Appendix 8: Interior Forest Analysis for FMU E8

Interior Forest Analysis

For FMU E8

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Introduction

The Interior Forest Analysis for FMU E8 was prepared by the Edson RIU for the Foothills Forest Management Area. The processes used were a combination of the process used by Tammy Kobliuk of the Forest Management Branch as described in her document "InteriorForestAnalysisProcedure.pdf" and input from Stephen Wills, Bill Tinge and Amanda Hamelink.

Grant Klappstein of ASRD in Edmonton developed the Seral Stages used.

Samuel Kennedy and Don Page were the GIS Technicians that prepared the spatial component of the analysis.

This document explains the GIS methodology used and contains a data dictionary for each of the datasets provided.

Please Note: The final output data has not yet been fully QC'd.

General GIS Methodology

The Net Landbase from FMU E8 (E8-NET4.shp) was used as the starting point for the analysis.

- **Seral Stages**
  - These were calculated based on Grant Klappstein's work in the Excel Spreadsheet "Provincial_seral_stages.xls"
  - The initial work did not account for some tree species in the FMU so Grant modified the tables to include them.
  - The "Mature" and older stands were considered "Forest" polygons while the "Regeneration" and "Young" stands were considered "Soft" edges unless they were less than 40 years of age (See Hard Edge Description).
- **Hard Edges**
  - Any Road buffer was considered a Hard Edge. Other buffered features were ignored because they were less than 8 metres.
  - *New roads were not added to this analysis.*
  - Non-Forest Stands. Queried for SP1 = "".
  - Any stands less than 40 years of age. This was taken from the planning manual.
  - Any stands less than 3 metres in height.
- **Soft Edges** (Non-Interior Forest Edges)
  - Any stand not already identified has a "Hard" Edge
  - "A" Density and Seral Stage is "Regeneration" or "Young" and >= 40 years of age.

- **Preliminary Preparation**
  - A check was done to ensure all polygons had an edge value

- The polygons were dissolved based on the Edge value to reduce the number of polygons and simplify the data

- **Buffering**
  - Both Vector and Raster buffering methods were used. The concepts are very similar between the two methods.
  - Vector
    - Pros & Cons
      - Conceptually easier to understand
      - Requires more processing time
      - Technically the processes are simpler
      - More precise. This may not always be a good thing as it may lead to slivers and may create larger contiguous polygons that are joined by very narrow corridors (i.e. 1 metre wide corridors).
    - The "Hard" and "Soft" Edges were each extracted into separate coverages and buffered 60 and 30 metres respectively.
    - The buffers were then "Unioned" with the Dissolved edges and "Forested" stands not within the buffers were extracted
    - The polygons >= 100 ha were extracted creating the final "Interior Forest Polygons"
  - Raster
    - Pros and Cons
      - Conceptually harder to understand by non-GIS users.
      - Slightly less processing time
      - Technically slightly more complex
      - Slightly less precise. The cells will generalize the line work of the polygons modifying the areas slightly. However, this generalization may help break up polygons that may be joined by narrow corridors (See the "Summary" Section)
    - A cell size of 5 metres was used.
    - The "Forest" polygons and the "Soft" and "Hard" Edges were all extracted into their own grid.
    - The "Euclidian distance" → straight line distance, was calculated for each of the Edges.
    - The areas within the Edges are set to NULL and Forested areas are set to 1.
    - The resulting data is then grouped into "Regions" → contiguous groups of cells.
    - The raster is converted to polygons, the linework is smoothed and areas >= 100 ha are extracted to create the interior Forest Polygons.

- **Cover Groups Within Each Interior forest Polygons**
  - The primary Species "SP1" was concatenated with the cover group "Cov_grp" into a new field in the Net Landbase coverage.
  - The data was then dissolved on this concatenated field. This creates contiguous polygons for each leading species of each cover group

- This data was then "Intersected" with the Interior Forest Polygons so that percentages of each cover group can be calculated for each Interior Forest Polygon.

Summary

Both the Raster and Vector methods produced 96 Interior Forest Polygons. The Vector method resulted in 55,688 ha .The Raster method resulted in 56,317 ha which is a difference of 629 ha.

For the most part the polygons between the two methods are near identical. The following examples show some of the differences.

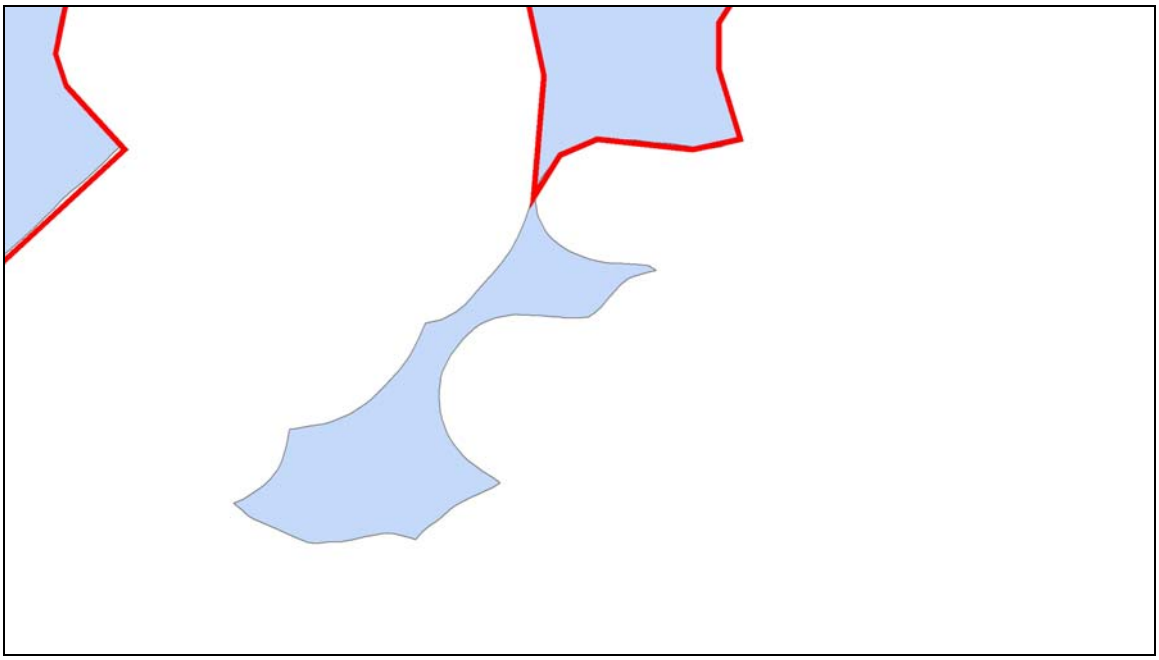

Figure 1: (and Figure 2) Example of how the Raster method (Red Outline) can break up polygons connected by narrow corridors.

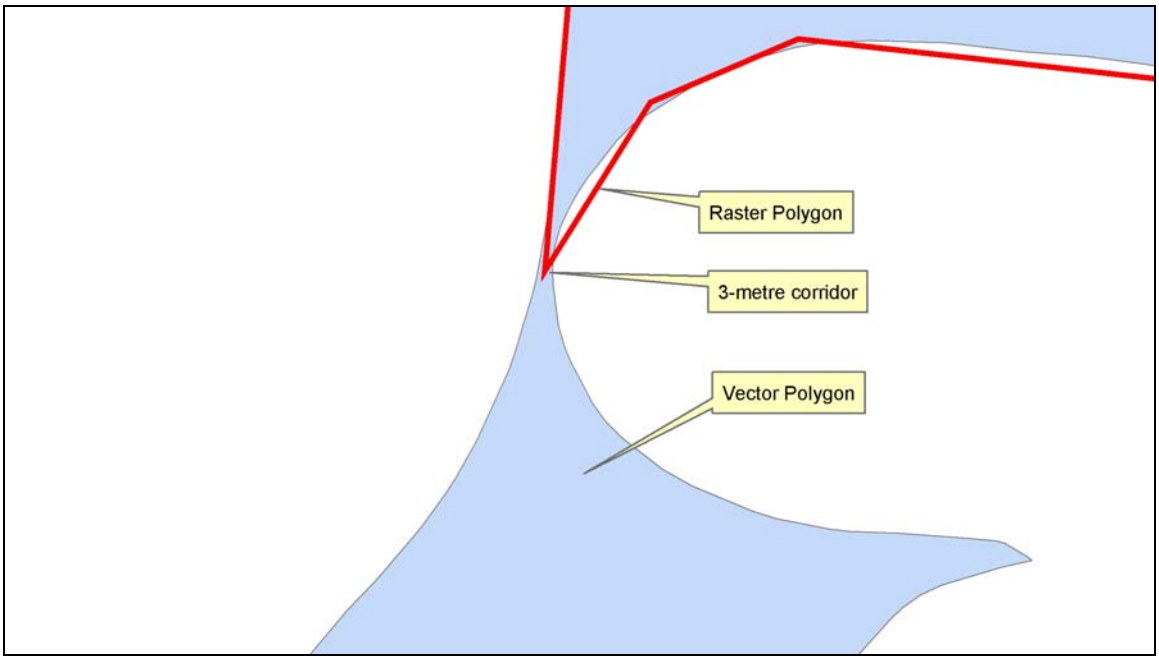

Figure 2: A zoom-in on the corridor in Figure 1.

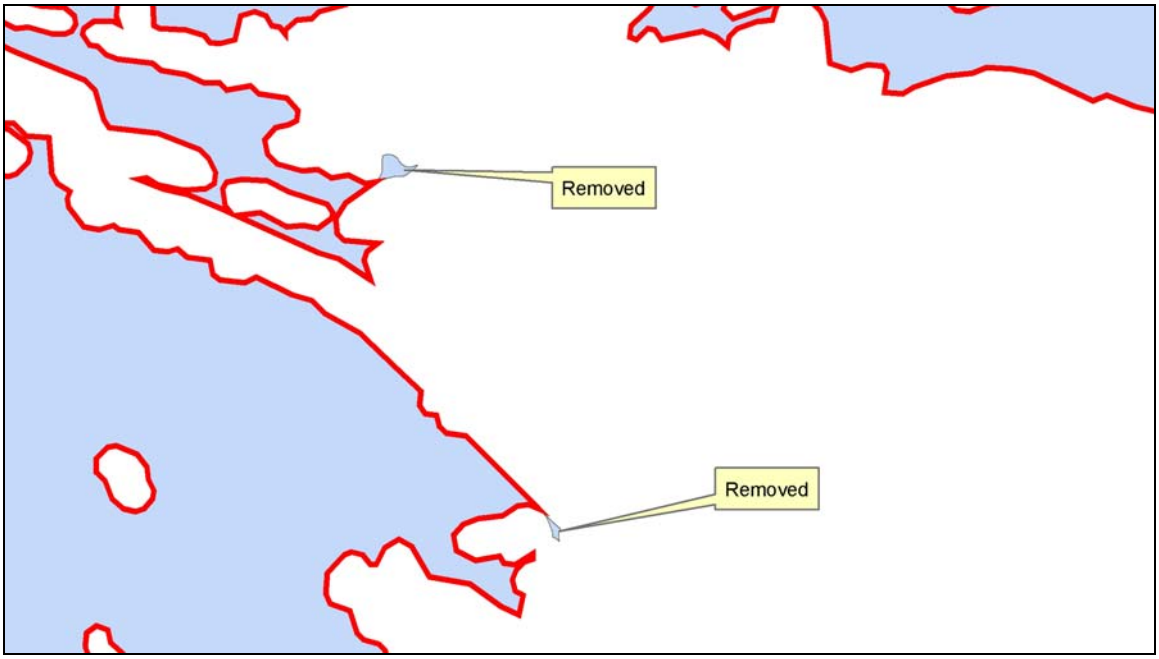

Figure 3: Another example showing how corridors are sometimes removed by using Raster.

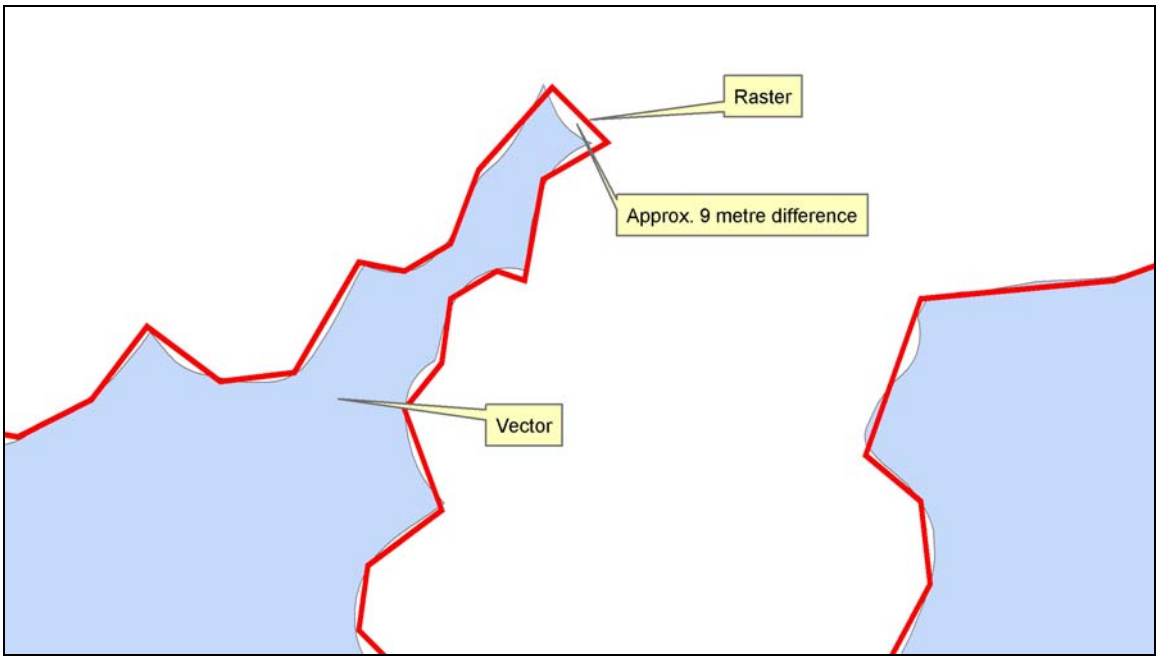

Figure 4: Difference between the smoothed Raster and Vector line work

Data Dictionaries

The following Tables explain the attributes and Values that can be found in each of the final products.

Interforest_v → The Interior Forest Polygons created using the "Vector" Methodology.

Field	Description	Values
Interforest_v-ID	Unique Identifier for each polygon	0 – Null Value (Donut Hole) 1 or greater -Unique Number for the polygon
Edge*	Indicates whether it is a forest polygon or a "donut hole"	FOREST – A Forest Polygon Blank – A Null value (Donut Hole)

Note: In Shapefiles, the NULL Values have been removed.

Interforest_r → The Interior Forest Polygons created using the "Raster" Methodology.

Field	Description	Values
Interforest_r-ID	Unique Identifier for each polygon	0 – Null Value (Donut Hole) 1 or greater -Unique Number for the polygon
Grid-code*	Indicates whether it is a forest polygon or a Null polygon	1 or Greater – A Forest Polygon -9999 – A Null value (Donut Hole)

Note: In Shapefiles, the NULL Values have been removed.

Inte_cov_grp → The Interior Forest Polygons (from the Vector Method) Unioned with the Cover groups.

Field	Description	Values
Cover-grp# & Cover-grp-id	The ArcInfo IDs from the Dissolved Cover groups	0 – Null Value (Donut Hole) 1 or greater -Unique Number for the polygon
Cov_grp_a	The concatenated Cov_grp value and SP1 value. Both from the E8-NET4.SHP	Standard ArcInfo Values
Interforest_V# & Interforest_v-id	The ArcInfo IDs from Interior forest poloygons	Standard ArcInfo Values
Edge*	Indicates whether it is a forest polygon or a Null polygon	FOREST – A Forest Polygon Blank – A Null value (Donut Hole)

Note: In Shapefiles, the NULL Values have been removed

Cover-grp → The Dissolved cover groups

Field	Description	Values
Cover-grp# & Cover-grp-id	Standard ArcInfo IDs	0 – Null Value (Donut Hole) 1 or greater -Unique Number for the polygon
Cov_grp_a	The concatenated Cov_grp value and SP1 value. Both from the E8-NET4.SHP	Standard ArcInfo Values
Interforest_V# & Interforest_v-id	The ArcInfo IDs from Interior forest poloygons	Standard ArcInfo Values
Edge*	Indicates whether it is a forest polygon or a Null polygon	FOREST – A Forest Polygon Blank – A Null value (Donut Hole)

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