

How Healthy Is Your Ahupua'a?



COMMUNITY WATERSHED SNAPSHOT GUIDEBOOK



HAWAI'I
CONSERVATION
ALLIANCE



HAWAI'I CONSERVATION ALLIANCE

A Partnership Dedicated to Environmental Stewardship, Community Engagement, and Conservation Capacity

The Hawai'i Conservation Alliance envisions thriving, abundant lands and seas with their native ecosystems actively cared for by generations of stewards, steered by excellent science and Hawaiian values and practice.

We provide unified leadership, advocacy, and collaborative action to conserve and restore native ecosystems and the unique biodiversity of our islands.

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**STATE OF HAWAI'I, OFFICE OF PLANNING,
COASTAL ZONE MANAGEMENT PROGRAM**

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**“AS HAWAIIANS, WE
RELATE TO THE LAND AS
OUR ELDER SIBLING. THE
LAND TAKES CARE OF
US, AND WE TAKE CARE
OF THE LAND. FROM THE
AIR WE BREATHE, TO
THE WATER WE DRINK,
TO THE FOOD WE EAT,
EVERYTHING COMES BACK
TO THE RELATIONSHIP
THAT WE MĀLAMA
SOMETHING.”**

– NOELANI LEE, EXECUTIVE DIRECTOR
OF KA HONUA MOMONA, MOLOKA’I,
GAVE HER SONS KAULUWAI 6 YEARS OLD
(BOTTOM LEFT) AND KEOLINOHOKAI 4
YEARS OLD (BOTTOM RIGHT), THEIR NAMES
TO REFLECT THE MAGIC OF THE SPACE
WHERE FRESH WATER AND SALT WATER
MEET IN A FISHPOND’S *MULIWAI*.

right: This 800-year-old *kuapā* (rock wall) at
Ali’i Fishpond, Moloka’i, like many fishpond
walls across Hawai’i, was built rock by rock,
passing through thousands of hands. It
represents sustained community efforts,
not only from the past, but also continuing
today. It exemplifies that if we care for our
‘āina (Land), it will, in return, feed us.

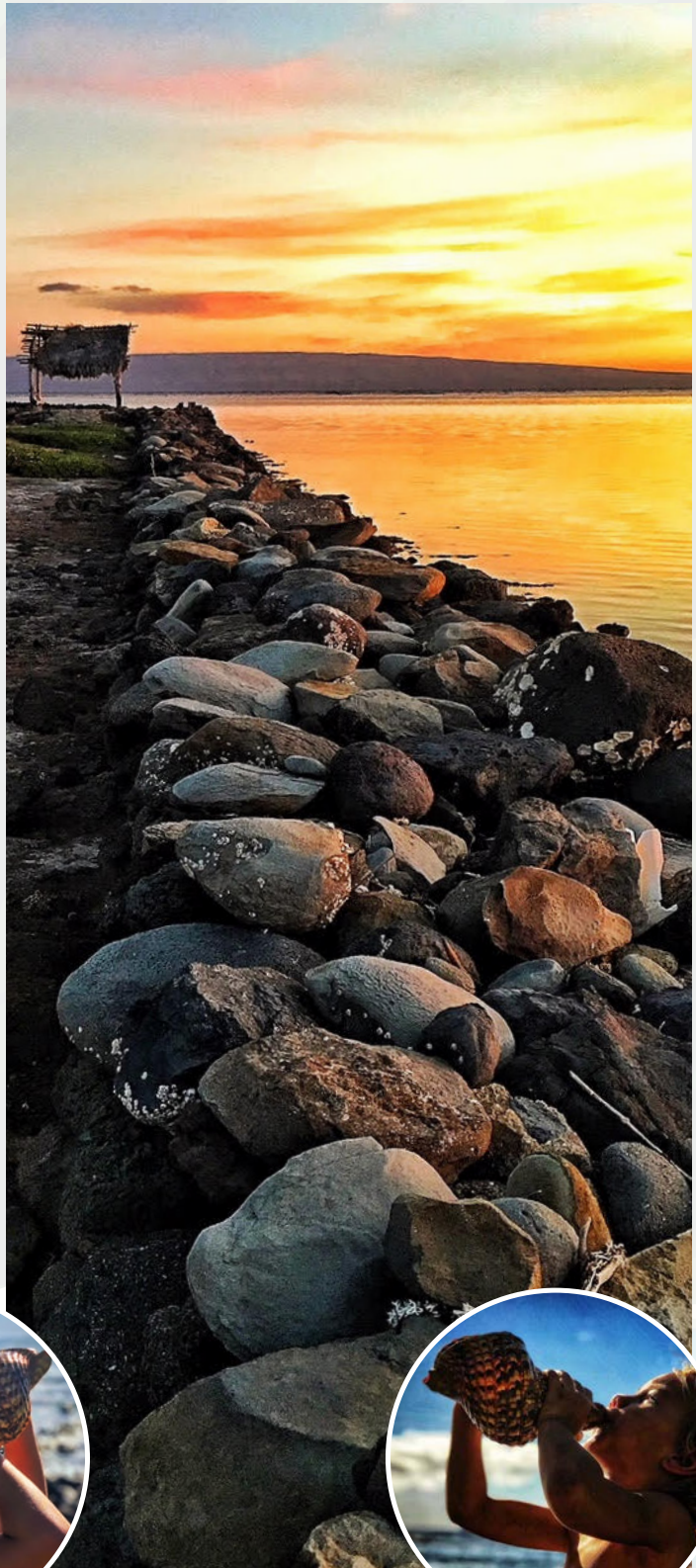




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FROM OUR COMMUNITIES TO YOURS

A MESSAGE FROM THE PILOT CWS PROJECT COMMUNITIES

A snapshot of an ecosystem is a representation of a moment in time, affectionately referred to as a “place-based selfie.” HCA’s Community Watershed Snapshot (CWS) Project is a first step to understanding, analyzing and addressing humanity’s relationship with its environment as part of the solution to taking care of Hawai‘i. The CWS Project is a participatory and collaborative process to answer the burning question, “How healthy is your *ahupua‘a* (watershed)?”

Completing the snapshots gave our communities the opportunity to produce game plans aimed at improving ridge-to-reef ecosystems by addressing some of the priority issues that currently exist. Before the snapshots, there was a lack of consensus about where to start addressing threats to watershed health. However, through this snapshot process and cooperatively developed communications tools (poster, fact sheet with infographics and PowerPoint presentation), we have a greater ability to proceed as a unified community. For Maunalua and Hau‘ula/Punalu‘u, a major watershed threat identified was water quality due to cesspools, stormwater and sediment runoff flowing into nearshore waters, wetlands and fishponds. Following the snapshot process, the Maunalua Watershed Hui was established with the purpose of collaborating to foster the health

and abundance of the Maunalua region. Hau‘ula became a pilot site for a University of Hawai‘i Department of Urban and Regional Planning Coastal Community Resilience Project and received a National Oceanic and Atmospheric Administration (NOAA) Bay Watershed Education and Training (B-WET) grant to continue data collection and to acquire a watershed “xplormobile” to conduct experiential field-based learning activities for students and their families.

The most valuable aspect of the community snapshot posters we developed is that they represent and effectively communicate the way each of our communities views its place. One participant reflected, “The poster represents our community and health indicators of everything that is important to us. The most striking thing about the poster is what is not there.” Although in practice, there are jurisdictional lines between the different departments of the state, divisions within DLNR, or between county offices, there are actually no jurisdiction lines in an *ahupua‘a*. We are using this tool in many of our outreach and education efforts, not only in our communities, but also in others, and in discussions with local state and federal resource managers. The snapshot communication tools and process provided the foundation for a conversation that has, thus far, been missing. That is, it provided



above: Anna's Retreat, Community Watershed Snapshot Design Planning Workshop with all 8 communities, Waimea, Hawai'i, September 2014

an opportunity to do something that we have been saying that we need to do for years—bring all of the data into one place and interpret them for our communities from our *keiki* (children) all the way to decision-makers.

Asking ourselves about our knowledge and our relationship to our places was a step toward reinvigorating a sense of community and righting the canoe. What better imagination, vision and memory to engage than the native and local people of the place? This seems especially important when our communities will be the ones to bear the impact of changes to our environment. What better way to take care of our home than to engage a long-standing sense of *kuleana* (responsibility, obligation, right) to *mālama* (care for) Hawai'i?

*"I HOPE THAT WE COULD PRODUCE
SNAPSHOTS FOR EVERY ISLAND, AND
ESPECIALLY FOR URBAN AREAS, AND
THEN HAVE ALL OF THEM TOGETHER
PRESENTING A VISUAL OF THE
HEALTH OF THE WHOLE PAE'ĀINA.
THE IMPACT WOULD BE PROFOUND."*

— **KAWIKA WINTER,**
LIMAHULI GARDEN AND PRESERVE

Deborah Zilly

Chris Cromer

Kenia Iwani

Dotty Kelly-Paddock

Kawika Winter

[Signature]



RESILIENCE IN THE 21ST CENTURY

Landscapes and seascapes are changing in response to a diversity of pressures and threats, including climate change, land-use change, invasive species, fire, overharvesting, expanding development and recreation. Hawai'i's climate models paint a picture of a future that is warmer, drier and subject to more frequent and intense storms. Ecological trajectories point

to an expanding cover of invasive species, a greater area affected by land use and wildfires, and an overall increase in pressure on limited natural resources. To reverse these trends, there is an urgent need to understand the foundational elements of resilient systems that couple natural and human systems, and then to build these elements into our management.

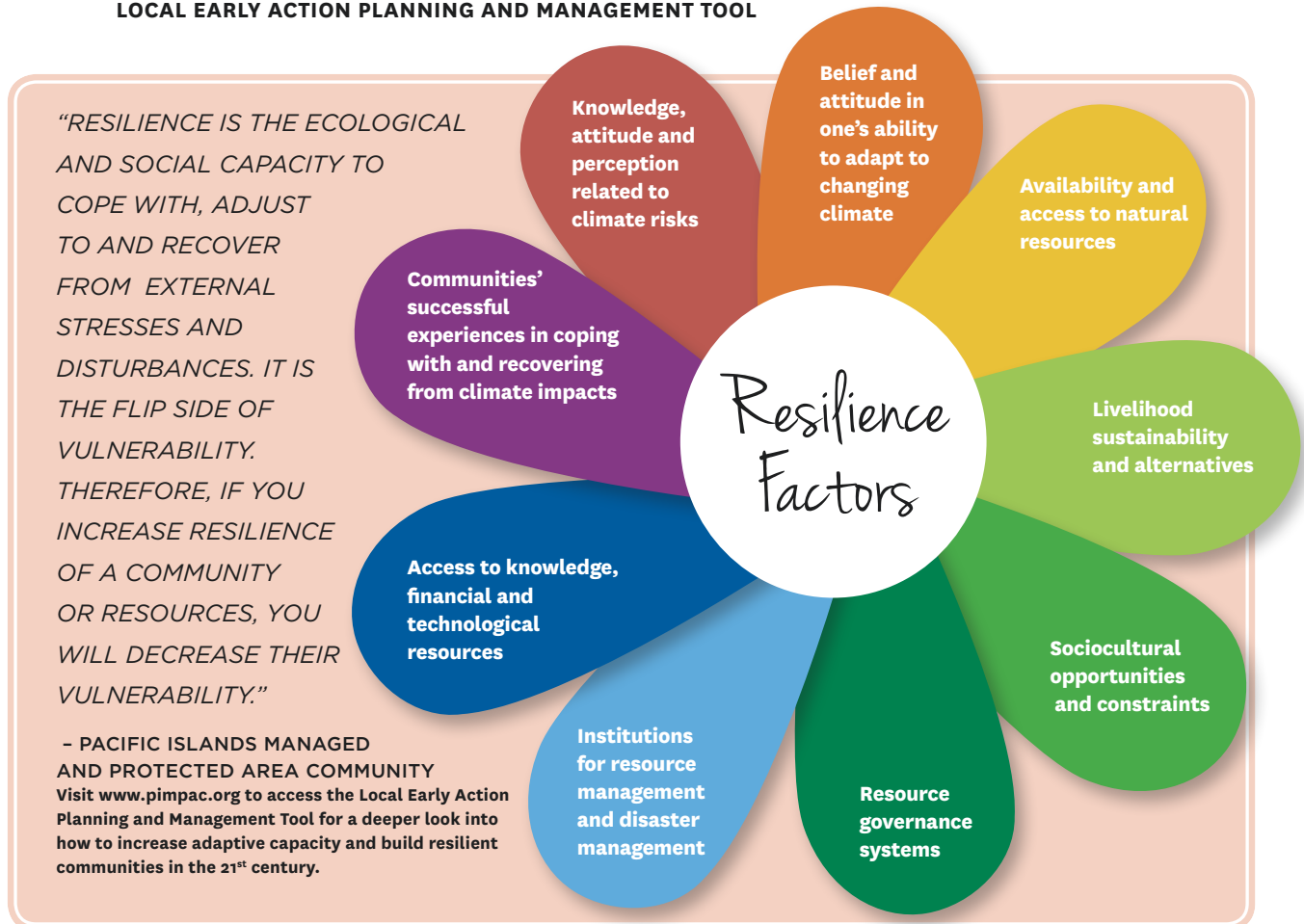
below: **Hawaiian Monk Seal**



PHOTO: NOAA

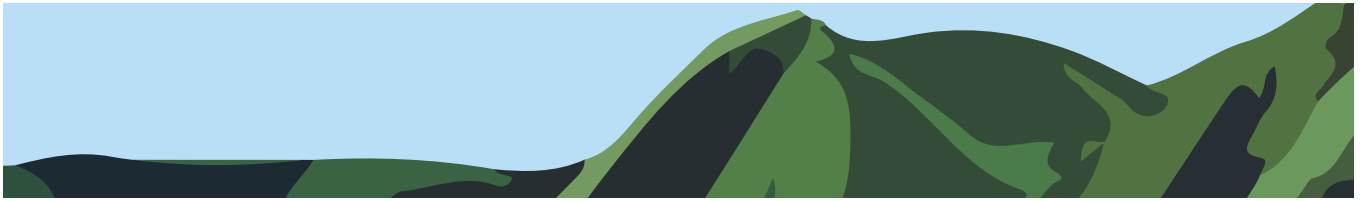
RESILIENCE FACTORS

FROM PACIFIC ISLANDS MANAGED AND PROTECTED AREAS COMMUNITY(PIMPAC)
LOCAL EARLY ACTION PLANNING AND MANAGEMENT TOOL



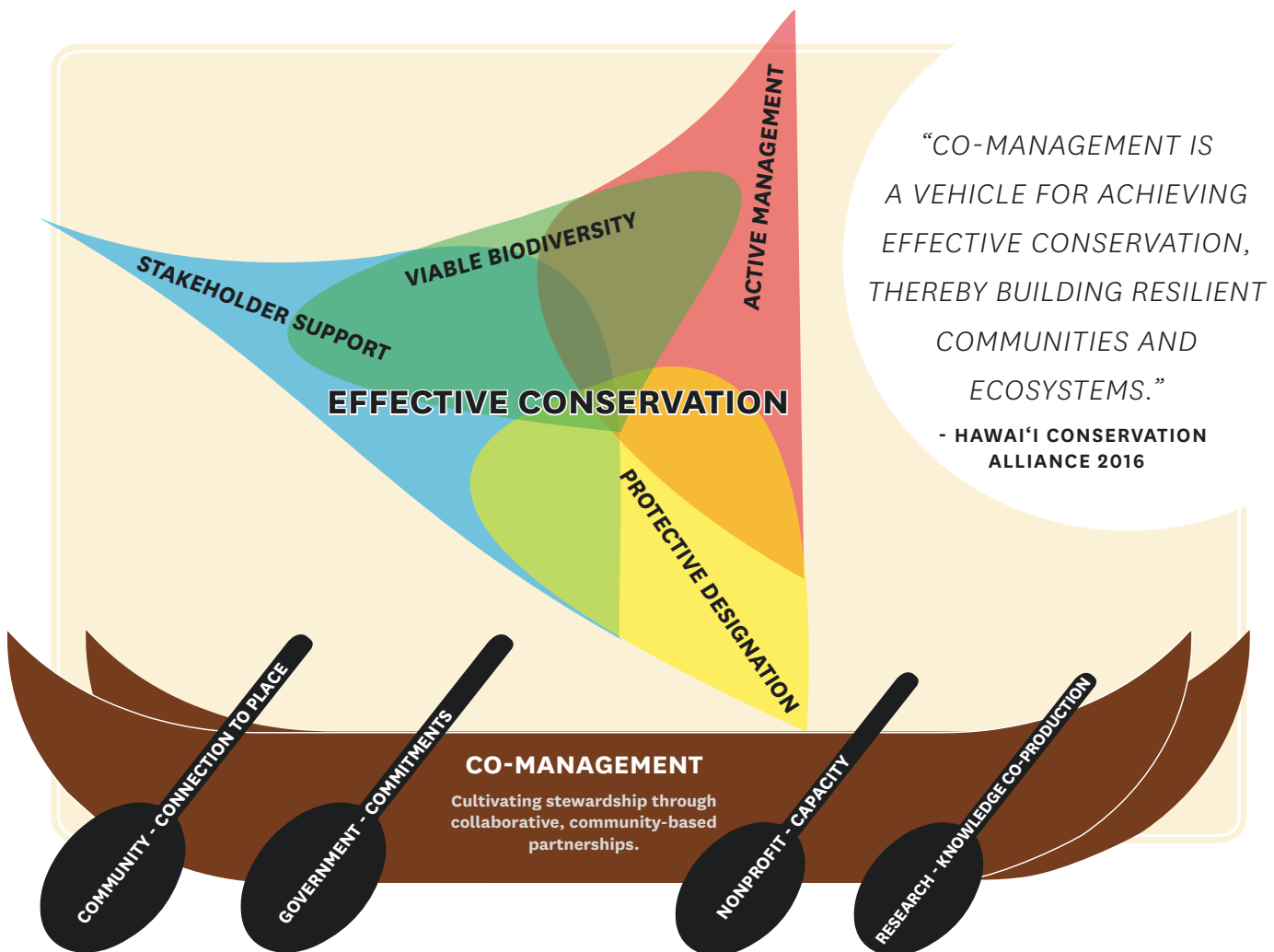
"COMMUNITY COLLABORATIVE CO-MANAGEMENT WILL BE AN EXPANDING STRATEGY FOR CONSERVATION, SERVING TO NOT ONLY BUILD THE LOCAL CAPACITY OF CONSERVATION EFFORTS, BUT TO ENGENDER THAT WHICH MAKES CONSERVATION FOREVER: AN UNSHAKABLE ALOHA (LOVE, AFFECTION) FOR THE PLACE WHERE YOU LIVE, BUILT ON AN INTIMATE KNOWLEDGE AND PRIDE IN WHAT YOUR PLACE HAS TO OFFER, AND YOUR ROLE IN MAKING THAT RICHNESS PRESENT FOR YOUR DESCENDANTS, FAR INTO THE FUTURE."

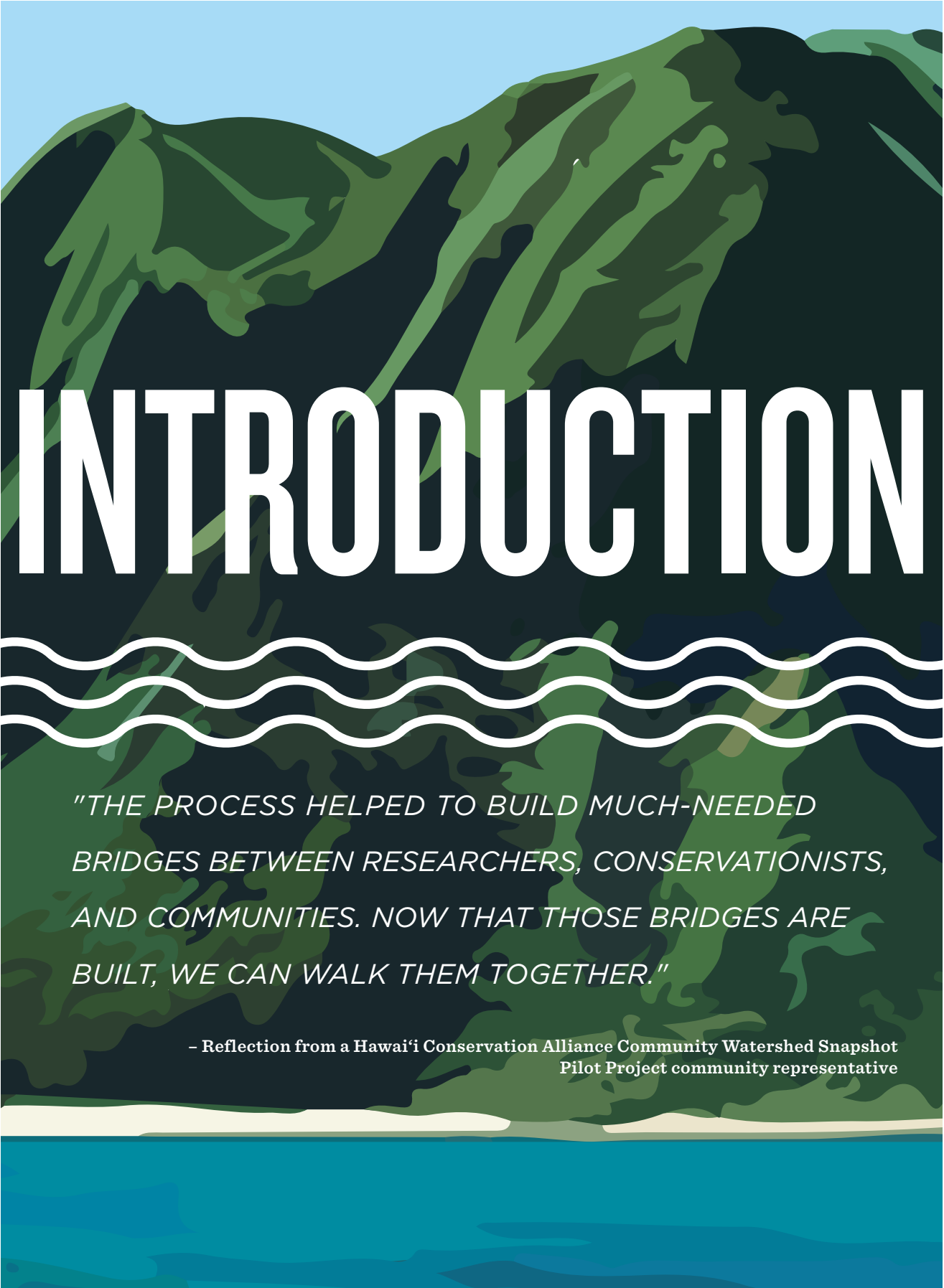
– **SAM GON**, 2016 HCA CHAIR & THE NATURE CONSERVANCY



We define resilience as the ability to recover from unexpected and catastrophic change. On the surface, this may appear straightforward, but resilience is a complicated target for both ecological and human communities. Resilience discussions need to consider changing not only ecological factors, but also dynamic social, economic and spiritual attributes of communities. Further, managing for resilience should enhance adaptive capacity, or the capability or ability

of built, natural and human systems to adapt to impacts of climate change and climate variability with minimal potential damage or cost. This enhanced adaptive capacity should benefit the entire system such that the system can be sustained in the face of change and can recover from disturbances. Resilience, therefore, must become a central consideration as communities, resource managers and policy-makers plan for 21st century Hawai‘i.





INTRODUCTION

*"THE PROCESS HELPED TO BUILD MUCH-NEEDED
BRIDGES BETWEEN RESEARCHERS, CONSERVATIONISTS,
AND COMMUNITIES. NOW THAT THOSE BRIDGES ARE
BUILT, WE CAN WALK THEM TOGETHER."*

– Reflection from a Hawai'i Conservation Alliance Community Watershed Snapshot
Pilot Project community representative

A Community Watershed Snapshot (CWS) provides a status report on ridge-to-reef health. The snapshot can help communities understand the status of their priority watershed resources and ecosystems, and it can provide a foundation for management. The purposes of the guidebook are as follows:

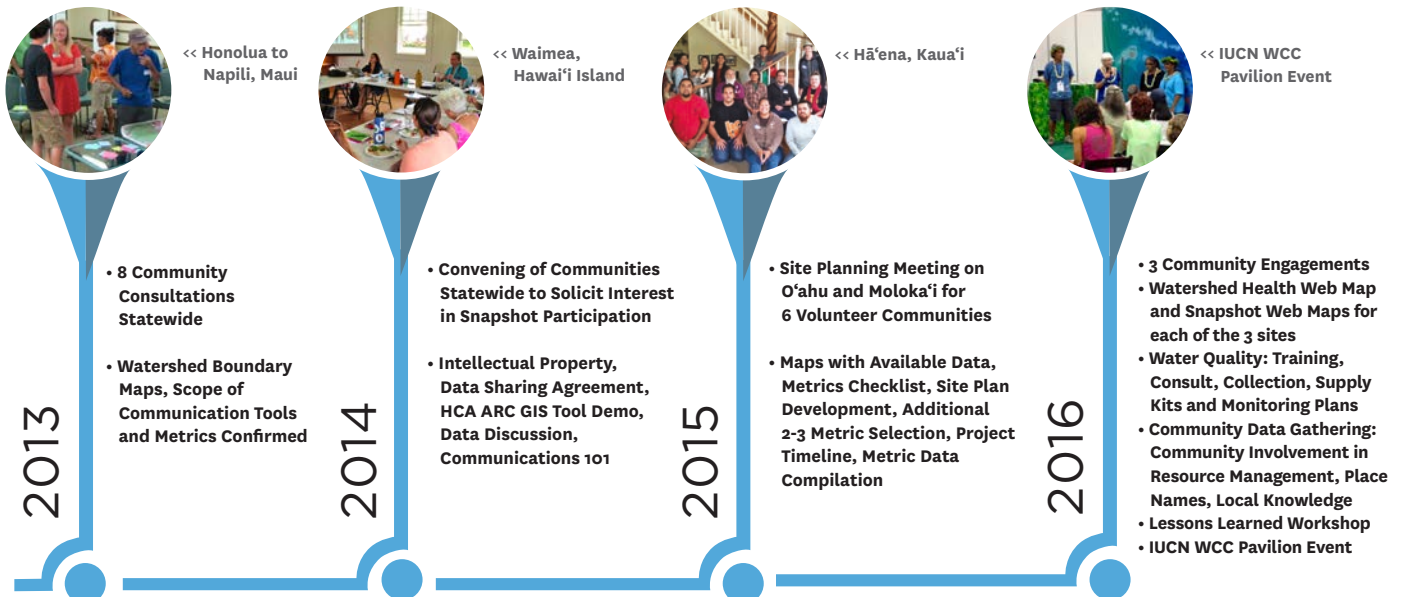
- 1) To share the CWS process with community representatives who wish to unite their communities around and catalyze *mauka* (towards the mountains) to *makai* (towards the ocean) ecosystem-based management.
- 2) To capture and share local watershed-related knowledge alongside available agency natural resource data to inform and engage communities in collective decision-making.

The Hawai'i Conservation Alliance Community Watershed Snapshot Guidebook describes a community-friendly process to better understand the health of an *ahupua'a*. A community group can use the process in the guidebook to determine the health of its ridge-to-reef ecosystem by developing its own CWS.

This guidebook strongly recommends that community groups use an experienced facilitator to help the group move through the process. The seasoned facilitator will utilize this guidebook as participatory and collaborative process advice. Although this resource is not a facilitation methods guide, the Community Watershed Snapshot Guidebook provides recommendations about how to engage a community group in interactive and inclusive exercises that generate dialogue, build capacity and result in consensus-based products. Rather than duplicating existing tools, this guidebook attempts to complement and reinforce resources already in use throughout the Pacific Islands.

This guidebook provides resources to help inspire community interest at the beginning of a watershed management process and to evaluate long-term management efforts. The second session of the "Inspiring Action" section, titled "Planning to Take Action" (page 86) features a list of recommended resources available for community management planning. Facilitation tips and other community management resources are referenced throughout the Community Watershed Snapshot Guidebook.

PROJECT HISTORY





above: **Lessons Learned Workshop O'ahu, July 2016**

1) Community members engaging in a CWS initially work together to determine the boundaries of their area and to identify key natural, cultural and socioeconomic geospatial characteristics. Then they create a timeline of significant historical changes in resource use and status. A facilitator then guides a CWS team (page 31) through a participatory process to design evaluation metrics that will be used to assess the health of the area, including socioeconomic and cultural variables. The evaluation design is complete once the agreed-upon metrics are sufficient to provide a geospatial information system (GIS) specialist with the information needed to access and analyze selected metrics using available data housed in Hawai'i Conservation Alliance's (HCA) online library of all Hawai'i watershed-related data (hca.maps.arcgis.com). For communities not located in Hawai'i, we recommend the use of a similar data-sharing platform or, at a minimum, the development of a GIS web map.

2) Through facilitated discussions, the CWS team determines priority gaps in snapshot metrics data and develops a plan to contribute to the collection of priority data and additional local knowledge. A communication expert leads the CWS team to design and produce a suite of communication tools, along with a plan for their use. The snapshot results are provided to the CWS team to help inform, guide and engage partners for more effective *mauka-to-makai* management efforts.

3) Following a reflection of snapshot results, a first step to management planning called a "Problem-Solution Model" guides the team to select priority actions to most effectively address the

identified threats to the health of the *ahupua'a*. For those communities interested in moving forward with initial options for management, a Watershed Action Plan Review (page 90) is provided. For those communities wishing to dive into a more comprehensive management planning effort, we provide an orientation to several widely used management planning approaches.

4) Viewing the initial snapshot as a baseline, the guidebook concludes with a discussion about when to repeat the snapshot process to guide ongoing monitoring of the watershed, ensuring the explicit linking of management actions to snapshot metrics.

Throughout the development of the guidebook, HCA worked to ensure that the Community Watershed Snapshot Metrics and resulting local management efforts were aligned with and contribute to statewide management efforts and targets such as the Ocean Health Index (ohi-science.org), Ocean Resources Management Plan (<http://planning.hawaii.gov/czm/ocean-resources-management-plan-ormp>) and Sustainable Hawai'i Initiative (<http://governor.hawaii.gov/sustainable-hawaii-initiative>) to protect 30% of priority watersheds and effectively manage 30% of nearshore ocean waters by 2030—among other food, energy and biosecurity goals.

Visit www.hawaiiconservation.org/communitysnapshot for more information on the HCA Community Watershed Snapshot Project, including examples of communication tools and resources such as the public HCA ArcGIS Online Tool, example community maps and a video tutorial.



PHOTO: LIHLA NOORI



above: Individuals representing Papahānaumokuākea Marine National Monument and University of Hawai'i-Hilo, Kū'ula (an integrated marine science course) conduct an opening inspired by Kanaloa, Hawaiian god of sea and the Kumulipo for the 2016 IUCN World Conservation Congress Ocean Pavilion Event featuring the UNESCO World Heritage Launch for World Heritage in the High Seas, September 2016.

left: *Cyanea st.johnii*, Helemano

The CWS process is one way to begin building resilience into communities and ecosystems, thereby effectively conserving our natural resources. This process is founded on a rekindling of relationships between the community and those individuals within organizations that have jurisdictional responsibility for managing resources within the community's *ahupua'a* of interest. It is our belief that over time, such relationship-building will help your *ahupua'a* become more resilient to change because your community will become better informed about the health and trajectory of the *ahupua'a*. In turn, this new *mana'o* (thought) fosters *aloha* for the places dear to you, a desire to *mālama* (take care of) these places, and the *'ike* (knowledge) to

effectively *mālama* these places. Because state and federal financial resources are often limited, communities that practice *mālama 'āina* (care for the land) or *mālama kai* (care for the ocean) can greatly enhance the health and resilience of their *ahupua'a*; in so doing, they elevate the health and resilience of individuals, families and the community. Where resilience is high, communities usually have high adaptive capacity. Where state and federal agencies support management actions promoted by communities that are committed to *mālama* their places, the adaptive capacity of the community also grows, thereby enhancing the resilience of all members of the *ahupua'a*.

WATERSHED OR AHUPUA‘A?

A community watershed snapshot can also be referred to as an *ahupua‘a* snapshot. The process serves both the contemporary ecosystem concept called a watershed and the Native Hawaiian traditional concept of *ahupua‘a*. A watershed is a land area that drains to a common waterway such as a stream, lake, estuary, wetland and, ultimately, the ocean. An *ahupua‘a* is a Hawaiian land division. In some cases, *ahupua‘a* boundaries closely follow watershed boundaries; in other cases, they do not.

Throughout this guidebook, the terms “watershed” and “*ahupua‘a*” are both used because this guidebook originated from a Hawai‘i-based experience. There is a resurgence of

ahupua‘a management—for example, in Hā‘ena, Kaua‘i, Ka‘ūpūlehu, Hawai‘i and Kawela, Moloka‘i—where a community’s identity and vibrancy can be demonstrated through a sense of *aloha* and *kuleana* for its place.

Ultimately, whether you call your ridge-to-reef assessment an *ahupua‘a* snapshot or a watershed snapshot is your community’s choice. In reflecting on your community demographics and sense of place, the concept that resonates most with your community will increase participation and support, yield more relevant products and lead to greater management results.

“AN AHUPUA‘A IS A HAWAIIAN VIEW OF A MANAGED LANDSCAPE, GENERALLY SPEAKING, A UNIT OF LANDSCAPE—PERHAPS A VALLEY FROM ITS MOUNTAIN RIDGES TO AT LEAST A MILE OUT TO SEA—AND THE RELATIONSHIPS WITHIN IT—including HUMANS—AND HOW THEY ARE A PART OF THE HEALTH (GOOD OR BAD) OF THE NATURAL SYSTEMS WITHIN. THIS SNAPSHOT AND OTHER ASSESSMENTS FRAMED BY THE AHUPUA‘A PERSPECTIVE HELP TO SHAPE AN INVENTORY OF THE RELATIONSHIPS OF COMMUNITIES AND THEIR PLACES TOWARD A MORE INTEGRATIVE VISION OF MANAGEMENT.”

– KEVIN CHANG, KUA‘ĀINA ULU ‘AUAMO



above: Waimea, Hawai‘i



above: Hā'ena Watershed Poster

AHUPUA'A (AH-WHO-POOH-AH-AH)^{1,2}

“More than a millennium ago, the *kanaka maoli* (indigenous people of Hawai'i) developed the *ahupua'a* system of resource management as a means to live in perpetual abundance on isolated oceanic islands. The success of this system was founded in its recognition of the intrinsic interconnectedness between nature and humanity. *Ahupua'a* management employed several strategies which aimed towards maximizing the availability of resources in order to sustain large and healthy populations. They were designed in various ways throughout the archipelago, and thus provide us several templates for sustainable living in our islands. Many—like that of Hā'ena in the *moku* (district) of Halele'a on the island of Kaua'i—correspond closely with watershed boundaries, but other types exist as well. By looking to this system of resource management, along with the values associated with it, we can find both inspiration and practical methods for living in balance with nature.”

– KAWIKA WINTER, LIMAHLI GARDEN AND PRESERVE'S AHUPUA'A POSTER

¹ “Spatial Modeling of Social-Ecological Management Zones of the Ali'i Era on the Island of Kaua'i with Implications for Large-Scale Biocultural Conservation and Forest Restoration Efforts in Hawai'i” by Kawika Winter and Matthew Lucas, published in 2017 by *Pacific Science* (volume 71, issue 4).

² “Toward an Inventory of *Ahupua'a* in the Hawaiian Kingdom: A Survey of Nineteenth- And early Twentieth-Century Cartographic and Archival Records of the Island of Hawai'i” by Lorenz Gonschor and Kamanamaikalani Beamer, published in 2014 by *The Hawaiian Journal of History* (volume 48).

Hawai'i Association of Watershed Partnerships www.hawp.org

HAWP comprises eleven island-based Watershed Partnerships that work collaboratively with more than 74 public and private partners on five islands to protect over 2.2 million acres of vital forested watershed lands. These Watershed Partnerships are making a critical difference for the protection of forested watersheds in our state. HAWP's mission is to increase the effective management and protection of *mauka* watershed areas by raising the capacity of Watershed Partnerships, facilitating sharing of watershed management expertise, building public support for protecting watershed values, and developing sustainable funding sources. A watershed is an area of land, such as a mountain or valley, which collects rainwater into a common outlet [such as a stream, lake or wetland]. In Hawai'i, the common outlet is ultimately the ocean. Some of the rain is absorbed by plants, some of it is absorbed underground, and the rest flows into surface rivers and streams. Unfortunately, various forms of pollution, including runoff and erosion, can interfere with the health of the watershed. Therefore, it is important to protect the quality of our watershed. A critical component of a watershed's ability to collect rainwater is the existence of forests. Fog condensing on trees high up in watershed areas can increase rainfall collection and absorption by as much as 30% annually.

Healthy, Forested Watersheds

- >> Recharge our water supply and help with droughts by collecting rainwater which flows underground into our aquifers supplying residents and communities as well as agriculture and businesses with their water needs
- >> Protect oceans for swimming and fishing by controlling erosion and run-off as the roots of trees and other vegetation help to hold soils to keep them from flowing down into oceans and impacting coral reefs, fisheries, and swimming areas
- >> Mitigate flooding as forests help to slow down water flow
- >> Provide habitat for Hawai'i's unique plants and animals that can be found nowhere else in the world
- >> Supply culturally important plants and animals to continue traditions such as hula, storytelling, and medicine
- >> Serve as recreational and educational places for communities and schools
- >> Protect public health by providing clean water and air
- >> Supports the economy through providing watershed management related jobs, opportunities for businesses for needed supplies and materials, and eco-tourism
- >> Mitigate the effects of climate change by absorbing carbon dioxides."

– HAWAI'I ASSOCIATION OF WATERSHED PARTNERSHIPS ([HTTP://HAWP.ORG/WHY-WATERSHEDS-MATTER/](http://hawp.org/why-watersheds-matter/))

"EARTH IS COVERED IN 70% WATER AND UNFORTUNATELY 40-50% OF OUR NATION'S WATERS ARE IMPAIRED OR THREATENED. 'IMPAIRED' MEANS THAT THE WATER BODY DOES NOT SUPPORT ONE OR MORE OF ITS INTENDED USES. THIS COULD MEAN THAT THE WATER IS NOT SUITABLE TO DRINK, SWIM IN OR TO CONSUME THE FISH THAT WAS CAUGHT THERE."

– THE NATURE CONSERVANCY,
"JOURNEY WITH NATURE:
WATERSHEDS 101"
([https://www.nature.org/ourinitiatives/
regions/northamerica/unitedstates/
indiana/journeywithnature/
watersheds-101.xml](https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/indiana/journeywithnature/watersheds-101.xml))

SNAPSHOT EVOLUTION

Between 2013 and 2016, the Hawai'i Conservation Alliance (HCA) carried out the Community Watershed Snapshot Project. The purpose of the CWS Project was to create a community-led process for periodically measuring the status and health (a "snapshot") of local watersheds through time to inform local community discussions and support local watershed management decision-making by community leaders and state and county officials. A summary of the key achievements made throughout the process of implementing HCA's CWS Project from 2013 through 2016 is presented in the timeline and in more detail below.

2013

COMMUNITY-LED DESIGN OF WATERSHED SNAPSHOT METRICS

The HCA CWS Project commenced in 2013. Over the period of several months, HCA visited and consulted with community leaders and local stakeholders from eight *ahupua'a* across the Main Hawaiian Islands, inviting their feedback and suggestions on how best to measure the health of their local watersheds. The eight *ahupua'a* were selected by HCA members based on several criteria including the importance of the watershed for native biodiversity, the presence of an active and informed group of local stakeholders focused on watershed stewardship, and cultural and geographic diversity across the Main Hawaiian Islands.

Prior to each consultation, a watershed map with the relevant *ahupua'a* boundaries were developed by HCA for each of the eight communities consulted. The maps were developed based on HCA's ArcGIS database and online web map portal. These *ahupua'a* maps were reviewed, discussed and, in some cases, adjusted and corrected by community participants as part of the HCA consultation process.

The nearly 80 local representatives who attended and participated in HCA's community consultations collectively identified a shared set of *mauka* (terrestrial), *makai/wai* (ocean/freshwater) and *ka'ike* (socioeconomic and cultural knowledge) metrics that they believe are important for understanding the status and health of their *ahupua'a* (i.e., to complete a snapshot). See page 56 for HCA's Watershed Snapshot Metrics.



PHOTO: HANNAH SPRINGER



PHOTO: HANNAH SPRINGER

above from top: Hanalei and Ka'upulehu consultation

2014

VOLUNTEER COMMUNITIES STEP FORWARD TO CONDUCT SNAPSHOTS

Following formal review and consideration of these three sets of watershed health metrics by HCA's members during late 2013 and early 2014, a set of ten biophysical and four sociocultural metrics of watershed health were confirmed and endorsed by HCA in 2014. This was followed by a CWS design workshop held in Waimea, Hawai'i with the eight communities that had been consulted by HCA the year prior. During this design workshop, six of the eight attending communities volunteered to become pilot sites for conducting watershed snapshots.

As part of this process, an intellectual property and data-sharing agreement was developed between the volunteer communities and HCA. The six volunteer communities also began discussing the communication product formats that their snapshot results would take once the selected watershed health indicators had been measured. (See definition on page 63.)

top: **Community Watershed Snapshot Design Planning Workshop with all 8 communities, Waimea, Hawai'i**

middle: **Site Planning Meeting with community representatives from Maunaloa, Hā'ena and Hau'ula, O'ahu**



“THERE IS A SENSE OF HOPE ATTRIBUTED TO DAYS OF EFFORT THAT ARE DONATED TO VISITING RESEARCHERS THAT WILL ONE DAY RETURN TO THE COMMUNITY AS A COLLECTIVE STORY OR INFORMATION THAT IS RELEVANT AT THE SITE LEVEL. ACCOUNTABLE RESEARCHERS WHO ARE HUMBLLED BY THE OPPORTUNITY TO CONDUCT RESEARCH AND GIVE BACK TO THE COMMUNITY BY CONTRIBUTING TO A COLLECTIVE LIBRARY.”

– **KAWIKA WINTER**, LIMAHLI GARDEN AND PRESERVE

2015

SNAPSHOT PLANNING AND DATA COLLECTION COMMENCES

During 2015, HCA held workshops with the six volunteer communities to complete site planning for measuring two to three CWS metrics that were selected by each pilot site. Out of this site-planning process, three volunteer communities identified themselves as willing to conduct snapshots within the resources and timeline available (i.e., during 2015-2016): Hā'ena, Kaua'i; Hau'ula/Punalu'u; and Maunaloa, O'ahu. The three remaining communities (from the Maui Nui island group and Hawai'i Island) decided they would conduct snapshots later, following the completion of the first three pilot snapshots.

Following the site-planning workshops, available data relating to the selected metrics were identified, collated and entered into HCA's ArcGIS database for site use. Where data did not exist for selected metrics (including most of the sociocultural and several of the biophysical metrics), HCA worked with each volunteer site to develop a plan for data collection on-site, with technical support from HCA members and the provision of data-collection equipment (e.g., water quality testing equipment). Data were collected at a site level and submitted to HCA for collation and georeferencing throughout the second half of 2015 into the first half 2016.

Pilot sites also identified and designed target communications products through which to share the results of their watershed snapshot results, resulting in site-based communications plans that were supported by HCA.

2016

FIRST THREE PILOT WATERSHED SNAPSHOTS COMPLETED

During the rest of 2016, the pilot sites completed data collection for their selected metrics of watershed health. At the request of these sites, this included HCA conducting a water quality monitoring training workshop, followed by providing equipment and on-site technical support for water quality data collection. Data collection on-site by volunteers included identifying and documenting traditional Native Hawaiian watershed feature place names, quantification of local participation in natural resource management activities within the watershed, and measurement of local awareness and traditional knowledge with elders and other community stakeholders.

Also during 2016, volunteer sites worked closely with HCA on the design and production of their selected snapshot results communications tools—for example, ahupua'a maps, infographics, and fact sheets. HCA also generated web maps of watershed health and snapshot metrics using its ArcGIS Online Tool.

Finally, pilot sites participated in a workshop during mid 2016 to share and document lessons learned from the CWS process. This included both site-specific and shared lessons learned, as well as key findings and advice to be shared with outside communities interested in conducting watershed snapshots of their own.

The development of this HCA Community Watershed Snapshot Guidebook intends to inform the future application and utility of the CWS process for communities across the Hawaiian Islands.



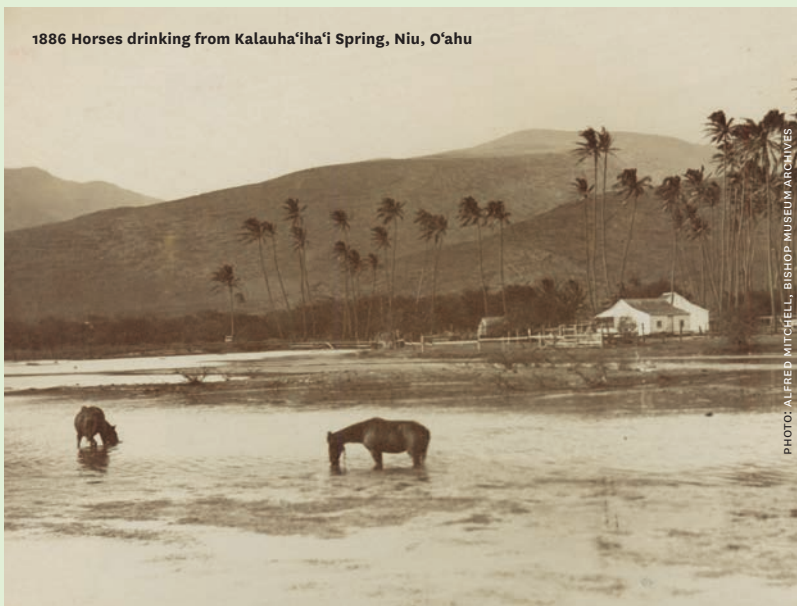
top: Maunaloa Communications Engagement Meeting, Hawai'i Kai, O'ahu. middle: Lessons Learned Workshop. above: Kawika Winter, Community Watershed Snapshot Lessons Learned Pavillion Presentation, IUCN 2016 World Conservation Congress Honolulu, O'ahu

SNAPSHOTS INSPIRE PARTNERSHIPS

As a result of completing the snapshot process, all three pilot communities experienced relationship benefits such as unifying and bridging previously disparate groups. Collaboratively developing metrics and sharing in the monitoring of baseline conditions allowed participants to connect the various interactions in a ridge-to-reef ecosystem. With this new understanding, communities collectively realized which indicators are under immediate threat or warranted priority action. Discussions helped to bring perspective and understanding to community representatives as they candidly shared personal accounts of how resource-use patterns and local events have changed the quality and abundance of natural resources over time. Participants reflected how their children now experience a different environment than their parents and grandparents experienced. This concept of shifting baselines is captured in the adjacent historic photo, where a horse is drinking out of the tidepools of Maunalua Bay (Niu) in 1886. These tidepools were fed by an underground spring at Kalauha'ihā'i, previously in such quantity that the water fanned out along the

nearshore almost to the reef. The water was fresh! This unspoiled environment is how *kūpuna* often characterize memories of their childhoods. The Maunalua region has since undergone several threats over the years, which, coupled with development, has resulted in poor water quality, defined as an impaired water body by the Environmental Protection Agency. The tide is changing for this suburban community. Mālama Maunalua, The Nature Conservancy, and the National Oceanic and Atmospheric Administration have led the removal of 3.5 million pounds of invasive alien algae since 2007. Another snapshot highlight was the purchase of Kānewai Spring by the Maunalua Fishpond Heritage Center through a partnership with The Trust for Public Land. One of three pilot snapshot communities, Maunalua completed its watershed snapshot in fall 2016 with a clear focus on improving water quality. To address these threats, the Maunalua Watershed Hui formed in spring 2017 with the purpose of collaborating to foster the health and abundance of the Maunalua region.

1886 Horses drinking from Kalauha'ihā'i Spring, Niu, O'ahu



"WHEN I WAS LITTLE, OUR YARD IN NIU INCLUDED KALAUHA'IIHA'I SPRING. ON ITS 'EWA SIDE WAS A SMALL PASTURE WITH DAIRY COWS AND HORSES. THOSE ANIMALS DRANK FRESH WATER FROM THE POND. WATER IN THIS VALLEY TRAVELS FROM THE MOUNTAINS IN BIG LAVA TUBES."

- LAURA LUCAS THOMPSON,
KUPUNA FROM NIU, O'AHU

NOTES



GETTING STARTED

Sessions in “Getting Started” include the following:

SESSION 1: EVALUATING COMMUNITY READINESS (1 HOUR)

SESSION 2: CLARIFYING ROLES AND RESPONSIBILITIES (1 HOUR)

Understand who will be participating in the Snapshot

SESSION 3: FORMING THE COMMUNITY WATERSHED

SNAPSHOT TEAM (1 HOUR)

Ensure the Snapshot is developed with support from a diverse mix of people

SESSION 4: FINANCING YOUR SNAPSHOT (1 HOUR)

Learn how to support the cost of conducting the Snapshot

**SESSION 5: INVITING PARTICIPANTS AND SURVEYING KNOWLEDGE
AND PERCEPTIONS (1 TO 2 HOURS)**

Asses the general state of natural resource management in your place

Whether your community has a long history of community-based resource management experience or is just starting the discussion around how to *aloha ʻāina* in your *ahupuaʻa*, the CWS process and associated products offer a variety of benefits to your community. The section titled “Resilience in the 21st Century” (p. 8) describes some of the wider benefits to communities engaged in stewarding their places. Before moving forward with conducting a CWS, completing the exercises in “Getting Started” helps to ensure that your community is sufficiently prepared and has adequate capacity and resources. The “Getting Started” sessions also will help you to identify clear roles and responsibilities for people working on your CWS. Once this is complete, you are ready to start the CWS process for your community, starting with a survey assessing current knowledge and perceptions in your community.

Starting Smart and Scaling Up

Deciding on the size and scope of your CWS is one of the most important early steps you can take to begin understanding and improving the health of your ridge-to-reef ecosystem, watershed or *ahupuaʻa*. Selecting the right size and scope of your project will contribute to the success and longevity of the effort. For example, if the project area is too large or the scope too ambitious, the effort required to effectively *mālama* the place might exceed the community’s initial capacity to bring about visible change. When a project is too large, a great deal of time, energy and *aloha* can be devoted to a place, but threats creep back in, ultimately giving the community the feeling that the threats are too overwhelming to overcome. On the other hand, a well-selected project area or scope can inspire participating community members and even engage more members of the community to join in supporting various parts of the project.



top: Hāʻena Community Consultation, Kauaʻi September 2013

Definitions

Size: The number of acres, number of *ahupuaʻa* that define the project or place you will cover in your CWS

Scope: Relates to the goals, intentions and features you will include in your CWS. For example, is it necessary to include particular streams, ridges, coastlines and nearshore fisheries in your assessment? Are there specific impacts from upper *mauka* or pressure from the coast that are of interest for your CWS?

Community Watershed Snapshot Timeline

ESTIMATED PROJECT LENGTH (7-10 MONTHS)

SESSION TITLE	ESTIMATE LENGTH	MONTH
I. Getting Started		
I. 1: Evaluating Community Readiness	1 hour	1
I. 2: Clarifying Roles and Responsibilities	1 hour	1
I. 3: Forming the Community Watershed Snapshot Team	1 hour	1
I. 4: Financing Your Snapshot	1 hour	1
I. 5: Inviting Participants and Surveying Knowledge and Perceptions	1-2 hours	1
I. 5: Facilitator processes survey responses.	2 hours	1
II. Focusing on Your Place		
II. 1: Participating in Mapping	2-3 hours	2
II. 2: Informing Your Snapshot	2-3 hours	2
II. 2: Facilitator processes input.	2 hours	2
II. 3: Building Your Historical Timeline	1-2 hours	2
III. Moving to Measurement		
III. 1: Protecting Your Snapshot Information	2 hours	3
III. 2: Confirming Snapshot Metrics	1-2 hours	3
III. 2: GIS lead develops GIS map product or web map, analyzes existing data for all metrics, and creates table of results with gaps.	Page 56	3
III. 3: Understanding Snapshot Results	1-2 hours	3
III. 4: Engaging Local Knowledge	1-2 hours	3
III. 4: CWS Team completes Local Knowledge Checklist.	As needed	4
III. 5: Gathering Additional Information	1-2 hours	4
III. 5: CWS team collects data.	as needed	4-5
IV. Sharing Results		
IV. 1: Learning About Effective Communications	1 hour	6
IV. 2: Shaping Foundational Communication Tools	2-3 hours	6
IV. 2: CWS team completes templates.	As needed	6
IV. 2: Communications lead completes design for three draft snapshot communications tools.	Page 75	6
IV. 3: Developing the Snapshot Communications Plan	1-2 hours	7
IV. 3: CWS team and communications lead finalize the Snapshot Communications Plan and tools.	As needed	7
V. Inspiring Action		
V. 1: Creating a Problem-Solution Model	2-3 hours	7
V. 2: Planning to Take Action	3 hours	7
V. 3: Monitoring Your Management Progress	1-2 hours	7

» SESSION 1.

EVALUATING COMMUNITY READINESS

(1 HOUR)

By completing the checklist below, your community can gauge whether you have the level of awareness and capacity necessary to effectively move forward with the snapshot.

OBJECTIVES

To confirm that your community is prepared to begin the CWS process.

To help ensure that you have sufficient resources and capacity to successfully execute the snapshot.

RESOURCES NEEDED

- Community Readiness Checklist (p. 27), either as handouts or an electronic copy with the ability to share using a projector, laptop and screen or wall
- Pens or pencils
- Snapshot communications materials and relevant reports from the three pilot snapshot communities (See p. 114 for more information.)

EXERCISE

1. Gather an interested group of community members. Review Community Watershed Snapshot Timeline on page 25.
2. With your understanding of the CWS process and timeline described on page 25, host a discussion about whether your community is ready to start the snapshot process. Use the Community Readiness Checklist (p. 27) to guide your discussion. Most, if not all, of the answers to the questions should be “yes” before you move forward with the CWS. If the answers to any of the questions is “no,” discuss with your group what needs to be done to turn the answers to “yes.”
3. Discuss whether your community has reached consensus about moving forward with the snapshot process. If your community is not ready, discuss what it may take to get ready and who will volunteer to support that process.



PHOTO: JOHN PARKS

from left: Hā'ena focus group, site planning meeting, O'ahu, September 2015



WORKSHEET 1: COMMUNITY READINESS CHECKLIST

GETTING STARTED

QUESTIONS	Yes/ No/ Maybe	Detailed Explanations
1. Do you think this is the right time to conduct a Community Watershed Snapshot (CWS)? If so, why?		
2. Have you undertaken basic outreach steps with the community about the possibility of conducting a CWS?		
3. After reviewing the CWS timeline on page 25, is a core group of community members committed to participating in the entire snapshot process?		
4. Have you already chosen the geographic focus area for your CWS? (Detailed boundaries will be determined later.)		
5. Do you have enough basic information, ecology and history about the site?		
6. Do you have a group of interested community or agency people who are willing to contribute to the process?		

(Adapted from the Pacific Islands Managed & Protected Area Community (PIMPAC))



PHOTO: MAUNALUA MEIWA

Site planning meeting with community representatives from Maunaloa, O'ahu; Hā'ena, Kaua'i; and Hau'ula, O'ahu, September 2015

Good Facilitation Tips

A good facilitator is one of the most important roles to be filled in the CWS process, this graphic gives you an idea of the many “hats” the facilitator will play in throughout the Snapshot process.

A good facilitator...

- ✓ Spends time on the overall process design
- ✓ Keeps the group focused on task and process
- ✓ Remains objective
- ✓ Is an informed guide helping the group to chart its course and accomplish its goal
- ✓ Listens more than talks
- ✓ Adapts to various learning styles
- ✓ Encourages everyone to participate while remembering that individuals participate in different ways (some may talk only in small groups, yet are still participating; others may wish to talk constantly yet contribute little)
- ✓ Protects members of the group from attack by others
- ✓ Is gender and culture sensitive
- ✓ Helps keep the group within time constraints
- ✓ Energizes a group or slows it down as needed
- ✓ Recaps, occasionally, what happened in the workshop and helps the group to make connections between the sessions
- ✓ Is flexible
- ✓ Makes it **fun**

“Report on Training of Trainers in the Planning and Facilitation of Community Participatory Learning and Action (PLA) Workshop for Natural Resource Use Planning in East Timor” by Tawake, A; Tabunakawai, K; Veitayaki, J and Bogiva, A, published in 2001 by Institute of Applied Science at the University of the South Pacific, Suva, Fiji.

» SESSION 2. CLARIFYING ROLES AND RESPONSIBILITIES (1 HOUR)

If you have decided that your community is ready to move forward with conducting a snapshot, this session helps to identify who would be good to play specific roles on the team. This includes both community participants (internal) and professional expertise (external) recommended for key roles in this process and defines how each of their responsibilities intersect and complement one another.

OBJECTIVES

To identify who will be implementing the CWS and clarify how they will contribute to the process.

RESOURCES NEEDED

- Community Watershed Snapshot Team Roles (p. 30), either as handouts or an electronic copy with the ability to share using a projector, laptop and screen or wall
- Pens or pencils

EXERCISE

Interested community members meet to review and discuss potential people to fill the roles listed in the Community Watershed Snapshot Team Roles worksheet. As names of people are generated, add them to the “Suggested People” column.

Data Management Tip

One of the most critical responsibilities of the CWS team coordinator is to make sure there is a clear plan for who will track, store and manage participant input including meeting notes and information collected and generated. The coordinator will be the keeper of physical materials (flip-chart paper, historical timeline, snapshot map) and will establish a safe space for electronic files such as meeting notes, completed checklists, photos of flip-chart paper and so on. Free web-based storage is readily available—Google, Dropbox or Cloud, for example. See “Protecting Your Snapshot Information” (p. 51) to learn how to safeguard and protect sensitive information related to the snapshot and how to determine how participants can use information from and communication about the CWS.



above: Community representatives from Hā'ena, Kaua'i

WORKSHEET 2: COMMUNITY WATERSHED SNAPSHOT TEAM ROLES

GETTING STARTED

ROLES	RESPONSIBILITIES	COST	SUGGESTED PEOPLE (prioritized if more than 1)
Community Watershed Snapshot (CWS) Team	Participates in consultations, exercises, surveys, data collection and communication tools development. Recommend 10-20 people.	VOLUNTEER	
CWS Team Coordinator	Ensures that the team is engaged and informed of the meetings, products and outcomes. Organizes and stores materials and electronic documents. Supports facilitator in prepping and set-up for consultations. Ensures data collection, contractor preparation and other “homework” is completed in a timely manner.	VOLUNTEER Sponsored by a local organization or hourly short-term contract, depending on funding and community capacity	
CWS Facilitator	In concert with the team coordinator, plans and facilitates meetings; also manages and conducts follow-up related to the community exercises described in this guidebook.	SHORT-TERM CONTRACT	
GIS Lead	Supports data-related exercises and preparation including “Focusing on Your Place,” “Moving to Measurement” and “Understanding Snapshot Results”, See GIS Scope of Work for more details.	SHORT-TERM CONTRACT	
Communications Lead	Supports communications-related exercises and preparation including “Sharing Results” and design of communications materials	SHORT-TERM CONTRACT	

(Adapted from the Pacific Islands Managed and Protected Areas Community (PIMPAC))

» SESSION 3. FORMING THE COMMUNITY WATERSHED SNAPSHOT TEAM (1 HOUR)

With the CWS team roles in mind, the next step is to carefully select and establish your CWS team. Your team should be composed of individuals representing different partners and perspectives from the community and, possibly, local organizations and groups. The CWS team should be an equitable representation of your community.

OBJECTIVES

To recruit a CWS team that generates wide investment in the snapshot products, results and future management efforts.

Definition

Stakeholders: Individuals, groups or institutions that have a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same.

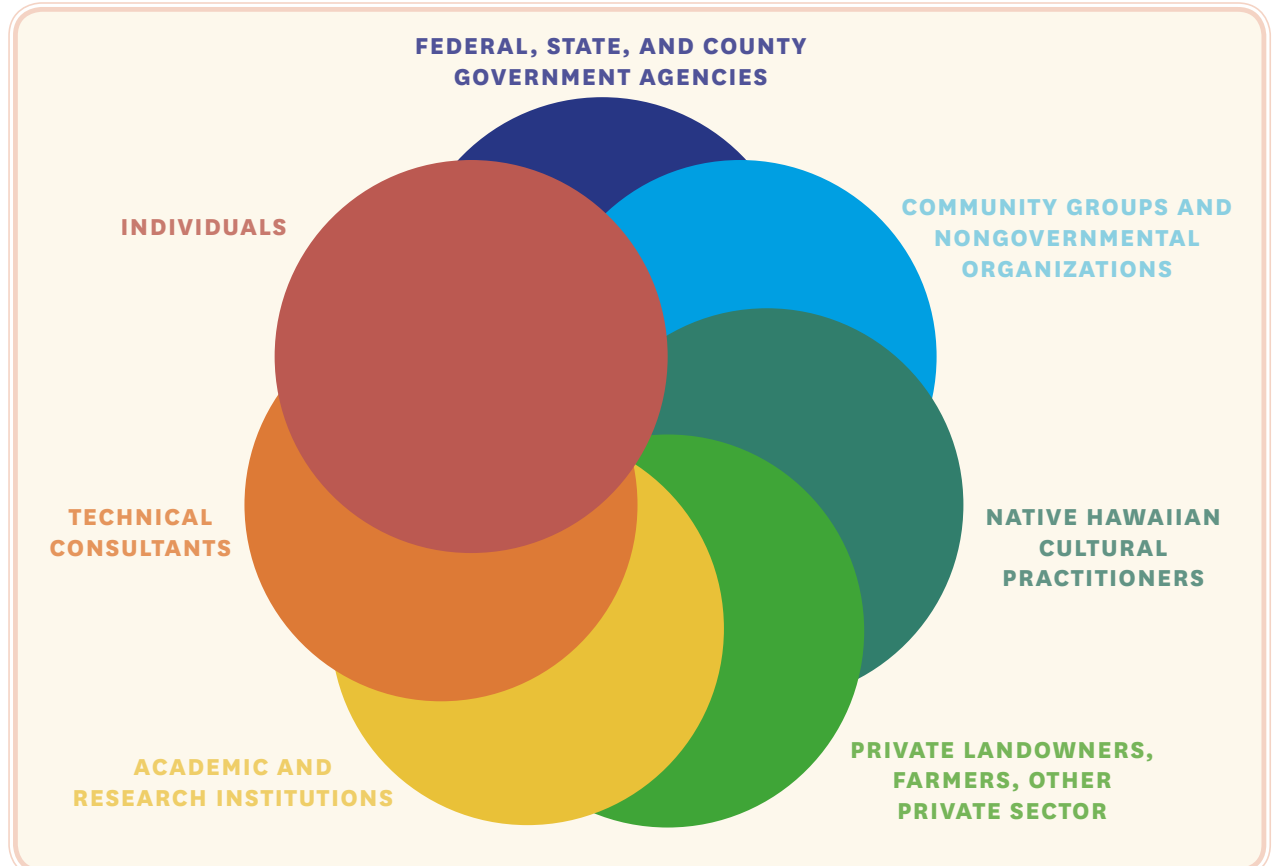


FIGURE 2: HAWAII WATERSHED GUIDANCE, HAWAII OFFICE OF PLANNING COASTAL ZONE MANAGEMENT 2010

SESSION 3 (CONTINUED)

RESOURCES NEEDED

- Worksheet 3: Stakeholder Identification (p. 33), either as handouts or an electronic copy with the ability to share using a projector, laptop and screen or wall
- Pens or pencils

EXERCISE

1. Gather the initial group that is interested in conducting a CWS.
2. Together, complete the Stakeholder Identification worksheet, making sure to include names of people or organizations, with contact information where possible.

Over the course of the project, it may be wise to revisit the worksheet if the CWS team needs to be extended. As stakeholders are added to the team, add their names to the master list.

3. Determine who will follow up by inviting the stakeholders identified to participate in the CWS process.



above: Dotty Kelly-Paddock Community Watershed Snapshot Lessons Learned Pavilion Presentation, IUCN 2016 World Conservation Congress, Honolulu, O'ahu, September 2016

below: Site planning meeting with community representatives from Maunaloa, O'ahu; Hā'ena, Kaua'i; and Hau'ula, O'ahu, September 2015



What are the main groups of people involved in the area?	Describe their interest in the area.	Describe the validity of their interest or "stake."	How important is this group to the planning process?	How and when should they be involved in the snapshot process?	Do you want a representative of this stakeholder group on this CWS team? If so, who would you like to join?

» SESSION 4.

FINANCING YOUR SNAPSHOT

(1 HOUR)

The majority of the snapshot can be completed with resources that are likely available in your community, including time and knowledge of local people. However, it is also important to engage some professional expertise to ensure the most effective process ensues and stated goals are achieved. In an effort to maximize your community's time, a draft proposal and budget is provided for your fundraising efforts.

OBJECTIVES

To support the capacity and expertise required to successfully implement an effective snapshot.

RESOURCES NEEDED

- Proposal Template (starting on page 96), including timeline and budget
- Pens or pencils

EXERCISE

1. Review the following information with interested parties:

The cost of conducting your snapshot can vary depending on the capacity and resources of your community as well as the size and scope of your snapshot (see more information in "Starting Small and Scaling Up" on p. 24). A trained facilitator is necessary to help manage the community exercises described in this guidebook. A coordinator is helpful to manage data and ensure the team is moving forward with project milestones, such as completing data collection, collating survey information and the like. The facilitator and coordinator could be the same person. Depending on the capacity of your community, an able and willing volunteer can play this role. Keep in mind that if you would like to meet the timelines suggested, it may be necessary to contract these critical positions.

The GIS and communications leads require modest funding to produce the deliverables described in this guidebook. Other real costs include meeting space, paper, colored markers, copies, online fees for storage or surveys, and refreshments for the community exercises. The community may be able to sponsor or donate some of these items.

To support your community's fundraising efforts, the proposal template features an example funding request for your use and modification. The proposal template includes an estimated project timeline and budget for conducting a Hawai'i-based CWS.

2. Discuss your community's fundraising approach with your CWS team, including seeking private and public sources of funding. Use the template as guidance.

right: Hau'ula Community Consultation, Hau'ula, O'ahu, September 2013



» SESSION 5. INVITING PARTICIPANTS AND SURVEYING KNOWLEDGE AND PERCEPTIONS (1-2 HOURS)

Once your CWS team has been formed and you have secured sufficient resources to get started, the invitation to the first community consultation includes a request for each participant to respond to a brief survey. Once compiled and analyzed, this information familiarizes the CWS team, facilitator and contractors with an overview of community concerns and basic ecosystem knowledge of your area to inform future sessions.

OBJECTIVES

To scope the community's local knowledge, interest and values as they relate to ridge-to-reef ecosystems.
To guide the preparation of the facilitator and other contractors.

RESOURCES NEEDED

- Community Watershed Snapshot Survey (p. 36), which you can use to create and distribute as an online survey

EXERCISE

1. Along with an email invitation to the CWS process, send a survey link to each participant. There are several free web-based survey instruments to make data collection and analysis easier, such as SurveyMonkey, JotForm, or Wufoo. If an online survey is not possible, print and distribute printed copies of the survey.
2. Once surveys are returned, engage a volunteer to manually enter responses into online software for easy compilation and analysis. The team member or coordinator should compile survey results in preparation for presenting. Responses to questions 3, 4, 7 and 10 should each be displayed as percentage of "yes" responses and percent of "no".
3. During the first CWS team meeting, present all results to the community to help establish the group's working relationships, and identify areas of agreement that will enhance and complement the consultations described in later sections of this guidebook. The information collected from the survey also will help to prepare the facilitator and other experts as they plan the subsequent activities required to support the community in the development of its snapshot.

Facilitation Tip

Prior to the day of the consultation, make sure you have coordinated the supplies and room set-up with the coordinator. Always have a camera or phone on hand for capturing flip-chart and action photos. Begin each community consultation session with introductions. Then review and post the agenda and update to the project timeline, including completed and remaining products for each section. Allow participants to voice expectations for the meeting. At the end of each meeting, prior to confirming next steps and setting the next meeting date, debrief what about the meeting went well and what could be improved.

WORKSHEET 4: COMMUNITY WATERSHED SNAPSHOT SURVEY

GETTING STARTED

- 
1. Name *(optional)*
 2. How long have you lived in this community? ____ years
 3. Do you believe your community's natural environment is healthy? **YES or NO**
Please explain why you answered "yes" or "no."
 4. What do you believe to be the benefits to your community of a healthy watershed?
 5. What are the most valuable natural resources in your watershed?
 6. Have you observed changes to the health of your community's watershed resources? **YES or NO**
If you answered "yes," please describe what changes you have observed.
 7. Are you concerned about any particular resources or areas? **YES or NO**
If you answered "yes," which resources or areas are you concerned about?
 8. What are the top 3 priority threats to be addressed?
 9. Why do you believe these are the top 3 threats?
What changes do you believe they have created over time?
 10. Is enough being done to safeguard your community's watershed resources? **YES or NO**
 11. What additional/new actions need to take place to better address the threats to watershed resources?
 12. Please list potential resources in your community that may be available to support this process.

NOTES



NOTES





FOCUSING ON YOUR PLACE



Sessions in “Focusing on Your Place” include the following:

SESSION 1: PARTICIPATING IN MAPPING (2-3 HOURS)

The CWS team cooperatively documents key features and resources within the study area boundaries.

SESSION 2: INFORMING YOUR SNAPSHOT (2-3 HOURS)

The CWS team builds a shared sense of ownership and priorities.

SESSION 3: BUILDING YOUR HISTORICAL TIMELINE (1-2 HOURS)

The CWS team shares and documents memories and stories that affected the present condition of its *ahupua'a*.

Native Hawaiian stewardship is rooted in deep ancestral relationship, experience and knowledge of place. The CWS is grounded in and guided by Hawaiian knowledge and practice while also integrating and honoring multiple knowledge systems. Through guided dialogue, this section helps to build a shared understanding for the community's relationship to its *ahupua'a*. By recalling key features of the *ahupua'a* and sharing stories from the past, "Focusing on Your Place" helps to generate enthusiasm and collaboration with respect to safeguarding the intimate relationships between people and their places. The CWS team will gain a shared sense of place that is reinforced and captured in the collaborative mapping and timeline exercises.



PHOTO : ELIZABETH KASHINSKY

above: Hōkūle'a's 43rd Birthday at the 9th Annual Kualoa/Hakipu'u Canoe Festival-an official stop of the Mahalo, Hawaii Sail, Kualoa Regional Park

"IT IS SEEING THAT ESTABLISHES OUR PLACE IN THE SURROUNDING WORLD; WE EXPLAIN THAT WORLD WITH WORDS BUT WORDS CAN NEVER UNDO THE FACT THAT WE ARE SURROUNDED BY IT. THE RELATION BETWEEN WHAT WE SEE AND WHAT WE KNOW IS NEVER SETTLED... THE WAY WE SEE THINGS IS AFFECTED BY WHAT WE KNOW OR WHAT WE BELIEVE... WE NEVER JUST LOOK AT ONE THING; WE ARE ALWAYS LOOKING AT THE RELATION BETWEEN THINGS AND OURSELVES."

- JOHN BERGER, "WAYS OF SEEING"

» SESSION 1.

PARTICIPATING IN MAPPING

(2-3 HOURS)

By completing this participatory mapping exercise, the CWS team will reach consensus about the geographic boundaries of the CWS study area. Creating a visual representation of the area involves discussing and documenting information related to natural, cultural and socioeconomic resources. The resulting map will represent a collective understanding of your place to refer to throughout the snapshot process, including informing the historical timeline and, later, the development of communication tools.

OBJECTIVES

To define which *ahupua'a* or watershed boundary will be the focus of the assessment.

To understand and appreciate the natural, cultural and socioeconomic features and resources of the *ahupua'a*.

RESOURCES NEEDED

- Facilitator
- GIS lead
- Hand-drawn or printed map of the general community area that includes *ahupua'a* and watershed boundaries, streams, roads and so on—either one large poster-size version to post or a copy for each participant.
- Markers, pencils and pens
- Camera or phone that can take photos

EXERCISE

The following facilitation guidance has been developed from established participatory planning processes in the Pacific Islands.^{3,4}

1. With large printed or hand-drawn maps of the snapshot area and markers for the team to note their responses, utilize the following prompts to facilitate an interactive discussion regarding key natural resources and community features. Ensure that participants are noting the information using markers as they are sharing and completing notations prior to the next participant to ensure all are engaged and listening to the person speaking.

“HAWAIIANS HAVE GOTTEN IT RIGHT: ANY VISION WE HAVE OF THE FUTURE IS ULTIMATELY GROUNDED IN THE PAST. IMAGINATION AND WHAT WE KNOW OF THE PAST IS OUR WAY FORWARD.”

– KEVIN CHANG,
KUA'ĀINA ULU 'AUAMO

PHOTO : MEGHAN GOMBOS



above: Community Map Example from Management Planning Training in the Solomon Islands.

³ “Locally-Managed Marine Areas: A Guide to Supporting Community-Based Adaptive Management,” by Hugh Govan, William Aalbersberg, Alifereti Tawake and John E. Parks, published March 31, 2008, retrieved via chrome-extension://oemndcblbdoiebnladdacbfmadadm/http://www.reefresilience.org/wp-content/uploads/LMMA-Guide-2008.pdf

⁴ “A Management and Adaptation Planning Guide for Natural Resource Managers,” by Pacific Islands Managed and Protected Area Community (PIMPAC), published in 2006.

SESSION 1 (CONTINUED)

DISCUSSION PROMPTS

A. Check *ahupua'a* and watershed boundaries, and agree on which ones will be the focus of your CWS.

B. Label resources, geographic and infrastructural features such as streams, stormwater outfalls, waterfalls, wells, water quality monitoring locations, managed and protected areas, coral habitat, fishing areas, invertebrates, bird habitat, known spawning or nesting grounds, invasive species such as ungulates (deer, sheep, pigs and others), and other resources that are important to your community. For all natural resources, note the health or condition of the resource. For example, indicate on the map if an area of coral is healthy or not or if an area of forest is native or not.

C. Point out key cultural features such as *heiau* (sacred), *lo'i* (taro patch), *hale* (house) and *loko i'a* (fishpond).

D. Document how and where climate events such as flooding, rising streams and seas, pollution and coral bleaching impact your community.

E. Label areas where social and economic activities such as farming, fishing, boating, other recreation (swimming, diving, hiking, etc.), schools, fish markets and farmers markets occur.

F. Include any other geographical features the community values.

2. Once the initial snapshot map is completed, back it up by taking a digital photo of the map. Convert photos into PDF file format documents to encourage digital sharing. A hard copy of the group's snapshot map should be posted during all subsequent meetings as a source of inspiration and information, as well as a natural gathering spot for the future meetings of your CWS team. Your snapshot map can be referred to and added to throughout the CWS process and future projects. Ideally, the snapshot map boundaries should be translated into a digital format by the GIS lead using ArcGIS or Google Maps.

3. Discuss and confirm whether your team will use the term "*ahupua'a* snapshot" or "watershed snapshot" to describe this process. Ultimately, whether you call your ridge-to-reef assessment an *ahupua'a* snapshot or watershed snapshot is your community's choice. In reflecting on your community's demographics and sense of place, the concept that resonates most with your community will increase participation and support, yield more relevant products and lead to greater management results.

Facilitation Tip

Writing on printed maps from GIS or aerial photographs can be difficult even when printed on large-size paper or plotters, both of which can be costly. Consider having printed maps on hand to refer to, and hand-draw rough sketches of the area on multiple sheets of white flip-chart paper taped together or on a large roll of paper. The paper can be attached to the floor or a wall to allow participants to comfortably draw on.

Working with one map could be cumbersome, depending on the complexity of your group. If your team would like to increase the mapping focus for a small group of around 20 participants, and if many of your participants have detailed expertise in certain subject matters as related to the discussion prompts above, you may want to consider an alternative approach to the mapping exercise. Divide the participants and assign the questions above by having a different blank map for each question/expertise area. The group can then self-select which focus group to which they could offer the most benefit. Participants would then form one small for each question and complete the mapping exercise. Afterward, each focus group should present its results to the whole team. This gives the opportunity for the other participants to provide additional information and gain in-depth knowledge about their *ahupua'a*. Later, all maps should be combined, with all input recorded onto one map.

Depending on your team's GIS capacity, a map of the area can be projected onto a screen, and a GIS expert can digitally note comments received during the exercise. While the information captured will be electronic, legible and organized, this highly technical approach will take more time.

» SESSION 2. INFORMING YOUR SNAPSHOT (2-3 HOURS)

By listening and understanding each other's perspectives, this session will strengthen the relationships essential to move through this snapshot assessment and other community-led planning processes. Through completing "Informing Your Snapshot," your CWS team will be a more unified and collaborative working group. In addition to establishing a collective community vision for a healthy watershed, this section provides an arena for developing shared recommendations for locally relevant watershed health metrics. The shared recommendations for communication methods and products developed in this section will inform the "Sharing Results" section.

OBJECTIVES

To strengthen your CWS team by establishing a sense of shared ownership and common ground.

RESOURCES NEEDED

- Sticky notes
- Markers or pens
- 2-3 easels
- 3 flip-chart paper pads (sticky, if possible)
- Camera or phone that can take photos

EXERCISE

The level of detail provided here serves to ensure that all voices are heard and that no one perspective dominates the group.

1. Room set-up: Position two easels in the front of the room with chairs in a horseshoe or oval formation facing the easels. The facilitator should prepare white flip-chart paper in advance.

- A. Set one pad of flip-chart paper at Easel A. Write headlines, as instructed below, at the top of four sheets of the flip-chart paper:
- Page 1: Q1-Define a healthy ridge-to-reef watershed or *ahupua'a*
- Page 2: Q2-Identify benefits of a healthy environment for your community
- Page 3: Q3-Share your suggested metrics for how to evaluate the health of your ridge-to-reef watershed or *ahupua'a*
- Page 4: Q4-Ask the participants to share their suggested methods and products for communicating the health of your ridge-to-reef watershed or *ahupua'a* to your community

Key Terms

Metric: A way of measuring the health of a watershed—for example, "water quality."

Indicator: Specific information on the state or condition of the associated metric. For example, indicators of water quality include levels of nutrients such as phosphorus and nitrogen or presence of bacteria such as *Enterococcus* or *Leptospirosis*.



above: Honolua-Napili Community Consultation, O'ahu

Page 1: Q1-Shared definition of healthy ridge-to-reef watershed or *ahupua'a*Page 3: Q3-Shared metrics for how to evaluate the health of a ridge-to-reef watershed or *ahupua'a*

2. Explain that the group will discuss the questions posted on Easel A, and then they will develop shared definitions or understandings that will be posted on Easel B. Distribute sticky notes and markers or pens to all participants.

4. Once all questions are completed, review the shared responses found on Easel B. These are community recommendations that will be used in future exercises.

5. Take photos of each piece of flip-chart paper (Easel A, pages 1 through 4 including sticky notes, and Easel B, pages 1 through 4 shared responses). The group will use these for future exercises including developing a list of suggested metrics and communication methods.

Multiple online tools are available to facilitate this activity electronically—for example, MeetingSift and Wordle. These online tools allow for instant creative presentation of results such as word clouds, charts and graphs. However, the group loses the critical relational benefits gained by conducting this session in person.

[illegible]

» SESSION 3. BUILDING YOUR HISTORICAL TIMELINE

(1-2 HOURS)

The historical timeline will tell the story of the place, highlighting the knowledge of particular champions or *kūpuna* who may be sources of natural and cultural resource information. The results from this session will be highlighted in the communication tools development process and will inform future community-based management planning efforts.

OBJECTIVES

To share, understand and document local community knowledge about the area's natural, cultural and socioeconomic resources; major historical and political events and other resource use changes in time. A completed historical timeline will help to inform the documentation of the community's local knowledge.

RESOURCES NEEDED

- Facilitator
- Five or more sheets of flip-chart paper taped together and attached to the floor or a wall where everyone can see and access them
- Markers
- Snapshot map for reference
- Historical imagery of the area⁵
- Camera or phone that can take photos



left: A community developing their historical timeline

⁵ One good source for historical imagery is <http://www.soest.hawaii.edu/coasts/data/>. Choose your island, and then click "Historical Mosaics."

SESSION 3 (CONTINUED)

EXERCISE

The following facilitation guidance has been developed from two established participatory planning processes used in the Pacific Islands^{6,7}.

1. Explain what a historical timeline is, and state the purpose for completing one (see the session introduction and objective above).

2. Discuss how to document the stories that champions and *kūpuna* share. Documentation options include note-taking, photos, video recording or audio recording. Determine who will be the keeper of the information. Introduce the upcoming Information-Management Agreement (p. 52).

3. Review the available historical imagery. The SOEST website, included in the footnotes on p. 45, provides hundreds of images to the public. Aerial photos can show change over time. Be sure to archive the images you use for future access.

4. Create a long line toward the bottom of the connected flip-chart pages that you prepared prior to the meeting. At intervals along the line, write timestamps by year. Make the farthest right the current year, and write the 1800s at the farthest left-hand point. The years you write do not need to be drawn to scale, as the group will have greater detail to add during years closest to the present.

5. Lead discussion of the guiding questions provided below. To keep the discussion on track, the facilitator should focus on recording only key information on the timeline, such as the following:

When: The year the event occurred

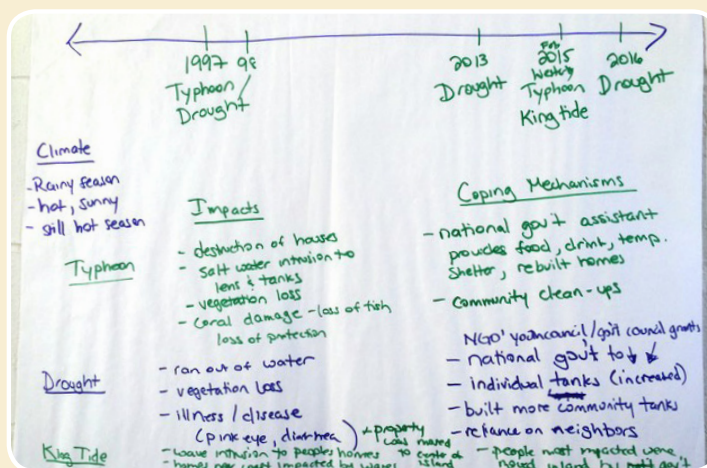
What: A brief description of the event

Where: One to two words describing the location of the event

Why: The reasons an event caused an impact

How: How the event impacted the resource, whether positively or negatively

Who: Sources that may have more information



left: Example of historical timeline

"I KA WA MA MUA,
KA WA MA HOPE."
("OUR FUTURE CAN BE
FOUND IN THE WISDOM
OF THE PAST")

-HAWAIIAN SAYING

⁶ "Locally-Managed Marine Areas: A Guide to Supporting Community-Based Adaptive Management," by Hugh Govan, William Aalbersberg, Alifereti Tawake and John E. Parks, published March 31, 2008, retrieved via chrome-extension://oemmdcbldboiebnladdacdbfmadadm/http://www.reefresilience.org/wp-content/uploads/LMMA-Guide-2008.pdf

⁷ "A Management and Adaptation Planning Guide for Natural Resource Managers," by Pacific Islands Managed and Protected Area Community (PIMPAC), published in 2006.

SESSION 3 (CONTINUED)

GUIDING QUESTIONS

- a. Reflect on whether resources in the watershed have changed over time. If so, what resources have changed, when did they change, and why did they change? It may be helpful to review different areas of the watershed. For example, have farming and fishing practices changed? Has the health of marine fish and invertebrates changed? What about freshwater fish and plants? Are invasive species present? How is the water quality?
 - b. Have significant political or climactic events contributed to changing resource health in the area (e.g., development, infrastructure, floods, storms)? What were the impacts of those events? How did the community respond to those events? What worked well and what didn't work well?
 - c. How did people in the past manage the watershed? Reference significant events and key community champions or *kūpuna* stories (oral histories) of watershed management.
 - d. Have significant conservation-related projects been conducted? If so, what were the outcomes? Are any still underway? If so, what is their status?
 - e. Add any other notable natural resource-related events that your community would like to highlight on its historical timeline.
6. Once the historical timeline is complete, take a high-resolution digital photo of it to document it for future use. Provide the digital photo to the keeper of the CWS team products. The historical timeline should be posted for reference according to the group's agreement. The team can add information to the timeline throughout the CWS process and future projects. As a participant offers a comment about, a correction to, or an addition to a historical issue or story, these should be reflected on the historical timeline. Ensure that all input and stories are captured, and be sure to take and archive a new digital photo with each timeline revision.

Facilitation Tip

In addition to the option of developing the historical timeline on paper as recommended in this guidebook, there are several web-based tools that you may find useful. These include Capzles (www.capzles.com), Timeglider (timeglider.com) and Timetoast (www.timetoast.com). ArcGIS supports points of interest that can be linked to photos and audio, although this requires technical expertise. By documenting the historical timeline electronically, communities can archive information for the long term, share it easily, utilize it in other projects, and edit it freely.

Documenting and storing historical information is critical, as it can be lost easily over time. Consider developing an online community resource for documenting oral histories and historical photos. Consider georeferencing *kūpuna* stories. Google Earth (www.google.com/earth/) provides the ability to create points of interest that link to online information. Transformative Storytelling for Social Change (www.transformativestory.org) provides additional resources for effectively documenting stories. Mibio (www.mibio.com) is a mobile app that organizes text, audio, video and photos to tell your story.

The background of the page features large, stylized green fern fronds. One frond is on the left side, and another is on the right side, both pointing towards the center. The fronds are composed of many small, rounded leaflets.

NOTES

MOVING TO MEASUREMENT

Sessions in “Moving to Measurement” include the following:

SESSION 1: **PROTECTING YOUR SNAPSHOT INFORMATION** (2 HOURS)

Protect all information that is shared and come to agreement about how information will be used and how to secure permission for information use.

SESSION 2: **CONFIRMING SNAPSHOT METRICS** (1-2 HOURS)

Identify what metrics (or key features of your watershed) that you will assess to measure the health of your watershed.

SESSION 3: **UNDERSTANDING SNAPSHOT RESULTS** (1-2 HOURS)

Understand the results of the analysis of available data for your metrics, and identify any gaps in data.

SESSION 4: **ENGAGING LOCAL KNOWLEDGE** (1-2 HOURS)

Bolster your snapshot metrics with additional information from the community.

SESSION 5: **GATHERING ADDITIONAL INFORMATION** (1-2 HOURS)

Develop a plan for collecting additional information, to be completed before the “Sharing Results” section.

Mahalo nui loa (thank you very much) to the CWS team for providing critical input and *mana'o* to the development of the snapshot. With the snapshot map and historical timeline in hand, the next step is to discuss how you will measure the health of the ridge-to-reef area or *ahupua'a*, identify what information you have and make a plan for gathering any additional information that is needed.

Alii Fishpond, Ahupuaa of Makakupaia, Molokai



» SESSION 1.

PROTECTING YOUR SNAPSHOT INFORMATION

(2 HOURS)

Collecting and displaying information about an *ahupuaʻa* requires sensitivity and careful deliberation about how this information may be used. This session leads the group to create agreement around the following information-sharing considerations:

- Information provided by *kūpuna* and others with intimate knowledge of the *ahupuaʻa* is intellectual property that must be honored and carefully handled.
- Information about resources in the *ahupuaʻa*, such as where certain plants or animals are found, can be very sensitive and should be treated with care.

As a result of the snapshot process, there may be more attention to your *ahupuaʻa*. Even information that was already in the public domain can suddenly become highlighted to people who may have never noticed or been aware of it before. Finally, in discussing how to manage sensitive information about your *ahupuaʻa*, it is important to determine how the people participating in the CWS process should communicate about the process to the public, to donors and to partners.

Best practices for intellectual property rights and data-sharing and information-management agreements should be reviewed before any sensitive information is discussed. Prior to this session, take time to review the “Pāoakalani Declaration,” which establishes a foundation for Hawaiian communities about the protection of *kanaka maoli* knowledge. The declaration offers guidelines for how to handle this knowledge with responsibility and accountability.

In this session, you will develop an Information-Management Agreement, which includes determining whether a data-sharing agreement (DSA) is needed. However, since DSAs are typically between specific organizations, the exercise does not take the group through the DSA development process. However, it provides guidance for organizations interested in entering into a DSA to develop together and later share with the group.



above: Hanalei, Kauaʻi

SESSION 1 (CONTINUED)

OBJECTIVES

To determine how participants can use information from the CWS process, communicate about that information and the process, and safeguard and protect sensitive information gathered during the process.

RESOURCES NEEDED

- Historical timeline and snapshot map (for reference displayed on a wall or easel)
- Projector and laptop, if displaying documents electronically
- Data-Sharing Agreement Template (p. 102)
- Information-Management Agreement Questionnaire (p. 104)
- Information-Management Agreement Template (p. 107) as a Google Doc or form-fillable PDF
- CWS survey results from Getting Started (p. 36)

Facilitation Tip

Begin by reviewing results from the knowledge and perception survey, snapshot map, historical timeline and “Informing Your Snapshot” session.

There are several ways you can help protect and manage sensitive information about your *ahupuaʻa*. These include developing and signing information-management agreements; following the practice of securing free, prior and informed consent; and entering into data-sharing agreements when sensitive data or information are being collected or shared. It is important to develop your snapshot with a community-driven approach and make sure sensitive community information is protected. Ultimately, jointly developing and entering into agreements covering information management and sharing are about making sure that all participants in the process are on equal footing in determining how information can be used. From developing the main questions to determining criteria and rules for when and how to share the knowledge and data collected, there are various degrees of collaboration that can take place with the community. The more collaborative and open you are, the more comfortable community participants are likely to feel in sharing their knowledge and participating in the process.

INFORMATION-MANAGEMENT AGREEMENT

One way to ensure that sensitive information is collected, stored, managed and communicated properly is to create a CWS Team Information-Management Agreement. This agreement covers all information including traditional knowledge, collated information, data that are collected or summarized, existing published sources and all communications in relation to snapshot products. This agreement is typically developed by the CWS team through the process in the exercise below and will be signed by all people participating in the snapshot process. These agreements provide guidance to all people participating in the process about how information should be handled. They are broader than data-sharing agreements. As developed in the exercise below, information-management agreements are not legally binding, but they provide important guidance for participants. We suggest entering into these agreements because most people will gladly follow the guidance once it is clear. If your team wants the information-management agreement to be legally binding, you must seek advice from legal counsel.

To fully protect sensitive information, the CWS team should utilize all three of the following methods as part of the CWS process:

- Develop and enter into an information management agreement between all people participating in the process to cover all information and communication about the snapshot.
- Follow procedures for free, prior and informed consent with individuals providing information. This entails developing a consent form that each person providing information must thoroughly understand and sign. Review the consent form with each person providing information, ensure that he or she understands the form, and ask him or her to sign prior to asking for any information.
- Enter into data-sharing agreements between all organizations collecting, collating and/or sharing data and information.

SESSION 1 (CONTINUED)

EXERCISE

1. In light of Pāoakalani Declaration you reviewed, begin by highlighting the importance of discussing and coming to agreement about how the team will manage sensitive information (existing and new), protect intellectual property, and communicate about the CWS.
2. Ask participants to share any concerns they have that are related to the protection of information and communications about the CWS. Record participants' concerns on flip-chart paper where all can see it.
3. Use the laptop and projector to project the Information-Management Agreement Questionnaire (p. 104) on a wall so that all participants can see it. Discuss each question in the Information-Management Agreement Questionnaire, and use flip-chart paper to track discussion notes, follow-up items and specific concerns that arise.
4. Guide the team to complete an information management agreement using the template on p. 107. Review the concerns listed on flip-chart paper to be sure each item has been addressed. If follow-up activities are required, note a deadline and responsible party for each activity. Follow up as soon as possible to complete the agreement.
5. Determine together whether your team also needs a data-sharing agreement. See the call-out box below for more information. The same process can be used to complete the data-sharing agreement, if one is needed, using the template on p. 102.
6. Once the agreement is finalized, all members of the CWS team and all participants in the CWS process should review and sign it.
7. In the future, all people who join the CWS process should review and sign the information management agreement and, if needed, the data-sharing agreement, to record that they understand and agree to the group's agreements about how sensitive information can or cannot be used and how to communicate about the CWS process.

Data-Sharing Agreement⁸

If your snapshot process involves the collection of new data or the compilation of sensitive data, you may want to enter into a data-sharing agreement (DSA). We provide an example template on p. 102. A DSA is typically entered into between two or more organizations or an organization and individual researchers. Organizations that enter into a DSA are typically the community-based, non-governmental organizations hosting the CWS process in the community and the organization or individuals that are helping to collect data in the field. For data-sharing agreements to be legally binding, consult with legal advisors. In some cases, a memorandum of agreement or other tool to make a data-sharing agreement legally binding will need to be developed and signed as well.

Given the information above and your information management agreement, does your CWS team think a DSA needs to be developed? If the answer is “yes,” we recommend holding a special session to develop a DSA between the organization(s) hosting your CWS and the organizations and individuals collecting data. Once the DSA is drafted, it should be presented to the CWS team for review at a future meeting. Refer to the DSA template on p. 102. Consider seeking legal advice if you want the DSA to be legally binding.

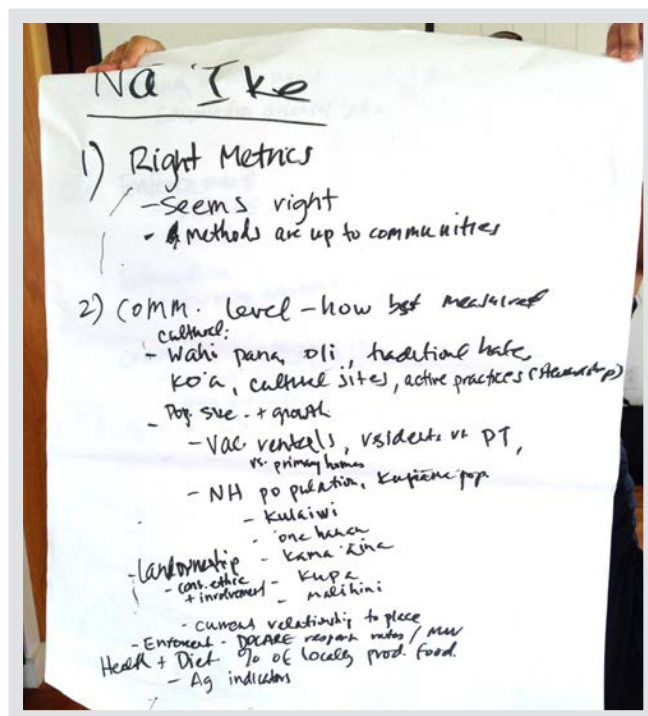
⁸“Data Sharing: Creating Agreements in Support of Community-Academic Partnerships” by Paige Backlund Jarquin, MPH, published Feb. 2, 2012, by Colorado Clinical and Translational Sciences Institute & Rocky Mountain Prevention Research Center. Retrieved via <http://www.ucdenver.edu/research/CCTSI/community-engagement/resources/Documents/DataSharingCreatingAgreements.pdf>

FREE, PRIOR AND INFORMED CONSENT

Free, Prior and Informed Consent⁹ (FPIC) is a best practice that you should follow whenever you engage in information-sharing and community-based research. Based on definitions developed by the United Nations Permanent Forum on Indigenous Issues, we define the concept of concept of free, prior and informed consent as follows:

- “Free” means that there is no manipulation or coercion of any indigenous person (or other persons sharing information) and that the process is self-directed by those affected by the project.
- “Prior” implies that consent is sought sufficiently in advance of beginning or authorizing any activities.
- “Informed” requires that any person sharing information will receive information on the purpose and key points of the project, including the scope of the project, the reason for it its duration, and how information might be used.
- “Consent” means a process in which participation and consultation are the central pillars. Each individual has a right to participate or not participate with no negative repercussions.

Consent forms protect information for people who are interviewed and provide information for the CWS. Consent forms clearly explain what information is being collected, why, and how it can be used. A useful example of protocols and consent forms can be found at www.pacificworlds.com/homepage/education/essays/consent.doc. You can adapt these as needed. In this example, one form provides consent to be interviewed and can be adapted for other forms of information-sharing. A second form discusses opportunities for the participant to review and modify the information that was shared and provides final consent and permission for the use of that information.



above: Community Watershed Snapshot Design Planning Workshop with all 8 communities, Waimea, Hawaii'i, September 2014

⁹Source: “Free, Prior and Informed Consent in the Aftermath of the UN Declaration on the Rights of Indigenous Peoples: Developments and Challenges Ahead” by Mauro Barelli, published in 2012 in The International Journal of Human Rights (volume 16, issue 1). Retrieved via https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1991731

» SESSION 2.

CONFIRMING SNAPSHOT METRICS

(1-2 HOURS)

Watershed health changes significantly over time. Increasing climactic threats result in ecosystem-level changes; therefore, it is critical that agencies and managers from a wide of array of disciplines work together to identify impacts, causes of these impacts, and solutions that may address these impacts. It is particularly important to gather key resources management agency data to monitor these changes. To support monitoring, the HCA Watershed Snapshot Metrics were developed in 2013 following consultation with eight communities across the Hawaiian Islands. Highlighting both biophysical and socioeconomic metrics, 24 of Hawai'i's leading natural resource management agencies reached consensus on the most critical indicators that define watershed health (see the metrics on p. 56). The HCA Watershed Snapshot Metrics recommend how to best measure and track changes in watershed health.

During this session, your team will compare the metrics your community identified during the session titled “Informing Your Snapshot” against the HCA Watershed Snapshot Metrics. The team will adjust as needed to develop your own community snapshot metrics. Using these metrics, the GIS lead can identify and analyze the data that are already available on these metrics.

As your community plans and implements solutions to threats and challenges in the watershed, regular collection of data on the selected metrics enable the community to monitor changes over time, shedding light on the success of your engagement and management efforts.

OBJECTIVES

To understand how each metric contributes to evaluating the health of a watershed.

To confirm which indicators will be used in your CWS.

RESOURCES NEEDED

- Facilitator
- GIS lead
- Watershed Snapshot Metrics Checklist (p. 63)
- From the session titled “Informing Your Snapshot,” the shared responses to question 3, listed in order from the most frequently named to the least frequently named
- HCA Watershed Snapshot Metrics (p. 56)
- Flip-chart paper and easel
- Markers
- Previously developed historical timeline and snapshot map

Definitions

Metric: A way of measuring the health of a watershed—for example, “water quality.”

Indicator: Specific information on the state or condition of the associated metric. For example, indicators of water quality can include monitoring levels of nutrients such as phosphorus and nitrogen or presence of bacteria such as *Enterococcus* or *Leptospiriosis*.

SESSION 2 (CONTINUED)

EXERCISE

1. Review the HCA Watershed Snapshot Metrics (on the right) and ensure that the CWS team understands the description and importance of each metric.

2. Compare the metrics the team identified in the “Informing Your Snapshot” exercise with the HCA Watershed Snapshot Metrics. Ask which of the metrics that the team identified are the same or align closely with the metrics identified by HCA. Ask which of the metrics that the team identified are not found in the list of HCA metrics. Record these findings on flip-chart paper.

3. If there is anything that the team identified that is different from the HCA metrics, include those metrics or indicators in your final community snapshot metrics.

4. For any metrics that may have been added by the community, have the group add to the checklist by drafting a short description of the metric and a statement that correlates it to watershed health.

5. Complete the Watershed Snapshot Metrics Checklist. Select each box indicating where data may be available, and list possible data providers.

GIS LEAD WORK TO BE COMPLETED PRIOR TO THE NEXT SESSION:

With the HCA Watershed Health Web Maps¹⁰ and your final community snapshot metrics in hand, the GIS lead will locate missing data, analyze all available data, note the year the data were collected, and track which agency owns the data. For missing data, the GIS lead will note any limitations. The GIS lead will prepare a comprehensive Excel table or grid showing what data exist, which are fully analyzed, and the data gaps. At your community's discretion, the GIS lead can also create a web map for your community that shows where the data came from. This will be presented as part of the next session, titled “Understanding Snapshot Results.” See an example on p. 57.

¹⁰ Access via <http://hca.maps.arcgis.com/home/item.html?id=89e-1c5a5b48742e6881a907766d5f8d0>

WATERSHED SNAPSHOT METRICS

BIOPHYSICAL
Rainfall (rain and stream gauges- NOAA-Weather)
Availability of Fresh Water (# of water sources/household (or capita), Board of Water Supply)
Water Quality (Stream sediment, flow, pathogens)
Groundwater Recharge, Land Use (% impermeable surface, ratio of developed over natural)
Native Vegetation (% trees/plants cover, acres)
Key Bird Species (Presence, abundance, compare historic)
Target Food Fish (Biomass, fishing effort, size structure)
Ocean Habitat Quality (Coral: abundance & biodiversity; sand; rubble; etc.)
Marine Invertebrates & Algae (Indicators of water or habitat quality)
Freshwater: Food Fish & Key Invertebrates (see fish and invertebrate above)
SOCIO CULTURAL
Population Size and Growth (DBEDT)
Cultural (# of recognized <i>kūpuna</i> , # of recognized <i>wahi pana</i> (place names), # of families persisting, presence of <i>lo'i</i> , # of households engaged in traditional and customary practices)
Health/Diet (Prevalence of diabetes, heart disease, obesity, drug abuse, # of farmers/fish markets)
Community Involvement in Natural Resource Management (# of people, # of projects, # of organizations, # of schools, etc)

OBJECTIVES

RESOURCES NEEDED

-

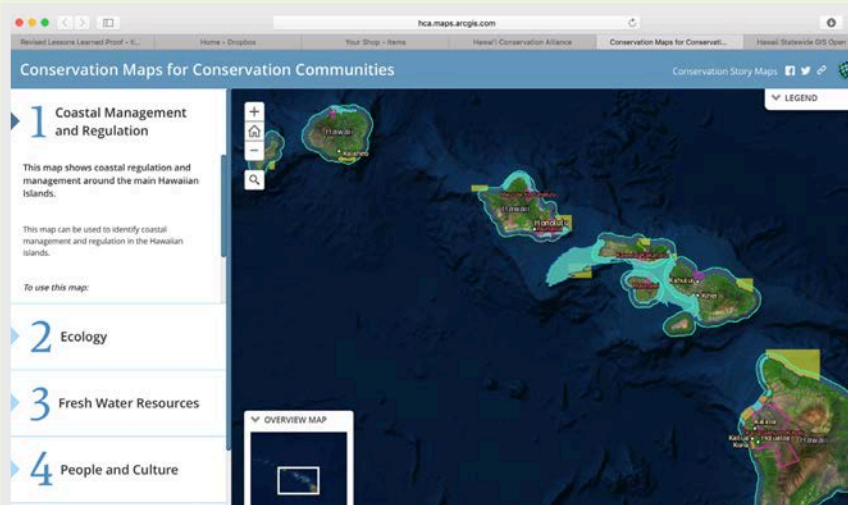
¹³ Access via <http://www.hawaiiconservation.org/what-we-do/our-strategy/effective-conservation-restoration/community-watershed-snapshot>

SESSION 3 (CONTINUED)

EXERCISE

1. The GIS lead reviews the progress made in the session titled “Confirming Snapshot Metrics.”
2. Before giving the results of the analysis, the GIS lead orients the team to the HCA Watershed Health Maps, including the information the tool provides and a demonstration of how to use it.
3. The GIS lead explains the process by which the snapshot metrics were analyzed and describes the status of each available metric—for example, the extent of native forest cover.
4. The GIS lead displays an example web map from a CWS pilot community or your own community’s snapshot web map that contains all available data to support the community’s snapshot metrics.
5. Distribute copies of the snapshot metrics analysis table to team members. Then the GIS lead walks the team through the outputs of each metric’s analysis. The team should note where data are ineffective and unreliable and decide whether to include the data in the snapshot.
6. Once the GIS lead completes the presentation, the facilitator engages the group in a discussion with the support of the communications lead. The purpose is to reach consensus on which data have the most value to the community and decision-makers. The following questions can support the discussion:
 - Which metrics are most meaningful and why?
 - How can local knowledge (for example, quotes and stories) amplify each metric?
 - Which metrics do not have GIS data but could be used if presented differently?

Have the team discuss the different ways each metric might best be communicated—for example, as a quote, graphic or image—and the scale at which each metric might best be communicated—*ahupua’a*, *moku* (District, island), island or state, for example. The intention is to represent each of the snapshot metrics in at least one way. The communications lead should take notes of key discussion points and compile these for development of the communication tools in a future session.



To learn how to use the HCA Watershed Web Maps and see example web maps, visit <http://hca.maps.arcgis.com> and view the video tutorial at www.hawaiiconservation.org/communitysnapshot. Also, to ensure the data you collect are safeguarded, key data-management recommendations are highlighted on p. 53.

» SESSION 4.

ENGAGING LOCAL KNOWLEDGE

(1-2 HOURS)

The deep value of community members sharing their knowledge and experience with their place should not be underestimated. Scientific data can be insufficient, as most are typically collected over a limited time and do not capture the full range of conditions and biophysical variations that occur in a specific watershed. Even though data from local knowledge are often not measured using numbers, they are typically gathered over years or decades of interaction with a place. While this type of knowledge has only recently begun to receive similar levels of respect as scientifically collected data, its foundation in deep experience with a place makes this data, in many ways, even more valuable to understanding how a watershed has changed over time.

In this session, local knowledge will bolster the effectiveness of the snapshot metrics and communication tools by increasing their relevance and use by community members and decision-makers. Products generated from prior sessions—for example, the historical timeline—may also emphasize local watershed knowledge. Some important local knowledge may not be readily available and may take several months to gather. It is very important that requests for local knowledge be initiated by the right people. For example, sensitive requests to *kūpuna* may be facilitated by people with existing relationships. It's very important not to push too hard while attempting to collect local knowledge; many people hold this knowledge as sacred and may not be ready to share it at the time of the request. Simply letting people know that the CWS team is available, should they like to share, is a good way to address this situation.

OBJECTIVES

To capture available local knowledge for all snapshot metrics.

RESOURCES NEEDED

- Facilitator
- Communications lead
- Snapshot map the team developed in the session titled “Participating in Mapping” (Display where all can see it.)
- Historical timeline the team developed in the session titled “Building Your Historical Timeline” (Display where all can see it.)
- Community snapshot metrics
- Projector, laptop, screen or blank wall, and internet connection
- Worksheet 6: Local Knowledge Checklist (p.64)
- Pens or pencils



SESSION 4 (CONTINUED)

EXERCISE

1. Introduce the concept of Shifting Baselines described below and watch the video links provided. With the snapshot metrics and data analysis in mind, review the historical timeline and the information collected during the participatory mapping exercise.

2. Discuss whether there are any specific people or other critical first-hand information sources that can reflect on changes in watershed resource health over time. This may include research, photos, stories, videos, websites, press, articles and other documentation. Have a volunteer record notes from the discussion directly onto the Worksheet on page 64.

3. For each snapshot metric, complete the Local Knowledge Checklist, including the name of who is responsible for collecting the information and sending it to the communications and GIS leads. Note any gaps or suggestions.

Facilitation Tip

Host a *huaka'i* (tour, field trip) of your *ahupua'a* to highlight the area through the eyes of the *kūpuna* and local champions. Ensure that the CWS Team Information-Management Agreement has been completed prior to this activity. Refer to existing methodologies www.hawaiiconservation.org/communitysnapshot for georeferencing stories and recording stories with a voice recorder and other tools. Create a participatory video of the *huaka'i* using a tool such as Animoto (animoto.com).

above: Anna Ranch Waimea, Hawai'i

Key Term

"Shifting baselines" is a term created in 1995 by fisheries scientist Daniel Pauly that has since been applied to other areas of change. "Among environmentalists, a baseline is an important reference point for measuring the health of ecosystems. It provides information against which to evaluate change. It's how this used to be...If we know the baseline for a degraded ecosystem, we can work to restore it. But if the baseline shifted before we really had a chance to chart it, then we can end up accepting a degraded state as normal — or even as an improvement...What this means is that people are now visiting degraded coastal environments and calling them beautiful, unaware of how they used to look. Without the old-timers' knowledge, it's easy for each new generation to accept baselines that have shifted and make peace with empty kelp beds and coral reefs. Which is why it's so important to document how things are — and how they used to be."

Reference: http://www.shiftingbaselines.org/op_ed/
For more information: http://www.ted.com/talks/daniel_pauly_the_ocean_s_shifting_baseline, <http://ocean.si.edu/ocean-videos/really-small-fry-shifting-baselines-marine-fish-stocks>



» SESSION 5. GATHERING ADDITIONAL INFORMATION (1-2 HOURS)

Now that your team understands what data are available to support the snapshot metrics, this session gives the team a choice to collect additional information. During the HCA Community Watershed Snapshot Project's pilot phase, several communities found that additional information is available that can be important. For example, community involvement in natural resource management and places names were not captured by the GIS lead analysis yet are critical to understanding the health of a watershed. This session guides the team to develop a community information plan to outline goals, resources needed and a timeline for collecting additional data. The implementation of this plan must be underway prior to developing the communications tools in the section titled "Sharing Results."

OBJECTIVES

To develop a plan for the team to collect additional local data on the metrics that are most important.

RESOURCES NEEDED

- Facilitator
- Communications lead
- change to Worksheet 8: Community Information Plan Template (p. 66), either paper copies or an electronic copy displayed with a laptop, projector and screen or blank wall
- Pens or pencils



SESSION 5 (CONTINUED)

EXERCISE

1. Depending on the size of your team, divide into groups of about four.
2. In each group, discuss and recommend which two to three snapshot metrics are not already paired with biological and/or socioeconomic data; are valuable to the community and ecosystem; and are feasible within the community's capacity, as indicated by a willingness to build community capacity and collaborate to complete data collection prior to established deadlines for the development of snapshot communications tools.
3. Each group should share two to three metrics that the group determined are incomplete. Note similarities, and use those as a basis to reduce the list of metrics to a total of two or three. Ensure that the team is willing to collect the data for those indicators.
4. Using Worksheet 7: Community Information Plan, record the team's selected two or three metrics in the far left-hand column.
5. As a team, enter the information about resources needed, capacity and time. The Community Information Plan Template will act as the team's guide to collecting those two to three indicators in the short term so that the information can contribute to the site's snapshot.

CWS TEAM WORK TO BE COMPLETED PRIOR TO THE NEXT SESSION:

Team members assigned to collect data should do so according to the agreed-upon timeline, which should be prior to starting the section titled "Sharing Results." Team members should provide data to the GIS lead for web map creation and to the communications lead. Keep in mind that some important information may not be readily available and may take several weeks to get. For example, sensitive requests to *kūpuna* may need to be facilitated through existing relationships.



above: Community Watershed Snapshot Design Planning Workshop with all 8 communities, Waimea, Hawai'i, September 2014

WORKSHEET 5: WATERSHED SNAPSHOT METRICS CHECKLIST

MOVING TO MEASUREMENT

BIOPHYSICAL	
☐	Rainfall (rain and stream gauges-NOAA-Weather)
☐	Availability of Fresh Water (# of water sources/household (or capita), Board of Water Supply)
☐	Water Quality (stream sediment, flow, pathogens-DOH)
☐	Groundwater Recharge, Land Use (% impermeable surface, ratio of developed over natural)
☐	Native Vegetation (% trees/plants cover, acres)
☐	Key Bird Species (presence, abundance, compare historic)
☐	Target Food Fish (biomass, fishing effort, size structure)
☐	Ocean Habitat Quality (coral: abundance & biodiversity; sand; rubble; etc.)
☐	Marine Invertebrates & Algae (indicators of water or habitat quality)
☐	Freshwater: Food Fish & Key Invertebrates (see fish and invertebrates above.)
SOCIO-CULTURAL	
☐	Population Size and Growth (DBEDT)
☐	Cultural (# of recognized <i>kūpuna</i> , # of recognized <i>wahi pana</i> , presence of <i>lo'i</i> , # of households engaged in traditional and customary practice)
☐	Health & Diet (prevalence of diabetes, heart disease, obesity, drug abuse; # of farmers/fish markets)
☐	Community Involvement in Natural Resource Management (# of people, # of projects, # of organizations, # of schools, etc.)

WORKSHEET 6: LOCAL KNOWLEDGE CHECKLIST

MOVING TO MEASUREMENT

METRICS	QUESTIONS	EXISTING SOURCES research, quotes, photos, videos, press, story, website	NEW SOURCES	CONTACTS name, number, email	RESPONSIBILITY name, number, email	TIMELINE
RAINFALL (rain and stream gauges- NOOA-Weather)	Have rainfall patterns changed? Flooding?					
AVAILABILITY OF FRESH WATER (# of water sources/ household (or capita), Board of Water Supply)						
WATER QUALITY (stream sediment, flow, pathogens- DOH)	Has water quality changed in your streams? How clean were streams historically?					
GROUNDWATER RECHARGE, LAND USE (% impermeable surface, ratio of developed over natural)	How much has land cover changed? Were there historically any developments that significantly changed water runoff patterns that impacted nearshore waters? How has land use changed over time?					
NATIVE VEGETATION (% trees/plants cover, acres)	Has there been loss of native vegetation? Are there any native plants that you remember that are no longer present? Where? What impacts on the culture and environment have these losses imposed?					
KEY BIRD SPECIES (presence, abundance, compare historic)	What native birds formerly present are now absent? What alien bird species have moved in?					
TARGET FOOD FISH (biomass, fishing effort, size structure)	How was fish catch, historically? Type and abundance? If abundance is diminished, what do you think caused that?					
OCEAN HABITAT QUALITY (coral: abundance & biodiversity; sand; rubble; etc.)	Has there been loss of coral in the nearshore area? What do you think caused these losses? What impacts on the culture and environment have these losses imposed?					

METRICS	QUESTIONS	EXISTING SOURCES research, quotes, photos, videos, press, story, website	NEW SOURCES	CONTACTS name, number, email	RESPONSIBILITY name, number, email	TIMELINE
MARINE INVERTEBRATES & ALGAE (indicators of water or habitat quality)	Has there been loss of marine invertebrates and algae (<i>limu</i>) in the nearshore area? What do you think caused these losses? What impacts on the culture and environment have these losses imposed?					
FRESH WATER: FOOD FISH & KEY INVERTEBRATES (See fish and invertebrates above.)	Has there been loss of food fish and key invertebrates in the nearshore area? What do you think caused these losses? What impacts on the culture and environment have these losses imposed?					
POPULATION SIZE AND GROWTH (DBEDT)	Has the population grown significantly in your area? What impacts has this had. Culturally and environmentally, what were things like before population growth?					
CULTURAL (# of <i>kūpuna</i> , # of <i>wahi pana</i> , presence of <i>lo'i</i> , # of households engaged in traditional and customary practice)	What is the historical use of the natural resources of the land? Are there culturally important features that require conservation? In your memory, was this once a food-sustainable area where most food was gleaned from the land or sea?					
HEALTH/DIET (prevalence of diabetes, heart disease, obesity, drug abuse, # of farmers/fish markets)	How has diet changed in your area? Historically, what foods were generally consumed? How has this changed?					
COMMUNITY INVOLVEMENT (# of people, # of projects, # of organizations, # of schools, etc.)	What was community participation in natural resource management like historically? Did the community traditionally harvest/fish together? How has this changed?					

WORKSHEET 7: COMMUNITY INFORMATION PLAN

MOVING TO MEASUREMENT

NAME OF COMMUNITY: _____ DATE: _____

NAME OF REPRESENTATIVES: _____

LIST OF SNAPSHOT METRICS EXISTING: _____

LIST OF SNAPSHOT METRICS TO BE COLLECTED: _____

OBJECTIVES	ACTIONS	RESPONSIBILITY	
FRESH WATER SYSTEMS HEALTH Stream flow Data			
Water Quality & Biological Monitoring			
Native vs. Non-Native Water Consumption Study			
Groundwater Recharge			
COMMUNITY ENGAGEMENT Volunteer Restoration Effort			
Community-based Initiatives			
TOURISM IMPACTS Carrying Capacity Study			
Socioeconomic Monitoring			

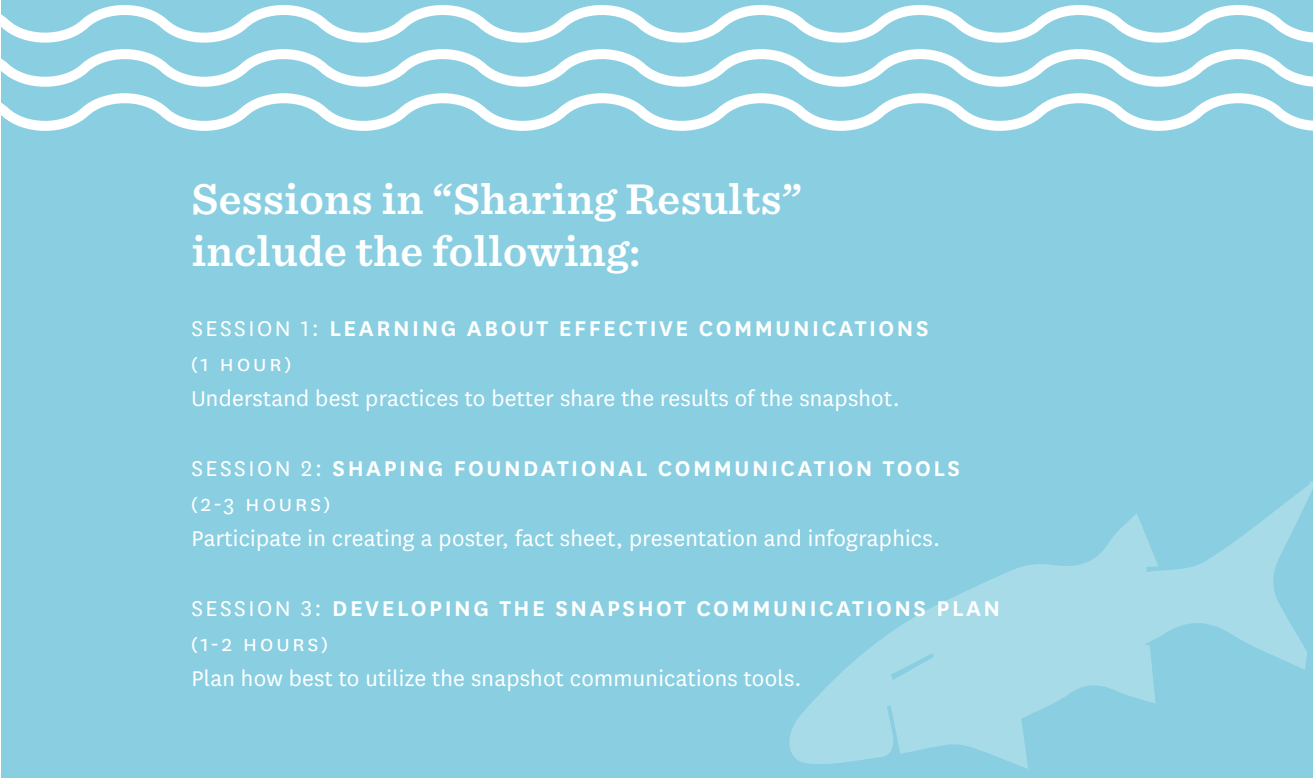
NOTES



NOTES



SHARING RESULTS

The page features a light blue background with a large, faint silhouette of a fish in the upper right. Below the main title, there are three horizontal wavy white lines. In the bottom right corner, there is a smaller, faint silhouette of a fish.

Sessions in “Sharing Results” include the following:

SESSION 1: LEARNING ABOUT EFFECTIVE COMMUNICATIONS

(1 HOUR)

Understand best practices to better share the results of the snapshot.

SESSION 2: SHAPING FOUNDATIONAL COMMUNICATION TOOLS

(2-3 HOURS)

Participate in creating a poster, fact sheet, presentation and infographics.

SESSION 3: DEVELOPING THE SNAPSHOT COMMUNICATIONS PLAN

(1-2 HOURS)

Plan how best to utilize the snapshot communications tools.

» SESSION 1.

LEARNING ABOUT EFFECTIVE COMMUNICATIONS

(1 HOUR)

OBJECTIVES

To build the CWS team's understanding of basic communications principles in order to contribute to the development of communications tools.

To learn how to effectively share snapshot results with target audiences.

To learn how to better advocate for and promote natural resource-related community initiatives.

RESOURCES NEEDED

- Facilitator
- Communications lead
- Projector, laptop and screen or blank wall
- Three sets of example communications tools from the CWS pilot (three products each for three community snapshots from www.hawaiiconservation.org/communitysnapshots)
- Snapshot map the team developed in the session titled "Participating in Mapping" (Display where all can see it.)
- Historical timeline the team developed in the session titled "Building Your Historical Timeline" (Display where all can see it.)
- "Communications 101" presentation (Display with projector or provide printouts. Please review prior to the session.) www.hawaiiconservation.org/communitysnapshot
- Example graphics from various types of media
- From the session titled "Informing Your Snapshot," the shared responses to question 4 about communications strategies, listed in order from the most frequently named to the least frequently named

below: Community Watershed Snapshot Design Planning Workshop with all 8 communities, Waimea, Hawai'i, September 2014



Key Communications Concepts

Target Audience: Particular group of people, identified as the intended recipient of the communications product or message. Usually defined in terms of specific traits such as age, gender, livelihoods, role in the management of the area, interests and behaviors.

Key Message: Key messages help you focus your communication, which is critically important. Key messages are words that help you deliver the point you are trying to make.

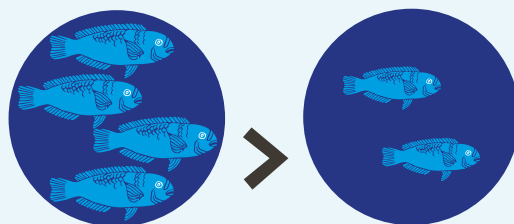
THREE FEATURES OF GREAT KEY MESSAGES:

Clear: Are free of jargon, devoid of technical language and relevant.

Concise: Can be delivered in seven to eight seconds, as that might be all the time you get.

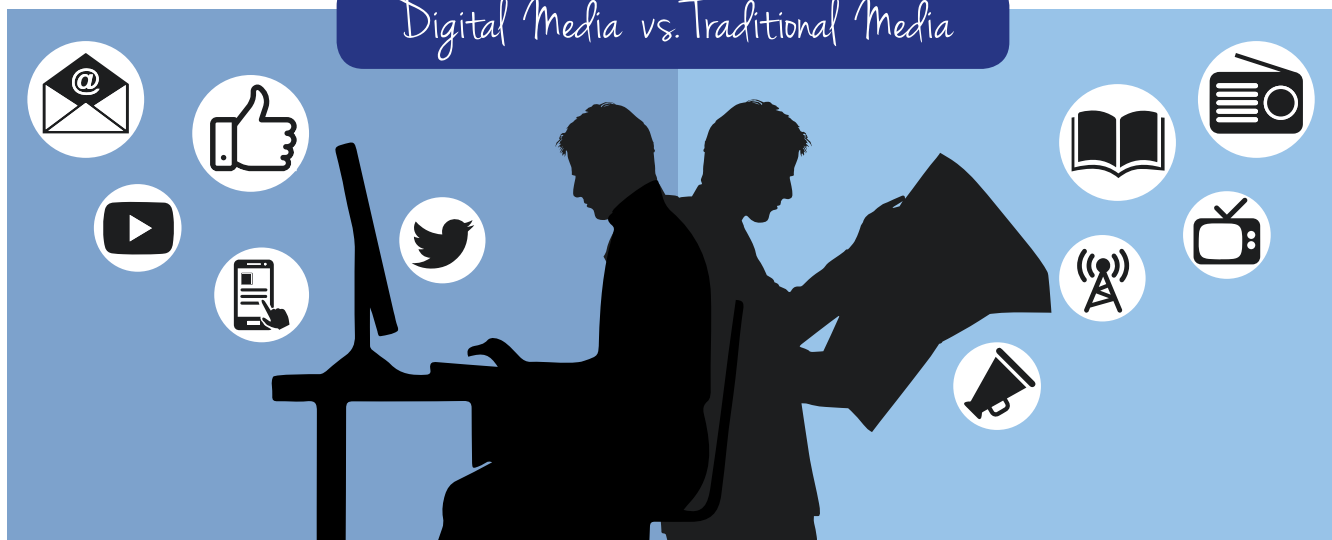
Consistent: Must be repeated if they are to sink in.

Infographic: Now becoming a standard for conveying data to target audiences, infographics are visual representations of information or data. More informative than a graphic, more graphic than information, the infographic condenses important data into graphical elements that capture the eye and absorb the mind. Infographics illustrate information clearly and quickly in graphic format that, in text form, would be lengthy and complex.



"The numbers of nearshore reef fish such as uhu (parrotfish) have decreased over the years, likely due to a combination of factors including a loss of coral habitat, overharvesting of fish, and decreased water quality from pollution such as sediment runoff from land" - NOAA FISHERIES, PACIFIC ISLANDS REGIONAL OFFICE

Digital Media vs. Traditional Media



above: **Traditional vs. Digital Media Infographic:** Illustrates how and, most importantly, why the type of media is chosen for the target audience.

SESSION 1 (CONTINUED)

EXERCISE

1. Review the progress of the snapshot and project timeline to date. Review the products generated in prior sessions, including the snapshot's map, metric analysis and data-collection plan along with additional data gathered prior to this session.
2. Divide into 3 small groups. With the communications lead leading, review the "Communications 101" presentation and key communication concepts in the call-out box. Review the example graphics from various types of media. Explain that through these and other communications tools, you can more effectively achieve your resource management-related communications goals. Explain that the team will be considering this information and tools as it develops the communication plan for the snapshot results. Have each of your small groups present back.
3. Divide into small groups according to interest—one for each of the objectives. With the facilitator leading and keeping in mind the principles of communication just covered, review the shared responses from question 4 of the session titled "Informing your Snapshot" that were listed in order of frequency. Highlight the team's suggested communications methods to gain a sense of the types of methods the team considers to be of most value to the watershed. Have each small group present their work and receive additional input.
4. With the communications lead leading, consider more deeply the suggested communications methods, using guidance from the call-out box. Discuss which methods and products the team believes it has the capacity to use.
5. Share and review the three existing sets of HCA Community Watershed Snapshot Project products for communicating the health of a ridge-to-reef watershed or *ahupua'a* to the community and other stakeholders.

CWS TEAM WORK TO BE COMPLETED
PRIOR TO THE NEXT SESSION

The coordinator should draft the site overview within a limit of 75 words. For more information on developing a site overview, see CWS Fact Sheet. The communications lead illustrates the first draft of the watershed snapshot poster background using 3-D imagery and the Snapshot Team *ahupua'a* boundary. See the Communications Lead Scope of Work on p. 100.

Communication Tool Selection

Depending on your target audiences and desired key messages, any one of the team's recommended methods or products could be considered. However, some products require more work than others and can be more complicated to produce, including videos and podcasts. Consider the team's capacity, and start with products and methods that are less complicated, less expensive and less time-consuming. Note where poster, fact sheet and PowerPoint presentations fall on the list. These three items provide the foundational elements needed to derive other communication products, are often used for multiple types of audiences, and can be employed using a variety of media. As a result, it is recommended that every CWS team develop a poster, fact sheet and PowerPoint presentation.

» SESSION 2. SHAPING FOUNDATIONAL COMMUNICATION TOOLS (2-3 HOURS)

The CWS team's direct contribution to the scoping and design of communications tools will ensure these are most relevant to community needs and community investment in future management planning and implementation efforts.

OBJECTIVES

To agree on a suite of communications tools that will help to ensure effective documentation, education, sharing and wide use of the CWS.

RESOURCES NEEDED

- Facilitator
- Communications lead
- Product templates for a poster, fact sheet and PowerPoint presentation (www.hawaiiconservation.org/communitysnapshot)
- Downloadable icons (access HCA website addy)
- Communication lead's first draft 1 poster background of the watershed site (artistic rendition of 3-D image or photograph, or Google Earth imagery)
- Examples of past snapshot products (www.hawaiiconservation.org/communitysnapshot)
- Coordinator's draft site overview (as described in CWS Fact Sheet Template found on HCA website www.hawaiiconservation.org/communitysnapshot)
- Markers or pens

right: **Lessons Learned Workshop, O'ahu, July 2016**



EXERCISE

1. With the communications lead leading, use the templates to design drafts of a poster, fact sheet, and PowerPoint presentation.

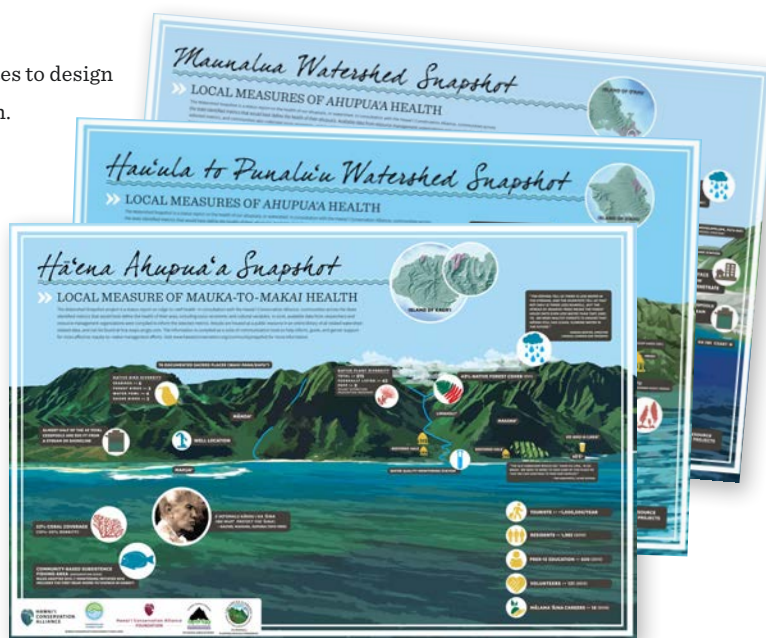
POSTER

a. View a draft poster background (derived as an artistic rendition from Google Earth imagery of the selected *ahupua'a*). Discuss the perspective, geographical references, streams and other major physical features that could make the artistic rendition a more realistic representation of the site.

b. Review the downloadable icons, and which icons could illustrate snapshot metrics or other natural or cultural features. Confirm whether existing icons, existing icons with modifications or new icons will be used.

c. The poster should include community logos for those actively involved in the CWS. Discuss and decide which logos should be included. Make note of any agreements or next steps.

d. With the watershed backdrop, add or move icons to suit the data that exist.



FACT SHEET WITH INFOGRAPHICS

a. Review the fact sheet template with infographics, highlighting major components for which input is needed and where such information exists. Reflect on the major components of the fact sheet, including what information is pending and where input is needed.

b. Review the draft site overview, and confirm the language.



POWERPOINT PRESENTATION

Review the PowerPoint template, indicating placeholders for pending information. Using the “Moving to Measurement” section, add slide notes to provide explanations of what each metric or result means, how it relates to the health of the watershed, and the challenge of collecting meaningful data. Note what information is still needed, what products components need further development, and who will take responsibility for completing each task

COMMUNICATIONS LEAD WORK TO BE COMPLETED PRIOR TO THE NEXT SESSION

Use the templates the team developed to create a draft poster, fact sheet, and PowerPoint presentation to circulate to the team for feedback.

» SESSION 3.

DEVELOPING THE SNAPSHOT COMMUNICATIONS PLAN

(1-2 HOURS)

Because communications can be as technical and complex as any other part of management, this session will guide the community to plan the communications for the snapshot using the tools developed in the previous session. We recommend that the communications plan be implemented prior to or concurrently with the “Inspiring Action” sessions.

OBJECTIVES

To create a snapshot communications plan that prepares the CWS team to leverage the tools developed during the snapshot process.
To build community support for watershed management.

RESOURCES NEEDED

- Facilitator
- Communications lead
- Three draft snapshot communications tools (poster, fact sheet and PowerPoint presentation)
- Worksheet 8: Snapshot Communications Plan (p. 78)
- Flip chart paper with easel or tape
- Markers

EXERCISE

1. With the communications lead leading, review draft communication tools for your snapshot. Note comments or edits as needed.
2. Divide into three groups—one for each draft communications product. Have each group use the Snapshot Communications Plan (p. 78), brainstorming the top three objectives for using the CWS communications tools and the respective target audiences. Have groups present back their three main objectives and respective audiences to the team. Discuss the objectives and audiences for each communications product until the team reaches consensus about which three objectives and respective audiences with which to begin the communications plan.
3. Divide into three groups, based on interest—one for each of the three objectives. Have small groups work with the respective objective to identify actions that are needed or additional to the key audience’s communication tool to support, responsibility, resources, and timeline. Have each group present its work and receive additional input.

COMMUNICATIONS LEAD WORK TO BE COMPLETED PRIOR TO THE NEXT SESSION

Finalize the snapshot communications plan and three products. Send the plan and products to the team for final review. Finalize the plan and products before beginning the section titled “Inspiring Action.”

Celebrating Your Snapshot Results

HCA experience conducting pilot snapshots in Hā'ena, Maunaloa, and Hau'ula/Punalu'u demonstrated how valuable it is to host a snapshot results celebration with neighborhood residents, stakeholders, elected officials, local schools, community groups and nonprofit organizations and others. Presentation of the snapshot process highlighting results is important for effective engagement. In Maunaloa and Hā'ena, attendees reviewed products and shared their “ahas” and what value the snapshot process contributed to the community. Consider how the results relate to priority actions moving forward.

LEARN BY DOING

Peer-to-peer or site-to-site demonstrations and exchanges can be effective ways to share efforts, restore sites, ask questions about processes, how to gather metrics. During the pilot phase, Hau'ula/Punalu'u and Maunaloa shared information through such a community exchange.

VIDEO INNOVATION IDEAS (COURTESY OF SHEILA SARHANGI)

The core CWS communications tools of the poster, fact sheet, and PowerPoint presentation video products may be very valuable to your watershed management efforts. Video products can engage a wide range of audiences and generate enthusiasm for your management efforts. Before you develop video products, consider how they will be used, which audiences they will address, and how they will be developed. Please see several ideas about video communications products below.

Data visualization storytelling videos of important *ahupua'a* metrics can be shared via websites, social media platforms, and story maps to engage online users. For example, videos can share specific species, their characteristics, where they are found, their importance to the region and so on. One example can be found at this YouTube link; however, for the CWS purpose, the tone of the video should be more upbeat (<https://www.youtube.com/watch?v=gQelgbDlhuw>).

Stories from the field videos show community members and researchers engaged in monitoring. Video portraits of *kūpuna* telling histories or stories about an area or short video clips about local fishing traditions and culturally appropriate management are compelling methods for effectively sharing information. Videos can be shared via websites, social media platforms, and story maps to engage online users. Later, if specific goals are set, videos can be used to spur action against particular threats. See examples from Chesapeake Bay at http://www.chesapeakebay.net/videos/clip/from_the_field_monitoring_water_quality_in_the_chesapeake_bay and at <https://www.youtube.com/watch?v=jWZ5oor1z4A>.

WORKSHEET 8: COMMUNITY WATERSHED SNAPSHOT

COMMUNICATIONS PLAN

SHARING RESULTS



GOAL (Relevant CWS metric)	AUDIENCE	KEY MESSAGES	METHODS/ TOOLS	RESPONSIBILITY	RESOURCES	TIMELINE

NOTES



NOTES



INSPIRING ACTION



Sessions in “Inspiring Action” include the following:

SESSION 1: **CREATING A PROBLEM-SOLUTION MODEL** (2-3 HOURS)

Build an understanding for how to improve the condition of your priority resources.

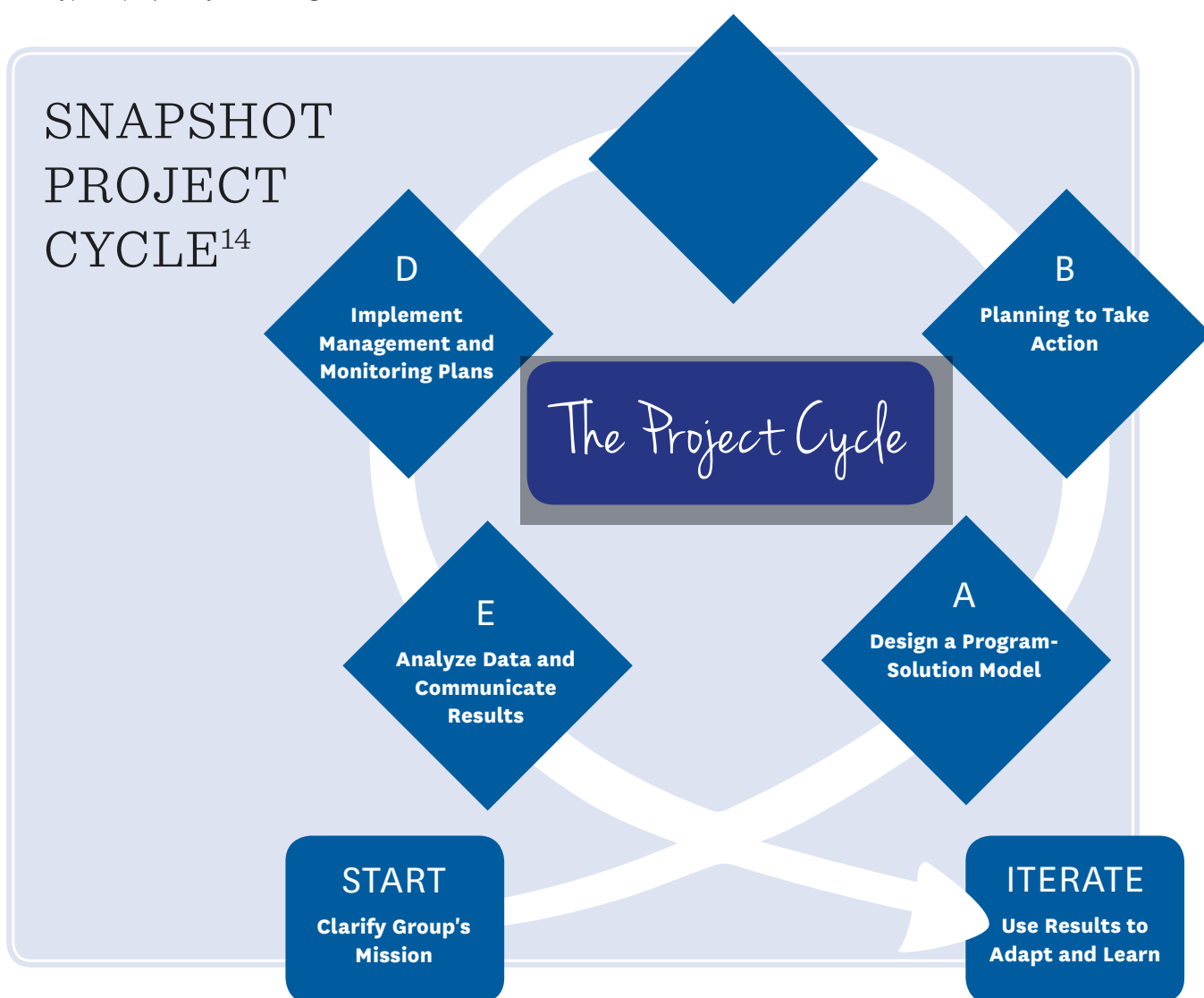
SESSION 2: **PLANNING TO TAKE ACTION** (3 HOURS)

Conduct a simple process to engage the community in moving forward with management and resources for developing a more comprehensive plan.

SESSION 3: **MONITORING YOUR MANAGEMENT PROGRESS** (1-2 HOURS)

Create goals and reflect on grading.

With your snapshot communications products completed, you are well positioned to begin taking management action in your watershed. By looking at your new CWS poster, you can see areas in which your community is interested in moving the needle by implementing management actions. In the absence of technical assistance, this section offers your community a straightforward approach for how to plan and implement initial actions that will improve the health of the watershed. On the other hand, if your team decides a more comprehensive approach to management planning is necessary, technical resources on widely accepted management planning approaches are also provided. This section will cover steps A, B and C in a typical project cycle. See figure below.



¹⁴ "A Management and Adaptation Planning Guide for Natural Resource Managers," by Pacific Islands Managed and Protected Area Community (PIMPAC), published in 2006; "Measures of Success: Designing, Managing, and Monitoring Conservation and Development Projects" by Richard Margoluis and Nick Salafsky, published in 1998 by Island Press.

» SESSION 1. CREATING A PROBLEM-SOLUTION MODEL (2-3 HOURS)

The participatory process by which the CWS team develops its problem-solution model will help determine what the best solutions are to threats and problems on each of the metrics, and how your community can begin undertaking specific actions to address those threats. Informed by the snapshot results and identified priorities, this session will directly support fundraising efforts by justifying funding requests and clarifying the level of community support for specific management actions.

OBJECTIVES

To gain an understanding of priority resources and threats to them.
To build consensus around solutions and actions.

RESOURCES NEEDED

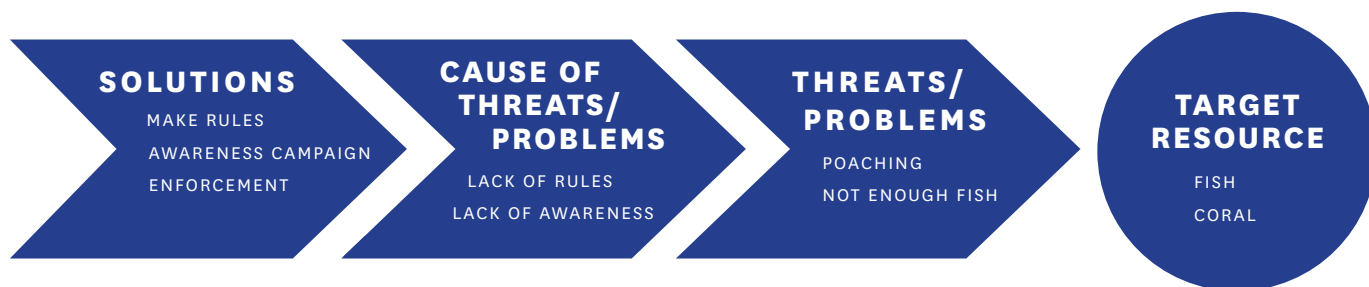
- Community snapshot poster, historical timelines and map
- Sticky notes or color paper cut into different shapes (one color per)
- Markers
- Large sheet of white paper, affixed to a wall
- Camera or phone that can take photos
- Exercise¹⁵



above: Hā'e'ena Ahupua'a snapshot celebration March, 2017

¹⁵ The following facilitation guidance has been developed from three established participatory planning processes used in the Pacific Islands: the Problem Tree from "Locally-Managed Marine Areas: A Guide to Supporting Community-Based Adaptive Management," by Hugh Govan, William Aalbersberg, Alifereti Tawake and John E. Parks, published March 31, 2008, retrieved via chrome-extension://oemmndcblldboiebfnladdacbfmadadm/http://www.refresilience.org/wp-content/uploads/LMMA-Guide-2008.pdf; the Threat Solution Model

SESSION 1 (CONTINUED)



EXERCISE

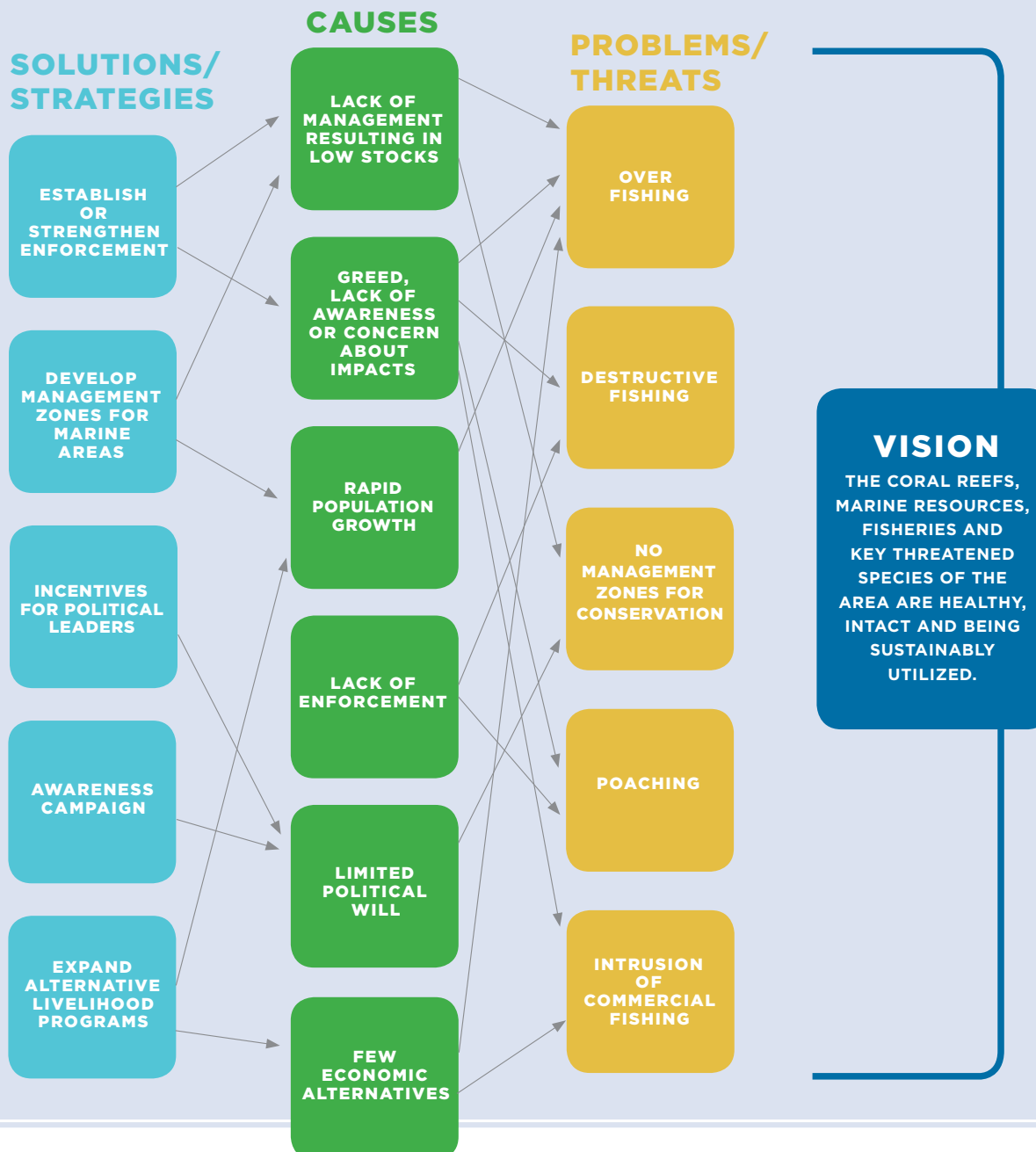
1. Looking at metrics displayed in your snapshot poster, discuss which specific resources you are most concerned about. To start, choose the top five highest priority resources. List those resources, or conservation targets, on the far right of the sheet of white paper.
2. Once you have listed the priority resources, have each participant brainstorm about the threats or problems causing negative impacts to each resource. Write those threats to the left of the respective target resource. Use arrows to connect the threat to each resource that it is impacting. A threat may impact multiple resources.
3. For each threat the team identifies, discuss what caused or is the source of the threat. Write the causes to the left of the respective threats. Use arrows to connect each cause to each threat. A cause may contribute to multiple threats. As an example, the cause of high nitrogen levels could be sewage leaks, and high phosphorus levels could be caused by agricultural activities. Sediment could be caused by land use and invasive species.
4. For each cause, brainstorm about potential solutions to increase the health status of the priority resource. Use arrows to connect solutions to the causes. A solution may address multiple causes.
5. Take a high-resolution photo the problem-solution model as a record of the team's preparation for management planning.

right: Kānewai Spring, Kuli'ou'ou, O'ahu



Sample Problem-Solution Model

Problem-solution models are also known as conceptual models, threat/solution models and problem trees. They come in many shapes and sizes. You can interactively represent your results using online sites such as popplet.com and www.creaza.com and computer-based applications such as PowerPoint that provide a function that helps you develop a flow chart using colors and shapes. These tools allow future editing, changes and multiple versions.



» SESSION 2.

PLANNING TO TAKE ACTION

(3 HOURS)

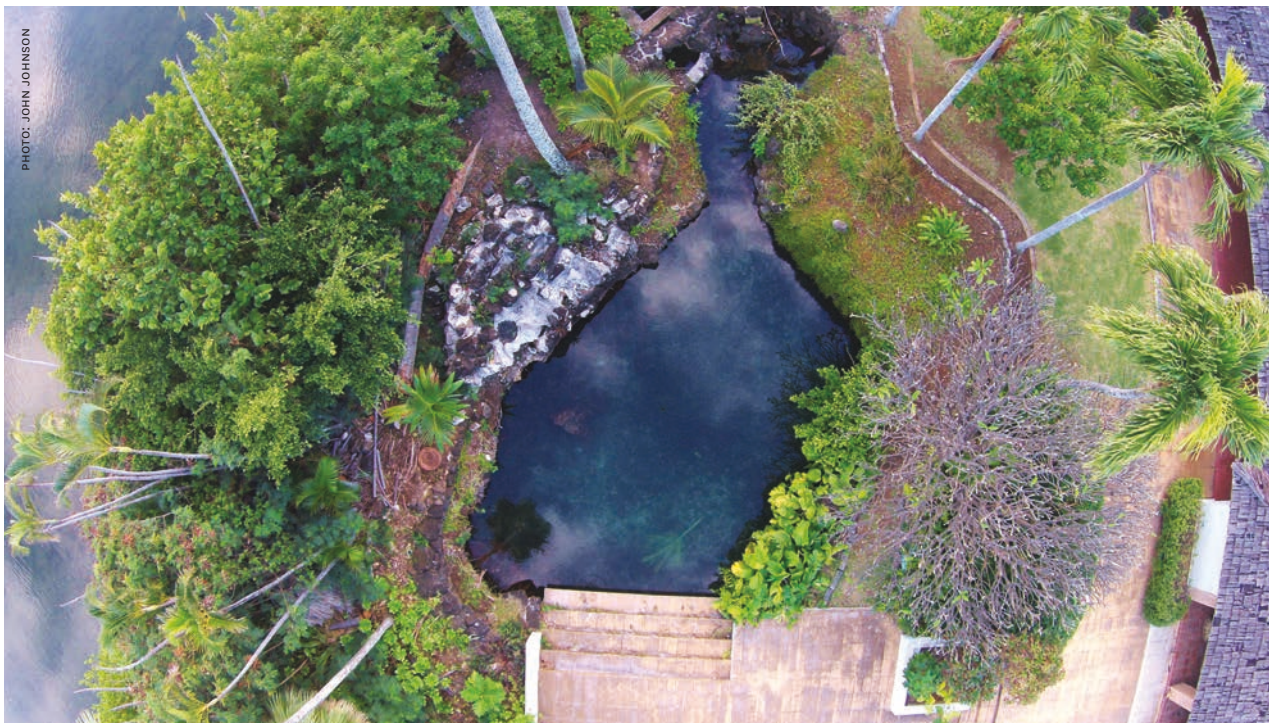
In this session, the CWS team will use the problem-solution model and develop a concise action plan to start addressing key problems and threats. The team will become familiar with a variety of management planning approaches to help determine if it wants to undertake a more comprehensive management planning process. Following this activity, the CWS team will have a clear sense of which solutions would be feasible and well-supported by the community.

OBJECTIVES

To provide guidance for which watershed solutions the CWS team can implement in its *ahupua'a*.
To provide advice for future management planning efforts.

RESOURCES NEEDED

- Facilitator
- Worksheet 9: Simple Action Plan Template (p. 88)



above: Kānewai Spring, a successful community solution model

SESSION 2 (CONTINUED)

EXERCISE

1. Within the problem-solution model, the team listed solutions. As a group, complete the Simple Action Plan Template to identify viable management actions that will improve the health of the watershed.
2. In section A, fill in the priority resources the team identified during the session titled “Creating a Problem-Solution Model.” List why each is important.
3. In section B, note any changes in any of the resources listed in column A. Note the resource, the observed change and the reasons for the change.
4. In section C, list the threats to each resource and the causes of the threat. For example, the team could list fish as a resource, poaching as a threat, and lack of employment and lack of enforcement as causes.
5. In section D, list which solutions might address each threat, the action the team will take to implement the solution, and the outcomes or results the team hopes to achieve with each action.

Snapshots Inspire Partnerships

As a result of completing the snapshot process, all three pilot communities experienced relationship benefits such as unifying and bridging previously disparate groups. Collaboratively developing metrics and sharing in the monitoring of baseline conditions allowed participants to connect the various interactions in a ridge-to-reef ecosystem. With this new understanding, communities collectively realized which indicators are under immediate threat or warranted priority action. Discussions helped to bring perspective and understanding to community representatives as they candidly shared personal accounts of how resource-use patterns and local events have changed the quality and abundance of natural resources over time. The Maunalua region has undergone several threats over the years, which, coupled with development, has resulted in poor water quality, defined as an impaired water body by the Environmental Protection Agency. The tide is changing for this suburban community. Mālama Maunalua, The Nature Conservancy, and the National Oceanic and Atmospheric Administration have led the removal of 3.5 million pounds of invasive alien algae since 2007. Another snapshot highlight was the purchase of Kānewai Spring by the Maunalua Fishpond Heritage Center through a partnership with The Trust for Public Land. One of three pilot snapshot communities, Maunalua completed its watershed snapshot in fall 2016 with a clear focus on improving water quality. To address these threats, the Maunalua Watershed Hui formed in spring 2017 with the purpose of collaborating to foster the health and abundance of the Maunalua region.

WORKSHEET 9: SIMPLE ACTION PLAN TEMPLATE¹⁶

INSPIRING ACTION

A. Which resources (land/ocean animals, plants, habitats, cultural) are most important to your community and why? Use your list from the problem-solution model.

List the specific resources:	Why is it important ?

B. Have you noticed any changes in the resources? Why have these changes occurred?

List specific resources:	What changes and why?

¹⁶ Originally developed by Scott Atkinson; adapted for HCA Community Watershed Snapshot Guidebook.

C. Are any ongoing activities in your area acting as threats or problems to your resources? If so, what is causing those activities?

Resources	Threats and Problems	Causes

D. What solutions can address the threats and problems or their causes? For each solution, note the specific actions that would be needed to implement the solution. Include activities that will increase support from the community and stakeholders. For each action, what will be the result?

Solutions	Actions	Intended Outcome (Results)

Comparison of Common Management Planning Approaches in the Pacific Islands

	CAPACITY	TIME	COST	BENEFIT
Locally Managed Marine Area Network Immanetwork.org CONTACT: Ron Vave ronvave@hawaii.edu	Regional and national network of resources; structure provides facilitation and technical advisors; built on local observation and resource knowledge	1 to 6 months	Low; helpful to have a facilitator but not necessary	Simple plan for community to use; wide-reaching; community network formed; existing tools available for wide replication
Pacific Islands Managed and Protected Area Community www.pimpac.org CONTACT: Michael Lameier michael.lameier@noaa.gov	Regional network of resources; mentors available to support process; utilizes local observation and knowledge	3 to 6 months	Medium; facilitator recommended	Series of simple participatory exercises results in production of a feasible plan linked to a suite of complimentary resources
TNC Conservation Action Planning CONTACT: Manuel Mejia mmejia@tnc.org	Regional network of resources; facilitation support depending on availability; local stakeholder engagement along with technical resource people	6 months to 2 years	Medium; advanced technical skills required	Extensive process features production of a comprehensive plan of action for the area

Comprehensive Management Planning Frameworks

The array of recognized management planning approaches shown above suggests that the decision to select one is rather complex. Although there are resources and support for each, how to identify which planning approach may work better is not clear. If your community is interested in a more comprehensive approach to management planning, one way to help you decide which process is right for you is to first familiarize yourself with the approaches by looking through the links above. As you review the approaches, consider their similarities and differences.

Your community can invite the experts on each tool listed in the table to join a video conference call with the CWS team to further discuss the merits of each approach. Prior coordination is necessary, along with securing a web-based video hosting service such as Google Chat, Skype or Facebook video chat and a venue with strong internet and conference call resources.

» SESSION 3. MONITORING YOUR MANAGEMENT PROGRESS (1-2 HOURS)

With the first iteration of the snapshot successfully establishing a baseline from which to begin management, the ultimate intention of the CWS is to be repeated every few years to track how implementation of management strategies have resulted in improvements to the health of the watershed. In this way, the snapshot can also serve as a method of evaluation for the community's management projects.

Below, we provide a simple tool that can be used annually to track progress toward your goals. We also provide guidance on reviewing your snapshot results to see if any metrics have changed to help you determine if a full snapshot update is needed and, if so, when.

OBJECTIVES

To prepare the CWS team to reflect on progress and utilize the snapshot as an ongoing monitoring tool.

RESOURCES NEEDED

- Problem-solution model completed during the session titled "Creating a Problem-Solution Model"
- Simple Action Plan Template completed during the session titled "Planning to Take Action"
- Worksheet 10: Watershed Action Plan Review (p. 92)
- Pens or pencils



left: Manuel Mejia, Maunaloa resident collecting water samples at Kānewai Spring

WORKSHEET 10: WATERSHED ACTION PLAN REVIEW

INSPIRING ACTION

DATE REVIEW COMPLETED:

NAMES OF REVIEW TEAM MEMBERS:

SOLUTIONS	ACTIONS	STATUS OF ACTIONS	INTENDED OUTCOMES (RESULTS)	STATUS OF RESULTS

WORKSHEET 10: WATERSHED ACTION PLAN REVIEW

INSPIRING ACTION



DATE REVIEW COMPLETED:

NAMES OF REVIEW TEAM MEMBERS:

SOLUTIONS	ACTIONS	STATUS OF ACTIONS	INTENDED OUTCOMES (RESULTS)	STATUS OF RESULTS

WORKSHEET 10: WATERSHED ACTION PLAN REVIEW

INSPIRING ACTION



DATE REVIEW COMPLETED:

NAMES OF REVIEW TEAM MEMBERS:

SOLUTIONS	ACTIONS	STATUS OF ACTIONS	INTENDED OUTCOMES (RESULTS)	STATUS OF RESULTS



GLOSSARY OF ENGLISH WORDS

ADAPTIVE CAPACITY >> the capability or ability of built natural and human systems to adapt to impacts of climate change and climate variability with minimal potential damage or cost

COMMUNITY-BASED RESOURCE MANAGEMENT >> the collective use and decision-making of natural resources in rural areas by a group of people with a self-defined, distinct identity, using communally owned facilities

COMMUNITY-BASED COLLABORATIVE MANAGEMENT >> a combination of community-based and collaborative management in which a community is one of two or more decision-makers working in a collaboration that could also include critical supporters and informants. This is the current and widely accepted state of management in many Pacific Island countries. Hawai'i is experiencing growing support for deepening the current level of community participation in management toward the community co-management model, which empowers communities to take on a higher level of authority or leadership in resource management.

COMMUNITY SNAPSHOT TEAM >> volunteer group selected from the community surrounding the snapshot location that is responsible for regular and active participation in consultations, exercises, surveys, data collection and communication tools development. Recommend 10-20 people.

COMMUNITY WATERSHED SNAPSHOT METRICS >> HCA's recommendation for how to measure "How Healthy is Your *Ahupua'a*?", informed from consultation with eight communities in 2012.

DATA-SHARING AGREEMENT >> also known as Information Sharing Agreement

ECOSYSTEM-BASED MANAGEMENT >> an environmental management approach that recognizes the full array of interactions within an ecosystem, including humans, rather than considering single issues, species, or ecosystem services in isolation

FREE, PRIOR AND INFORMED CONSENT >> to establish bottom-up participation and consultation of an indigenous population prior to beginning development on ancestral land or using resources within the indigenous population's territory

GEOGRAPHIC INFORMATION SYSTEMS (GIS) >> a system for the management, analysis and display of geographic information. These systems have a wide range of abilities that could be applied to the snapshot project. ESRI Arc GIS and Google Earth are examples of the many applications used to manage geographical data. Page 103 provides an overview of mapping technologies to consider when doing the snapshot project.

INDICATOR >> specific information on the state or condition of the associated metric. For example, indicators of water quality include levels of nutrients such as phosphorus and nitrogen or presence of bacteria such as *Enterococcus* or *Leptospiriosis*.



GLOSSARY OF ENGLISH WORDS (CONTINUED)

INFOGRAPHIC >> a visual representation of information or data; becoming a standard for conveying data to a target audience. More informative than a graphic, more graphic than information, the infographic condenses important data into graphical elements that capture the eye and absorb the mind.

INFORMATION-MANAGEMENT AGREEMENT >> also known as Data Sharing Agreement

INTELLECTUAL PROPERTY >> a category of property that includes intangible creations of the human intellect, including traditional ecological knowledge shared by community members and *kūpuna*

KEY MESSAGE >> words that help you deliver the point you are trying to make and help focus communications, which is critically important

METRIC >> a way of measuring the health of a watershed—for example, “water quality”

RESILIENCE >> the ability to recover from unexpected and catastrophic change; the ecological and social capacity to cope with, adjust to and recover from external stresses and disturbances

RIDGE-TO-REEF >> a natural resource management practice of viewing the health of a watershed or *ahupuaʻa* from the top of the mountain down to the coral reef. Implies the entire watershed operates as one holistic system for which decisions are made, reflecting the connectivity between land and sea. For more information, see pp. 15-16.

SCOPE >> relates to the goals, intentions and features you will include in your snapshot. For example, is it necessary to include particular streams, ridges, coastlines and nearshore fisheries in your assessment? Are there specific impacts from upper *mauka*, or pressure from the coast that is of interest to your Community Snapshot Team?

SHIFTING BASELINE >> also known as *sliding baseline*, a type of change to how a system is measured, usually against previous reference points (baselines), which themselves may represent significant changes from an even earlier state of the system. For more information, see p. 60.

SNAPSHOT >> the state of your *ahupuaʻa* in this moment. Ideally, a snapshot would be replicated to track changes as a result of community awareness, empowerment and action.

TARGET AUDIENCE >> particular group of people, identified as the intended recipient of the communications product or message. Usually defined in terms of specific traits such as age, gender, livelihoods, role in the management of the area, interests and behaviors.

WATERSHED >> an area of land, such as a mountain or valley, which collects rainwater into a common outlet such as a stream, lake or wetland. In Hawaiʻi, the common outlet is ultimately the ocean. Some of the rain is absorbed by plants, some of it is absorbed underground, and the rest flows into surface rivers and streams



APPENDICES

COMMUNITY WATERSHED SNAPSHOT PROPOSAL TEMPLATE

This template and example guides you in developing a proposal for funding your snapshot. For additional support, please see Additional Resources: “Proposal Writing Made Easy” by Scott Atkinson.

This template uses a basic outline that is applicable to most proposals. We use the terms Goal, Objectives, Activities, Outcomes, and Outputs as the core of the proposal. The donor may use other terms; in general, any proposal will include the following elements:

1. INFLUENCERS: The overall long-term change in the condition of the resources or social elements that you are trying to achieve. In this case, “to restore the health of our watershed.” The CWS process is one step in that long-term effort.

2. OBJECTIVES (SOMETIMES REFERRED TO AS RESULTS): The specific things that you will accomplish during the course of the project. These can be thought of as the results of the project, and they should contribute to achieving the long-term goal. Objectives should be developed based on the SMART criteria (Specific, Measurable, Achievement or Accomplishment Oriented, Realistic, Time-bound. Refer to Proposal Writing Made Easy (www.hawaiiconservation.org/communitysnapshot) for more guidance on developing SMART objectives.

3. ACTIVITIES (MAY ALSO BE CALLED ACTIONS): Activities are the specific things that you will do to accomplish your objectives. You should check to make sure that if you undertake all the activities that you will achieve your objective. If for some reason you find that you won’t be able to achieve your objective with your list of activities, you either need to add activities or adjust your objective. You may have one or two objectives that may be beyond your control to accomplish. For example, they include generating political support. But the majority of your objectives should be things that you can accomplish.

4. OUTCOMES: Outcomes are the beneficial things that result from your project. They may be the results that you have set out in your objectives, but they go beyond that. For example, one outcome of the CWS projects that may not be a specific objective could be better communication and trust built among your community that will enable you to better accomplish other community stewardship efforts. Think of all the benefits that your work will generate; these are your outcomes.

5. OUTPUTS: Some donors will also ask for outputs. Generally speaking, outputs are the physical products that will result from your project. In this case, they may include the CWS poster, fact sheet, and presentation for your watershed.

PROJECT TITLE

[INSERT YOUR COMMUNITY NAME] **COMMUNITY WATERSHED SNAPSHOT**

AMOUNT REQUESTED: \$15,000

EXECUTIVE SUMMARY: Summary of the proposal narrative, as concise as possible.

[Insert a brief background of ahupua'a and problems/threats you wish to address.]

The Community Watershed Snapshot (CWS) is a key component of the Hawai'i Conservation Alliance's (HCA) Effective Conservation Program for Collaborative Engagement. The CWS aims to provide communities, resource management agencies and decision-makers with data products and communication tools to assess the health status of watershed and nearshore marine areas. HCA has developed a guidebook, which is based on the experiences of three communities which piloted the CWS process, and is designed to make the CWS process accessible to resource managers and communities interested in better understanding their place while inspiring collaborative stewardship action.

Our long-term goal is to restore the health of our watershed. The main objectives of this proposal will be to build capacity for our community to better monitor, measure and communicate the health of our watershed so we can begin implementing actions to address the major threats.

In order to achieve these objectives, we will facilitate the CWS process which includes 1) conducting participatory mapping and historical timeline exercises; 2) selecting appropriate ecological, social and cultural watershed health indicators; 3) reviewing the inventory of available data sets and resources for additional monitoring efforts; 4) developing effective communication tools; and 5) guiding future management action including technical support and policy advice.

BACKGROUND: *[Describe key features of your ahupua'a; include size, location, natural resource highlights, points of interest, and threats or impacts to the area's natural and cultural resources from mauka to makai.]*

ORGANIZATION: *[Briefly describe the organization applying, including mission and history, year established, geographic reach, staff size, and staff capabilities to conduct the proposed work.]*

ACCOMPLISHMENTS TO DATE: *[Insert any watershed related work, community projects, collaborations and activities related to this project.]*

PROJECT APPROACH OR METHOD: *[Describe the objectives of the project and the activities to be performed. If the project is a partnership, describe each partner's role. Explain why you chose this approach to the problem or opportunity.]*

CWS PROPOSAL TEMPLATE (CONTINUED)

The three pilot communities that completed the development of their snapshots were Hā'ena, Kaua'i; Maunaloa, O'ahu; and Hau'ula, O'ahu. Their entire communities and the resources located in them have and will benefit from the snapshots that were completed in October 2016. For more information, visit www.hawaiiconservation.org/communitysnapshot. Based on the work of these three communities, HCA developed the CWS Guidebook to assist other communities to complete the CWS process. This project will use the HCA CWS Guidebook to implement the process in *[insert name of community]* with the support of a facilitator, coordinator, GIS & communication lead, and a mentor/coach for the facilitator.

EXPECTED OUTCOMES

OBJECTIVE 1: By the end of the project, our community will successfully complete the CWS process, both building our capacity to participate in large-scale assessments and planning exercises and identifying the status of our priority resources and needed actions for their sustainable management.

ACTIVITIES

- i) Develop and compile *ahupua'a* knowledge utilizing participatory map and historical timeline.
- ii) Publish Community Watershed Snapshot poster, fact sheet, and presentation (measure by expertise and diversity of the project team, documented development and coordination meetings and attendance).
- iii) Participate in interactive vetting process to help unify our community and elevate high priority management actions.

OBJECTIVE 2: By the end of the project, our wider community and other stakeholders will have a greater understanding of the current state of *[insert name of community]* watershed and begin high priority actions to address identified threats.

ACTIVITIES

- i) Conduct meetings (# of meetings, workshops, participants).
- ii) Produce metrics checklist, problem-solution model, simple action plan and planned review.
- iii) Complete survey.
(*Explain how participants or the community will benefit. Provide specific, measurable expected results.*)

CWS PROPOSAL TEMPLATE (CONTINUED)

OUTPUTS: *[Describe the physical products that will result from your project.]*

Our project will develop several physical products that will summarize the condition of our resources, and illustrate the actions that are needed to start to restore and sustain the natural and cultural resources of our watershed. These include the CWS poster, fact sheet, and presentation. These products will be used to communicate these important elements and needed stewardship actions to our community and other stakeholders to encourage their support for and participation in efforts to restore and maintain our watershed.

EXPECTED OUTCOMES

The main outcome of this proposal is to build capacity for our community to better monitor, measure and communicate the health of our watershed *[insert name of ahupua'a]* so we can begin implementing actions to address the major threats of *[list current threats from mauka to makai]*.

Our community will benefit by strengthening relationships with our community and establishing relationships with resource management agencies to increase the success of future management actions. Together, we will understand what information is available and which data gaps community members can learn to collect. After completing the process, the *[insert name of community]* Community Snapshot Team will more effectively communicate the current status of the watershed using a variety of communication tools and new tools to support future management planning.

Through the support of the *[insert donor name]*, the *[insert name of community]* Community Snapshot Team will be community leaders for natural resource management, have a greater sense for what and how they can move forward with management of the *ahupua'a*, ultimately contributing to building community and ecosystem resilience.

EVALUATION: *[Explain how you will track and evaluate progress on your project.]*

Evaluation will occur qualitatively by way of gauging the reception and interest from conservation professionals and community members during the initial outreach and launch events planned. In addition, success will be indicated by the breadth of interactive tools developed to complement the CWS process. Qualitative evaluation information will occur through measuring how many people learned about the guidebook during outreach/launch events. Most importantly, we have one community in the queue to test the guidebook, and we will continue to monitor the number of additional communities interested in utilizing the guidebook to begin their own CWS.

CWS PROPOSAL TEMPLATE (CONTINUED)

SNAPSHOT BUDGET*

EXPENSES

COMMUNICATION LEAD	(SEE SCOPE OF WORK)	\$3,520
GIS LEAD	20 HOURS (SEE SCOPE OF WORK)	\$1,800
FACILITATOR	100 HRS X \$40/HOUR	\$4,000
COORDINATOR	120 HR X \$30/HOUR	\$3,600
COACH/ADVISOR	25 HOURS X \$80/HOUR	\$2,000
SUPPLIES		\$300
		\$15,220

COMMUNICATIONS LEAD SCOPE OF WORK

I. CONSULTATION TIME WITHIN EXERCISES

Moving to Measurement >> Session 3: Understanding Your Snapshot Metrics (1-2 hours) // Gain a sense for the results of the analysis of available data on your metrics and any gaps in data (Take Away Excel Sheet with all metrics data)

Session 4: Engaging Local Knowledge (1-2 hours) // Bolster your snapshot metrics with additional information from the community

Sharing Results >> Session 1: Learning about Effective Communications (1 hour plus 2 hours prep) // Understand Best Practices to better share your snapshot **Session 2:** Shaping Foundational Communication Tools (2-3 hours plus \$1200 for illustrating the first draft of watershed snapshot poster background using 3-D imagery & the Snapshot Team *ahupua'a* boundary) Participate in creating a poster, fact sheet, presentation, and infographics

Session 3: Developing the Snapshot Communication Plan (1-2 hours) // Plan for how best to utilize the snapshot communication tools

Estimated Consultation Hours= 12hrs X \$60/hour plus \$1200 background illustration >> **Subtotal= \$1920**

II. DESIGN OF COMMUNICATION TOOLS with input received from Community Snapshot Team during exercises above, including receiving the metrics data table and local knowledge checklist. Estimate includes 2 rounds of edits and does not include printing.

POSTER DESIGN >> \$800 (based on existing pilot poster branding and layout complexity)

FACT SHEET DESIGN >> \$300 (based on template, not including any additional illustrations)

PRESENTATION DESIGN >> \$500 (based on presentation template, using poster and factsheet information)

SUBTOTAL DESIGN COST = \$1600 >> TOTAL ESTIMATED COST FOR COMMUNICATION LEAD = \$3520

*Additional costs incurred for illustrations, significant layout change, change of icons, etc

*Any cost savings funds printing communication tools and online fees.

**Donors will likely ask for a work plan or timeline. For an example, refer to Proposal Writing Made Easy ([insert HCA link](#)) and page 25 of guidebook for a recommended schedule for the process.

CWS PROPOSAL TEMPLATE (CONTINUED)

GIS LEAD SCOPE OF WORK

I. CONSULTATION TIME WITHIN EXERCISES

Focus on Your Place >> Session 1: Participating in Mapping (4 hours) // Participation in the exercise and preparing the map described using HCA Watershed Health Web Maps

Moving to Measurement >> Session 2: Confirming Snapshot Metrics- support to exercise (2 hours)

Prior to Session 3, GIS Lead will prepare *Snapshot Analysis* and Session 3 presentation (8 hours)

With the HCA Watershed Health Web Maps and the final community snapshot metrics and checklist in hand, the GIS lead will locate missing data, analyze all available data, note the year the data were collected, and track which agency owns the data. For missing data, the GIS lead will note any limitations. The GIS lead will prepare a comprehensive Excel table called “*Snapshot Analysis*” showing what data exist, which are fully analyzed, and the data gaps. At your community’s discretion, the GIS lead can also create a web map for your community that shows where the data came from.

Session 3: Understanding Your Snapshot Metrics (2 hours) // Facilitate and present the exercise

Sharing Results >> Support Communication Lead inquiries to assist the communication products (4 hours)

TOTAL ESTIMATED COST FOR GIS LEAD = 20HRS X \$90/HOUR >> SUBTOTAL= \$1800

*Additional costs incurred for additional data analysis, product requests or other services outside of this scope.

*** Based on estimate from CWS Pilot Project GIS Lead: christinefeinholz@gmail.com

GIS TECHNOLOGY OPTIONS

MAPPING OPTION	WHERE	EXPENSE	PROS	CONS
Hawaii State maps are served at: geodata.hawaii.gov. These maps can be viewed and downloaded in a Google-compatible format or GIS shapefile format.	geodata.hawaii.gov	Free	Easily print maps of boundaries such as <i>ahupua'a</i> Free.	Static maps only
Google Earth provides digital, printable satellite imagery, road maps, and the ability to create point, line, and area files with tabular information.	www.google.com/earth	Free	Ability to create and save data that are compatible with most GIS.	Requires basic computer experience and a modest learning curve. Requires an internet connection. Must have administrative permission to download software. Not highly customizable without a computer developer.
ArcGIS Online for Non-Profits	http://www.esri.com/nonprofit	Modest administrative fee	Ability to ingest data from servers such as the Hawaii State GIS server and create custom maps. Highly customizable.	Learning curve may be steep.
Geospatial consultant	Christine Feinholz, India Clark, Kalisi Fa'anunu Mausio	Varies widely	Ability to create custom webpages and custom interactive web-enabled maps. Ability to create custom printed maps. Ability to analyze map data.	Can be expensive, though basic community support is possible



COMMUNITY WATERSHED SNAPSHOT DATA-SHARING AGREEMENT TEMPLATE

This agreement is made and entered into by and between (“A” = insert name of CWS host organization) and (“B” = insert name of organization or individual researching, collecting, or compiling sensitive or new information) beginning on (insert date) and ending on (insert date).

HOST ORGANIZATION CONTACT (INSERT “A” ORG NAME):

Name:

Title:

Phone:

Email:

RESEARCHER OR ORGANIZATION CONTACT (INSERT “B” ORG NAME):

Name:

Title:

Phone:

Email:

1. PURPOSE OF THE DATA-SHARING AGREEMENT

The purpose of this DSA is to provide (*INSERT “A”*) with data from (*INSERT “B”*) as it pertains to the (*insert CWS site name*) Community Watershed Snapshot.

2. QUESTIONS AND MOTIVATION OF RESEARCHER

Researcher explicitly states:

- what the research questions/methodologies are,
- what the study entails,
- what the researcher intends to do with the data,
- where the researcher will share the data, and
- what information is needed from the community.

(*INSERT “B”*) affirms data will not be published without written permission. (*initial here*)

(*INSERT “B”*) will return to (*INSERT “A”*) all raw and analyzed data, and interpretations of the data. (*initial here*)

(*INSERT “B”*) will not share raw data, analyzed data, or interpretations of the data with other communities, organizations, researchers, or agencies without explicit written permission of (*INSERT “A”*).

3. QUESTIONS AND CONCERNS OF CWS HOST ORGANIZATION

Please list and detail any concerns that you may have related to the use of data and information. The DSA is intended to address any concerns that you may have. As you move through the sections of the DSA, reflect back on your concerns and make sure they are addressed. As needed, add additional information or limitations in the DSA to be sure your concerns are addressed.

Examples of the types of concerns you may have include:

- a. Cultural misappropriation
- b. Misrepresentation of community
- c. Control of data and sensitive information
- d. Update from researcher before publication
- e. Protecting intellectual property

4. DESCRIPTION OF DATA TO BE SHARED

(LIST DATA SETS HERE)

5. DATA SECURITY

Provide details on how important data will be stored and how access will be managed. You may have developed ideas on this in your Information-Management Agreement Questionnaire. In many cases, organizations elect to have data and information stored on multiple password protected computers, and access is assigned to specific people in writing. As databases are becoming more common, it's important to be sure you are clear with the database manager about how the information is to be stored, who has access, and how new people are provided with access.

(DETAIL STORAGE and ACCESS)

6. USE OF DATA

Data from *(INSERT "A")* Community Watershed Snapshot will be used to develop educational and communication products with the consultation of the *(INSERT "A")* CWS team for the purpose of sharing the watershed health of the *(INSERT NAME OF CWS SITE)*. Only large-scale mapping and public communication products will be used to represent the health of the watershed.

7. ADD OTHER PROVISIONS AS NEEDED.

8. SIGNATURES

(INSERT "A") AUTHORIZED REPRESENTATIVE

(PRINT NAME)

(SIGN NAME)

(DATE)

(INSERT "B") AUTHORIZED REPRESENTATIVE

(PRINT NAME)

(SIGN NAME)

(DATE)

INFORMATION-MANAGEMENT AGREEMENT QUESTIONNAIRE

The CWS team should fill out the questionnaire below. Input key information into the Information-Management Agreement Template.

Name and location of the *ahupua'a*: _____

Name of community watershed snapshot: _____

Date of completion of this questionnaire and template: _____

For the purposes of this questionnaire and template, any individual who participates in the CWS process is considered a CWS team member and, as a result, should help to develop these documents, understand and agree to comply with them.

1. What type of information has been or is being collected or compiled by this CWS?	Circle all that apply: 1. Compiled data on the watershed from HCA web systems? 2. Community member (including <i>kūpuna</i>) interviews 3. Maps of the <i>ahupua'a</i> 4. Historical photographs 5. Raw data on biological features 6. Location of biological or cultural features 7. CWS poster 8. CWS map 9. CWS fact sheet 10. CWS presentation 11. Other Please be specific and list:	Collected or compiled (yes or no). Explain as needed.
2. Are all of the types of information included in this Information-Management Agreement? If not, which types of information are not included, and why?	Any information not included in this agreement:	Why not included:

3. How will this information be stored and maintained, and by whom?	Method for storage and maintenance:	By whom:
4. How would the participants in the CWS like this information to be used? (Be specific about uses). For example: • For non-profit, non-commercial uses only without prior approval of the CWS team. • For promoting the conservation and sustainable management of the <i>ahupua'a</i>. • For educational purposes. • To help communities and organizations learn about the CWS process.	Allowable uses of information:	Notes:
5. Are there any principles for sharing information or communicating about the project that the CWS team would like all CWS team members and others involved in the process to follow? For example: • Do not share locational information on biological resources. • Always seek the approval of the CWS team prior to sharing information that has not been previously approved for sharing. • Do not seek support from donors, government agencies or other organizations without approval of the CWS team.	Principles:	Notes:
6. Are there any ways in which the CWS team would like to promote the project? For example, telling community members about the project and sharing copies of completed and approved documents with them?	Allowable promotion:	Notes:

7. Are there any types of information that are approved for open use in terms of sharing with community members, the public, agencies or organizations (for example, completed and approved CWS communications products such as poster, presentation, and fact sheet)? Please list.	Types of information approved for open use:	Notes:
8. Are there any restrictions that participants would like to place on the use of any information? Be specific by type of information. For example: Approved CWS documents like posters, fact sheets and presentations may be shared with the public. Raw data or interview data may not be shared with the public.	Type of information:	Restrictions on use:
9. How would the participants like to describe the project to the public? Please focus on key messages about the project.	Description of project:	Notes:
10. Are there any restrictions that the CWS team would like regarding discussions about the project? For example, don't discuss the project for fundraising without first discussing and getting approval from the CWS team.	Restrictions requested on discussions about the project:	Notes:
11. Is there anything else that the CWS team would like to encourage team members to do related to the management and sharing of project information?		
12. Will there be any sensitive or new information collected or compiled that requires a DSA? If so, refer to DSA Template (p. 104).	Information	



INFORMATION-MANAGEMENT AGREEMENT TEMPLATE

This Information-Management Agreement covers the _____ Community Watershed Snapshot (CWS) undertaken for the _____ *ahupuaʻa*.

By signing below, participants in the _____ CWS agree to the following:

1. The following types of information will be collected and/or compiled by this CWS:

2. All of this information is included in this Information-Management Agreement with the exception of _____ (if all included, remove this sentence) _____.

3. The information collected and compiled by this CWS will be stored and maintained by _____ in the following way(s):

4. The information collected and compiled by this CWS will be used for the following purposes only:

5. To abide by the following principles when sharing information or communicating about this CWS project:

6. To promote the CWS project in the following ways:

7. That the following information is approved for open use in terms of sharing with community members, the public, agencies, and/or organizations:

8. To abide by the following restrictions in the use of the types of information below:

INFORMATION-MANAGEMENT AGREEMENT TEMPLATE (CONTINUED)

9. To describe this CWS project to the public as follows:

10. To abide by the following restrictions in discussing this CWS project:

11. When in doubt about how to use information from this CWS or how to communicate about this CWS, to seek the guidance and approval of the _____ CWS team.

12. Any other provisions the CWS team would like to include:

By signing below, each participant of the _____ Community Watershed Snapshot agrees to follow the terms and restrictions of this Information-Management Agreement.

1. _____	_____	_____
Name	Signature	Date
2. _____	_____	_____
Name	Signature	Date
3. _____	_____	_____
Name	Signature	Date
4. _____	_____	_____
Name	Signature	Date

COMMUNITY WATERSHED SNAPSHOT METRICS

BIOPHYSICAL

RAINFALL

Rainfall is the most important indicator of what plants and animals an ecosystem can support. Over time, knowing how much rainfall enters an ecosystem and how rainfall amount changes provides an indicator of the supply of water for recharging aquifers and providing surface and groundwater sources. Acquiring and sustaining long-term data is key to understanding how this precious foundation for growth might be changing over time.

(RAIN AND STREAM GAUGES: USGS, NOAA-WEATHER)

AVAILABILITY OF FRESH WATER

From a human perspective, access to fresh water for residential consumption is an indicator of human well-being. Fresh-water access varies by place and may be more applicable to rural settings that are not connected to the county water supply lines. Green infrastructure such as prevalence of residential water catchments or grey water reuse systems could indicate future resilience.

(# OF WATER SOURCES/HOUSEHOLD (OR CAPITA): BOARD OF WATER SUPPLY)

WATER QUALITY

Acceptable water quality is an indicator of a healthy watershed. Quality of water sampled from a river, shoreline or coastal area can show the impact of land-based sources of pollution such as invasive species, land development, forest management, commercial activities and pesticide use. Long-term and carefully collected data are required to measure and translate information. A Quality Assurance Project Plan is required for community data collection to be recognized by the Hawai'i Department of Health and U.S. EPA. (STREAM SEDIMENT, FLOW, PATHOGENS: DOH)

GROUNDWATER RECHARGE, LAND USE

Impervious surfaces are land areas that create 100% runoff during rain. These surfaces include concrete, rooftops, streets and compacted bare land. A high percentage of impervious surfaces in a watershed can indicate a high likelihood of surface runoff reaching nearshore coastal waters, which can impact water quality and health. It can also drive flash flooding and accelerate erosion when water leaves impervious surfaces.

(% IMPERVIOUS SURFACE, RATIO OF DEVELOPED OVER NATURAL)

NATIVE VEGETATION

The ecosystems created by native vegetation have evolved over millennia and are conducive to supporting other native species on our lands and in our oceans. Invasive plant species alter ecosystems, with effects ranging from increased water use, reduced groundwater recharge, increased flammability, reduced plant cover, higher erosion and reduced habitat for other native plants and animals. (% TREES/PLANTS COVER, ACRES: USGS)

KEY BIRD SPECIES

The presence of native forest bird species is an excellent indicator of native forest health, as our forest birds typically require native trees and native food sources (nectar, fruit, insects) to persist. (PRESENCE, ABUNDANCE, COMPARE HISTORIC TO PRESENT)

TARGET FOOD FISH

The abundance and biomass (total weight of species present in the water based on estimating their length in surveys) are good indicators of population health of key species. Additionally, the trophic (or food chain) structure of species present from marine animals that eat coral, to herbivores, to predators, to apex predators is an important indicator of the overall health of target food species. Finally, the amount of fish or other species that people are able to harvest consistently over a period time (the catch per unit effort of fishing) is also a good indicator of the health of the populations of key important food species.

(BIOMASS, CATCH-PER-UNIT-EFFORT, SIZE STRUCTURE)

BIOPHYSICAL

OCEAN HABITAT AND WATER QUALITY

Ocean habitat quality is a critical indicator of overall ocean health. For populations of fish and other species to be abundant, they need healthy habitats including coral reefs, rock reefs, embayments, and points, sandy areas, rubble areas, and others habitats. Measuring the overall health and distribution of key habitats is important to understanding ocean health. In addition to habitat health, it's also important to measure water quality. Depending on the area, water quality indicators that can be measured include levels of sediment and key pollutants. In Hawai'i the balance between fresh water and ocean water is often an important indicator of the types of habitats and species you will find. For example, several species of *limu* (algae) depend on fresh water outflows to grow.

(CORAL: ABUNDANCE AND BIODIVERSITY; SAND; RUBBLE)

MARINE INVERTEBRATES & ALGAE

Marine invertebrates and native algae are important resources for food, income, and cultural practice and are also important to maintaining and indicating ecosystem health. Native marine algae (*limu*) is often abundant in areas of fresh water outflow. Alien and invasive algae can lead to habitat changes and in some locations have nearly completely replaced coral reef and native algae habitats. Many herbivorous marine invertebrate species help to keep alien algae populations in check. Monitoring of invertebrate and native as well as alien algae is important to understanding overall ecosystem health.

(INDICATORS OF WATER OR HABITAT QUALITY)

FRESHWATER: FOOD FISH & KEY INVERTEBRATES

With marine species, fresh water fish and invertebrates are important sources of food, recreation, and cultural practice. Healthy populations and distribution of these species is a key aspect the overall health of an *ahupua'a*. Unfortunately, unsustainable land development practices have significantly impacted a large percentage of fresh water bodies including streams, rivers, and lakes across Hawai'i. The abundance, biomass, and distribution of fresh water fish and invertebrates including alien and invasive species are good indicators of overall population health of these species and ecosystem health overall.

(SEE FISH AND INVERTEBRATES ABOVE)

SOCIO-CULTURAL

POPULATION SIZE AND GROWTH

The current and changing number of people in a geographic area suggests the local density, carrying capacity and resource pressure. Observing how the demographics of a watershed are declining or growing can shed light on the reciprocal relationship of humans to their natural and cultural resources. For example, agricultural practice, water quality and land use are biophysically influenced by number of residents and visitors in an area (DBEDT)

CULTURAL

Indigenous cultural knowledge can be a critical component of local watershed health. Historical context can be used to inform and formulate baseline metrics that can be compared with current conditions. In many cases, indigenous knowledge can be used not only to record historical and present-day health, but also to provide instruction regarding the maintenance and restoration of watershed health.

(# OF RECOGNIZED KŪPUNA, # OF RECOGNIZED WAHI PANA, PRESENCE OF LO'Ī,
OF HOUSEHOLDS ENGAGED IN TRADITIONAL AND CUSTOMARY PRACTICE)

HEALTH/DIET

(PREVALENCE OF DIABETES, HEART DISEASE, OBESITY, DRUG ABUSE: DOH; # OF FARMERS/FISH MARKETS)

COMMUNITY INVOLVEMENT

The extent of activity around natural resource management in your watershed can be monitored by uncovering where work is taking place, the degree of community participation (either volunteer or paid) and which institutions support the work. These are valuable measurements to begin strengthening the capacity of your community to sustain and grow watershed management efforts.

(# OF PEOPLE, # OF PROJECTS, # OF ORGANIZATIONS, # OF SCHOOLS)

WORKING WITH GOVERNMENT TO BETTER MANAGE RESOURCES

There are many ways communities can care for their resources. Sometimes, working with the government agencies responsible for rules and regulations can aid this effort. Co-management efforts can occur in many different forms and can be both formal, as in legal agreements or designations, or informal. Formal co-management typically requires a high level of capacity and a long-term commitment on the part of both communities and agencies. The information herein is intended to assist in identifying key agency partners for resources that were identified as important by communities that have participated in the community watershed snapshot (CWS) process. If appropriate, a community may decide to reach out to agencies during the CWS process.

MANAGING TERRESTRIAL RESOURCES

As part of the snapshot process, communities can use publically available maps to visualize which parts of their *ahupua'a* are privately or publically owned. Privately owned lands are managed by their owner, subject to federal, state and county regulations.

In Hawai'i, each county planning department (Kaua'i County, Honolulu City and County, Maui County, and Hawai'i County) is responsible for working with communities to produce regional development plans that usually include zoning (e.g., urban, agricultural, conservation) that indicates the intended use of lands. These are guiding documents and are not binding.

Public lands may be managed by federal, state or county agencies. Through the CWS process, communities will access maps that identify relevant management agencies. It can be useful for a community interested in engaging in a management partnership to reach out to relevant agencies, many of which are members of the Hawai'i Conservation Alliance. See <http://www.hawaiiconservation.org/about-us/our-members>.

MANAGING AQUATIC RESOURCES

Water quality: Water quality is regulated and monitored by the Hawai'i Department of Health (DOH, <http://health.hawaii.gov/about/links-to-doh-program-information/environmental-health-administration/>). This includes regulation of household wastewater systems such as septic systems and cesspools. Wastewater infrastructure, including treatment plants and injections wells, are typically the responsibility of the counties.

Some communities may wish to conduct their own water quality monitoring. There are many different indicators that can be monitored (e.g., turbidity, bacteria levels), and testing can range from very inexpensive to very expensive. Communities concerned about water quality should carefully consider the need and intention of a monitoring program. In order for the Department of Health to use data to determine if a water body is impaired, that data must meet certain standards and be covered by a quality assurance plan (QAP).

Additional water quality resources: See <http://planning.hawaii.gov/czm/initiatives/coastal-nonpoint-pollution-control-program/watershed-approach-to-nonpoint-source-pollution-management/>

Fishponds: The State of Hawai'i Office of Conservation and Coastal Lands has developed a streamlined process for permits for managing fishponds. See <https://dlnr.hawaii.gov/occl/fishpond-permits/>

Fisheries: The Department of Land and Natural Resources, Division of Aquatic Resources (DAR), is responsible for managing the harvest of aquatic species including freshwater and marine fish. Fishing rules can include gear regulations, seasonal regulations, catch limits and spatial designations such as marine life conservation districts (MLCDs) and community-based subsistence fishing areas (CBSFAs). See <http://dlnr.hawaii.gov/dar/fishing/fishing-regulations/>

Through the CWS process, communities can access available data on the status of marine resources as well as existing spatial designations. In some cases, communities may decide to work with DAR to pursue additional protections for fisheries. Any changes to regulations are subject to a public rule-making process. See http://files.hawaii.gov/dcca/oah/hrs/hrs_oah_91.pdf

Community-based subsistence fishing area legislation enables communities to work with DAR to develop regulations that protect Native Hawaiian subsistence fishing practices. See http://dlnr.hawaii.gov/coralreefs/files/2015/02/CBSFA-Designation-Procedures-Guide_v.1.pdf.

➤ CIVICS 101 FOR WATERSHED GROUPS¹⁷

Purpose: To provide communities with an overview for how to participate in advocacy related to watershed management.

This section will cover who are the key decision-making entities, how to engage in policy-making, and where to find additional resources. We do this by demystifying government processes and empowering our communities to get a seat at the table.

INFLUENCERS: WHO ARE THE DECISION-MAKERS AT ALL LEVELS OF LOCAL GOVERNMENT?

When trying to better understand and impact policies that govern the management of local watersheds, it is important to understand where decision-making power lies. While this largely depends on the specifics of your issue, getting a basic understanding of local government, who your local elected officials are and the various government agencies will help you chart a course forward in your advocacy efforts.

In many cases the management of water resources lies within the state, within the state's purview rather than the counties'. However, your local County Councilmembers and government agencies can impact local land use designation through planning processes and zoning ordinances. Honolulu County also has Neighborhood Boards, which are largely advisory: <https://www.honolulu.gov/nco/boards.html>.

COUNTY COUNCIL

Find your County Councilmembers here: <https://portal.ehawaii.gov/government/county-governments/>

STATE LEGISLATORS

State representatives are elected to two-year terms, and state senators are elected every four years. Your state legislators can easily be found on the state capitol website in "Find Your Legislator" search in the upper right-hand corner: <https://www.capitol.hawaii.gov/>.

LEGISLATIVE COMMITTEES

In addition to knowing your legislator, it is useful to know who in the State House or Senate chair key committees related to your concerns. Committee chairs are important because they must schedule hearings for proposed bills in order for them to advance. <https://www.capitol.hawaii.gov/committees/committees.aspx?chamber=all>.

DEPARTMENT OF LAND & NATURAL RESOURCES (DLNR)

The DLNR manages the state's public lands and the water and mineral resources on those lands. It also manages the state's aquatic life and wildlife resources, forest reserves, state parks, and small boat harbors, and administers the state conservation districts and the endangered species, natural area reserves, boating and ocean recreation, and historic preservation programs. The department develops and enforces rules on conservation and resources.

BOARD OF LAND & NATURAL RESOURCES (BLNR)

The Board of Land and Natural Resources governs the DLNR. The Board is composed of seven members, one from each land district and three at-large, who are appointed to four year terms by the governor with the advice and consent of the senate.

¹⁶ CIVICS 101 FOR WATERSHED GROUPS provided by Hawai'i Alliance for Progressive Action (HAPA). HAPA's mission is to catalyze community empowerment and systemic change toward valuing 'āina and people ahead of corporate profit.

COMMISSION ON WATER RESOURCE MANAGEMENT (CWRM)

In addition to the BLNR, the Commission on Water Resource Management is a water resources agency whose mandate is “to set overall water conservation, quality, and use policies; define beneficial and reasonable uses; protect ground and surface water resources, watersheds, and natural stream environments; establish criteria for water use priorities while ensuring appurtenant rights and existing correlative and riparian uses; and establish procedures for regulating all uses of Hawaii’s water resources.” The Commission consists of seven members, including the Chairperson of the Board of Land and Natural Resources, who serves as Chairperson of the Commission, and the Director of Health, who serves as an ex officio, voting member. The five remaining members are appointed to four-year terms by the governor.

ARMY CORPS OF ENGINEERS

In some cases the Army Corp of Engineers has jurisdiction over aspects of our watersheds.

PROCESS: HOW DO CITIZENS ENGAGE IN ADVOCATING FOR POLICY CHANGES?

LEGISLATIVE ADVOCACY

The state legislative session runs from mid-January to April/May. If you are interested in getting involved in advocating for or against proposed legislation, you will need to learn how to utilize the Hawai‘i State Legislature website. In the upper right-hand corner of the home page, click on the “register” link to create an account. This will allow you to track bills and submit written testimony. You can testify in person at key hearings and set up meetings with key legislators to advocate for your concerns. If you are seeking to propose a bill, you will need to get a legislator to write and champion it for you. See the resource section for more on legislative advocacy and connect with local organizations: <https://www.capitol.hawaii.gov/>.

BOARDS & COMMISSIONS

Boards and commissions such as the BLNR and CWRM have monthly meetings, which are open to the public. Members of the public can sign up to testify on agenda items. Agendas are typically posted a week prior to the hearings. CWRM has a mechanism for filing citizen complaints.

WHERE DO I FIND RESOURCES AND SUPPORT ON POLICY EFFORTS?

Public Access Room at the Capitol: <http://lrbhawaii.org/par/>

Offers great 101 workshops on how to engage in legislative process

Sierra Club of Hawai‘i / Capitol Watch: <https://www.hawaicapitolwatch.org>

Your one-stop shop for all environmental bill tracking

HAPA’s Kuleana Academy: <http://www.hapahi.org/kuleana-academy>

An in-depth leadership development, advocacy and candidate training program

CIVICS 101 FOR WATERSHED GROUPS provided by Hawai‘i Alliance for Progressive Action (HAPA). HAPA’s mission is to catalyze community empowerment and systemic change toward valuing ‘āina and people ahead of corporate profit.



The Follow the Drop program was created by Roth Ecological Design Intl. and Kupu in 2017 to enhance water education and stewardship into the classroom. The overarching goal behind the Follow the Drop project is to bridge 21st century water resiliency practices into the classroom to begin to unite and lay the foundation of knowledge for youth to develop critical thinking skills and solution-based opportunities that meet water security goals. These goals are aimed to increase the total amount of freshwater available to sustain local and regional communities and enhance resiliency in the event of a disaster. The targeted water security goals follow the Hawaii Freshwater Initiative framework and include:

- Reduce: water conservation
- Reuse: recycled water and greywater
- Recharge: stormwater back into the ground



In the fall of 2017, the Follow the Drop program received funding from the Hawaii Community Foundation and from State of Hawaii Department of Land and Natural Resources Water Security Advisory Group to develop version 1.0 of the Follow the Drop mobile application and accompanying lesson plans. Although it is envisioned that the Follow the Drop program will eventually include all three of these water security goals and be available for a wide-range of age groups, stormwater capture and recharge were selected as the initial focal point for the mobile app development and the accompanying lesson plans were targeted for specifically 5th grade students. The Follow the Drop mobile application and lesson plans are being piloted in four schools in the spring of 2018. The schools will receive teacher trainings, in-class instruction and facilitation of the ten Follow the Drop lessons. The pilot schools include: Waikiki, Ka'ewai, Ka'ohao and Sunset Elementary schools. Ka'ewai and Ka'ohao will also receive rain gardens as an outcome for this initial pilot project.

Follow the Drop – Stormwater Curriculum

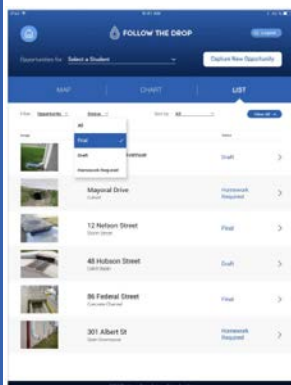
The Follow the Drop – Stormwater curriculum uses the school campus as a mini-watershed. Where does water come from? Where does the water go? What is stormwater? How might this impact the watershed? Where are the opportunities to close-the-loop and recharge or capture stormwater onsite? Students will learn about issues relating to water security and the design process. They will learn how to identify (grey) stormwater infrastructure features and identify those that could become “opportunities” to implement green infrastructure best management systems (such as rain gardens and rain catchment) to capture or recharge the stormwater onsite. One of the lesson plans includes facilitation of a “design charrette” with the class to determine which type and best location(s) for their green infrastructure project and engage them in its design.



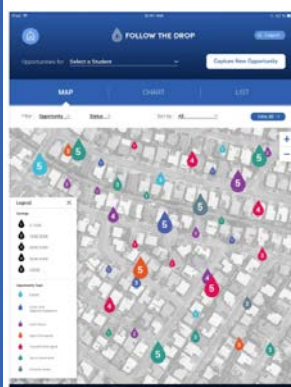
CONTACT LAUREN ROTH VENU >> lauren@rothecological.com



Follow the Drop - Mobile Application



The Follow the Drop app will serve as an educational tool for users to identify opportunities to capture and/or recharge stormwater. The Follow the Drop mobile application (app) is being initially developed so that it can be used as a data collection and analysis - decision tool. The app will allow the learners to identify and collect “opportunity” data points around their respective campuses and homes, compare annual stormwater runoff volumes from each of these identified opportunities and then importantly, compare these opportunities for the potential to reduce the stormwater runoff volumes by implementing a rain garden or rainwater catchment system. The embedded data analysis within the app allows for the data points to be collected, analyzed and congregated for comparison, which then can be used as a decision-making tool to identify and prioritize potential projects, offering real-world critical-thinking skills. To further engage the students, the app also includes basic gaming features (badges) to reward the user as he/she gets through certain functions of the app for encouragement.



All of the data points collected include photos, icons with descriptions for the user to select from to help identify the stormwater infrastructure “opportunities”, summarized notes and a GPS reference point. The GPS reference point then generate the annual rainfall data since the Hawaii Rainfall Atlas data is embedded in the app. The geolocation also is used to connects to Google maps where the user determine is directed to identify the “drainage area” for that opportunity using a measuring tool embedded in the Google map. To determine the drainage area the user will be prompted to identify and trace the area where water drains from towards the opportunity identified (for example a section of roof or parking lot). This area along with the annual rainfall information is then recorded in the app and generates the stormwater volume (calculation is embedded in the app). After the drainage area has been measured by the user and the rainfall data has been verified, the app user can then see how much stormwater volume is generated at that location (shown as a bar graph). Multiple data points can be collected and analyzed in this way and then compared. Next the user is directed to input which type and size of a green infrastructure best management practice (rain garden or rain catchment) they want to implement and the bar graph would react and show the estimated stormwater runoff reduction (calculation is embedded in the app).



To compare and view all the data collected the user would go to the app’s “home” button to view the opportunities collected in three different view windows: list, map and chart. In each window the user can view the opportunity data that has been collected and stormwater runoff calculated. There are options to sort the data results by feature type, stormwater volume, as well as compare stormwater reduction between opportunity types when green infrastructure is applied.



COMMUNICATION TOOLS

Hā'ena Ahupua'a Snapshot

LOCAL MEASURE OF MAUKA-TO-MAKAI HEALTH

The Watershed Snapshot project is a status report on ridge-to-reef health. In consultation with the Hawai'i Conservation Alliance, communities across the State identified metrics that would best define the health of their area, including socio-economic and cultural variables. In 2016, available data from researchers and resource management organizations were compiled to inform the selected metrics. Results are housed as a public resource in an online library of all related watershed-related data, and can be found at hawaii-conservation.org/communitysnapshot for more information.



ISLAND OF KAUAI

"THE KUPUNA TELL US THERE IS LESS WATER IN THE STREAMS, AND THE SCIENTISTS TELL US THAT NOT ONLY IS THERE LESS RAINFALL, BUT THE RIVERS ARE ALSO DRYER. WE NEED TO FIND A WAY TO HOLD ONTO EVEN LESS WATER THAN THEY USED TO. WE NEED HEALTHY FORESTS TO ENSURE THAT HA'ENA STILL HAS CLEAN, FLOWING WATER IN THE FUTURE."

- KAHAKA UNIVER, DIRECTOR
LIMAHULI GARDEN AND PRESERVE

76 DOCUMENTED SACRED PLACES (WAHI PANAKAPU)

NATIVE BIRD DIVERSITY
SEABIRDS >> 6
FOREST BIRDS >> 5
WATER FOWL >> 4
SHORE BIRDS >> 3

NATIVE PLANT DIVERSITY
TOTAL >> 275
FEDERALLY LISTED >> 43
PEPP >> 9
(ACTION PREVENTION PROGRAM)

43% NATIVE FOREST COVER (2017)

ALMOST HALF OF THE 45 TOTAL CESSPOOLS ARE 200 FT FROM A STREAM OR SHORELINE

WELL LOCATION

MAKUA

MĀNOA

LIMAHULI

MAKANA

RESTORED HALE

RESTORED HALE

KE-AHU-A-LANA

KEE

WATER QUALITY MONITORING STATION

"THE OLD HAWAIIANS WOULD SAY 'HAKA KA LIMA, 'AI KA HAKA' AND WE WOULD SAY 'TOO MUCH PLACE SO THAT WE CAN CONTINUE TO DO OUR MAI'LES'"

- TOM HAHINOTO, LIVING KUPUNA

E HO'OMALU KĀKOU I KA 'ĀINA
(WE MUST PROTECT THE 'ĀINA)
- RACHEL MAHUKU, KUPUNA (1913-1993)

53% CORAL COVERAGE
(10% 30% DENSITY)

COMMUNITY-BASED SUBSISTENCE FISHING AREA (DESIGNATION 2006)
RULES ADOPTED 2015 // MONITORING INITIATED 2016
INCLUDES THE FIRST NEAR-SHORE PO UNOONA IN HAWAII

TOURISTS >> ~1,000,000/YEAR

RESIDENTS >> 1,985 (2010)

PRE-K12 EDUCATION >> 600 (2015)

VOLUNTEERS >> 131 (2015)

MĀLAMA 'ĀINA CAREERS >> 18 (2016)



#HAWAIIANALIFE

WWW.CONSERVATIONCONNECTIONS.ORG

Hā'ena Watershed Snapshot 2016



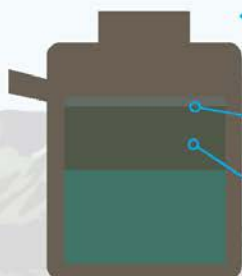
TARGET FOOD FISH

Community-Based Subsistence Fishing Area

Established 2006 // In 2016 became the first CBSFA to have rules adopted. // Monitoring Initiated 2016 // **INCLUDES THE FIRST NEAR-SHORE PU'UHOA (REFUGE) IN HAWAII**

AVERAGE ANNUAL RAINFALL

WATER QUALITY



3 of 45 Cesspools are within 200 feet of a stream.

18 of 45 Cesspools are within 200 ft of the coastline.



"The kūpuna tell us there is less water in the streams, and the scientists tell us that not only is there less rainfall, but the spread of invasive trees means the forest holds onto even less water than they used to. We need healthy forests to ensure that Hā'ena still has clean, flowing water in the future."

- KAWIKA WINTER, DIRECTOR
LIMAHULI GARDEN AND PRESERVE

76 DOCUMENTED SACRED PLACES (WAHI PANA/KAPU)

RESIDENT AND VISITOR POPULATION (2010-15)



1,985 Resident Population

THE 1900 CENSUS RECORDED SEVEN HOUSEHOLDS IN HĀ'ENA, ALL OF WHICH WERE COMPRISED OF NATIVE HAWAIIANS. IN 2010, THE CENSUS RECORDED 332 RESIDENCES, 23% OF WHICH IDENTIFIED AS NATIVE HAWAIIAN AND 43% WERE LISTED AS SEASONAL/VACATION USE.



~1,000,000
visitors/year

COMMUNITY INVOLVEMENT (2010-15)



131 Volunteers

18 Mālama 'Āina
Careers



NATIVE VEGETATION (2011)

Native Forest Cover 43%



HAWAII
CONSERVATION
ALLIANCE



CONSERVATION
CONNECTIONS

WWW.CONSERVATIONCONNECTIONS.ORG



Hawai'i Conservation Alliance
FOUNDATION



#HAENALAWAIPONO



#LIMAHULI
#UPPERLIMAHULIPRESERVE

» LOCAL MEASURES OF MAUKA-TO-MAKAI HEALTH

The Watershed Snapshot project is a status report on ridge-to-reef health. In consultation with the Hawai'i Conservation Alliance, communities across the State identified metrics that would best define the health of their area, including socio-economic and cultural variables. In 2016, available data from researchers and resource management organizations were compiled to inform the selected metrics. Results are housed as a public resource in an online library of all related watershed-related data, and can be found at hca.maps.arcgis.com. The information is compiled as a suite of communication tools to help inform, guide, and garner support for more effective *mauka-to-makai* management efforts.

Visit www.hawaiiconservation.org/communitysnapshot for more information.

HĀ'ENA

Remote in nature, the *ahupua'a* of Hā'ena is the westernmost land in the *moku* (district) of Halele'a on the northwest coast of Kaua'i. Hā'ena is comprised of two valleys, each with a stream – Mānoa and Limahuli. Limahuli stream drains through Limahuli Valley and into the ocean, providing an important freshwater input to Hā'ena's ocean environment. Traditionally, the watershed and offshore has been an important subsistence and cultural resource for native Hawaiians and local families. In 2015, Hā'ena became the first Community Based Subsistence Fishing Area to have rules adopted.



In March 2016, a water quality training with community members resulted in data collection from two sites. Communities received water quality kits and are in the process of developing monitoring plans for on-going data collection.

STATEWIDE WATERSHED HEALTH DATA



To access statewide, publicly available watershed-related data compiled from various agencies, visit the online Watershed Health Web Map at hca.maps.arcgis.com. Also available is the Hā'ena Web Map, which features data from the community snapshot metrics used for this project and additional requested data.

» WATERSHED SNAPSHOT PROGRESS 2012-16



« Honolulu to Napili, Maui

2013

- 8 Community Consultations Statewide
- Watershed Boundary Maps, Scope of Communication Tools and Metrics Confirmed



« Waimea, Hawai'i Island

2014

- Convening of Communities Statewide to Solicit Interest in Snapshot Participation
- Intellectual Property, Data Sharing Agreement, HCA ARC GIS Tool Demo Data Discussion, Communications 101



« Hā'ena, Kaua'i

2015

- Site Planning Meeting on O'ahu and Moloka'i for 6 Volunteer Communities
- Maps with Available Data, Metrics Checklist, Site Plan Development, Additional 2-3 Metric Selection, Project Timeline, Metric Data Compilation



« Maunaloa Bay, O'ahu

2016

- 3 Community Engagements
- Watershed Health Web Map and Snapshot Web Maps for each of the 3 sites
- Water Quality: Training, Consult, Collection, Supply Kits and Monitoring Plans
- Community Data Gathering: Community Involvement in Resource Management, Place Names, Local Knowledge
- Lessons Learned Workshop
- IUCN WCC Pavilion Event

* HAROLD K.L. CASTLE FOUNDATION

HAWAII CONSERVATION ALLIANCE
WWW.HAWAIICONSERVATION.ORG

Hau'ula to Punalu'u Watershed Snapshot

LOCAL MEASURES OF AHUPU'UA HEALTH

The Watershed Snapshot is a status report on the health of our ahupua'a, or watershed. In consultation with the Hawai'i Conservation Alliance, communities across the state identified metrics that would best define the health of their ahupua'a. Available data from resource management organizations was compiled to inform the selected metrics, and communities also collected socio-economic, and local Kūpuna (elder) knowledge. An online library of all available watershed related data has been created as a public resource and can be found by visiting hca.maps.arcgis.com. The information compiled in a suite of communication tools will help inform, guide and garner support for increasing mauka to makai management efforts. Visit www.hawaiiconservation.org/communitysnapshot for more information.



"THE KŪPUNA TELL US THERE IS LESS WATER IN THE RIVERS AND STREAMS BUT THE SPREAD OF INVASIVE TREES MEANS THE FOREST HOLDS ONTO EVEN LESS WATER THAN THEY USED TO. WE NEED HEALTHY FORESTS TO ENSURE THAT THIS CLEAN, FLOWING WATER IN THE FUTURE."
- KAWAIA WINTER, PH.D., NATIONAL TROPICAL BOTANICAL GARDEN



"THE NUMBERS OF NEAR SHORE REEF FISH SUCH AS UNU HAVE DECREASED SINCE 1990. THIS IS DUE TO THE LOSS OF CORAL HABITAT, OVER HARVESTING OF FISH, AND DECREASED WATER QUALITY FROM POLLUTION SUCH AS SEDIMENT RUNOFF FROM LAND."
- NOAA FISHERIES, PACIFIC ISLANDS REGIONAL OFFICE



"THE OCEANS NEEDS TO DRINK. THE ZONE WHERE THE WAI (FRESHWATER) FROM THE MOUNTAINS MEETS THE OCEAN IS THE MUSEUM FOR MARINE AND STREAM LIFE. WE NEED GOOD QUALITY WATER FLOWING FROM MAUKA SO THAT THE OCEAN CAN BE FULL OF FOOD."
- UNCLE HENRY CHANG WOI, UNU LOA (EXPERT), (1941 - 2013)



HAWAII'Ī CONSERVATION ALLIANCE

Hawai'i Conservation Alliance
FOUNDATION

HCA
HAWAII'Ī CONSERVATION ALLIANCE

RESIDENT POPULATION:
5,439 (2010)

VOLUNTEERS:
2,650 (2010-15)

13 NATURAL RESOURCE
MANAGEMENT PROJECTS
(SINCE 2010)

WWW.CONSERVATIONCONNECTIONS.ORG

» LOCAL MEASURES OF AHUPUA'A HEALTH

The Watershed Snapshot is a status report on the health of our *ahupua'a*, or watershed. In consultation with the Hawai'i Conservation Alliance, communities across the state identified metrics that would best define the health of their *ahupua'a*. Available data from resource management organizations was compiled to inform the selected metrics, and communities also collected socio-economic, and local *kūpuna* (elder) knowledge. An online library of all available watershed related data has been created as a public resource and can be found by visiting hca.maps.arcgis.com. The information is compiled as a suite of communication tools to help inform, guide, and garner support for more effective *mauka-to-makai* management efforts. Visit www.hawaiiconservation.org/communitysnapshot for more information.

HAU'ULA TO PUNALU'U

Located on the northeast coast of O'ahu in the Ko'olaupoko *moku* (district) are the rural communities of Hau'ula and Punalu'u. Hau'ula and Punalu'u are small, coastal communities with fertile landscape fronted by sandy beaches and adjacent fringing reef. Five streams in Hau'ula and two streams in Punalu'u support natural wetlands and inland ponds. In the 1800s the lowlands contained a patchwork of lo'i, later rice fields and then sugarcane. In the 1900s land was subdivided into lots. Hau'ula is the first in the State to be NOAA Certified Storm and Tsunami Ready (2012, 2015).



In March 2016, a water quality training with community members resulted in data collection from three sites. Communities received water quality kits and are in the process of developing monitoring plans for on-going data collection.

STATEWIDE WATERSHED HEALTH DATA



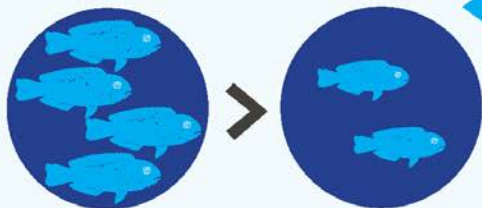
To access statewide, publicly available watershed-related data compiled from various agencies, visit the online Watershed Health Web Map at hca.maps.arcgis.com. Also available is the Hau'ula to Punalu'u Web Map, which features data from the community snapshot metrics used for this project and additional requested data.

» WATERSHED SNAPSHOT PROGRESS 2012-16



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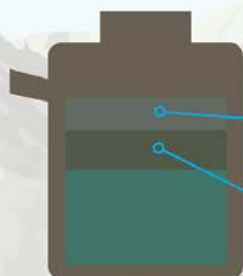
Hau'ula to Punalu'u Watershed Snapshot 2016



TARGET FOOD FISH

The numbers of near shore reef fish such as *Uhu* have decreased over the years likely due to a combination of factors including a loss of coral habitat, over harvesting of fish, and decreased water quality from pollution such as sediment runoff from land - NOAA FISHERIES, PACIFIC ISLANDS REGIONAL OFFICE

AVERAGE ANNUAL RAINFALL



WATER QUALITY

121 of 698 Cesspools are within 200 feet of a stream.
201 of 698 Cesspools are within 200 ft of the coastline.



"The kūpuna tell us there is less water in the streams, and the scientists tell us that not only is there less rainfall, but the spread of invasive trees means the forest holds onto even less water than they used to. We need healthy forests to ensure that Hau'ula still has clean, flowing water in the future."

- KAWIKA WINTER, PH.D.
NATIONAL TROPICAL
BOTANICAL GARDEN

MARINE INVERTEBRATES AND ALGAE

"The oceans needs to drink. The zone where the wai (freshwater) from the land meets the kai (ocean water) is where the limu grows, and is the nursery for marine and stream life. We need good quality water flowing from mauka so that the ocean can be full of food."

- UNCLE HENRY CHANG WO, LIMU EXPERT, 1941 - 2015



5,439

RESIDENT POPULATION (2010)

HAU'ULA'S POPULATION IN 2010 WAS 4,275 AND PUNALU'U WAS 1,164
LAND AREA FOR HAU'ULA IS 1.2 SQ MI AND FOR PUNALU'U IS 2.1 SQ MI

COMMUNITY INVOLVEMENT (2010-15)



13 Natural Resource
Management Projects

2,650 Volunteers



NATIVE VEGETATION (2011)

Native Forest Cover 27%



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WWW.HAUULACOMMUNITYASSOCIATION.NET

LOCAL MEASURES OF AHUPUAʻA HEALTH



"OVER THE PAST 100 YEARS, RAINFALL IN HAWAII HAS SLOWLY DECLINED OVERALL. WHILE THE EFFECTS OF GLOBAL WARMING ON HAWAIIAN RAINFALL ARE STILL UNCERTAIN, EVIDENCE SUGGESTS DECREASES IN SOME AREAS WILL CONTINUE."

- DR. TON GIAMBELLU, PROFESSOR, UNIVERSITY OF HAWAII



Maunalua Watershed Snapshot 2016



TARGET FOOD FISH

"The great fishpond of Keahupua o Maunalua was noted for being the largest fishpond of its kind in Polynesia. Today, the renewal of ancient mullet ponds at Kalauha'iha'i and Kānewai gives us new hope as we uphold this rich legacy of Hawaiian ocean farming."

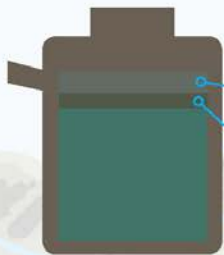
- CHRIS CRAMER, CO-FOUNDER, MAUNALUA FISHPOND HERITAGE CENTER

AVERAGE ANNUAL RAINFALL



"Over the past 90-100 years, rainfall in Hawai'i has slowly declined overall. While the effects of global warming on Hawaiian rainfall are still uncertain, evidence suggests decreases in some areas will continue."

- DR. TOM GIAMBELLUCA
PROFESSOR, UNIVERSITY
OF HAWAII



WATER QUALITY

248 of 1,655 Cesspools are within
200 feet of a stream.

165 of 1,655 Cesspools are within
200 ft of the coastline.

MARINE INVERTEBRATES AND ALGAE



One of the few places where
Halophia, native seagrass,
grows in Hawai'i.



Invasive algae removed
from **28 Acres**



207,400

RESIDENT POPULATION (2010)



53 Natural Resource
Management Projects

COMMUNITY INVOLVEMENT (2010-15)

12,973 Volunteers



LAND COVER

26%

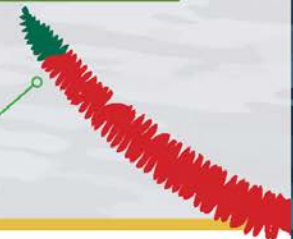
Impervious surface that
does not allow surface
water to penetrate



NATIVE VEGETATION

Native Forest
Cover

7%



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WWW.MALAMAMAUNALUA.ORG

» LOCAL MEASURES OF AHUPUA'A HEALTH

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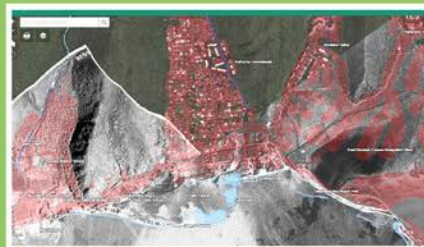
MAUNALUA

Located on the southeast coast of O'ahu, the Maunalua area profiled for the Watershed Snapshot stretches from Kūpikipikiō (Black Point) to Kawaihoa (Portlock Point), encompassing the eastern portion of Kona *moku* (district) and the entire Maunalua *moku*. The region has long been treasured for its beauty, abundant resources and cultural significance. In recent decades, the region's flatlands and hillsides have seen significant development, changing the area from rural to suburban. This development has increased the area's impervious surfaces in the form of paved roads, shopping centers, cementing of streams and the altering of other natural areas to support its 60,000 residents. As a result, an increase in sediment run-off into Maunalua Bay has caused degradation of near-shore ecosystems, poor water quality and invasive algae to take over near-shore reefs. Intense community action has led to efforts to protect Maunalua Bay, Paiko Lagoon State Wildlife Sanctuary, Kalauha'iha'i Fishpond, Kānewai Spring, and Keawaawa Wetland.



In March 2016, a water quality training with community members resulted in data collection from two sites. Communities received water quality kits and are in the process of developing monitoring plans for on-going data collection.

STATEWIDE WATERSHED HEALTH DATA



To access statewide, publicly available watershed-related data compiled from various agencies, visit the online Watershed Health Web Map at hca.maps.arcgis.com. Also available is the Maunalua Web Map, which features data from the community snapshot metrics used for this project and additional requested data.

» WATERSHED SNAPSHOT PROGRESS 2012-16



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Connect to Nature.

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