targeted HWB Vital Signs and/or pertinent HD that are perceived as highly important for the IS.

***Example:*** *One human dimension related to Toxics in Fish is local foods, particularly among tribal communities and immigrant populations. This connection is reflected in interdisciplinary social science literature. The HDC would be responsible for ensuring that this HD is taken into account and properly addressed within the IS Starter Package.*

## 2. INTERDISCIPLINARY TEAM (IDT) (DEVELOPMENT, GUIDANCE, AND REFINEMENT GROUP)

a. Recommendation: Recruitment of HD partners for the IDT can ensure HD technical input and content. HD IDT members can help provide technical input on what to include, focus on, and recommend as priorities within the IS (key pressures, strategies, programs, policy changes, types of actions, uncertainties, and research and monitoring needs). HD partners can be recruited through a public process, as other IDT participants; however, a more targeted solicitation may be needed to ensure non-normative networks and groups are contacted for recruitment. This recruitment could be coordinated by the HDC. Additional work or research may be needed to understand who or what backgrounds, areas of expertise, or fields are most pertinent to the IS under development.

***Example:*** *If Toxics in Fish IS closely associated with local foods (HWB Vital Sign and HD), then perhaps a local or regional social scientist or community health practitioner who directly or indirectly has a background in local foods or tribal community health in association with local foods (and other related topics) might be appropriate.*

## 3. SUBGROUPS (DEVELOPMENT, GUIDANCE, AND REFINEMENT GROUP)

a. Recommendation: HD Subgroup (HDS)

i. The interdisciplinary HDS can be formed to better address the HD Integration Questions and ensure HD partners and content are included in IS discussions and IS Starter Package development.

1. HDS can be coordinated and organized by the HDC, who ensures that the HDS sets goals, IS tasks/deliverables, and IS-specific timelines that are aligned with the IS as a whole.

a. HDS can be responsible for the development of long-term HD resources and tools for reiterative IS Starter Package development, like those developed for Toxics and Fish IS and Shoreline Armoring IS. Such tools include: (1) interdisciplinary social science literature directory; (2) literature review (based on literature directory sources); (3) and bibliography organized by HWB Vital Sign (based on literature directory sources).

b. HDS can be responsible for a more thorough HD review of all Starter Package materials and closer coordination with SSAC to ensure their review recommendations are adopted by the IS team(s).

***Example:*** *The HDS might be an effective collaborative group that could bring together various HD perspectives, specializations, and content to the IS. The HDS, as a subgroup could be comprised of social scientists, practitioners, public agency staff (from pertinent state or local agencies or departments, like WA Department of Health, WA Department of Social and Health Services, King County's Department of Community and Health Services, or a representative from a Local Integrating Organization), or community groups or members.*

## 4. (GROUP 1:) TECHNICAL PARTNERS (REFINEMENT GROUP)

a. Recommendation: Recruitment of HD partners as Technical Partners or experts to help assess and validate interim drafts of the IS. May be pertinent as HD weak points could be properly identified by HD partners or technical experts. This could be coordinated by the HDC.

## 5. (GROUP 2:) BROADER PARTNERS (REFINEMENT GROUP)

a. Recommendation: Recruitment of HD partners as Broader Partners or experts to help provide additional insights and feedback to refine IS, including identification of additional actions to implement the IS, policy changes needed, and potentially resources to assess costs. This could be coordinated by the HDC.

## 6. PUBLIC AND SCIENCE REVIEWERS (REVIEW GROUP)

a. Recommendation: Ensure that the public and science review process includes HD partners. This can take various forms, including the purposeful review of the IS by the Science Panel (SP) (which has some social scientists as members), SSAC, and Puget Sound Ecosystem Monitoring Program (PSEMP) (which also includes some social scientists and/or experts on components of HWB). Additional review could be conducted through the SP and/or SSAC professional networks, which could potentially be used to assist with the implementation of a more intentional, thorough, and robust HD review of the IS.

## SECTION 2.3.2. WHO ARE POTENTIAL HD PARTNERS FOR IS?

HD can be interpreted and approached from an array of perspectives and professionals, ranging from social scientists affiliated with universities to practitioners engaged in the field through public service to community members associated with local activities and advocacy around a particular social-ecological issue. Some IS Core Teams and Starter Package content creators, may have various interpretations as to who or what types of HD partners they may want to engage and include in the IS development, guidance, and refinement process. If social science is the primary goal and focus, the Partnership's SSAC and its affiliated social scientists (and their broader professional network, primarily focused within the Puget Sound region) is an excellent resource. Additional perspectives and professionals may also be of interest to IS groups, including the non-social scientist groups listed and outlined below:

**1. Social Scientists (higher education, public agencies, tribes, consultants, nonprofits, etc.)**

***Example:*** *SSAC members and regional social scientists involved in efforts through the University of Washington, Western Washington University, Oregon State University, Northwest Indian College, Washington Sea Grant, and other institutions.*

**2. Practitioners (higher education, public agencies, tribes, consultants, nonprofits, etc.)**

***Example:*** *HD practitioners and professionals, including those from the WA Department of Social and Health Services, WA Department of Health, Shore Friendly, King County Department of Community and Health Services, Swinomish Indian Tribal Community Department of Planning and Community Development, and other institutions.*

**3. Community groups, organizations, and private businesses (nonprofit organizations, public-private entities, consultant groups, advocacy organizations, local non-formal groups, tribal-affiliated groups or organizations, and businesses)**

***Example:*** *Community groups or organizations include formal and informal collections of people working around a particular community-based social-ecological issue(s). Such groups include, but are not limited: Friends of the San Juans, Citizens for a Healthy Bay, Toxic-Free Future, Washington Environmental Council, Got Green, Front and Centered, and/or The Nature Conservancy.*

**4. Community members at large (lay stakeholder community members who may have specific levels of knowledge or expertise gained through professional, voluntary, lived, or personal experiences, including through minority and/or place-based community membership or business ownership)**

***Example:*** *Community members at large may be directly or indirectly associated with the IS through a professional or voluntary capacities. Such members include, but are not limited to: experienced volunteers, civically engaged community members, business owners, and/or community-defined leaders.*

# SECTION 2.4. INTEGRATING HD CONTENT INTO THE IS STARTER PACKAGE

## SECTION 2.4.1. INTEGRATING HD INTO PHASE 1: PRE-IS PREPARATION

The integration of HD into IS content development necessitates the inclusion of tailored or targeted HD steps within already existing pre-IS preparation steps. These steps or tasks include the Integration HD through IDT recruitment and IS Starter Package development. These steps are also illustrated in **Figure 7.**

### Step 1. Recruit HD partners for an Interdisciplinary Team

Since the IDT is largely responsible for developing content and providing additional support and guidance for the IS, the integration of HD partners into the IDT is a major potential entry or inclusion point for HD within the IS and broader engagement of diverse perspectives and key partners. While the IDT may be the most likely or largely responsible group to integrate HD, other groups may also be responsible to assist with HD integration (e.g.: Core Team, Technical Partners, etc.) (see Section 2.3.1 and 2.3.2). Building upon the descriptions and recommendations already outlined in this protocol (see Section 2.3), additional steps can be taken to better ensure HD participation within the IDT. The steps should be considered as supporting and complementary to those steps outlined in the guidance (see 4.1, Step 1.).

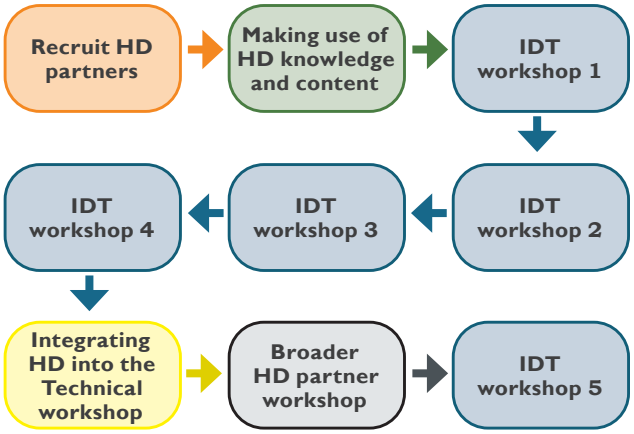


Figure 7. Integrating HD Content into the IS Starter Package

#### Step 1.1. Develop criteria for HD partner Interdisciplinary Team membership

Recommendation: Technical expertise identified for IS development should include criteria that focuses on the following:

- Expertise related to the HD of the Vital Sign, IS, and targets
- Expertise related to the HWB Vital Signs and possible overlap with Vital Sign and IS under development
- Diversity of HD perspectives, approaches, and knowledge, including social scientists from higher education, practitioners, community groups or organizations, and community members at large.

#### Step 1.2. Invite potential HD partners as Interdisciplinary Team members

Recommendation: The Core Team, in consultation with the appropriate Strategic Initiative Advisory Teams, can use the HD-integrated IDT criteria to develop a list of groups and individuals to recruit for the IDT and subgroups, including potential HD Champion (HDC) and/or HD Subgroup (HDS). The Science Panel, SSAC, and other IS- or Partnership-related networks can also be used to help develop a list of groups and individuals to recruit for the IDT and subgroups.

### Step 1.3. Begin to identify specific HD expertise needed and establish potential subgroups

Recommendation: Since subgroups will be established to work on topic-specific issues that advance IS development, HD and/or HWB subgroup(s) can be formed to better inform and integrate HD into the IS Starter Packages. A HDS can be coordinated by the HDC, if an HDC is identified and included in the IS via the Core Team or IDT. Note that HDS members and HD partners in general may have varying capacities, particularly when it comes to time, resources, and flexibility to participate. For example, some social scientists or community group representatives may not have flexible schedules, resources, or capacities to participate on a regular basis or in a particular location as part of a HDS.

## Step 2. Starter Package: Making use of HD knowledge about current conditions and strategies

Around the Sound and elsewhere, interdisciplinary social science and HD work is already underway by many different partners to recover and better understand the pressures facing most Vital Signs and their subsequent impacts. Such ongoing work is highlighted by the efforts of social scientists, practitioners, community groups and organizations, and community member at large in the Puget Sound region. The interdisciplinary efforts are illustrated through academic research, gray papers (e.g.: research, program, and/or policy reports), community outreach and education initiatives, and advocacy campaigns focused on or reflecting the HD of IS-related topics of interest, Vital Signs, and regional and local recovery.

Building upon the descriptions and recommendations already outlined in this protocol additional steps can be taken to better ensure HD content is effectively and equitably included within the IS Starter Package. The steps outlined below should be considered as supporting and complementary to those steps described in the guidance (see 4.1, Step 2.). In addition, the aforementioned HD integration questions (Section 2.1 above) can be revisited, emphasized, and integrated into guiding the development of the IS Starter Package. The HD integration questions should also inform the various Starter Package development sub-steps described later in this section (Steps 2.1-2.3).

### SIDEBAR 6. STARTER PACKAGE HD INTEGRATION

It will be important for the Core Team to identify who is responsible for coordinating and including HD partners and HD content into the IS Starter Package at all stages of development. The HD content compiled for the Starter Package will be included in the State of Knowledge (SOK) and Base Program Analysis (BPA) reports as part of the final IS package.

The Starter Package addresses an array of targeted issues for an audience that is expected to be familiar with the Vital Sign, but is not necessarily composed of technical experts associated with the Vital Sign target with the same types of expertise. It is likely that the HD and non-HD components being addressed within the Starter Package and IS more broadly may be challenging to coalesce and articulate to the same audience(s). Intention should be taken to ensure that the HD aspects are articulated and communicated in a way that is grasped and understood by non-HD partners or social scientists. For additional information related to social science and HD integration in practice, see Bennett et al. 2017 and Guerrero et al. 2018. For additional information related to writing more effective planning reports, see Johnson and Lyle 2016 and Letunic 2007.

## Step 2.1 Starter Package content development process

Whomever is made lead for managing Starter Package development and producing the package for IDT review should with intention ensure that HD content in integrated (**see Sidebar 5**). In order to ensure that HD content is wholly integrated, use the HD Checklist (see Appendix D, which includes a checklist and additional descriptions, recommendations, and examples). HD members, regardless of role or team, including the potential HD Champion, can include or intersect HD with other streams of IS content. Given the role of the Core Team to agree on priority content and check in on content, the Core Team should emphasize that HD content is a required element of IS (see Section 4, Step 2.1.) and included in the IS Starter Package development and review processes.

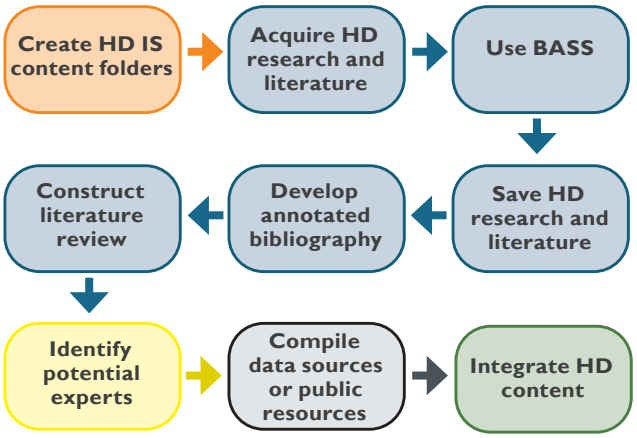


Figure 8. HD Content Development Process

HD Starter Package content and information should be compiled and summarized as follows (also see **Figure 8**):

- All HD content should be saved in appropriate IS content folders (folders may need to be created).
- Acquire interdisciplinary HD social science through a non-exhaustive research/literature search and compilation process.

Use Best Available Social Science (BASS) (see Charnley et al. 2017 and Appendix K) as a guide for acquiring interdisciplinary social science literature and resources.

- Save all interdisciplinary research and literature acquired in a social science/HD folder for future use by IS overtime.
- Develop an annotated bibliography that is frame by the HWB Vital Signs (see Appendix H).
- Construct a non-exhaustive literature review (see already prepared IS literature reviews in IS_ Common –> SocialScience –> IS Social Science Integration –> pertinent resources).
- Identify potential social science experts, particularly those residing or conducting pertinent HD research in the Puget Sound region.
- Compile document (word or excel) of relevant data sources or publicly accessible resources.

Overall, use social science research, as with natural science research, should follow a set of standard best practices expected for any rigorous scientific effort. For HD Starter Package content compiled and organized, it should be clear to the IDT how each piece of HD information, whether it be a resource, annotated bibliography, or literature review, is intended to inform IS content, support decision-making, or build partner confidence, and buy-in. HD Starter Package content and HD participation together can ensure that HD content and content-associated tools/resources, etc. can be integrated into content, decision-making processes, and build partner confidence, and buy-in.

## Step 2.2 Starter Package content and information source recommendations

The HD of a Vital Sign should be considered for the Starter Package. HD content and information should not be approached or intended to be comprehensive or exhaustive and all HD-associated information will not be relevant to all Vital Signs.

As HD include a broad spectrum of aspects, use the Partnership-identified Human Wellbeing Vital Signs (HWB VS) as mutually-constitutive and overlapping lenses or touch points when attempting to assess current conditions of the primary Vital Sign and IS under examination and development. The HWB VS reflect an array of Puget Sound community-defined dimensions that may directly or indirectly connect or intersect with the Vital Sign. Additionally, use the guiding HD Questions as needed to ensure HD are adequately integrated into the Starter Package.

**Current Conditions of the Vital Sign's HD: HWB Vital Signs**

HWB Vital Signs-Some, if not all HWB Vital Signs and their affiliated indicators, will connect as multifaceted HD with the targeted Vital Sign. Include pertinent HWB Vital Signs and how the Vital Sign intersects with these HWB VSs. Brainstorming via discussions, workshops, and engagement with relevant HWB VS/HD partners (including HWB VS experts) can assist fleshing out these connections. These can also be partly illustrated through the use of HD integration materials. See Appendix B.

HWB Survey-Once pertinent HWB Vital Signs and their connections to the target Vital Sign are identified, include data and findings from the HWB Survey to illustrate regional HWB VS and indicator in relation to the Vital Sign. See Fleming and Biedenweg 2019, Appendix M.

**Current Conditions of the Vital Sign's HD: Research, Literature, and/or Data Sources**

Interdisciplinary Social Science Research and Literature- Using BASS (see Charnley et al. 2017; Appendix K) as a guiding toolkit, conduct an interdisciplinary social science research and literature (e.g.: peer-review articles, policy or planning reports, etc.) search using whatever means are available. Collaborative and close engagement between natural science Vital Sign experts and social science/HD partners may help identify creative language when key words are needed to find relevant HD integration materials. Such exploratory searches can be exhaustive and unending, thus ensure that this is comprehensive and non-exhaustive for the needs of the IS while also considering time/capacity limitations, social science expertise and knowledge, and resource access challenges.

HD Integration Materials-Once an adequate amount of resources is found, construct HD integration materials, including an annotated bibliography (see Appendix H), literature review (based on a sample of the most pertinent annotated bibliography resources), and literature/resource directory (folder that houses all found articles and materials for more detailed use).

Social Science and HD Data Sources-Identify any accessible social science and HD data sources. Such data sources may include demographic data (e.g.: U.S. Census data, WA OFM data, WA DSHS data), social or policy data (e.g.: Rural Policy Research Institute, Urban Institute data, Migration Policy Institute data), economic data (e.g.: Economic Vitality VS data, Brookings Institute economic data), labor and commerce data (e.g.: Bureau of Labor Statistics data), public health data (e.g.: WA DPH Data), land use and development data (e.g.: Urban Institute data), and social-ecological/human dimensions data (e.g.: EPA EnviroAtlas). Data sources and needs will largely depend on the target Vital Sign.

**Current Conditions of the Vital Sign's HD: HD insights from experts, practitioners, and scholars**

| |
|---|
| HD partners |
| Science Panel |
| SSAC |

| |
|---|
| HD Working Group |
| Recognized HD experts |

# SECTION 2.4.2. IS HD CONTENT DEVELOPMENT-IDT AND PARTNER WORKSHOPS

Since most IS content development happens through a series of workshops with the IDT, subgroups, technical partners, and stakeholders, the IS Core Team should ensure that HD are integrated into the workshop process and series. This can occur by (1) organizing HD-specific workshop(s), as recommended under IS Guidance Step 8.2 Workshop for human wellbeing review (see Section 8.2, IS Guidance), and (2) ensuring HD questions, content, and/or members are fully included in any general IS content development workshop more broadly. HD-specific workshop(s) may be more relevant to some Vital Signs than others.

## Step 3. IDT Workshop 1-Foundations for including HD

During the initial kick-off IDT workshop, ensure that in addition to the already described workshop components outlined in the IS Guidance (Step 3), that HD, specifically HWB Vital Signs and HD integration are discussed and outlined as integral aspects of the IS Starter Package development process. This can be approached in a variety of ways.
Recommendation: Include HD partners in the IDT Workshop 1, whether they be part of the Core Team, IDT, HD Champion, or as external partners who have been integrated into the workshop in some capacity. Include HD content and/or context during the foundational discussion and workshop by highlighting potential HD of the Vital Sign and HWB Vital Signs and how they may connect or intersect with the Vital Sign. Include the HD guiding questions (see Section 2.2) as a potential starting or reference point during the workshop. Also, the benefits of social science and HD integration should also be highlighted, along with pertinent examples. Consider adding a HD output to the Workshop, including: Understanding the role of HD and HWB within IS process.

### SIDEBAR 7. CROSS-CUTTING SUBGROUPS

As all IS efforts will have one or more topical areas in common with other ISs and HWB VSs, it can be advantageous to build cross-IS and cross-HWB VS efforts to identify common barriers, strategies, and uncertainties through the establishment of common thematic workshops. While no explicit HWB ISs exist so far and HWB VSs are still being assessed for baseline data/results, social scientists, experts, or practitioners with pertinent HD or HWB VS expertise could be included in IDT workshop 2 or in the development of subgroups to better help understand, identify, and integrate HD and HWB VS into the IS Starter Package. Creating a HD Subgroup may be a relevant body to help make decisions and curate content for specific ISs.

## Step 4. IDT workshop 2-situation analysis that includes HD

During the IDT workshop 2, ensure that the HD and HWB Vital Signs are included in the description and documentation of the current recovery context (social, political, ecological) of the Vital Sign target and identification of existing and new HD-relevant strategies addressing the Vital Sign, including any pertinent connections to some underlying HWB VSs, such as governance (which would directly and indirectly connect to regulations, state incentive programs, policies, policy-makers, and politics more broadly). During the IDT

workshop 2, a conceptual model (diagram) and narrative (companion text) will be developed. These two interwoven outputs comprise the situational analysis. Given that HD are likely related to context, drivers, contributing factors, pressures, and candidate strategies, HD integration is integral to a more comprehensive IDT workshop 2 and situation analysis.

Recommendation: Include HD partners in the IDT Workshop 2, whether they be part of the Core Team, IDT, HD Champion, or as external partners who have been integrated into the workshop in some capacity. Participation of diverse HD partners will help ensure that HD is integrated in to the situation analysis. Additional questions could be added to the already recommended facilitation questions (see Step 4, IS Guidance; these questions already are directly related to HD), including the HD guiding questions (see Section 2.1) or more direct HD questions for this particular workshop, such as:

- What are the HD of these identified pressures?
- What are the HD of these identified contributing factors?
- What are the HD of these recognized drivers?
- What are the HD of these proposed strategies?
- What is the underlying HD context of this Vital Sign, including the social, political, economic, cultural, and geographic aspects of this Vital Sign?
- What are known broad HD of the Vital Sign?
- What are the known narrow HWB Vital Signs that intersect with this Vital Sign?

Ensure that the outlined outputs from IDT workshop 2 include HD content in the various potential deliverables, including, but not limited to: priority pressures and problem statements, draft conceptual models, uncertainties and research and monitoring needs related to context and barriers, draft narrative to support situation analysis, and draft strategies, and additional HD-/HWB VS-specific expertise and subgroup workshop need identified.

### Step 4.1 HD Subgroup workshops (optional)

One key potential HD integration resource for IS Core Teams and IS efforts is the development of a HD-specific subgroup(s). This will largely depend on the IS and identified IS needs. Building upon the information outlined in the Guidance (see Step 4.1 and Box 4.8; Step 8.2), a HD/HWB subgroup may be an option that the Core Team and IDT decide to take to assist with HD integration. This can take various forms, depending on the IS.

Recommendation: If the Core Team and IDT identifies the HWB VSs of Good Governance, Economic Vitality, and Sense of Place as integral aspects of the IS, the IS team should convene, organize, and implement a subgroup that targets those particular HWB VSs and their intersections with the Vital Sign. This may entail including pertinent experts, including scholars or practitioners with relevant knowledge, HWB Survey data (Fleming and Biedenweg 2019), and relevant interdisciplinary knowledge, data, or tools to help contribute to the workshop and its outputs.

## Step 5. IDT workshop 3-HD integration into strategy prioritization and logic development

In order to prioritize strategies and strategy gaps that were developed through the situational analysis during

IDT workshop 2, relevant HD will need to be considered during IDT workshop 3. Since the Core Team is responsible for developing criteria that work for the applicable VS and creating a list of strategies for the IDT to consider, the Core Team should consider HD and relevant HWB VS. This should be fairly straightforward if HD and HWB VS were integrated into IDT workshop 2.

### Step 5.1 Subgroups-HD integration into the development and refinement of results chains

As results chains are logic models, or theories of change that can be associated with social, political, or infrastructural changes or ecological or human wellbeing changes, HD or pertinent HWB VS should be included during the results chain process. Subgroup activity associated with the development and refining of results chains, can integrate HD either through the review of other results chains that already integrate HD or HWB VS, including those created by LIOs, which tend to include HWB components associated with local ecosystem recovery effort. During the webinar and facilitated results chain process, the facilitator and/or IDT members should ensure that the prompting questions for results chains connect to HD and HWB VS. This connection will likely be made as most of these prompting questions relate to HD in some capacity; however, by being more intentional and targeted with how these questions are addressed, HD will more likely be addressed during this process.

## Step 6. IDT workshop 4-Review HD-integrated results chains and recovery schematic

During IDT workshop 4, the Core Team has a chance to ensure that HD and HWB VS have been adequately reflected in the results chains. The HD-integrated results chains will then be reflected in the recovery schematic. The recovery schematic will identify priority pathways and the impact and certainty of those pathways. While HD may already be illustrated in the base-layer schematic, the workshop should also ensure that HD factors are considered as a key overlay. These HD factors are identified as social approaches and human wellbeing factors (see Step 6, Guidance), although these are distinct, yet overlapping factors. This can also be done by making connections to other Vital Signs, specifically the HWB VSs (see Step 6, Guidance). Additionally, if the schematic is not too complex, consider interdisciplinary social science when addressing or considering monitoring and/or research needs. When addressing the questions associated with each results chain, consider (1) asking the HD guiding integration questions again in relation to the results chains and/or (2) asking each question with HD as the primary focus or think about (3) adding the following questions and considerations:

- What are the HD reflected in the results chains (whether they be illustrated by technical information, actions, uncertainties, pathways, outcomes, geographic contexts, gaps, or impacts)?
    - Identify HD needs
    - Identify HWB VS connections and needs
    - Identify HD and HWB VS research and monitoring needs
- Are the HD sound and adequately captured?

As the IDT will be briefed on the goal of the subsequent technical and partner workshops, the IDT should coordinate with HD partners to ensure that HD content and participation is included. IDT members should coordinate with HD partners to ensure the potential invitees include individuals associated with HD and relevant HWB Vital Signs.

## Step 7. Integrating HD into the Technical workshop

If HD integration through general participation, content development, workshops remain a challenge, the technical workshop might be a good fit for the IS. The technical workshop is a review workshop meant to broaden participation in the IS development process and to validate and improve the already completed IS work. The technical workshop provides either another or a primary opportunity to integrate HD partners and content through a workshop setting by allowing technical experts-including HD practitioners, social scientists, etc.-to review material, including materials that outline recovery context, draft priority strategies, logic, and the overall approach (through the schematic). If HD or HWB VS connections and integration remain lacking, the technical workshop should integrate social scientists and relevant HD experts to review IS materials through a workshop environment. By integrating interdisciplinary experts, whether they be community outreach specialists with practical expertise, tribal community health professionals, and/or social scientists with specializations in recognized HWB VS, like governance, local foods, economic vitality, or sense of place, a technical workshop can provide a more thorough and direct setting to discuss and better integrate HD and HWB VSs into the Starter Package development process.

### Step 7.1 Workshop to review key HD-relevant uncertainties, research, and monitoring needs

Given that additional knowledge, information, expertise, and content may be required to address key HD uncertainties, research, and monitoring needs, the Core Team should review the likely HD and HWB VS expertise needed based on previous discussions and workshops, particularly the technical workshop. Research needs can partly be addressed and pinpointed through the development and use of HD tools/resources, including the annotated bibliography and literature review (see Appendix H) and Shoreline Armoring and TIF IS examples located in the appropriate Box Folders, including in IS_Common –> SocialScience –> IS Social Science Integration). HD and HWB VS monitoring and effectiveness needs may partly be addressed and pinpointed with the inclusion of HWB Survey data and responses (see Fleming and Biedenweg 2019, Appendix M). The workshop could be convened as a stand-alone meeting or could piggyback on a PSEMP, Science Panel, SSAC, and/or HD Working Group Meeting held among Partnership staff and some external partners. Science Panel, SSAC members, among other potential HD partners should be included and participation solicited. Outputs and deliverables could mirror those attributed to other similar review-based workshops (see Step 7.1, IS Guidance).

## Step 8. Broader HD partner workshop

Similar to the technical workshop, the broader partner workshop can provide an opportunity to reach and include a broader group of experts and partners into the IS development process. Also, similar to the technical workshop, the Core Team should extend invitations to as many HD partners as possible. In order to ensure HD partners are solicited and included, the Core Team should collaborate with and extend invitations through the Science Panel, SSAC members, HD Working Group, recognized regional/local social scientists as determined by HD research/literature search, among other potential HD partners should be included and participation solicited. By ensuring HD partners, the outlined workshop questions and outputs should include HD and HWB VS relevant content, context, and responses. In addition to the listed workshop content, additional content may include:

- Background on IS: What are the HD of the IS?
- Background on IS: What are the HWM VSs connections of the IS?

For each result within the results chain, workshop participants should also be asked:

- What are the HD reflected in the results chains (whether they be illustrated by technical information, actions, uncertainties, pathways, outcomes, geographic contexts, gaps, or impacts)?
  - Identify HD needs
  - Identify HWB VS connections and needs
  - Identify HD and HWB VS research and monitoring needs
- Are the HD sound and adequately captured?

Broader partner workshop outputs should not veer away from the intended outputs of Step 8 (see Step 8, IS Guidance), but should include HD and HWB VS within those outputs.

### Step 8.1. Work sessions to identify priority policy changes, activities, or programs

In order to properly and equitably identify priority policy changes, activities, or programs that link both natural and social or human aspects of the IS and Vital Sign, among other qualities or content areas, work sessions should include HD partners and all prior completed HD and HWB VS work associated with the Vital Sign and IS development.

### Step. 8.2. Workshop for human wellbeing review

While this workshop (see Step 8.2, IS Guidance) is optional for IS Starter Package development, this workshop should be considered by ISs, particularly if the IS development process is already lacking or struggling to properly integrate HD and HWB VS. If HD and HWB VS have consistently been integrated into the IS development process as outlined by the aforementioned sections of this protocol, then this workshop may seem redundant and unnecessary. Including and interweaving HD partners and HD content through HD participation, discussions through various workshops, and HD tool/resource development, then the Core Team may decide that this workshop is unnecessary. If additional HD and HWB VS insights and inputs are needed for a more detailed, thorough, and comprehensive understanding of the Vital Sign and IS development, then this workshop should be implemented by the IS in full. The Science Panel, SSAC, among other HD partners should be included and the HD guiding questions should be a guiding discursive tool.

### Step 8.3. Estimate costs

While the estimated costs should include and emphasize costs for program implementation, actions, recommended processes, research, and monitoring, additional economic literature and research can help inform the estimated costs section of the Starter Package. Such additional economic literature and research could come from a variety of fields and economic approaches. Such economic literature and research could be described and highlighted in narrative form within the Starter Package in addition to any other cost information. The HD of estimated costs, whether those be actions, programs, or research/monitoring could also be included. These may include cost effectiveness information and even

recognized cost-oriented challenges associated with similar programs, actions, or processes in the Puget Sound region or elsewhere. Additionally, cost-benefit analysis (CBA) and/or CBA tools, such as Structured Decision Making (SDM) consequence tables, could also be integrated and used to better assess or integrate estimated costs. Estimated costs will be reassessed and rearticulated post-economics protocol completion (2019).

## Step 8.4. Describe adaptive management priorities and processes

Adaptive management in this context applies to a deliberate and structured "learn-as-you-go" approach to recovery and is characterized by a recurring cycle of programmatic steps. Adaptive management illustrates the importance of a social-ecological systems approach to restoration, that includes natural resources, human users and/or managers of those resources, and resource-human interactions (or human-environment interactions); thus, IS adaptive management and governance should consistently and reiteratively recognize and include HD within its processes. This continuous recognition and integration of HD, will likely benefit the IS and assist with ensuring resilience and the continued accumulation or usage of social capital (e.g.: social networks, shared norms, trust, and reciprocity), among other forms, which in turn contributes to effective adaptive management (Stern 2018). Decker et al. 2012 note specific ways in which HD can inform adaptive management decisions, which include: (1) determining management objectives, goals, impacts, and/or outcomes for people involved (decision-makers, environmental planners, public(s), homeowners, tribes, etc.); (2) determining what people may find acceptable, desired, or more feasible (e.g.: incentive programs, regulations, information sharing/communications, etc.); (3) determining community or partner engagement level, capacity, or potential; and (4) determining potential tradeoffs and inequitable impacts, benefits/costs, or outcomes of specific decisions (p. 10) With regards to performance measures, consider the inclusion of interdisciplinary social science tools and approaches associated with adaptive management and developmental evaluation (DE), specifically when it comes to specific HD (e.g.: evaluating or making adaptive decisions around programming, education, or outreach initiatives associated with a particular IS or project) and HWB VS connections (Lawrence et al. 2018). With regards to the decision context, consider reflecting on the IS development process and the decision-making context, roles, and individuals. Consider integrating HD partners with decision-making and/or organizational behaviors/structures into the process to better understand and articulate the decision context of the IS.

# SECTION 2.4.3. PHASE 3: FINALIZING HD CONTENT, REVIEW, AND ENDORSEMENT

In order to finalize HD and HWB VS content, review, and endorsement, both the (1) public review and (2) external science review are required to take place. To ensure HD and HWB VS content, review, and endorsement among diverse HD partners both internal and external to the HD development process, the Core Team should target HD public audiences if needed, particularly if specific HD partners, communities, or social sciences are lacking and acknowledged as integral to the IS. For example, if an IS has direct connections to specific communities, like tribal communities or immigrant communities, then the Core Team should attempt to engage in a public review with those communities. Additionally, if specific content associated with a particular HD or HWB VS (e.g.: governance, sense of place, local foods, economic vitality) or social sciences (e.g.: economics, geography, political science, psychology) are needed, then the Core Team should attempt to engage in an external science review that directly solicits and includes those content areas and social sciences. The external science review will partly be conducted in coordination with the Science Panel and SSAC; however, using those resources, among others, the Core Team should extend the external science review through the Science Panel's and SSAC's professional/scholarly networks. Additionally, if a formalized process is initiated for any sort of public or science review, consider soliciting semi-identifying information in order to gauge areas of expertise, content knowledge, and science background (natural vs. social, etc.).

## Step 9. IDT workshop 5-HD-integrated synthesis

The final IDT workshop provides an opportunity to discuss feedback and inputs from the HD public and the external science reviews. This particular workshop may also be an opportunity to integrate any research, literature, and data associated with HD and HWB VS, including information from HD tools/resources (e.g.: the annotated bibliography and literature). If HD reviews and insights were provided and no HD member is on the Core Team or IDT, then perhaps an HD partner should be included to assist with assessing the reviews and helping with HD integration reviews as content into the IS Starter Package at this stage. If HD content and reviews are lacking, consider revisiting the HD guiding questions to ensure that HD and HWB VS content and information is included in the final IS Starter Package.

**END OF SECTION 2**

# BROADER MANAGEMENT CONFERENCE BRIEFINGS

During the briefings stage of IS finalization, consider highlighting pertinent HD and HWB VS connections made during the IS development process and within the Starter Package. These connections provide a more comprehensive and well-rounded understanding of the IS development process and Vital Sign. These connections, as reflected and supported by a diverse array of social sciences, HD content, and HD partners provide a more solid foundation for the IS and IS Starter Package. By highlighting these connections, the various briefings will illustrate the importance and strength of interdisciplinary and social-ecological systems approaches to ecosystem recovery.

# REFERENCES

J. Adam Becco and Greg Brown. 2013. Integrating space, spatial tools, and spatial analysis into the human dimensions of parks and outdoor recreation. Applied Geography. 38: 76-85. Available from: https://pspwa.box.com/s/mdxi26xkxc4zldcz7ux074kqn4k47b6w

Nathan J. Bennett, Robin Roth, Sarah C. Klain, Kai Chan, Patrick Christie, Douglas A. Clark, Georgina Cullman, Deborah Curran, Trevor Durbin, Graham Epsten, Alison Greenberg, Michael P. Nelson, John Sandlow, Richard Stedman, Tara L. Teel, Rebecca Thomas, Diogo Verissimo, and Carina Wyborn. 2017. 205: 93-108. Available from: https://pspwa.box.com/s/x0iema1mmfkn4omdu72u74pkuwvihf74

Connor Birkeland, Kelly Biedenweg, and Patrick Christie. 2015. Human Dimensions, In Puget Sound Fact Book (Version 3.1) (pp. 21-31). Puget Sound Institute, University of Washington Tacoma: Tacoma, WA. Available from: https://pspwa.box.com/s/cxylaok0wfsn3y4uhdywnykhdson448w

Kelly Biedenweg. 2016. A Comparative Study of Human Well-Being Indicators Across Three Puget Sound Regions. Society & Natural Resources. 30 (3): 362-376. Available from: https://pspwa.box.com/s/k6v4hoiz4vhkup1lif4h8thhi9qchlpw

References: Whitney Fleming and Kelly Biedenweg. 2019. Visualizing Human Wellbeing in the Puget Sound: A Report on the 2018 Subjective Human Wellbeing Vital Signs. Puget Sound Partnership: Tacoma, WA. Available at: https://pspwa.box.com/s/f7wpcv9x7c6w9vuf3k43jxjzf77uvpci

Kelly Biedenweg, Haley Harguth, and Kari Stiles. 2017a. The science and politics of human well-being: a case study in cocreating indicators for Puget Sound restoration. Ecology and Society. 22 (3): 11. Available from: https://pspwa.box.com/s/jtxmxu6u20prnzbz0csu7qs6qxcu3wtx

Kelly Biedenweg, Ryan P. Scott, and Tyle A Scott. 2017b. How does engaging with nature relate to life satisfaction? Demonstrating the link between environment-specific social experiences and life satisfaction. Journal of Environmental Psychology. 50: 112-124. Available from: https://pspwa.box.com/s/tftk2gmah5133d1uqjh91u36cm9qcezz

Kelly Biedenweg, Kari Stiles, and Katharine Wellman. 2016. A holistic framework for identifying human wellbeing indicators for marine policy. Marine Policy. 64: 31-37. Available from: https://pspwa.box.com/s/v9br1q9t673n75iqdlnzhzw4gzqpujqg

Kelly Biedenweg, Adi Hanein, Kara Nelson, Kari Stiles, Katharine Wellman, Julie Horowitz, and Stacy Vynne. 2014. Developing Human Wellbeing Indicators in the Puget Sound: Focusing on the Watershed Scale. Coastal Management. 42 (4): 374-390. Available from: https://pspwa.box.com/s/jco3znz4b4c4hn4739h4sdth4i9c2tgq

Sara Jo Breslow, Brit Sojka, Raz Barnea, Xavier Basurto, Courtney Carothers, Susan Charnley, Sarah Coulthard, Nives Dolšak, Jamie Donatuto, Carlos Garcia-Quijano, Christina C. Hicks, Arielle Levine,

# REFERENCES

Michael B. Mascia, Karma Norman, Melissa Poe, Terre Satterfield, Kevin St. Martin, and Phillip S. Levin. 2016. Conceptualizing and operationalizing human wellbeing for ecosystem assessment and management. Environmental Science & Policy. 66: 250-259. Available from: https://pspwa.box.com/s/epmgv3cyc1qbzy6vt0gzffxi8yumv9tx

D.D. Briske, Nathan F. Sayre, L. Huntsinger, M. Fernandez-Gimenez, B. Budd, and J. D. Derner. 2011. Origin, Persistence, and Resolution of the Rotational Grazing Debate: Integrating Human Dimensions Into Rangeland Research. Society for Range Management. 64 (4): 325-334. Available from: https://pspwa.box.com/s/oy6svzen0uhufwy0kjtbw5xq1ll7dlp6

Susan Charnley, Courtney Carothers, Terre Satterfield, Arielle Levine, Melissa R. Poe, Karma Norman, Jamie Donatuto, Sara Jo Breslow, Michael B. Mascia, Phillip S. Levin, Xavier Basurto, Christina C. Hicks, Carlos Garcia-Quijano, Kevin St. Marin. 2017. Evaluating the best available social science for natural resource management decision-making. Environmental Science & Policy. 73: 80-88. Available from: https://pspwa.box.com/s/i36i9vgirxbgacqnk41vcbnpxa0x4eyp

Conservation Measures Partnership (CME). 2016. Incorporating Social Aspects and Human Wellbeing in Biodiversity Conservation Projects. Version 2.0. Available from: http://cmp-openstandards.org/guidance/addressing-human-wellbeing/

Tim Cresswell. Geographic Thought: A Critical Introduction. 2012. John Wiley & Sons, Ltd.: Malden, MA. Pertinent Chapter available from: https://pspwa.box.com/s/597ihn48l0cnhm9xqmgjbsctztbqztih

Daniel J. Decker, Shawn J. Riley, and William F. Siemer. 2012. Human Dimensions of Wildlife Management (2nd Edition). The John Hopkins University Press: Baltimore.

Donatella Della Porta and Michael Keating. 2008. Approaches and Methodologies in the Social Sciences: A Pluralist Perspective. Cambridge University Press: Cambridge. Available from: https://pspwa.box.com/s/wl1goysa11gyb0v4vgmo7i2abi4032fx

Jennifer Dodge, Sonia M. Ospina, and Erica Gabrielle Foldy. 2005. Integrating Rigor and Relevance in Public Administration Scholarship: The Contribution of Narrative Inquiry. Public Administration Review. 65 (3): 286-300. Available from: https://pspwa.box.com/s/bi4r1crimqi2o8v9jeiy8r9ptwk2y5br

Daniel P. Faith. 2005. Global biodiversity assessment: integrating global and local values and human dimensions. Global Environmental Change. 15: 5-8. Available from: https://pspwa.box.com/s/kvxsnh26ochanevrdo6rpqwc01gop5vg

Adriana E. S. Ford, Hilary Graham, and Piran C. L. White. Integrating Human and Ecosystem Health through Ecosystem Services Frameworks. Ecohealth. 12: 660-671. Available from: https://pspwa.box.com/s/1ofae9jsaldxlyfy6t86ik5bq04t9ms0

# REFERENCES

Front and Centered. 2017. 2017 Community Listening Sessions: Pollution, Climate Change, and the Puget Sound. Front and Centered: Seattle, WA. Available from: https://pspwa.box.com/s/vjdlzo5pl5q1gt1d4vacafo4n7g1v24u

Angela M. Guerrero, Nathan J. Bennett, Kerrie A. Wilson, Neil Carter, David Gill, Morena Mills, Christopher D. Ives, Matthew J. Selinske, Cecilia Larrosa, Sarah Bekessy, Fraser A. Januchowski-Hartley, Henry Travers, Carina A. Wyborn, and Ana Nuno. 2018. Achieving the promise of integration in social-ecological research: a review and prospectus. Ecology and Society 23 (3): 38. Available from: https://pspwa.box.com/s/g9j8g1e00ym6fx7xjs3mmssep7kkwzer

Adi Hanein and Kelly Biedenweg. 2012. Well-Being Indicators in the Puget Sound Basin. Puget Sound Institute, University of Washington Tacoma: Tacoma. WA. Available from: https://pspwa.box.com/s/k8aqcwymh61frqmgi8ji5sawzvblkbdb

Haley Harguth, Kari Stiles, Kelly Biedenweg, Scott Redman, and Sandie O'Neill. 2015. Integrated Conceptual Model for Ecosystem Recovery. Puget Sound Partnership: Tacoma, WA. Available from: https://pspwa.box.com/s/j0z53i3nto8xebhuoxe2v09z36uho7fv

Bonnie J. Johnson and Ward Lyles. 2016. The Unexamined Staff Report: Results From an Evaluation of a National Sample. Journal of the American Planning Association. 82 (1): 22-36. Available from: https://pspwa.box.com/s/93p5oaooax6aat6ikje6k2m9n6hizf80

Natalie A. Jones, Sylvie Shaw, Helen Ross, Katherine Witt, and Breanna Pinner. 2016. The study of human values in understanding and managing social-ecological systems. Ecology and Society. 21 (1): 15. Available from: https://pspwa.box.com/s/ik2qfxsezc4c6uhqjk0sepgvuf9h4gi4

Elizabeth King, Jeanine Cavender-Bares, Patricia Balvanera, Tuyeni H. Mwampamba, and Stephen Polasky. 2015. Trade-offs in ecosystem services and varying stakeholder preferences: evaluating conflicts, obstacles, and opportunities. Ecology and Society. 20: 25. Available from: https://pspwa.box.com/s/tev325oqi47i6bw051xqr36bt63g9wy7

Tomas M. Koontz and Craig W. Thomas. 2018. Use of science in collaborative environmental management: Evidence from local watershed partnerships in the Puget Sound. Environmental Science and Policy. 88: 17-23. Available from: https://pspwa.box.com/s/eqyhj71hej4lihg6rxps7bzl8u374l9m

T. Bruce Lauber and Daniel J. Decker. 2012. Integration Human Dimensions into Fish and Wildlife Management: An Essential Component of Adaptive Capacity. Human Dimensions of Wildlife. 17 (5): 317-319. Available from: https://pspwa.box.com/s/llqsrcmegtsx4m8qw9kyfrd72e4pdniu

Frederick I. Lauer, Alexander L. Metcalf, Elizabeth C. Metcalf, and Jakki J. Mohr. 2018. Public Engagement in Social-Ecological Systems Management: An Application of Social Justice Theory. Society & Natural Resources. 31 (1): 4-20. Available from: https://pspwa.box.com/s/84m3z3mc7yveecsu9q1kbe2nm2ym8grn

# REFERENCES

Rachel B. Lawrence, Sharon F. Rallis, Laura C. Davis, and Karen Harrington. 2018. Developmental evaluation: Bridging the gaps between proposal, program, and practice. Evaluation. 24 (1): 69-83. Available from: https://pspwa.box.com/s/em4vz85rgk3wb2gi0h1lgmjs44et263g

Patricia Leavy. 2017. Research Design: Quantitative, Qualitative, Mixed Methods, Arts-Based, and Community-Based Participatory Approaches. The Guilford Press: New York.
Niko Letunic. 2007. Beyond Plain English. Planning Magazine. October. 40-43. Available from: https://pspwa.box.com/s/mlkiu5cpyg75ch99u5bv36jmeon4wy9w

Graham McDowell and Michelle Koppes. 2017. Robust Adaptation Research in High Mountains: Integrating the Scientific, Social, and Ecological Dimensions of Glacio-Hydrological Change. Water. 9: 739. Available from: https://pspwa.box.com/s/goharmpjq6zjsboviibtv61apvphw7zb

Millennium Ecosystem Assessment (MEA). 2005. Ecosystem and Human Well-Being: Synthesis. Island Press: Washington, DC. Available from: https://pspwa.box.com/s/sk6elwl7axdfmb1oaerumeaa0d32uksy

Unai Pascual, Jacob Phelps, Eneko Garmendia, Katrina Brown, Esteve Corbera, Adrian Martin, Erik Gomez Baggethun, and Roldan Muradian. 2014. Social Equity Matters in Payments for Ecosystem Services. BioScience 64: 1027-1036. Available from: https://pspwa.box.com/s/dl9zz0ov8vulw66b2f2yqkh8a0cb3lub

Ruxandra Malina Petrescu-Mag, Dacinia Crina Petrescu, Ioan Gheorghe Oroian, Ovidiu Calin Safirescu, and Nicoleta Bican-Brisan. 2016. Environmental Equity through Negotiation: A Case Study on Urban Landfills and the Roma Community. International Journal of Environmental Research and Public Health 13: 591- 611. Available from: https://pspwa.box.com/s/iwivmd96y8qk85dtg1xexgmjkarp92zk

Melissa R. Poe, Jamie Donatuto, and Terre Satterfield. 2016. "Sense of Place": Human Wellbeing Considerations for Ecological Restoration in Puget Sound. Coastal Management. 44 (5): 409-426. Available from: https://pspwa.box.com/s/w9hpm1hn5v7ysec4djnsg4ji08oz3nch

Charles L. Redman, J. Morgan Grove, and Lauren H. Kuby. 2004. Integrating Social Science into the Long-Term Ecological Research (LTER) Network: Social Dimensions of Ecological Change and Ecological Dimensions of Social Change. Ecosystems. 7 (2): 161-171. Available from: https://app.box.com/file/274216277387

Patrick Robinson, Ken Genskow, Bret Shaw, and Robin Shepard. 2012. Barriers and Opportunities for Integrating Social Science into Natural Resource Management: Lessons from National Estuarine Research Reserves. Environmental Management. 50: 998-1011. Available from: https://pspwa.box.com/s/ybilalawo69qyxrrcgqvqt0l4fxyep0g

Simo Sarkki, Mikko Jokinen, Maria Nijnik, Lyudmila Zahvoyska, Eleni M. Abraham, Concepcion L. Alados, Chloe Bellamy, Svetla Bratanova-Dontcheva, Karten Grunewald, Jozef Kollar, Jan Krajci, Apastolos P. Kyriazopoulos, Nicola, La Porta, Antonio T. Monteiro, Jose Munoz-Rojas, Taras Parpan, Louise Sing, Mike Smith, Marja-Liisa Sutinen, Anne Tolvanen, and Tetiana Zhyla. 2017. Social Equity in governance of ecosystem services: synthesis from European treeline areas. Climate Research 73: 31-44. Available from: https://pspwa.box.com/s/mxory8lnqjin8gd2h4yyjgcqw0homfwu

# REFERENCES

Jesse S. Sayles. 2018. Effects of Social-Ecological Scale Mismatches on Estuary Restoration at the Project and Landscape Level in Puget Sound, USA. Ecological Restoration. 36 (1): 63-75. Available from: https://pspwa.box.com/s/uqxuvp49vhlmm7n0llm0dw5n03tvq9q7

Morgan M. Schneidler and Mark L. Plummer. 2009. Human Well-being Indicators: Background and Applications for the Puget Sound Partnership. NOAA Fisheries: Seattle, WA. Available from: https://pspwa.box.com/s/ppgodj908c52znhmdmpjys98xao17854

Greg Schrock, Ellen M. Bassett, and Jamaal Green. 2015. Pursuing Equity and Justice in a Changing Climate: Assessing Equity in Local Climate and Sustainability Plans in US Cities. Journal of Planning Education and Research 35(3): 282-295. Available from: https://pspwa.box.com/s/v8i4brejmfdpt8jqu6bmzytkrlz5p7wh

Marc J. Stern. 2018. Social Science Theory for Environmental Sustainability: A Practical Guide. Oxford University Press: Oxford.

Kari Stiles, Kelly Biedenweg, Katharine F. Wellman, Leah Kintner, and Dave Ward. 2015. Human Wellbeing Vital Signs and Indicators for Puget Sound Recovery. Puget Sound Partnership: Tacoma, WA. Available from: https://pspwa.box.com/s/dxvdp03jm4edfumioufnuon1cmfntvom

David J. Trimbach. 2018. Equity & Social Science Integration at the 2018 Salish Sea Ecosystem Conference. Encyclopedia of Puget Sound. University of Washington Tacoma: Tacoma, WA. Available from: https://pspwa.box.com/s/y2ksojpq2727i0yitbkragwj4qfmlda4

Kati Von Reis. 2016. Toolkit for integrating human wellbeing into ecosystem recovery plans. Puget Sound Partnership: Tacoma, WA. Available from: https://pspwa.box.com/s/5d2l9pez1uu54x10q8xluek12ol2idu0

Katharine F. Wellman, Kelly Biedenweg, and Kathleen Wolf. 2014. Social Science in Puget Sound Recovery. Coastal Management. 42 (4): 298-307. Available from: https://pspwa.box.com/s/s5dyk73dwrsoyaa5npb0nlgm71eok9r8

# OUTLINE OF APPENDICES

Appendix A. Partnership HD Timeline
Appendix B. Human Wellbeing Vital Signs Handout
Appendix C. Partnership HD Glossary
Appendix D. HD Checklist
Appendix E. Potential IS HD Partner List
Appendix F. Integrated Conceptual Model for Ecosystem Recovery
Appendix G. Social Approaches and Social Science
Appendix H. HD Annotated Bibliography Template
Appendix I. Toolkit for Integrating Human Wellbeing into Ecosystem Recovery Plans
Appendix J. Understanding Equity
Appendix K. BASS Guide
Appendix L. Social Science Frameworks
Appendix M. Human Wellbeing Survey and Implementation Strategies
Appendix N. Economics Guidance
Appendix O. Structured Decision Making
Appendix P. Social Science for the Salish Sea
Appendix Q. IS Survey Examples