

## June 14<sup>th</sup> Workshop – TARGET SELECTION

### June 14 Workshop Notes: Target Selection – Group 1 (Jacques)

*Notetakers: Joe Gaydos & Jody Kennedy*

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#### JOE'S NOTES

**Group 1:** Morning Session to develop targets (Jacques White as facilitator)

Brain dump of habitats and species involved (preliminary and brought up today)

What are the parameters that allow us to characterize the ecosystem – eventually we will run those forward and evaluate stressors on these

**Participants:** Jacques W., Kirsten E., Phil G., Doug M., Zach F., Jim S., Rich O. Claudia M., Ginny B., Don R., Eric E., Steve N. Russel B., Dave C., Kit R., Kevin B-S., Jody K., Allen C.

#### **Habitats:**

Areas of high current and low current

Bays (low energy)

Bedlands

Cliffs (hard rocky and sandstone)

Detritus (floating and benthic)

Eelgrass beds

Estuary (including *Salicornia* meadows)

Feeder Bluff

Freshwater input and watersheds including seeps

Mud Flat

Open water

Riparian (marine) areas

Rocky Reef

Salt marsh

Sandy / Gravel Beach

Scenic landscape

Sub-tidal bottoms (Soft and hard)

Un-vegetated sand and gravel areas

Undeveloped shoreline

Photic and aphotic water as well as sea surface micro-layer

#### **Species:**

Trees (upland and shoreline)

Algae (kelp forests and others)

Pelagic fish – herring, sandlance, surf smelt, perch, salmonids, dogfish, ratfish,

Benthic fish – rockfish, lingcod, greenling, sculpins, flatfish

Benthic invertebrates

Birds (shorebirds, piciverous birds, raptors)

Mammals (pinnipeds, cetaceans, mustelids, procyonids)

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**Culling process:** start with list developed last week, which ones capture the elements of the ecosystem? Have some focus on things that might be restorable or protectable.  
Eelgrass – over emphasized, un-vegetated mudflats are just as important  
Salmon- nice that in a broader sense it is higher in the food chain, at the same time, it is dependent upon ecosystems that are outside of the San Juan Archipelago; Alan suggests crab might be a better harvestable species target; might be another organism that is higher up on the chain (i.e. harbor seals) that captures salmon.  
Middens – important, but does not capture biological or ecological parameters as discussed

**New Try:** (Eric E.) – can nest everything we talked about under one of these categories  
Communities that we want to protect as well as the connectivity between them...

Nearshore – upland  
Nearshore – intertidal  
Nearshore - subtidal  
Benthic  
Demersal  
Pelagic  
Epipelagic

Conversation: these are not fully developed and thus not targets  
Perhaps they should be expounded and then they would be more meaningful: ex. Muddy intertidal, rocky intertidal, soft sand intertidal, ...

### **Doug's suggestion:**

Diversity of bottom types  
Diversity of species  
High primary and secondary productivity  
Clean water  
Scenic shorelines  
Connectivity of habitat types  
Pros: capture everything that makes an ecosystem  
Cons: if you start measuring these and indices change, its hard to unravel why they change  
Ginny – seems more like attributes than targets  
Jacque – these seem more like conservation goals rather than targets; will set aside for attributes

**List of potential targets (community or ecosystem to use as a focal target):** try not to be exhaustive, but representative

Target 1: Upland viability or Sea-run cutthroat  
Relates to freshwater systems  
Target 2: Shorebirds  
Relates to intertidal systems  
Nested: oystercatchers, limpets, sanderlings, sandpipers  
Target 3: Subtidal – rocky reef community

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Nested: urchins, abalone, cucumbers, eelgrass, *Nereocystis*, submerged aquatic vegetation

Target 4: Subtidal – unconsolidated substrate communities

Nested: submerged aquatic vegetation; *Ptylosarcus gurneii* communities

Target 5: Piscivorous seabirds (Epipelagic: air water interface)

Nested: forage fish, breeding habitat,

Target 6: Harbor Porpoise

### JODY'S NOTES

#### Breakout Group 1:

Jacques draws a diagram of the processes along the nearshore to initiate a Brain dump, starting from zero to get stuff down on paper. Participants come up with: currents, unvegetated sand and gravel, trees, rivers/streams, big water (Frasier river inputs) effect eelgrass, reef, kelp forest, deep inverts, urchins, forage fish, salicornia meadows, rockfish, other algae, salmon, mammals, detritus

To develop discussion on focal targets, Jacques draws circles around areas on the diagram.

Ginny: geology is missing from this diagram.

List of geographic features: rocky reef, sandy gravel beach, mudflat, estuaries, low energy bays, open water, scenic landscape/undeveloped shoreline, rocky islands and headlands, feeder bluff, salt marsh, cliffs, soft subtidal bottoms, bedlands ( June 6<sup>th</sup> list), deep sandy gravelly subtidal, sandstone cliffs, surface micro layer

Don: 60 % of island habitat is deep sand wave habitats.

How to organize this list: On what basis do we chose targets from these?

Russel: Diversity, connectivity, or ones we have most impact on which would be more of a management perspective.

Jacques: looking for components for how to characterize the ecosystem/ what's important to natural systems. We want to try to capture species/habitats that characterize the greatest extent of the ecosystem as possible.

CRAB: Upland, intertidal, nearshore-subtidal, pelagic, epipelagic, benthic, dimersal

#### Post lunch/ Targets cont.:

Lumping:

Intertidal

Stuck – how to capture all the species, does that drag us down indicator species path?

Joe: how about we pick a target for each of the above characteristics.

Fresh water systems/Upland: native cut throat (possibly nested under fresh water system)

→ freshwater systems

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Intertidal: oyster catcher/limpets (nested), shorebirds

→ intertidal shorebirds

Subtidal unconsolidated: green/red urchins/abalone, benthic inverts, eelgrass, kelp (*nereocystis*)

→ substrate communities/ unconsolidated substrate

Subtidal rocky reef:

→ rocky reef communities

Pelagic: piscivorous seabirds, harbor porpoise, salmon,

→ piscivorous seabirds,

→ harbor porpoise

Benthic: invertebrates

Final List of Targets:

1. Freshwater systems
2. Intertidal shorebirds
3. Rocky reef community
4. Unconsolidated substrate
5. SAV: eelgrass, kelp, nereocystis
6. Piscivorous seabirds
7. Harbor porpoise

## **CRITTER'S NOTES**

A. Intro comments: Importance of spatial element and scale [ZF]

- Make sure to focus on and use scale matrix: regional (migratory), coarse, intermediate, local

B. Brainstorming Targets- 1<sup>st</sup> round [RG asked everyone to write down initial target ideas and share them with the group]

- [note initials following name- used to denote speaker throughout document; also, spp. denotes species]
- [Brad Hanson- BH] forage fish
- [Kari Koski- KK] small protected bays
- [Eliza Habegger- EH] estuarine habitats
- [Sandy Wyllie-Echeverria- SWE] rocky reefs
- [Terrie Klinger- TK] focus
- [Jan Newton- JK] kelp beds
- [David Lloyd- DL] holding grounds (where species collect i.e. convergence zones)
- [Phil Bloch- PB] seabird nesting aggregations
- [Laura Arnold-LA] heron rookeries
- [Rich Osborne- RO] orcas
- [Tina Whitman-TW] nearshore dependent spp.
- [Mary Masters-MM] nearshore habitat- land/water interface
- [Steve Hinton-SH] freshwater nearshore inputs

C. Detailed Target Discussion and Identifying of Targets (chosen targets listed first w/ major discussion issues following. Some of the below targets were outlined quickly, some after much of the discussion and still other changed slightly after lunch):

- 1. Reef communities/ “rocky reefs”- what should be included?
  - sub- and inter-tidal
  - rockfish, urchins, abalone, larval forms, juvenile
  - sessile & mobile inverts
  - seaweeds
  - should this have a broad umbrella? Include many spp.?
  - where on matrix? Intermediate/Marine Community
  - does protecting reefs capture organisms on the target list created above (in section B)? [TK]

## June 14 Workshop – Target Selection: Group A (Rachelle)

Notetaker: Critter Thompson

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- 2. Unconsolidated sediment (soft-bottom) communities [note: chosen quickly w/o much discussion]. Chosen as a counterpart to the rocky reefs: “if we have reefs, we have to account for the opposite as well.”
- [3. Functional intertidal zone] \*changed to ‘Shoreline Processes’ after lunch\*
  - This came from the “Undeveloped Shorelines” suggested targets – idea is to make it biological and not as subjective.
  - attributes: undeveloped shoreline, freshwater input
  - processes important, this is what the target is trying to capture
  - captures:
    - nutrient, sediment and energy flows (i.e. erosion and sediment transport)- v. important
    - freshwater input
- 4. Marine birds
  - regional
  - nesting aggregations- rookeries
  - prey spp.
  - Discussion of whether should be “seabirds” or “shorebirds” (both were suggested). Marine birds chosen because encompasses both sea- and shore-birds.
- 5. Pelagic zone
  - convergence zones
    - marine mammals
    - fish
- 6. Marine riparian zone
  - catch-all for everything that’s terrestrial? [LA]
  - adjacent to shoreline
- 7. Traditional Use Areas
  - middens
  - reef nets
  - subsistence harvests
  - seagrass
  - science research
  - marine mammal watching
  - (recreational?)
  - burial sites/ historical archaeological sites

## June 14 Workshop – Target Selection: Group A (Rachelle)

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### Discussion

- targeting single spp. is not such a good idea (but not necessarily a bad idea). Maybe a tiered classification is needed? [TWE]
- what about using a spp. group concept (i.e. seabirds)? Would incorporate some habitat and some spp. [TW]
- single spp. approach doesn't really work (has been shown in practice to not work- loses larger ecosystem focus) [SH]
- 'nested community' approach important [PB]
- benthic classifications (Meghan's published work): are they being used in County planning now? [TWE]
- [TWE] stated that he doesn't like the process being undertaken- we should be protecting the entire archipelago, not sitting around using scientists to justify maintaining the status quo of management.
- Process is important. Our focus should be to target species that represent the larger ecosystem. We should be asking the question, "we will have failed to protect the archipelago if [certain target spp.] are missing" [PB]
- We shouldn't be constrained by what would fit the [TNC] workbook. MRC wants to look beyond for the best possible solution [TK]. Tina Whitman and Mary Masters second TK's comment.
- Should geomorphic habitats be lumped together? i.e. freshwater input habitats, offshore habitats, etc. [SH]
- Megan Dethier's classification:
  - not mappable, b/c of range overlap- not discrete units
- Group wanted to use Dethier's classification for the targets (even went online and printed them up). Decided that a mix of some species, some systems was better.
- There is a need to define what is meant by estuary (there seem to be numerous interpretations depending on who is talking)- scale issue (i.e. to an oceanographer, entire Puget Sound is an estuary)
- What about the importance of diverse forage opportunities? What drives biological hotspots? What are the most productive habitats? They are generally unique and often intertidal. [SH]
- Perhaps we should have 'healthy intertidal' as a category with attributes such as freshwater inputs, undeveloped shoreline, etc. [RG- moderator]
- [at this point, the group defined targets 3-5: functional intertidal zone, seabirds, pelagic zone]

## June 14 Workshop – Target Selection: Group A (Rachelle)

Notetaker: Critter Thompson

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- A target of traditional use was proposed and raised many questions. Some of the questions are as follows:
  - What about current use? Should it be included somehow?
  - What about native use? Is this the same?
  - Should the designation be human use areas instead?
  - ...
- What about ecosystem processes? Should they be captured somehow? They are part of the MRC goals. [PB]

Matrix locations for targets (from the wall matrix provided by moderator):

- unconsolidated sediment communities: coarse/marine community
- marine birds: regional/species
- reef communities : intermediate/marine communities
- pelagic zone: regional/systems
- functional intertidal: coarse-intermediate/terrestrial- marine
- shoreline processes: coarse/ systems
- traditional use areas: local/terrestrial-marine
- marine mammal haul-outs: local/species

[lunch break]

Defining targets in more detail- including some nested targets



### 1. Pelagic zones

- Define:
  - Open water habitat (not benthic)
- Nested targets:
  - Marine mammals
  - Pelagic fish (i.e. salmon)
  - Seabirds
  - Meso-scale features (i.e. convergence zone, eddies)
  - Forage fish
  - Surface micro-scale
  - Trophic level physical feature organization (meso-/micro-)
    - a. primary producer
    - b. middle trophic

- c. upper trophic
- d. meso-scale features
- e. micro-scale features



## 2. Unconsolidated sediment communities

- Define:
  - Substrates of very fine sediment to boulders
  - Sub- and inter-tidal
- Nested targets:
  - Eelgrass/submerged aquatic vegetation
  - Forage fish
  - Primary/middle/upper trophic levels
  - Meso-/micro-scale features



## 3. Shoreline Processes

- Define:
  - Interaction at the freshwater-sea interface
- Nested targets:
  - Freshwater input
  - Drift cells
  - Energy, nutrient flow
  - Lagoons
  - Sediment transport (erosion)



## 4. Human use areas

- Define:
  - Traditional/historical and Contemporary
  - Extractive and non-extractive
- Uses:
  - Recreation, spiritual, extractive, non-extractive, intrinsic (There was some extended debate over these classifications. SWE, for example, felt intrinsic should be considered its own use. TK felt strongly that all human uses are either extractive or non-extractive- i.e. intrinsic should be considered non-extractive.)
- Nested targets:
  - Whale watching
  - Aquaculture
  - Cultural

## June 14 Workshop – Target Selection: Group A (Rachelle)

Notetaker: Critter Thompson

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- Research
- Marine transportation
- Subsistence
- Burial sites
- Middens
- Reef nets
- Recreation

- 5. Rock/consolidated communities
  - (just like Unconsolidated Sediment Communities...)
- 6. Marine birds
  - Upland nesting important
  - Define:
    - Sea- and shore-birds
- 7. Marine mammal haul-outs?
  - Should this be a separate target?
  - Briefly debated
  - Chosen because added certain terrestrial areas as targets and added to list just before breaking...

**JOE'S NOTES**

Consolidation of two lists:

1. In thinking of rock communities there is general consensus to break rocky communities in to rocky intertidal and rocky Subtidal communities. Will have shorebirds as tested targets within the first 4 targets.
2. Want to split unconsolidated sediment communities into sub-tidal and inter-tidal communities.
3. Shoreline processes from group A appears very broad. The idea was talking about freshwater inputs, nutrients, drift cells etc. Ginny B. asked why go so broad instead of just picking a feeder bluff? Tina W: Rachelle recommended having targets that were in systems down to species. Russell – seemed to me that the shoreline processes are incorporated into the first 4 targets listed below. He suggests to nest it. Do we need to define the intertidal communities (Targets 1 and 2) or do we want to make them ecosystems? Definition was fluxes of nutrients and materials at the land sea interface. This has a much more physical connotation than the community intertidal targets. Kirsten: one of the difficult things in understanding these for lumping and splitting is the distinction between processes and assemblages. Consequently, it might be better to cut shoreline analysis as it should come up into viability analysis. Kevin B-S – shoreline processes are very over-arching, rather than nested. Jacques:
- 4.

Final list:

Target 1 – rocky inter-tidal communities

Target 2 – rocky sub-tidal communities

Target 3 – unconsolidated inter-tidal communities

Target 4 – unconsolidated sub-tidal communities

Target 5 – shoreline processes

Target 6 – marine birds (with piciverous sea birds nested here)

Target 7 – pelagic zones (with harbor porpoise nested here)

Target 8 – Submerged Aquatic Vegetation (has value on its own as primary producers) – although some think it fits into rocky inter-tidal communities, rocky sub-tidal communities, unconsolidated inter-tidal communities and un-consolidated Subtidal communities

Target 9 – Freshwater systems

## **June 14 Workshop – Target Selection: Combining Targets**

*Various notetakers*

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Target 10 – Human Use Areas (debated – see below)

Target 11 – Marine Mammal Haul out sites (argued due to some areas being supra – littoral; see below)

Now, scope is important in that we can encompass more aspects of the ecosystem if we work on different scales (will give more detail in ecological attributes). That said, we've switched from having both species and systems to mostly having systems.

Rachelle – not encapsulated are freshwater systems (marine mammal haul outs and human uses are probably nested within other areas).

Ginny – human use area seems so broad that it doesn't seem valuable since almost everything is a human use area – Group A debates this and referred group B / 1 back to their definition

Russell – to be biologically and culturally correct, we need to acknowledge that there are human significances to each of these targets and as we identify nested targets, we need to determine what their cultural significance is. If we don't capture that than we're not going to have a viable stewardship plan.

Rachelle – great segway into viability analysis, which is how do we develop the key attributes (ecological, but also can be cultural). While you're doing viability, be sure to stay open to the idea that social can be an attribute.

### **JODY'S NOTES**

#### **Targets Discussion with Both Groups:**

Group A (Rachelle):

1. Consolidated communities
2. Unconsolidated sediment communities
3. Shoreline processes: fluxes of nutrients and materials
4. Marine birds: sea and shorebirds
5. Marine mammal haul-out zones
6. Human use areas

Group B (Jacques):

8. Freshwater systems
9. Intertidal shorebirds
10. Rocky reef community
11. Unconsolidated substrate

## June 14 Workshop – Target Selection: Combining Targets

*Various notetakers*

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12. SAV: eelgrass, kelp, nereocystis

13. Piscivorous seabirds

14. Harbor porpoise

Discussion: oyster catchers do not represent a community, too narrow a species. Need rocky intertidal and rocky tidal to cover this system

→ Rocky intertidal community and

→ rocky subtidal community captures more organisms and different indicators.

Are we comfortable lumping or splitting unconsolidated substrate and sediment? No

→ Unconsolidated inter-tidal substrate community &

→ Unconsolidated sub-tidal substrate community

Shoreline processes, the rationale for being so big is that not all targets fall in the same category on the project scope chart: species, community, system, etc. Russel recommends nesting it. Jan: we need to focus on representing the whole San Juan archipelago; the “A” Group tried to capture the whole county. Phil: disagrees with Russel that shoreline processes can be nested.

→ Shoreline processes

Marine birds: can they be nested? No. Jan: Nesting marine birds doesn’t capture actual nests.

Can we nest piscivorous seabirds? Yes.

→ Marine birds

Pelagic zones: can capture harbor porpoise as a nested target.

→ Pelagic zones

→ Freshwater systems

SAV (submerged aquatic vegetation): is it nested under unconsolidated intertidal community? When thinking about scope, it is better to represent multiple scales to allow for more flexibility presenting a case for keeping SAV as its own target.

→ SAV

Haul-out zones. The supertidal is not included in the other targets, so the haul out zones should stay.

→ Marine mammal haul-outs

Human use: this is a very broad category and could include everything. It is important that this process be politically and socially viable and so it should stay on the list and stay vague.

→ Human use areas

### Final Target List

1. Rocky intertidal community

2. Rocky subtidal community

## **June 14 Workshop – Target Selection: Combining Targets**

*Various notetakers*

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3. Unconsolidated inter-tidal substrate community
4. Unconsolidated sub-tidal substrate community
5. Shoreline processes
6. Marine birds
7. Pelagic zones
8. Freshwater systems
9. SAV
10. Marine mammal haul-outs
11. Human use areas

**CRITTER'S NOTES**

Afternoon- Combined Groups

[Group B]

Targets:

1. Freshwater systems
2. Shorebirds
3. Rocky reef communities
4. Unconsolidated substrate communities
5. SAV
6. Piseivorous seabirds
7. Harbor porpoise

[Combined targets]

oyster catchers NOT indicative of rocky intertidal health [TK]

1. Rocky intertidal community
2. Rocky subtidal community
3. Unconsolidated substrate intertidal community
4. Unconsolidated substrate subtidal community

Questions about the broadness of 'Shoreline processes'

- Group A was trying to capture nutrient flows, energy flows, etc. [TW]
- Shouldn't it just be incorporated into the unconsolidated sediment target? [RB]
- Group A was trying to be inclusive of entire SJ archipelago [JN]
- Including freshwater and some upland, so Russell's idea doesn't fit [PB]
- Fluxes of nutrients and materials = key ecological components [TK]
  - More physical connotations
- Keep as potential target

5. Shoreline processes

Questions about marine birds:

- Combine piseivorous and marine birds?

6. Marine birds

7. Pelagic zones

Questions about SAV's as own target?

- Do they fit into other targets (i.e. unconsolidated sediment)? [SWE]
- Vote: half group say yes, half no

8. SAV's

9. Freshwater systems

10. Human use areas

Questions about marine mammal haul-outs:

- Highly nested target? [JW]
- Supra-tidal? [TK, KK]
- Higher than intertidal- not included in other targets...

11. Marine Mammal haul-outs

Must be both biological as well as culturally/socially aware [RB]

- Won't have a viable stewardship plan without capturing these issues

