

**FEEDBACK FROM UNBC**

**(Jan 20 & Mar 21, 2017)**

**DR. KATHY PARKER**

**&**

**DR. PAMELA WRIGHT**

## VALUES

Wilderness, Wildlife, Culture

### VALUED COMPONENTS

#### Of Wilderness

Naturally appearing landscapes  
Remoteness  
Human solitude  
Ecological integrity

#### Of Wildlife

Focal species  
Rare, endangered, of concern

#### Of Culture

Indigenous  
Non-indigenous

### INDICATORS FOR MONITORING\*

#### Thresholds

**(below which valued components decline)**

Naturally appearing (% non-developed)  
Remoteness (distance to disturbance)

Habitat quality of focal species

What are cultural thresholds????

#### Baseline Conditions

**(inherent MKMA attributes)**

Human solitude  
Ecological integrity (enduring and special features, BEC, intactness)  
Species rare, endangered, of concern

What are cultural baselines????

\*measured at specific (and potentially multiple) spatial and temporal scales

## OTHER CONSIDERATIONS

### What information is needed by the MK Board?

How to describe baseline conditions

Review of thresholds

Any inventory data that are insufficient to make recommendations

### What should be considered prior to recommendations or decision-making?

Adjacency to other anthropogenic activities

Timing of activities

### What is necessary relative to monitoring?

Completion of an environmental (baseline) assessment by proponent

Plan for how to measure deviation from baseline and relative to thresholds

### Underlying principles

No shifting 'baselines'

Planning for cumulative effects

## OTHER CONSIDERATIONS

### Managing for Enduring Features

- One of the baseline indicators is ecological integrity, which is very difficult to monitor;
- As such, it may be useful to ensure that representation among enduring features, BEC classes, intact landscapes, etc., is maintained to minimize the loss of wilderness, wildlife, and cultural values given future resource development;
- Enduring features themselves probably won't change in the near future, but they set some of the context for biodiversity. In addition to obvious links between biodiversity, habitats, and wildlife, use of the land base and wilderness experiences also are related in part to enduring features and their attendant biodiversity values;
- What will change over time is where resource development impacts those enduring features. For example, do you choose to concentrate developments on certain rarely distributed enduring features or perhaps in an area of high enduring feature diversity?

## OTHER CONSIDERATIONS

### Enduring Features

- The rich variety of life in the greater M-KMA ecosystem is shaped in large part by the variety of the physical landscape;
- The physical landscape includes topography (elevation, slope, and aspect), bedrock and surface geology, macro landforms, and major aquatic elements—collectively called “enduring features”;
- It is the template upon which Earth’s living skin develops, and upon which organisms grow, diversify and combine, creating different ecosystems.

## OTHER CONSIDERATIONS

### Managing for Enduring Features

- One of the baseline indicators is ecological integrity, which is very difficult to monitor;
- As such, it may be useful to ensure that representation among enduring features, BEC classes, intact landscapes, etc., is maintained to minimize the loss of wilderness, wildlife, and cultural values given future resource development;
- Enduring features themselves probably won't change in the near future, but they set some of the context for biodiversity. In addition to obvious links between biodiversity, habitats, and wildlife, use of the land base and wilderness experiences also are related in part to enduring features and their attendant biodiversity values;
- What will change over time is where resource development impacts those enduring features. For example, do you choose to concentrate developments on certain rarely distributed enduring features or perhaps in an area of high enduring feature diversity?

## OTHER CONSIDERATIONS

### Managing for Enduring Features

- Presumably the risk of inadvertent loss of valued components is less if you maintain some representation in each 'class' of enduring features.
- From a monitoring standpoint, one could map baseline condition of the current human footprint on an "enduring features" layer and then project how it might change (in footprint area as well as representation of classes) given different development options or applications.
- The "enduring feature" layer is part of the Y2Y conservation assessment done for the MK Board (pg 28 of y2y Report)

## OTHER CONSIDERATIONS

### Managing for “How Much of What, Where?”

- The most important goal is to maintain the ecological integrity that provides wilderness, wildlife, and cultural values;
- To do that, we need to ensure that the components that make up ecological integrity are assessed and ‘safeguarded’ (as indicated by thresholds and baselines) to the best of our knowledge;
- Therefore, we want to optimize/maintain enduring feature classes, solitude, BEC, habitat quality of focal species, etc.;
- For each of these, the questions are:
  - **How do you decide “how much” to optimize or maintain?**
  - **How do you decide where?**

## OTHER CONSIDERATIONS

### Managing for “How Much of What, Where?”

#### - How do you decide “how much” to optimize or maintain?

- Relative to this question, who gets solitude where? Do you just maintain high-quality wildlife habitat or is some medium quality and connectivity also important?
- It is up to the Board to determine what the level of disturbance could be for each of the valued components (whether they are assessed with what you have identified as indicators with thresholds or indicators compared to baseline).
- There is theoretical science that can inform each of those targets, but we don't have much of that specific information for the MKMA.
- It could be approximated for each value through the use of expert science panels (e.g., a group of caribou or recreational user specialists) who could apply their best recommendations as to the minimum target level. In lieu of this, an alternative approach is to use broader conservation thresholds (see for example Svancara et al., 2005<sup>1</sup>) for North America which would suggest targets within the 40-75% level for conservation purposes.

## OTHER CONSIDERATIONS

### Managing for “How Much of What, Where?”

#### - How do you decide “where?”

- Relative to this question (and with reference to suggestions related to zoning), the MKMA is already zoned (RMZs, etc);
- Instead of adding additional pre-defined zones, it would seem more useful to map each valued component spatially;
- This would highlight areas that are of highest value;
- Overlapping those mapped layers would then show areas that are important for multiple values;
- The MK Board must then decide whether proposed developments could be accomplished outside those areas, or whether they are willing to take the risk of losing (some) system integrity;
- Picking an *a priori* number of developments (e.g., one mine per spatial area) seems to disregard the science of defining the values in the MKMA;

## OTHER CONSIDERATIONS

### Managing for “How Much of What, Where?”

#### - How do you decide “where?”

- Instead, wilderness and wildlife values for the landscape should be mapped first and then developments recommended in areas where system integrity is not compromised;
- It may be that more than one mine could operate in an area, or perhaps that none should occur if the spatial footprint cannot be altered;
- Similarly, even though forestry operations are ‘dispersed’, they still contribute to the total footprint in an area, which ultimately would be considered in relation to thresholds or baseline conditions;
- Potentially the MK Board may elect to be more stringent than the above procedures would recommend, by restricting the number of developments;
- Certainly, limiting road access could minimize the greatest threat to wilderness values;

## OTHER CONSIDERATIONS

### Managing for “How Much of What, Where?”

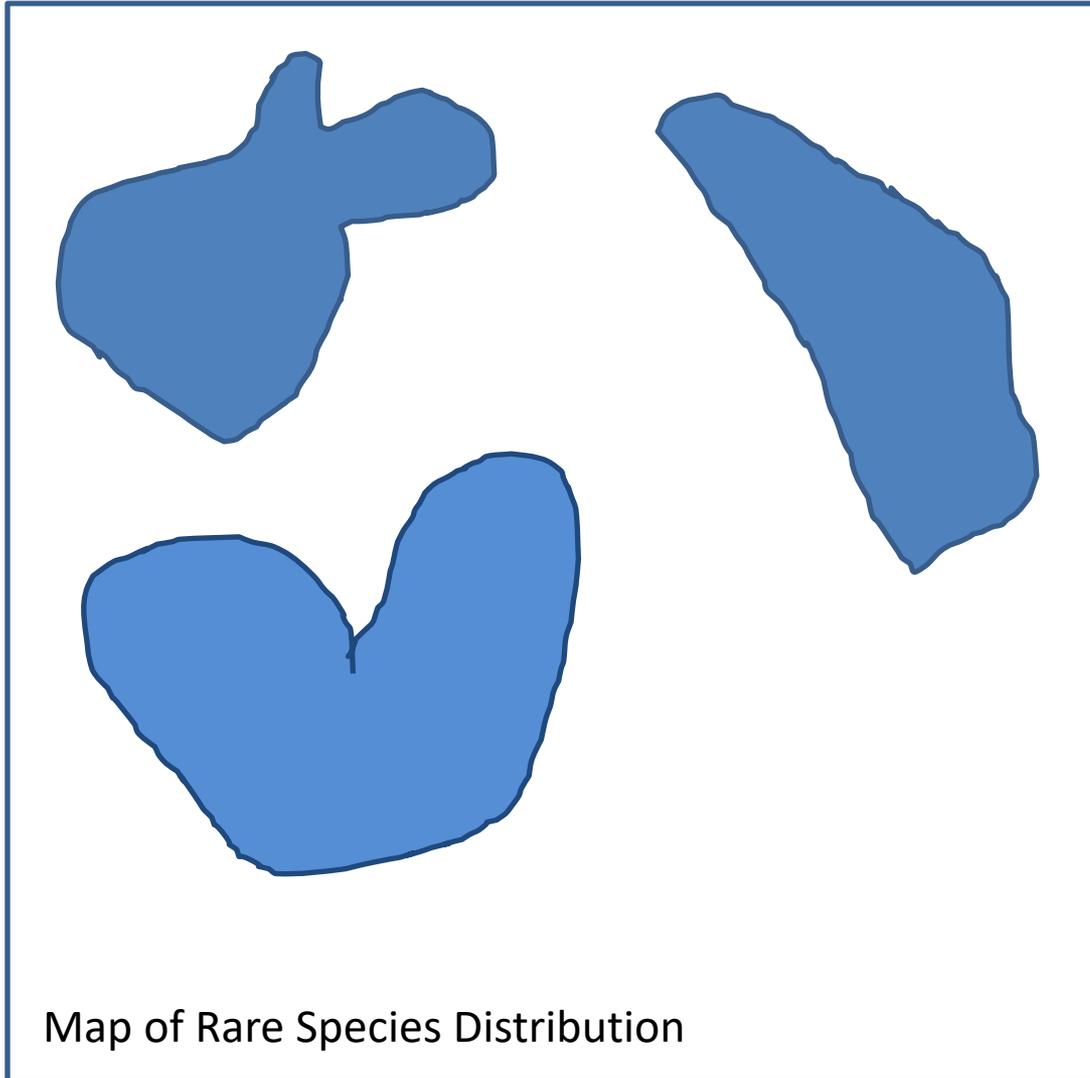
#### - How do you decide “where?”

- Because the goal is to maintain wilderness and wildlife (while allowing some resource development), the MKMA is unlike any other land base in the province;
- So the steps needed to keep it are probably more complicated than anywhere else!

# Analysis and Synthesis of Information for Advice to Government

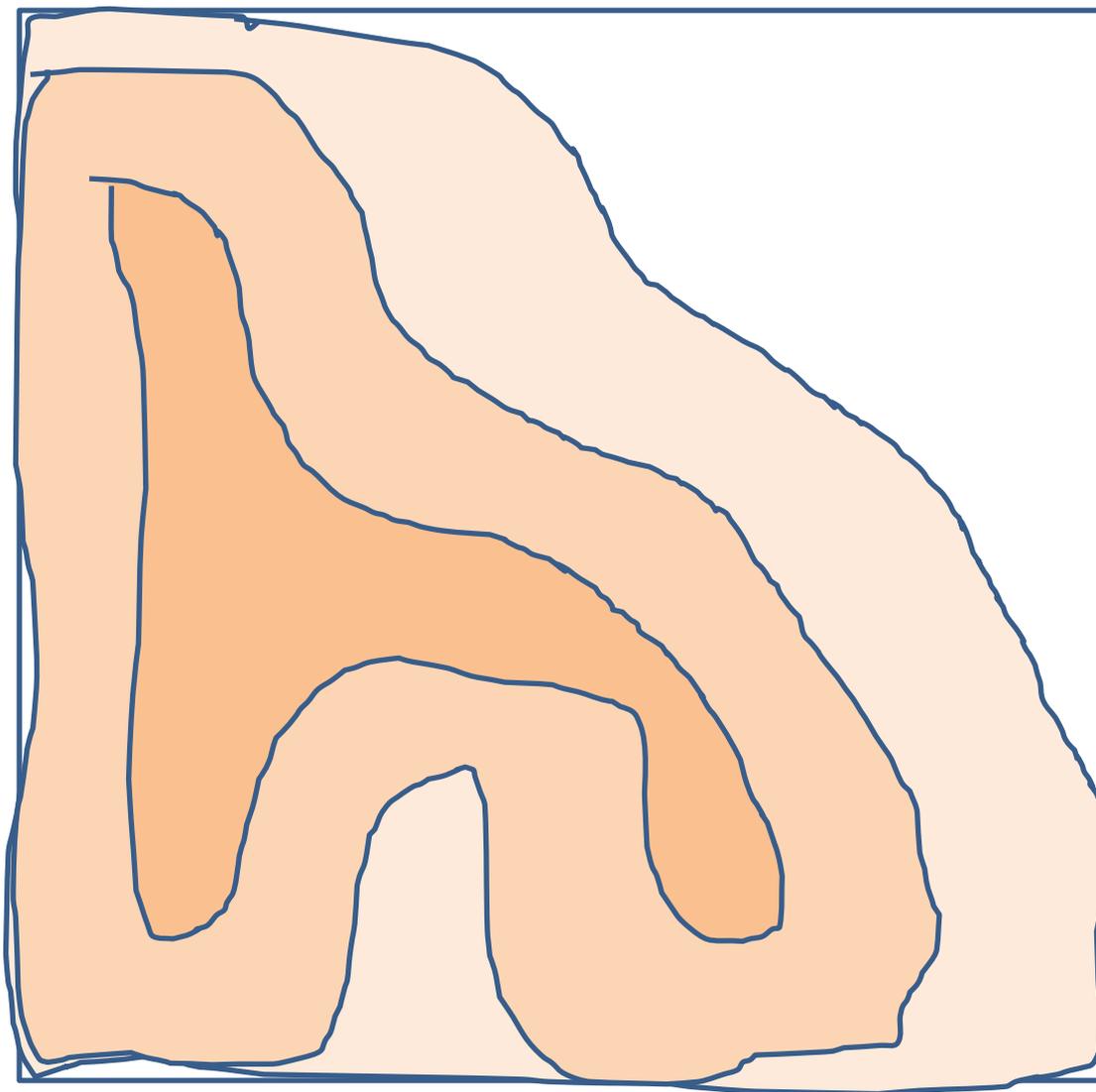
- *It's difficult to convey in text how we would advise using the information from assessment of conditions in the MK to inform governments, so in conjunction with the text Kathy has prepared we've prepped a little simplified model.*
- *We've used a fake landscape and fake data for a simplified set of variables just to illustrate the points and so we don't all get lost in the debate over whether the values are what we think they are.*
- *For this model we've identified just 3 Valued Components (Remoteness, Caribou habitat quality, Rare species)*

# Map Valued Component

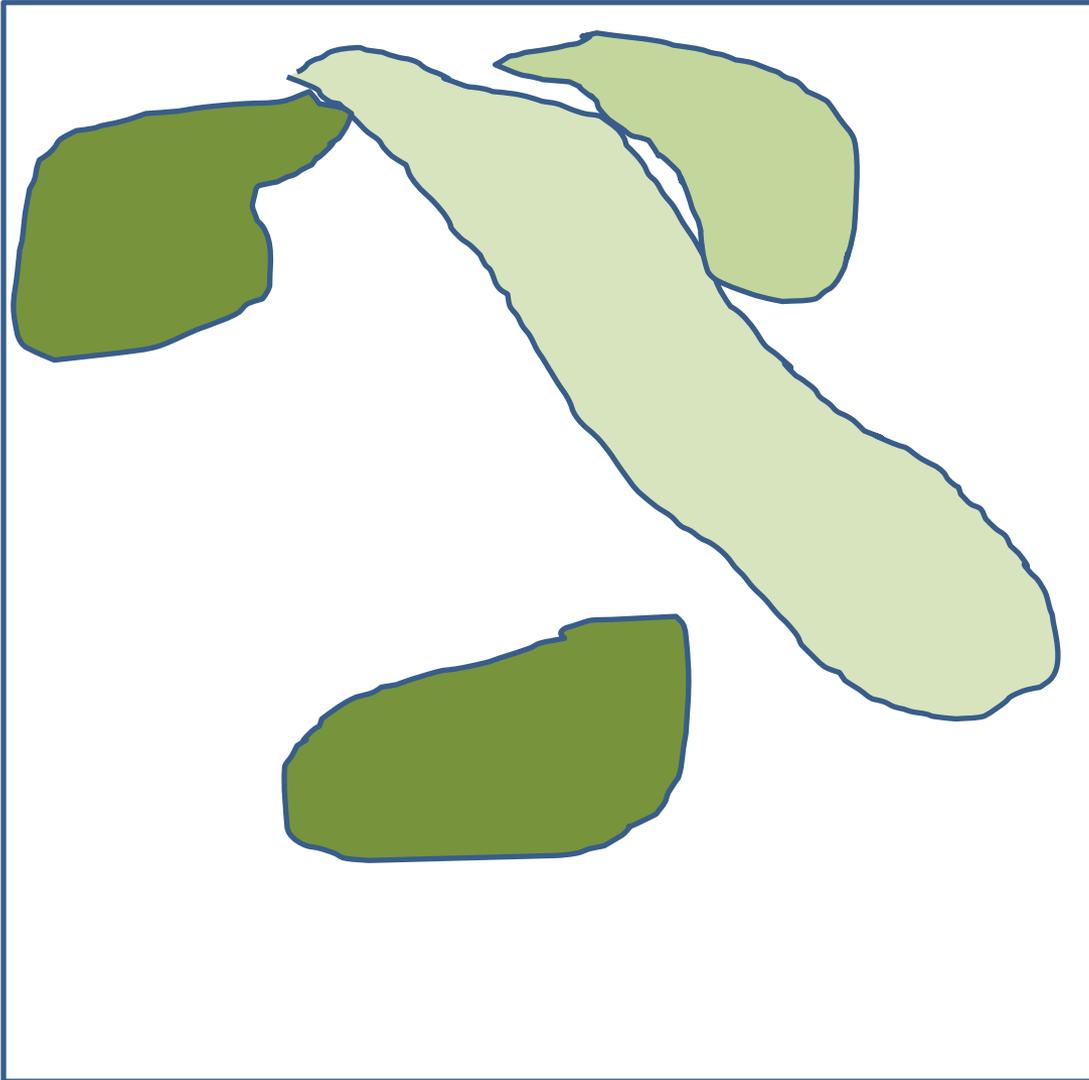


For each valued component, prepare a map of that indicator.

← This is the boundary of a watershed of interest



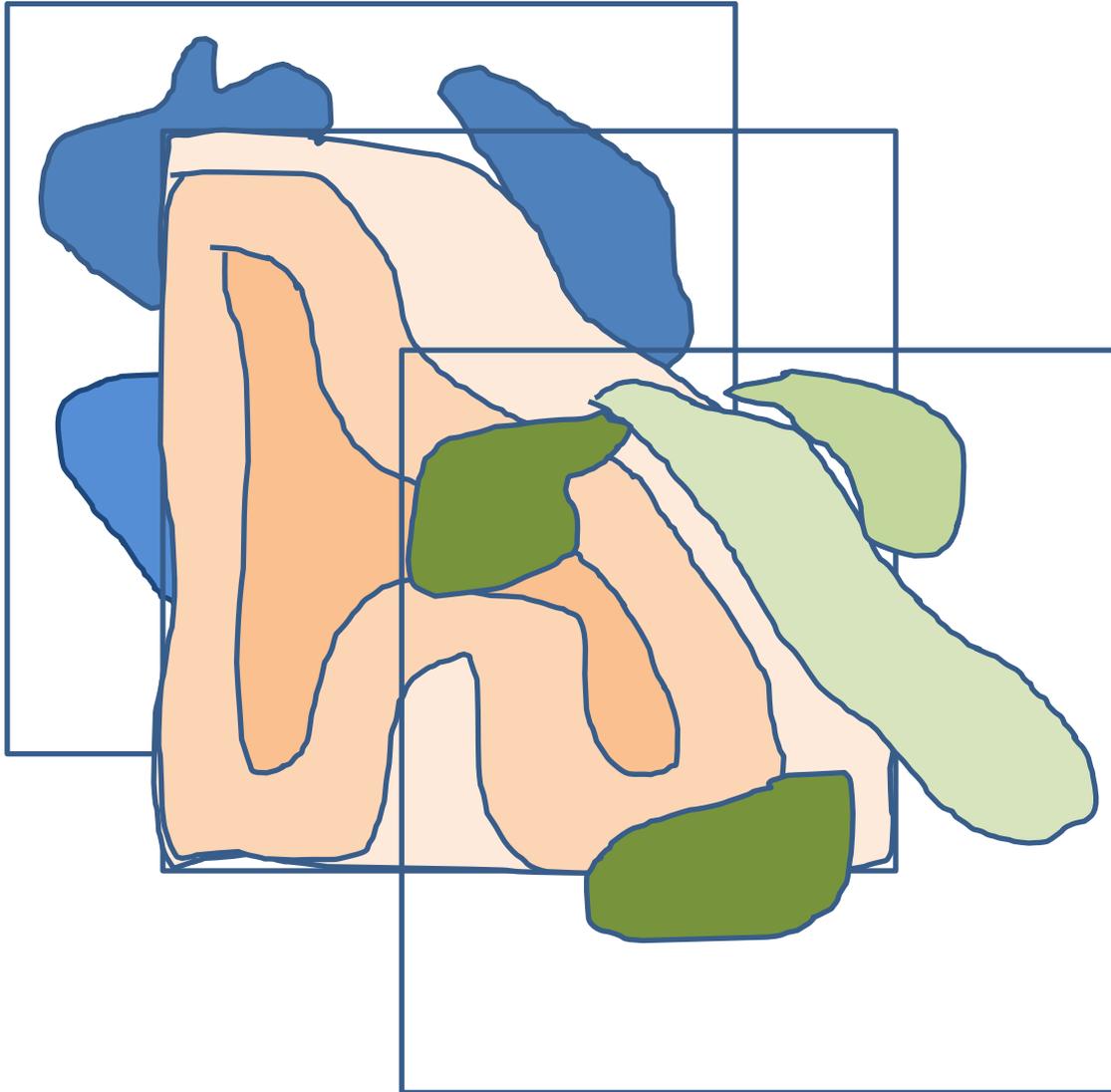
Map of Remoteness (buffered distance to disturbance; darkest peach colour representing most remoteness)



Map of Caribou Habitat  
(darkest green representing  
highest quality habitat)

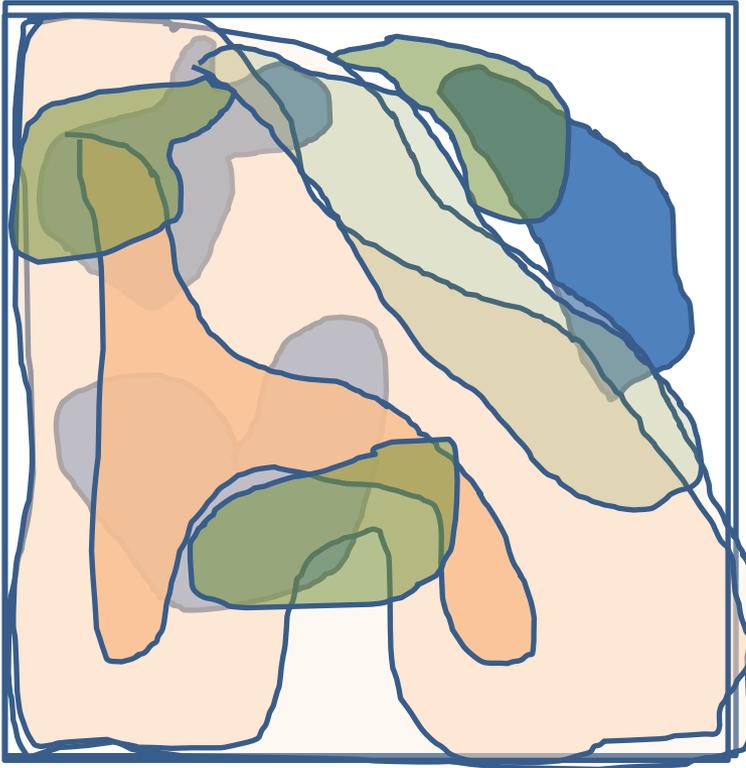
# Data Sources, Scale and Threshold Setting

- Step 1. **Produce maps** for each of the data layers in the valued components (identified in the 'Indicators for Monitoring' schematic from earlier discussions). Data could be from DataBC information sources or those available from the CAD, Biodiversity and Climate Change Assessment, or Nobi and Lindi's work.
- Step 2. **Set the largest scale of analysis** (e.g., RMZ or watershed). In our example the square box boundary is a watershed.
- Step 3. **Decide, for each valued component** (and it will probably be different for each) **how much** (the target) **you want to maintain of what and at what scale** (e.g.,):
  - 100% of high-quality caribou habitat and 50% of medium-quality caribou habitat at the watershed scale (green)
  - 50% of high and medium quality Remoteness environments (peach)
  - 100% of rare species habitats (blue)



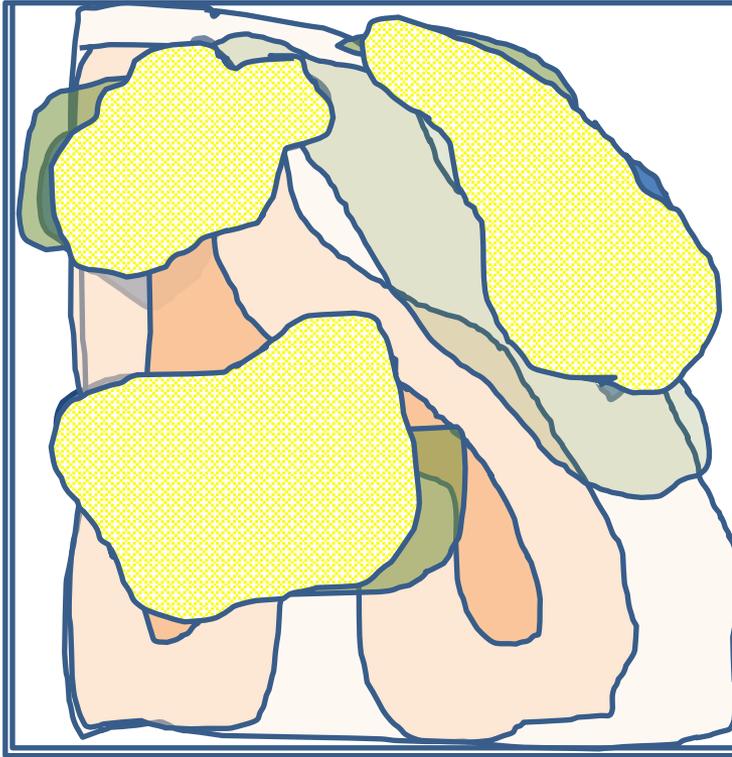
Step 4. **Overlay the three Valued Component maps.** Using an optimization program such as Marxan, ask for scenarios that achieve the targets for each condition while minimizing costs. Costs in this case could be:

- Solutions that are 'lumped' together so that habitats are not fragmented, and/or
- Solutions that meet targets while minimizing overlap with high-value resources for development.

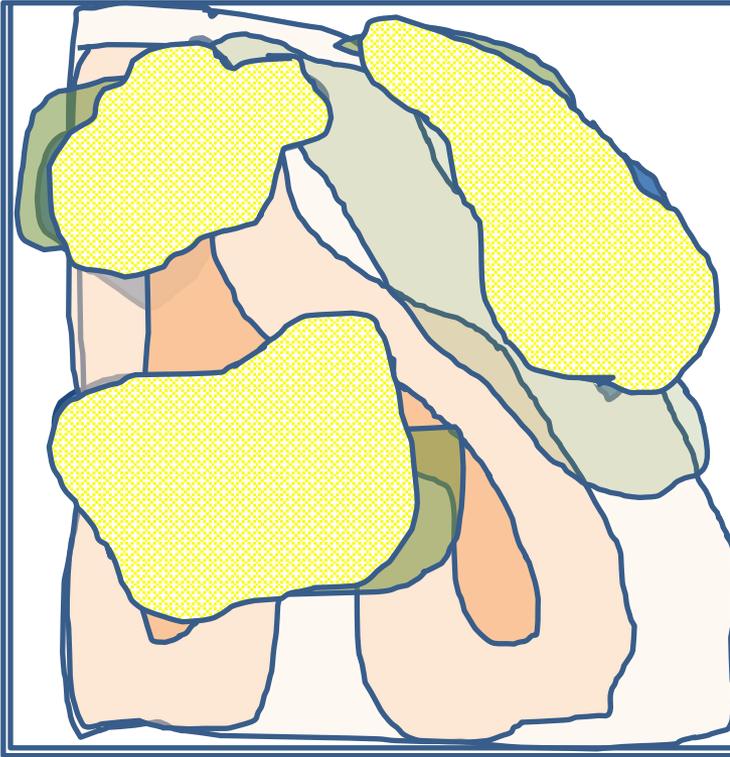


In our simplified model, you will now see the three overlays. The Marxan model will select lands that meet the conditions.

- e.g., all the dark green blobs will be selected because we said 100% of those and 50% of light green.
- 50% of the two darkest peach blobs will be selected, selecting first any peach that is also a green layer and then making sure the peach bits are connected.
- Similarly, 100% of blues will be selected.



The yellow polygons that overlay the other layers then would be one of a number of solutions the model develops for the watershed. This would indicate the land you would say 'don't develop' within each watershed. Marxan will run a whole bunch of options and you get to pick the best one.



What impact, if any, does this feedback have on our current framework?

Discussion:

-