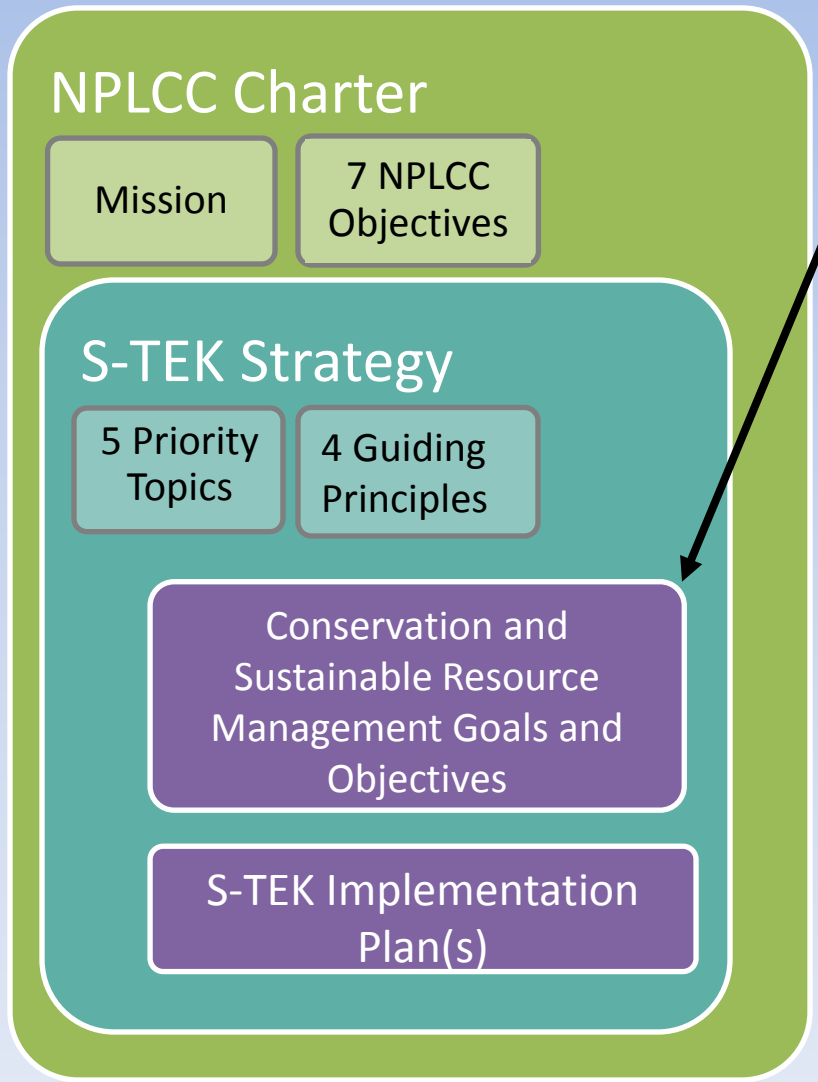
# Today's S-TEK Meeting

- Metrics for Conservation Objectives
- Tribal Network Database
- Next S-TEK Plans


# Task: Define "Measureable Objectives"




- *Measureable objectives* are needed for the Conservation and Sustainable Resource Management goals
  - Help us understand how well (or how poorly) we are doing
  - Provide an indication of when and how we should adjust our path
  - Provide information to our funders about our progress

# C&SRM Goals and Objectives are Framed by the Charter and the S-TEK Priority Topics

Conservation and sustainable resource management decisions

In the NPLCC region

Fish; Disease, pests, invasives / biologic communities

S-TEK Priority Topics: Hydrologic regime shifts / rivers, streams, and riparian corridors;

- *Goal:* Inform policy, management decisions, and actions of resource managers to support ecosystem functions and provide for conservation and sustainable cultural, subsistence, recreational, and commercial use of [priority resource] in light of projected changes [due to stressor]
- *Supporting Objective A:* Identify decision-relevant information needs associated with understanding how changes in [stressor] will affect [resource]
- *Supporting Objective B*: Where appropriate, develop, support, and/or provide that information to decision makers in a manner that can be used for promoting and informing decisions that 1) consider the effect of changes in the [stressor] on the [resource] and 2) reduce risk to, increase adaptive capacity of, and increase the resilience of the [resource] to the [stressor]

Air temp and precip / forests; Changes in seal level &

Landscape-scale

coastal storm / marine shorelines, nearshore, estuaries; Hydrologic regime / anadromous

In light of climate change and related stressors

# Measureable objectives / metrics

- In SDM / Decision Analysis, *metrics* measure how well an alternative achieves our objectives
  - Describes the consequences of each alternative on each objective
  - Enables a decision maker to make clear tradeoffs
- In our context, we are not comparing alternatives, nor are we making tradeoffs
- For the NPLCC C&SRM objectives, we will use metrics only to
  - Describe the consequences of NPLCC S-TEK funding choices and NPLCC-funded work

# Three Types of Metrics

| Type of metric | Characteristics |
|---|---|
| Natural | • Commonly understood and generally used<br>• Can be physically counted or measured using standard methods<br>• Measure the objective "directly"<br>• Generally preferred: Use natural metrics if available |
| Proxy | • Used /useful when no direct natural metric is exists<br>• "Look like" natural metrics, in that they can be physically counted or measured using standard methods<br>• Indirectly related to the objective<br>• Generally avoided in multi-objective decision analysis: makes it difficult to clearly articulate tradeoffs |
| Constructed | • Used / useful when no natural metric exists<br>• Builds from aspects closely associated with the objective of interest<br>• Requires careful effort to ensure they are clearly defined<br>• Often much more difficult to measure or estimate than Natural or Proxies |

# Examples of Natural and Proxy Metrics

| Type of metric | Examples |
|---|---|
| Natural | Objective: Minimize costs<br>Metric: Net present value of project costs in 2014 US dollars<br><br>Objective: Maximize waterfowl productivity at [location]<br>Metric: Number of breeding pairs at [location] |
| Proxy | Objective: Minimize adverse health effects from ozone and fine particulate pollution<br>Proxy metric: Maximum daily ozone concentration in [the region of interest]<br>*(Based on models and assumptions that relate concentration to health effects)*<br><br>Objective: Increase sage grouse populations<br>Proxy metric: Acres of habitat suitable for sage grouse<br>*(based on models and assumpations that relate habitat availability and quality to population health)* |

# Example of a Constructed Metric

- Objective: Increase local support for a new facility (siting decision)
  - What are indicators of local support or opposition?

| Metric level (shorthand) | Metric level description |
|---|---|
| Support | No groups are opposed to the facility and at least one group has organized support |
| Neutrality | All groups are indifferent or uninterested |
| Controversy | One or more groups have organized opposition, but none have action-oriented opposition. Other groups are neutral or supportive. |
| Some opposition | One group has action-oriented opposition. All other groups have organized support, indifference, or organized opposition. |
| Strong opposition | Two or more groups have action-oriented opposition. |

Example modified from Keeney, RL and RS Gregory, 2005. "Selecting attributes to measure the achievement of objectives," Operations Research: 53 (1) pp. 1-11.

# What makes a good metric (aka "measureable objective")?

- Unambiguous and clearly defined
- Understandable (to multiple stakeholders)
- Comprehensive
- Direct (or at least as direct as possible)
- Operational (can be implemented without extensive additional effort)

# Objective A

**Objective A: Identify decision-relevant information needs associated with understanding how changes in [stressor] will affect [resource]**

- List of information needs
- "Quality" of the list is what matters but can't be measured directly
- Potential indicators of quality include:
  - Broad participation in developing the list
  - Clear identification of how that information will be used, by whom, and what value will it provide
    - How detailed is detailed enough?
  - Developed using a structured process
  - Compare to similar information needs identified by others
  - Doesn't cost too much to develop the list
  - List is up to date

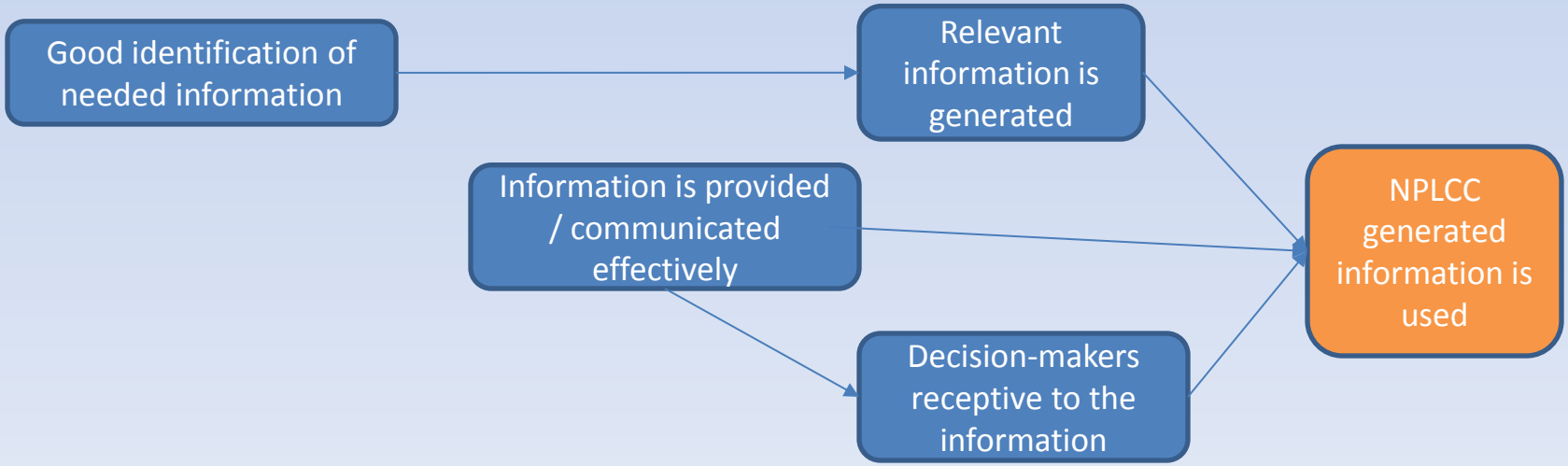
# Preliminary Metrics for "A"

| | Internal | Reporting |
|---|---|---|
| 1. Do we have a list of needs? (yes/no) | ✓ | ✓ |
| 2a. Number of unique stakeholders who participated in developing the list | ✓ | ✓ |
| 2b. Percent of NPLCC geography covered by those participants | ✓ | ✓ |
| 3. Percent of needs on the list that are described with all of the following characteristics: | ✓ | ✓ |
| a) Specific "customers" (partners who have said they want the information) | ✓ | |
| b) Additional customers | ✓ | |
| c) Specific uses for the information. E.g., a customer had described *how* the information will help them | ✓ | |
| d) Extent, importance, and frequency of the uses and decisions supported by the information | ✓ | |
| e) If the listed need is dependent on other factors and other information needs | ✓ | |

# Objective B

**Objective B: Where appropriate, develop, support, and/or provide that information to decision makers in a manner that can be used for promoting and informing decisions that 1) consider the effect of changes in the [stressor] on the [resource] and 2) reduce risk to, increase adaptive capacity of, and increase the resilience of the [resource] to the [stressor]**

- Ultimate objective is for NPLCC supported work to be useful and used
- Measureable objectives drafted for several factors that influence that value of information



# Preliminary Metrics

*Project / product delivery. Direct metrics proposed*

Good identification of needed information

Relevant information is generated

*Objective A & associated measurable objectives*

Information is provided / communicated effectively

NPLCC generated information is used

*Difficult to measure. A proxy metric proposed*

Decision-makers receptive to the information

*Metrics proposed for internally tracking purposes*

Decision-maker involvement in developing list, endorsing projects, etc

*Almost impossible to measure; no metrics proposed*

Relevant information is generated

# Preliminary Metrics for "B"

| Preliminary measurable objectives related to project and product "output" | Internal | Reporting |
|---|---|---|
| 1. # of needs identified in (A) that are addressed with projects | ✓ | ✓ |
| 2. Diversity of projects funded, measured by counts of:<br>(a) entities funded; (b)geographies covered; (c) scales; (d) types of customers (decision makers and stakeholders) who asked for the information; (e) types of work (e.g., data collection; synthesis; research; information sharing workshops, etc)<br><br>*(note that for internal tracking we will have details in addition to the counts)* | ✓<br><br>✓ | ✓ |
| 3a. # of projects that met their deliverable requirements | ✓ | ✓ |
| 3b. Project deliverables, measured by counts of each type of deliverable / project result and how it was documented and communicated. E.g.<br>(a) publications; (b) webinars (and webinar attendance) (c) Workshops (and number, diversity of workshop participants) (d) other types of planned information/results delivery (e.g, project web sites, etc?)<br><br>*(note that for internal tracking we will also have this data by project, and for NPLCC programmatic activities)* | ✓<br><br>✓ | ✓ |

Information is provided / communicated effectively

## (More) Preliminary Metrics for "B"

- No direct measure of the quality / usefulness of information delivery is available
- Concepts / potential metrics discussed:
  - Decision-maker confidence that they understand (and can use) the information
  - Dialogue between PI and the customer as project is ongoing or after the project?
  - Webinar / workshop to get feedback from customer on draft deliverable and incorporate that into final results
  - Follow-up requests for additional information (e.g., after webinars)

Information is provided / communicated effectively

# (More) Preliminary Metrics for "B"

- Proxy metric credits and encourages more interaction between the project developers and the decision-makers, thereby making the project results more useful

| Preliminary measurable objectives related to project and product "receipt" | Internal | Reporting |
|---|---|---|
| 4. Counts of the totals across NPLCC supported projects(for reporting) of some project-specific actions (tracked internally). For each NPLCC supported project:<br>a) Did the researcher interact with the intended end users about the project results *before* project completed?<br>b) Were the customers able to provide suggestions for what more/less/different information they need?<br>c) Did the project incorporate those suggestions in the final product | ✓ | ✓ |
| 5. UNDER DEVELOPMENT/CONSIDERATION – a similar measurable objective for other NPLCC activities (those that are not project specific, such as communication and outreach activities) | ✓ | ✓ |

NPLCC generated information is used

# (One final) Preliminary Metric for "B"

- Measuring information use is a big challenge
  - The best way to measure the usefulness of NPLCC-generated information likely requires a fairly large, well-designed formal survey and interviews of the "target" audience, conducted some years after project completion, and repeated periodically
  - Simple counts and simply surveys are tempting but results can be misleading
- Recommendation is to start with a simple "citation count," recognizing it's weaknesses:
  - Use for internal tracking only (to support adaptive learning),
  - Consider revisiting and revising the metric in future years

| Preliminary measurable objectives related to use | Internal | Reporting |
|---|---|---|
| 6. # of unique customers (decision-makers or stakeholders) who actively considered NPLCC work as part of their decision-making process<br>Details under development: approach would be to identify a subset of planning documents that NPLCC work could (should?) inform; conduct a citation search on those documents, perhaps annually, and record, track, and report (internally) what products are being cited, by whom, and for what purposes. | ✓ | |

NORTH PACIFIC LANDSCAPE CONSERVATION COOPERATIVE

| C&SRM GOAL (for each Priority Topic) | C&SRM Supporting objectives | | Preliminary Metrics |
|---|---|---|---|
| Inform policy, management decisions, and actions of resource managers to support ecosystem functions and provide for conservation and sustainable cultural, subsistence, recreational, and commercial use of [priority resource] in light of projected changes [due to stressor]<br><br>Note: Same as NPLCC Goal 1 | (A) Identify decision-relevant information needs associated with understanding how changes in [stressor] will affect [resource]<br><br>Note: Same as NPLCC Goal 3 | | 1. Do we have a list of informaton needs? |
| | | | 2a. Number of unique stakeholders participating in list development |
| | | | 2b. Percent of NPLCC geography covered by items on the list |
| | | | 3. Percent of identified needs on the list that are "well characterized" in terms of what the info will be used for |
| | (B) Where appropriate, develop, support, and/or provide that information to decision makers in a manner that can be used for promoting and informing decisions …<br><br>Note: Same as NPLCC Goals 4 & 5 | Develop, support, and/or provide the information… | 1. Number of items on the list that have been addressed with projects? |
| | | | 2. Diversity of projects (counts by entity type, project, type, geography, etc) |
| | | | 3a. Number/percent of projects that met their deliverable requirements |
| | | | 3b. Projects deliverable counts (pubs, webinars, participants, etc) |
| | | … in a manner that can be used for promoting and informing decisions… | 4. Number of projects that included direct interaction with intended end-uses of information prior to project finalization |
| | | | 5. ?? # of NPLCC activities that… |
| | | | 6. Citation counts for references to NPLCC-produced work |

# Discussion Questions on Preliminary Measureable Objectives

- Easy winners?  Did we miss a way to measure our objectives that should have been obvious?
- Red flags?  Did we identify a metric that you see big problems with?