

## Heidi Wiebe

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**From:** Karen Hamre [PASManagingDirector@northwestel.net]  
**Sent:** Tuesday, October 26, 2010 2:29 PM  
**To:** 'Heidi Wiebe'  
**Cc:** 'Lillith Brook'; 'PAS SC: Joel Holder'; 'Evelyn Gah'; 'Claudia Haas'; 'Michael Palmer'  
**Subject:** PAS Science Team comments on SLUP Draft 3  
**Attachments:** PAS Science Team Comments Draft 3 SLUPB October 26th 2010 final.doc

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hello Heidi,

Please excuse the delay, but attached are the Protected Areas Strategy (PAS) Science Team's comments on Draft 3 of the Plan and recommendations for the next four years.

I wish to emphasize that this is technical information on ecological representation and does not necessarily represent the views of the individual organizations that make up the PAS or other PAS partners. The respective organizations will submit (or have submitted) their comments separately and directly to the Sahtu Land Use Planning Board.

The Science Team comments are in these areas:

### **1. Page-by-page wording changes**

Includes *minor* corrections and *major* revisions to the description of the use of the Science Team's ecological representation analysis work.

### **2. Conformity requirement**

The PAS Science team recommends that the additional areas that the Marxan computer program consistently selects 90-100% of the time regardless of which areas are "locked in" (generally believed to be irreplaceable areas) be given a Conformity Requirement in Draft 4 of the Sahtu Land Use Plan. The suggested requirement is:

- a) prior to issuing any permits or licenses to developers in the irreplaceable areas (additional areas that the computer program consistently selects 90 to 100% of the time in the coarse filter terrestrial ecological representation analysis), an aerial landcover survey, including some on-the-ground confirmations, is required to verify that these areas do contain the infrequently occurring features expected; and
- b) if these infrequently occurring features can be confirmed, then developers must mitigate impacts on these features.

### **3. Recommendations**

Under 6.6 'Filling the Gaps' two additional recommendations be included:

- a) Additional studies be conducted prior to the next review of the Plan on the irreplaceable areas (additional areas that the computer program consistently selects 90 to 100% of the time in the coarse filter terrestrial ecological representation analysis) to confirm that they contain the expected infrequently occurring features; and
- b) The Board work with the PAS Science Team to ensure that freshwater biodiversity is adequately captured in conservation zones and other conservation initiatives.

We further recommend a section in Draft 4 on the importance of trans-boundary planning, with the Board stating their intention to work with other jurisdictions on matters of trans-boundary concern (this is beyond the current Recommendation #18)

The PAS Science Team would like to be listed as a resource to the Board Action #2, and that achieving full ecological representation be included in the work plan of the Sahtu Working Group.

The PAS Science Team believes that incorporating these comments will make the Plan more accurate and will assist in protecting the ecological diversity of the Sahtu. For technical questions on the analysis, please call members of the Science Team: Evelyn Gah at 873-7516 (terrestrial coarse filter representation analysis); Claudia Haas 920-8975 (special features) or Mike Palmer 766-2073 (freshwater classification). If you have any general questions about this, or if we can be of any assistance in providing more details or analyses to the Planning Board, please feel free to contact me (873-6717).

Karen

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PAS Science Team Comments on Draft 3 of the Sahtu Land Use Plan and  
Recommendations for the next 4 Years

October 26<sup>th</sup>, 2010

*Prepared by the Northwest Territories Protected Areas Strategy*

*Science Team*

## Purpose

The report summarizes the comments by the PAS Science Team on Draft 3 of the Sahtu Land Use Plan and the Background Report and gives some recommendations for work to be completed prior to the first review of the Plan. Some comments are for inclusion in Draft 4 of the Plan, mainly clarifying some confusion on the ecological representation analysis and its uses and suggesting some conformity requirements. We hope the comments and recommendations are useful to the Sahtu Land Use Planning Board (SLUPB). For more information or clarification, please contact Karen Hamre, Protected Areas Strategy Managing Director at 867-873-6717 or Evelyn Gah, GNWT Environment and Natural Resources, Protected Areas Strategy GIS Analyst at 867-873-7516.

## Page Specific Comments on Sahtu Land Use Plan Draft 3 and Background Report (July 2010)

### Sahtu Land Use Plan Draft 3 (July 2010)

#### Map 4: Land Use Zones (Pg. 38)

- 59 Sentinel Islands  
The islands just north of ?ehdacho are labelled 59 (Sentinel Islands) and mapped in the colour of special management zones, while all other islands labelled 59 are mapped in the colour of conservation zones. In the description of Zone 59 (Sentinel Islands) is referred to as Conservation Zone ( Pg. 168).

#### Map 8: Ecologically Significant Areas (Pg. 61)

- Glacial Refugia  
Text for glacial refugia in the legend is incorrect. (The figures refer to radio carbon years where if radio carbon years were used, it should read 14,500 and not 145,000. The text in the document Pg. 62 uses calendar years).

Correct text for green hatched legend box:

“Glacial Refugia (17,350 Calendar Years Before Present)”

Correct text for yellow hatched legend box:

“Glacial Refugia (15,600 Calendar Years Before Present)”

#### CR#12 - Ecologically Significant Areas

- Rare or May be at risk plants (Pg. 62):  
Change “GNWT Ecosystem Management Biologist” to “ENR Wildlife Biologist (Biodiversity)”
- References (Pg. 60)  
Reference No. 61 and 62 are missing

### Important Areas for Ecological Representation (Pg. 81)

#### Original wording

**Ecological representation** means “protecting samples of broad landscape and habitat variations in each ecoregion of the NWT” in order to “help protect the majority of species” that occur in the NWT.<sup>90</sup> Protecting portions of each ecoregion will in theory, help conserve the different life forms that are found in the NWT and their habitats. A computer model was run 100 times in order to identify areas that were found to be important for ecological representation.

- Areas that appeared 90-100% of the time;
- Areas that appeared 61-89% of the time; and
- Areas that appeared 30-60% of the time were identified in the Sahtu Settlement Area and were put forth for conservation consideration.

When “important for ecological representation” is used in the Zone Descriptions, it is in reference to the areas that appeared 30-60% of the time and “very important for ecological representation” refers to areas that appeared 61-100% of the time in the following report:

Northwest Territories Protected Areas Strategy Science Team. (August 6, 2009). Ecological Representation Analysis of Conservation Zones/Protected Areas Initiatives in the April 30, 2009 Draft Sahtu Land Use Plan.

[http://www.sahtulanduseplan.org/ftpfiles/public\\_comments/Draft%20%20Ecological%20Representation%20Analysis.pdf](http://www.sahtulanduseplan.org/ftpfiles/public_comments/Draft%20%20Ecological%20Representation%20Analysis.pdf)

#### Issues

- Misunderstanding of ‘locking in’ protected areas/conservation zones: The original wording does not mention that for the analysis that the PAS Science Team provided, existing and proposed protected areas, including Sahtu draft conservation zones, were “locked in” (meaning that the computer program was instructed to select those entire areas 100% of the time) and that the intent of the computer analysis was to identify if and where areas were needed in addition to those locked in to meet full ecological representation in an efficient manner. The additional areas required were ranked by how often they were selected, indicating their importance for achieving ecological representation efficiently.
- Inconsistencies and inaccuracies in how the ranking and description of ranking is done: The ranking in the original text on Pg. 81 differs from that shown on Map 17 (Pg. 61) in the background document and from the ranking in the GIS files that the PAS Science Team provided the Board.
- The ranking on Pg. 81. para. 3 is different from the ranking in the report that the PAS Science Team provided to the Board so that stating that it follows the Science Team report is incorrect. Note that the ranking can be broken down into varying levels if desired. The map in the report provided by the PAS Science Team is one way to rank the additional areas selected in order to help make decisions on which additional areas to protect to increase ecological representation in the Sahtu. While the Board’s ranking doesn’t follow the report provided by the PAS Science Team, it is based on the computer results used for that report.

#### Suggested re-wording

**Ecological representation** means “protecting samples of broad landscape and habitat variations in each ecoregion of the NWT” in order to “help protect the majority of species” that occur in the NWT.<sup>90</sup> Protecting portions of all landscapes and habitats in each ecoregion will in theory, help conserve the different life forms that are found in the NWT.

The PAS Science Team ran a computer model 100 times in order to assess whether existing and proposed protected areas and draft conservation zones in the Sahtu achieve full ecological representation and, if not, to identify where additional areas were needed. Current and proposed protected areas, including Sahtu draft conservation zones, were locked into the analysis (i.e. the computer program had to select them, assuming the areas would be protected) and areas of known development were locked out of the analysis (i.e. the computer program was not allowed to select them). The sites that the computer program selected in addition to those currently protected or proposed for protection were mapped based on how often they were selected. The more often they were selected, the more important those areas are for meeting ecological representation in an efficient manner.

Based on GIS files of the results of the ecological representation analysis provided to the SLUPB by the NWT PAS Science Team, the Board mapped the importance of additional areas selected in the Sahtu in the following way:

- Areas that were selected 90-100% of the time;
- Areas that were selected 50-89% of the time; and
- Areas that were selected 30-49% of the time.

When “important for ecological representation” is used in the Special Management Zone descriptions, it is in reference to the areas that were selected 30- 49% of the time and “very important for ecological representation” refers to areas that were selected 50-100% of the time

All Conservation Zones and Proposed Conservation Initiatives can be described as contributing to ecological representation. The computer program identified many additional areas, indicating that the Conservation Zones and Proposed Conservation Initiatives, together with existing protected areas, do not meet full ecological representation.

### **Important Wildlife Areas (Pg. 82)**

- Change reference from  
Haas, C.A., & Wilson, M.J., DRAFT Important Wildlife Areas in the Western Northwest Territories, February 2010, Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT  
to  
Wilson, M.J. & Haas, C.A., DRAFT Important Wildlife Areas in the Western Northwest Territories, February 2010, Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT

This change needs to be made throughout the document.

### **Section 5.4 Zone Descriptions (Pg. 88 – 261)**

#### **Summary**

1. Inconsistent terminology is used for importance of ecological representation throughout the zone descriptions. Also, the definition of “important for ecological representation” and “very important for ecological representation” in most zone descriptions doesn't match the definition given on Pg. 81, para. 3.
2. Ecological features - Description of importance of zones for ecological representation.  
Overall it appears that the SLUPB misunderstood how to use the ecological representation analysis results provided by the PAS Science Team.

The SLUPB used the results of the ecological representation analysis that the PAS Science Team provided them to describe the importance of Proposed Conservation Initiatives (PCIs), Conservation Zones (CZs) and Special Management Zones (SMZs) for ecological representation. However, the results of that analysis are not suitable for that purpose.

As noted in comments on pg 81, the intent of the ecological representation analysis that the Science Team performed was to assess if the Sahtu Draft 2 CZs and PCIs met full ecological representation and, if not, to identify which additional areas would be needed to meet full ecological representation in Sahtu ecoregions. For this purpose, all existing and proposed protected areas including draft CZs were “locked in”, meaning the computer program was instructed to select those entire areas 100% of the time. In doing so, the computer program first evaluates how well those “locked in” areas meet ecological representation and then selects a suite of additional areas to come up with the most efficient option for achieving full representation. These additional areas are all outside of existing and proposed protected areas and draft CZs and are meant to be used to help make decisions about how to most efficiently increase ecological representation. They do NOT allow to assess which areas inside existing and proposed protected areas and draft CZs are important for meeting ecological representation. A different type of analysis that doesn’t lock in CZs and PCIs so that areas for ecological representation can be chosen within them is necessary for this purpose.

Therefore, the descriptions of the importance for ecological representation of CZs in the Draft Sahtu Land Use Plan all refer to areas outside but bordering onto the CZs, NOT to the CZs themselves. No mention of areas important for ecological representation related to PCIs was made, but the same would apply to PCIs.

For the Special Management Zones it makes some sense to look at where within the SMZs areas in addition to the locked in ones get selected. However, SMZs don’t meet the criterion of no development that is required for ecologically representative areas.

3. There are no rare plants within the Sahtu Settlement Area. There are 2 rare plants in ecoregions shared between the Sahtu and other regions, but both are outside the Sahtu Settlement Area. Therefore, change “rare or possibly at risk plants” to “may be at risk plants” throughout the zone descriptions section. Also change “rare and possible at risk plants” to “may be at risk plants”.

## Background Report

### 2.3 Water and Watersheds

Watershed planning is incorporated into the Plan in the Background Report. Including freshwater in conservation planning is important yet has seldom happened throughout Canada. As a result, there are limited examples of how to incorporate freshwater in protected areas. The PAS Science Team is continuing its work on completing a coarse-level freshwater classification and collecting aquatic special features information. While the PAS Science Team is still working on developing a method for using the classification as a coarse filter to help ensure that freshwater ecosystems are represented and for how the classification can guide protected areas planning, we recommend adding a comment in this section on the importance of protecting the full diversity of freshwater ecosystem types as a vital component to the maintenance of overall biodiversity.

### 2.5.1 Representation Analysis (Pg. 59, 3rd to 6<sup>th</sup> para. )

Change title to “Ecological Representation Analysis”

Change wording of this section:

#### Original wording

The PAS tries to achieve ecological representation in its protected areas and within the NWT’s regional plans. Ecological representation means “protecting samples of broad landscape and habitat variations in each ecoregion of the NWT” in order to “help protect the majority of species” that occur in the NWT.<sup>82</sup> Protecting portions of each ecoregion will in theory, help conserve the different life forms that are found in the NWT and their habitats.

Ecological representation cannot be met through protected areas alone. It is just one way to offer some protection for the territory’s species.

As discussed in the Plan, Conservation Zones and Special Management Zones play particularly important roles in conserving biodiversity. They provide connectivity and travel corridors between landscapes which are required for species that move over large landscapes.

The PAS Science Team provided the SLUPB with an ecological representation analyses<sup>83</sup> report to help the Board represent as fully as possible the diverse features and species of the Sahtu.

The report included:

- areas identified as important for ecological representation by the Marxan computer model when run 100 times;
  - areas that appeared 90-100% of the time
  - areas that appeared 61-89% of the time
  - areas that appeared 30-60% of the time

See Map 17. Marxan Ecological Representation Analysis

#### Suggested rewording

The PAS aims to achieve ecological representation within each of the 42 ecoregions in the NWT.

Ecological representation means “protecting in protected areas and regional plans samples of broad landscape and habitat variations in each ecoregion of the NWT” in order to “help protect the majority of species” that occur in the NWT. Protecting portions of all landscapes and habitats in each ecoregion within areas of no development will in theory, help conserve the different life forms that are found in the NWT. No development is permitted in a core representative area.

Ecological representation cannot be met through protected areas alone. Protected areas are just one way to offer some protection for the territory’s species. Conservation zones with no development also contribute to ecological representation.

As discussed in the Plan, Special Management Zones also play an important role in conserving biodiversity. Well-managed and responsible development in these areas allow for continued large-scale processes and provide connectivity and travel corridors between landscapes which are required for species that move over large landscapes. Responsible development in General Use Zones is also necessary.

The PAS Science Team provided the SLUPB with an ecological representation analyses report to help the Board represent as fully as possible the diverse features and species of the Sahtu.

The report included:

One possible configuration of areas needed for meeting full ecological representation in addition to existing and proposed protected areas and draft 2 conservation zones. The additional sites selected by the computer program when run 100 times were mapped based on how often they were selected. The more often they were selected, the more important those areas are for meeting ecological representation in an efficient manner. All of these additional areas, together with the areas locked in, are one way to achieve full ecological representation.

The PAS Science Team provided GIS files of the results of the computer analysis to the SLUPB and the Board mapped the importance of the additional areas selected in the Sahtu in the following way:

- areas that were selected 90-100% of the time
- areas that were selected 50-89% of the time
- areas that were selected 30-49% of the time

See Map 17. Marxan Ecological Representation Analysis

### **2.5.1 Representation Analysis (Pg. 60, last para.)**

#### Original wording

The Board considered the results of the PAS analysis in its decision-making process. An Ecologically Representative Areas map was created to identify the areas identified for protection by the Marxan model. A second map of Ecologically Significant Areas was produced to include the special features as well as karst features identified through Dr. Derek Ford's report<sup>84</sup> and the International Biological Program (IBP). Both maps were used by the Board during decision making as the zones were being created and revised.

#### Issue

Delete reference to the ecological representation map as it is referred to in previous reworded paragraph above. Add the sentence related to the map of Ecologically Significant Areas right after the list of special features on Pg. 59/60

#### Suggested rewording (related to special features to be inserted after list of special features on Pg. 60)

A map of Ecologically Significant Areas was produced to include all special features listed above. The karst includes karst features identified in Dr. Derek Ford's report and through the International Biological Program (IBP).

The Board considered the results of the PAS analyses in its decision-making process.

### **Map 17: Marxan Ecological Representation Analysis (Pg. 61)**

Text for red legend box should read either "Areas selected  $\geq 90\%$  of the time" or "Areas selected 90 to 100% of the time"

### **Map 18: Ecologically Significant Areas (Pg. 62)**

Glacial Refugia - The figures for the years before present are in radio carbon years. Suggest to use calendar years.

For green hatched legend box: "Glacial Refugia (17,350 Calendar Years Before Present)"

For yellow hatched legend box: "Glacial Refugia (15,600 Calendar Years Before Present)"

## Overall Comments on Sahtu Land Use Plan Draft 3 (July 2010)

### Full Ecological Representation not Achieved

The PAS Science Team advises the SLUPB that the current network of protected areas, including the Draft 3 Conservation Zones and current Proposed Conservation Initiatives, still does not achieve full ecological representation in the Sahtu Settlement Area.

There are some landscape features that are mostly or entirely in the Sahtu Settlement Area and thus the Sahtu has full responsibility for achieving ecological representation of these features. For many features, ecological representation has currently either not been achieved at all or has only been minimally achieved and these would require protection to attain complete ecological representation. Further work is required to ensure that these landscape features are adequately protected.

As a starting point, there are several areas that the Marxan computer program consistently selects 90 to 100% of the time, regardless of whether Conservation Zones and Proposed Conservation Initiatives are locked in or not, and which are not protected in the existing protected areas network. These areas are deemed to be 'irreplaceable', meaning they likely cannot be found elsewhere in the ecoregion (see Figure 1).

Protecting these irreplaceable areas would go a long way towards achieving full ecological representation, however, additional areas are still needed to fully represent the ecological diversity in the Sahtu ecoregions.

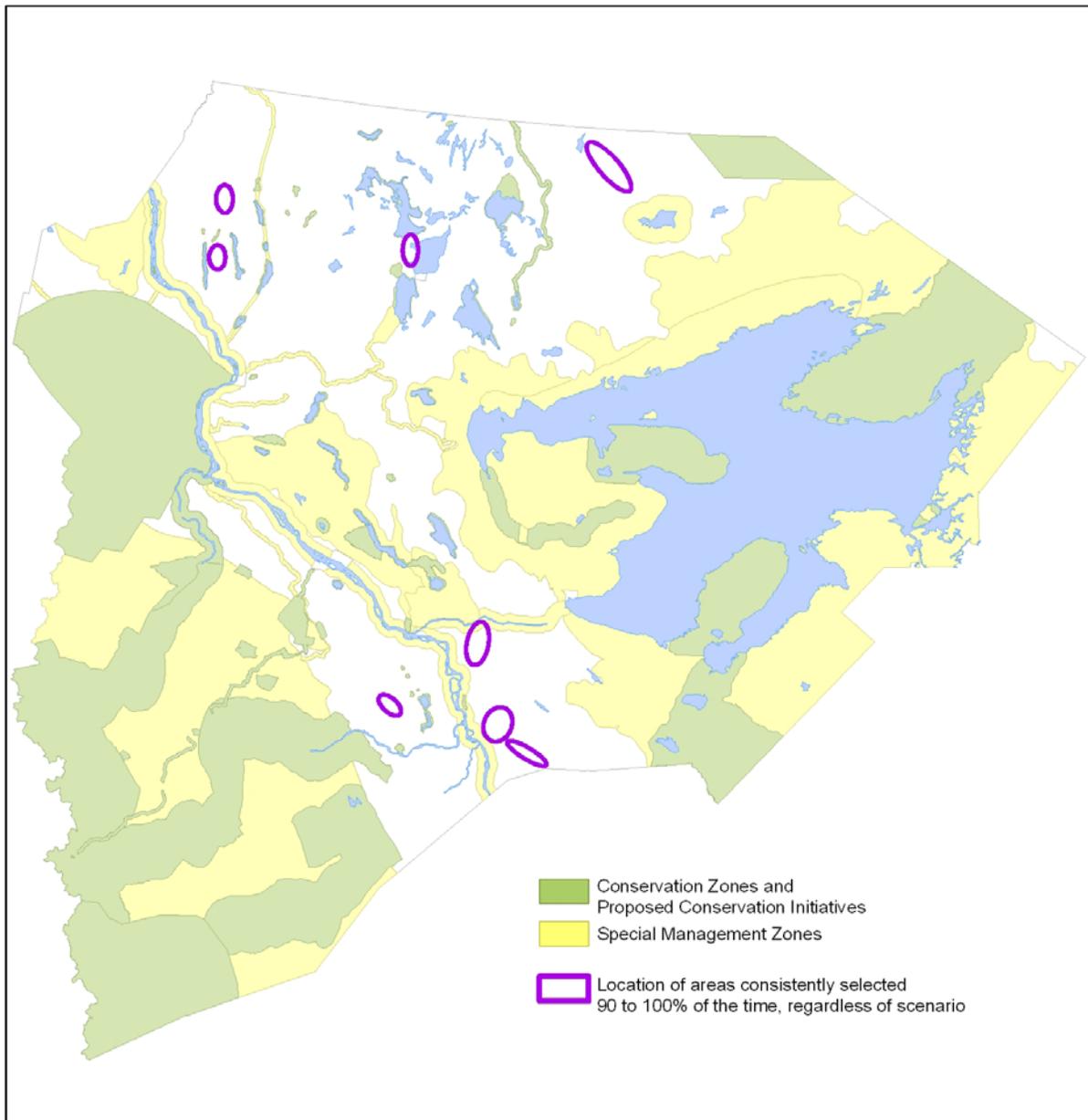
We recommend these irreplaceable areas be given a Conformity Requirement in Draft 4 of the Sahtu Land Use Plan. The suggested requirement is:

- a) prior to issuing any permits or licenses to developers in the irreplaceable areas, an aerial landcover survey, including some on-the-ground confirmations, is required to verify that these areas do contain the infrequently occurring features expected; and
- b) if these infrequently occurring features can be confirmed, then developers must mitigate impacts on these features.

The PAS Science Team will provide more detailed information on which infrequently occurring landcover (or vegetation classes) are found in the irreplaceable areas to support the aerial surveys.

In addition, the PAS Science Team suggests inclusion of a recommendation in Draft 4 that additional studies will be conducted prior to the next review of the Plan on these irreplaceable areas, including confirmation that they contain the expected infrequently occurring features (see Recommendations of Work to be Completed before First Review of Plan, Achieving Ecological Representation below)

### Location of areas consistently selected 90 to 100% of the time



**Figure 1: Draft 3 Sahtu Land Use Plan Zones (July 2010) with locations of irreplaceable areas (areas consistently selected 90-100% of the time)**

### **Trans-boundary Planning**

Since most ecoregions cross jurisdictional and regional boundaries, the PAS Science Team recommends that the SLUPB include in Draft 4 a section on the importance of trans-boundary planning, and state their intention to work with other jurisdictions to achieve full ecological representation and co-

operation on other matters of trans-boundary concern. This goes beyond Recommendation #18, which is focused on the Great Bear Lake Watershed.

## **Recommendations of Work to be Completed before First Review of the Plan**

### **Resource to the Sahtu Working Group**

As noted, the PAS Science Team advises the SLUPB that the current network of protected areas, including the Draft 3 Conservation Zones and current Proposed Conservation Initiatives, does not achieve full ecological representation in the Sahtu Settlement Area. We suggest that the SLUPB continue to work with the PAS Science Team on identifying areas that can be protected to contribute to complete ecological representation.

To formalize this, the PAS Science Team offers their services to the Sahtu Working Group (Action #2) to provide resources on ecological representation and special features discussed in our previous report “Ecological Representation Analysis of Conservation Zones/Protected Areas Initiatives in the April 30, 2009 draft Sahtu Land Use Plan”. In addition, the PAS Science Team can provide information and analyses on:

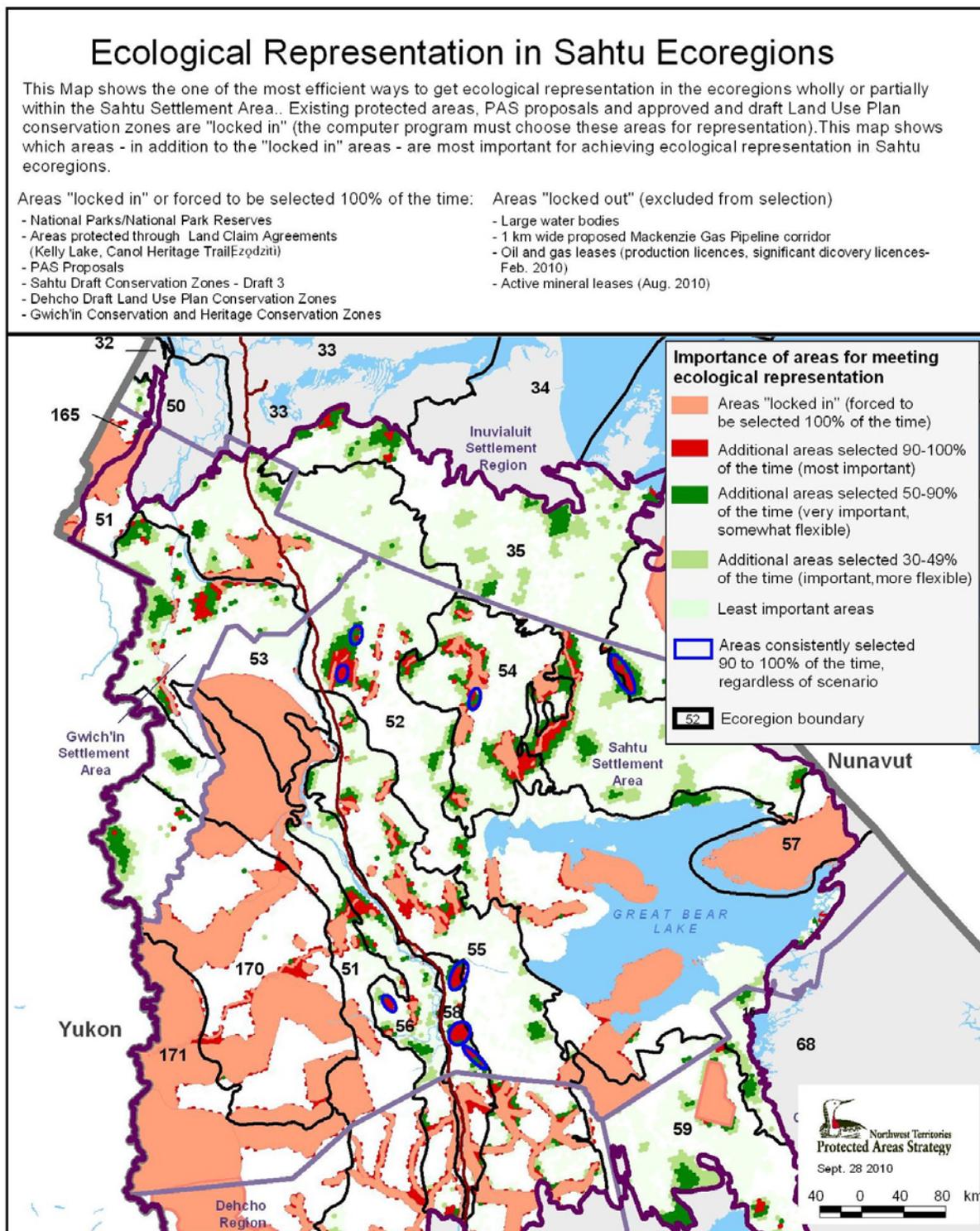
- Aquatic special features: The PAS Science Team is collating information on abiotic aquatic special features.
- Freshwater classification: The PAS Science Team is working on science-based freshwater information along with recommendations for including representative freshwater ecosystem types in protected areas. A draft coarse level freshwater classification has been completed and is expected to be finalized by early 2011. The classification uses abiotic data to characterize the dominant regional environmental patterns that influence freshwater ecosystems and the ecological processes that support them. The classification is currently going out for peer review and the PAS Science Team is working on how it can be most effectively used in conservation planning.
- How climate change may impact the NWT: Partners of the PAS Science Team are working with the University of Alaska at Fairbanks to model how habitats in the Canadian north might change due to climate change. This information will be included in protected areas planning so that areas can continue to be representative of all habitats. This work is expected to be completed by 2011. Initial information can be found on the PAS website under the [Science/Climate Change tab](#).
- Trans-boundary analyses: Most of the Sahtu ecoregions are shared with other jurisdictions. The PAS Science Team does analyses based on all NWT ecoregions and can assist in jurisdictions working together to achieve ecological representation.

We ask that working to achieve ecological representation, and consideration of the above, be included in the work plan of the Sahtu Working Group.

### **Research on Achieving Ecological Representation**

There are still several areas within the Sahtu Settlement Area that the Marxan computer program selects more than either 30 to 89% or 90 to 100% of the time and which are not currently captured in any

existing protected areas, Proposed Conservation Initiatives or Conservation Zones (see Figure 3). Some of these areas were already described in Appendix 1 of the previous report Ecological Representation Analysis of Conservation Zones/Protected Areas Initiatives in the April 30, 2009 draft Sahtu Land Use Plan.



**Figure 3: Terrestrial coarse filter representation in ecoregions falling wholly or partially within the Sahtu Settlement Areas using the Draft 3 Conservation Zones and Potential Conservation Initiatives. Locations of additional areas consistently selected 90 to 100% of the time, regardless of scenario, are outlined in blue.**

As a first step, the main focus should be on confirming the infrequently occurring features and providing protection to irreplaceable areas consistently selected by the computer program (as described earlier and can be seen in both Figure 1 and 3).

We recommend that under 6.6 'Filling the Gaps' the following recommendation be added:

"Since some of the landscape feature datasets used for the ecological representation analysis have not been ground-truthed (field verified), the PAS Science Team recommends that an aerial survey, including some on-the-ground confirmations, be done to confirm that these irreplaceable areas contain infrequently occurring features within the ecoregion where they occur. If these features are confirmed, these areas should be adequately protected since they are vital to achieving ecological representation; understanding that additional areas would still be needed to fully represent the ecological diversity in the Sahtu ecoregions.

The PAS Science Team will provide more detailed information, particularly on which infrequently occurring landcover (or vegetation classes) are found in the irreplaceable areas to support the aerial survey.

The areas around these irreplaceable areas are also selected frequently (50 to 89% of the time) because the Marxan site selection software identifies places that meet all the ecological representation goals using the least amount of land possible. It is more efficient to connect to or build upon red areas and/or areas already set aside for conservation. These areas are important to protect to complete ecological representation using the smallest amount of land on the ground. Consideration should be given to surveying these areas at the same time as the irreplaceable areas.

It should be understood, that representation goals for all landscape features must be met in order to help protect the biodiversity in the Sahtu ecoregions."

Furthermore , we recommend that under 6.6 the following recommendation be added:

"The Board work with the PAS Science Team to ensure that freshwater biodiversity is adequately captured in conservation zones and other conservation initiatives."