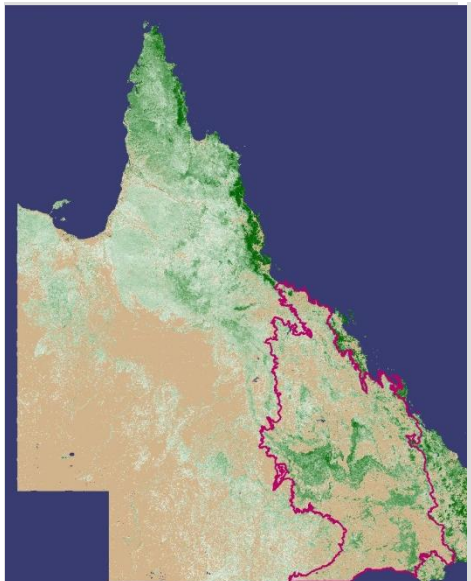
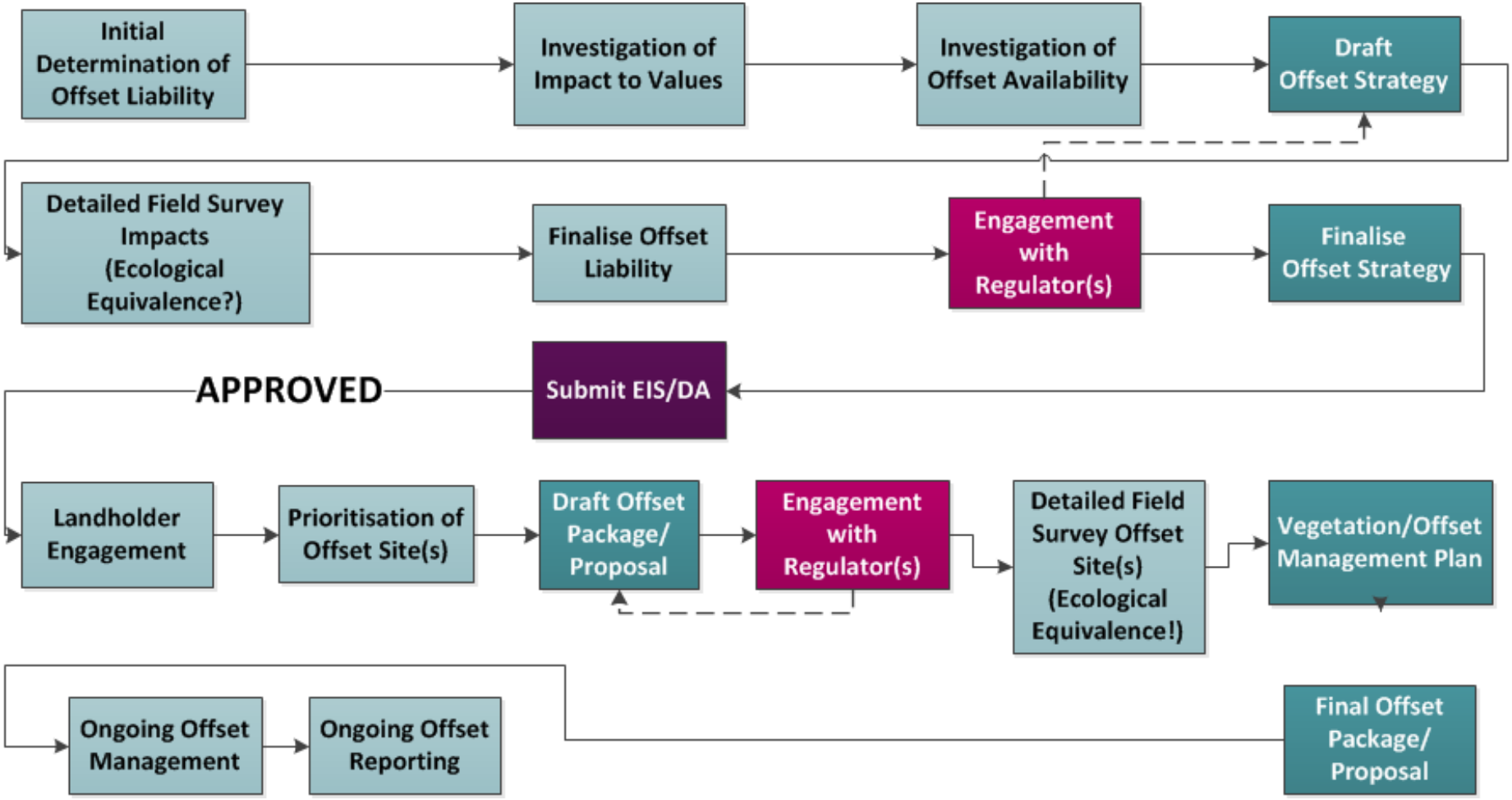
Where are the Trees & Which Ones do we Want?

9 August 2012

Tim O'Donnell
Offsets Analyst
Biodiversity Offsets Team



Offset Process



Offset Availability Analysis

- Fundamental Component of Offset Strategy
- Demonstrate to DEHP/SEWPaC an adequate availability of potential sites with offset values matching those being impacted

Woody vegetation + Offset Value(s) = Offset

Where in all of Queensland is the woody vegetation that can be used to offset my impacts?

Setting the Scene

Petit trou Mining Company

Clearing 15ha of RE 11.9.5 and 30 ha of Least Concern RE in BB (Bowen Basin or Brigalow Belt)

Required under BOP:
~15ha of Endangered RE
~20ha of Watercourse Vegetation
~30ha of NC Act Fauna Habitat

Required under EPBC Act:
~75ha of Brigalow TEC (5:1)
~30ha of MNES Fauna Habitat

Woody Vegetation + Offset Value(s)

Optimal Offset Vegetation:

- Regrowth (incl. PMAV Cat X land)
- Connectivity to remnant vegetation
- Strategic Biodiversity Corridors
- Minimal number of cadastral parcels

Woody Vegetation + Offset Value(s)

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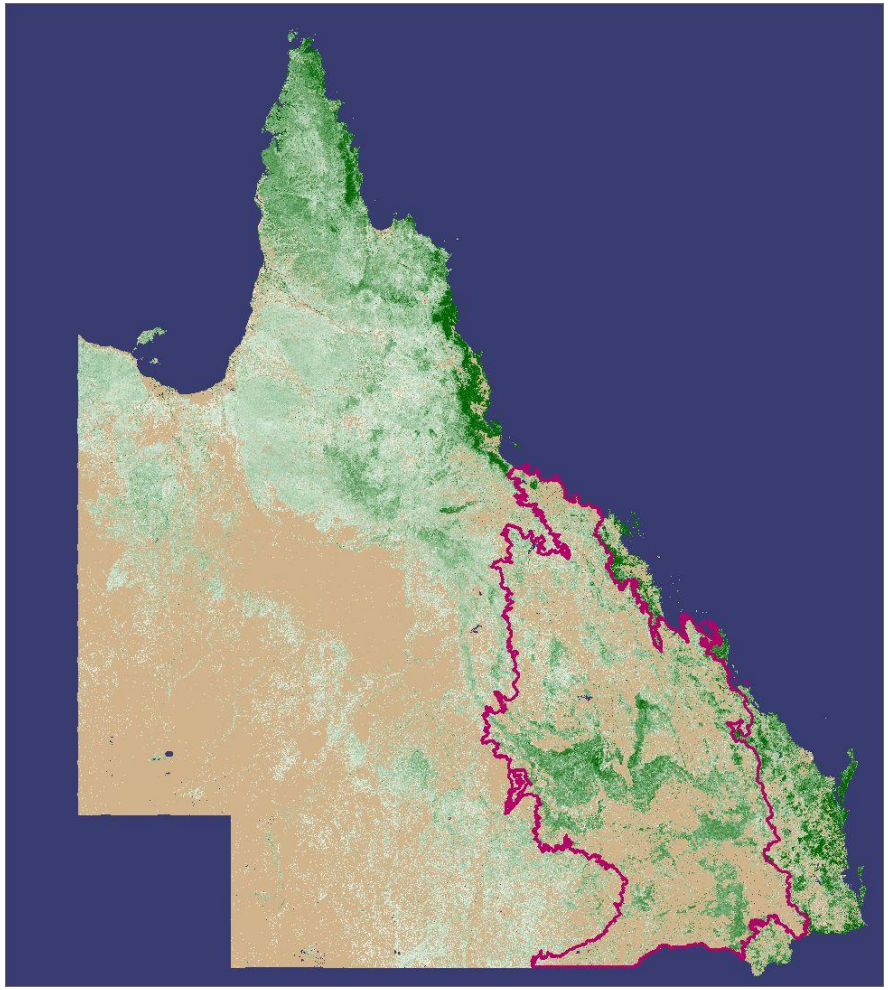
Optimal Offset Values:

- Mix of Remnant/Regrowth on pre-clearing REs of Brigalow TEC (EPBC); ***AND***
- Endangered VM Status BVG of the RE 11.9.5 (BOP); ***AND***
- Proximal to a watercourse with same or higher stream order than impact (BOP); ***AND***
- Reasonable habitat features

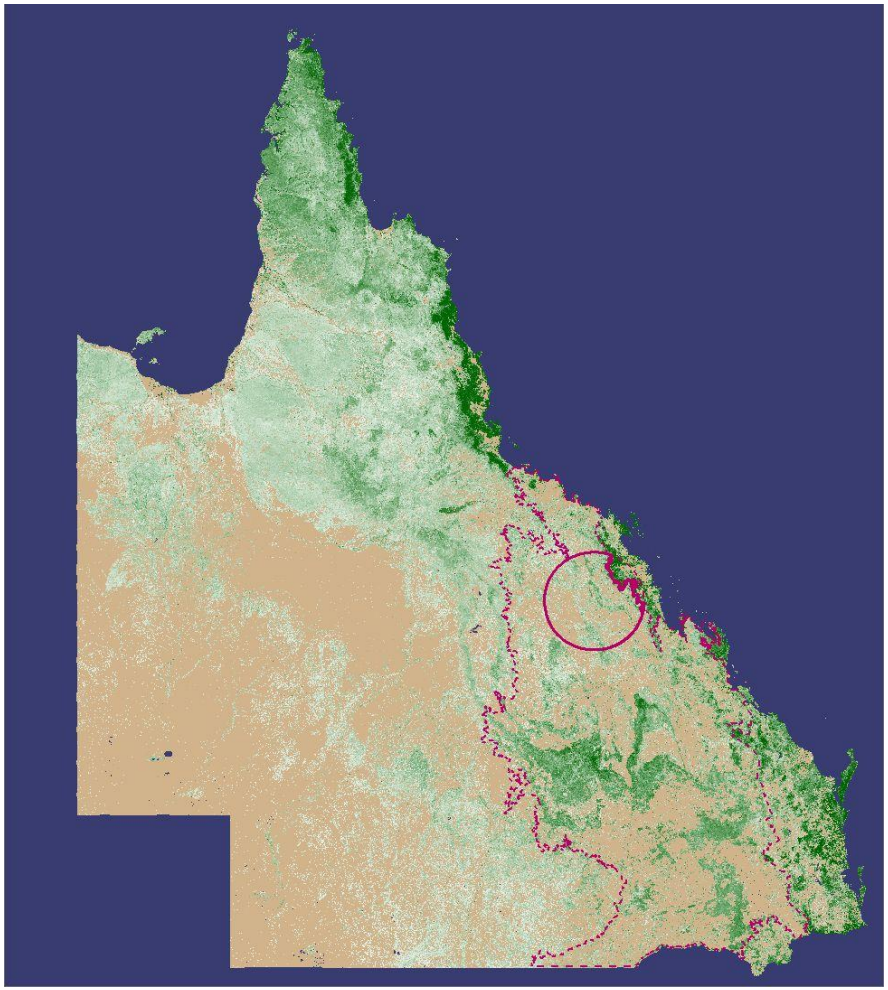
Woody Vegetation + Offset Value(s)



Define your Investigation Area

- Same Bioregion as Impact

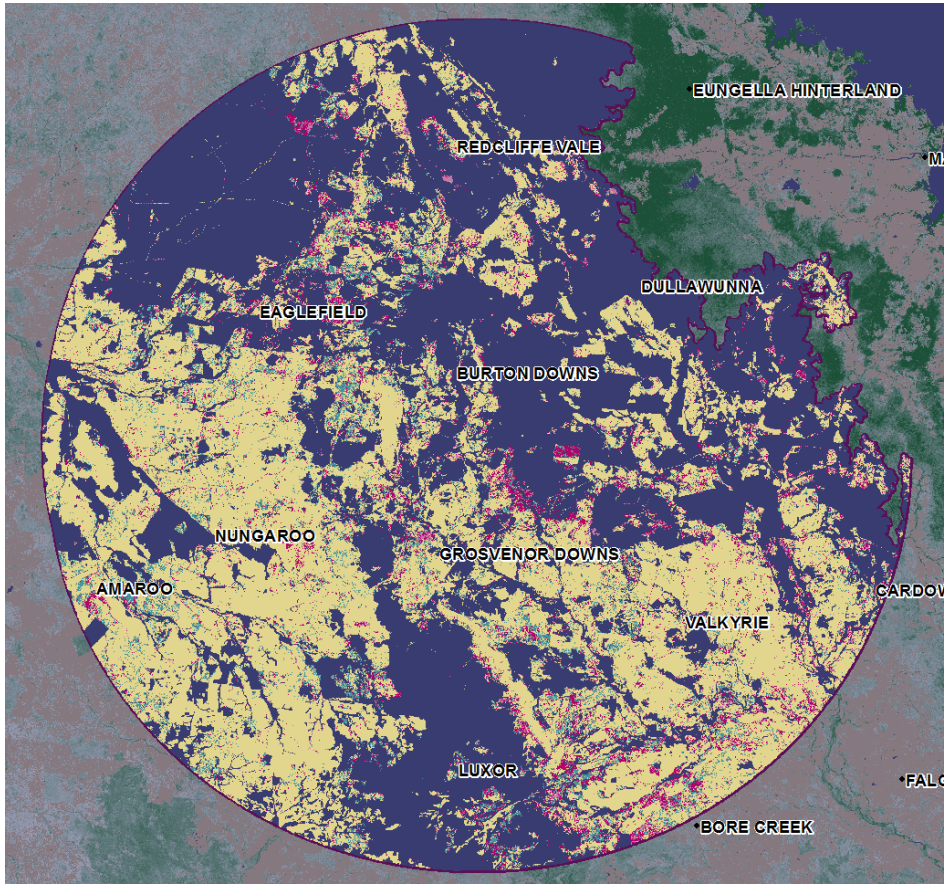
Woody Vegetation + Offset Value(s)



Define your Investigation Area

- Same Bioregion as Impact
- <100km from Impact

Woody Vegetation + Offset Value(s)



Define your Investigation Area

- Same Bioregion as Impact
- <100km from Impact
- Not constrained by Offset Policy
  - Remnant
  - HVR (Tenure, Essential Habitat, Stream Protection Zone, Wetland Protection Area, Slope >12%*)
  - Existing Protection (Estates, Nature Refuge, Offset Site)
  - Future Threat (Tenements)

Where are the trees Alisa?

Where are the trees?

Queensland is large (1.8M km^2)

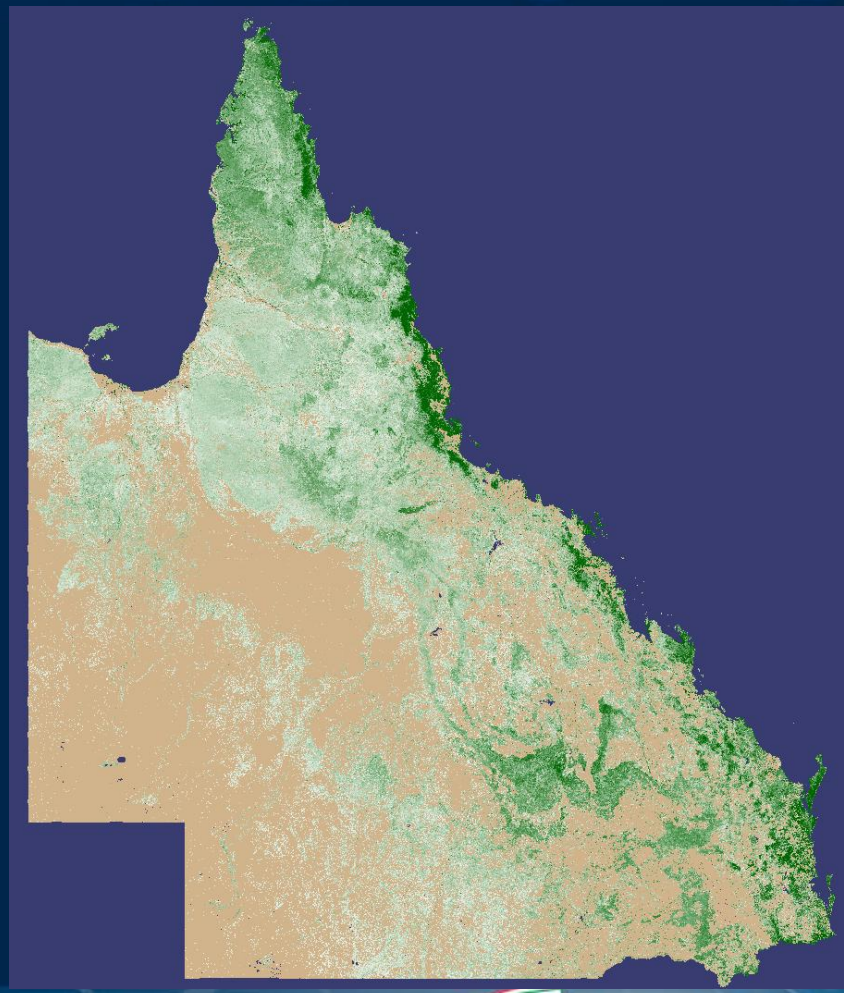
Fantastic existing Toolkit for locating trees State-wide:

- State-wide Landcover and Trees Study (SLATS)

- Regional Ecosystem (RE) Mapping

Need for an efficient approach:

- **Increase accuracies**
- **Be more informed at the Desktop**



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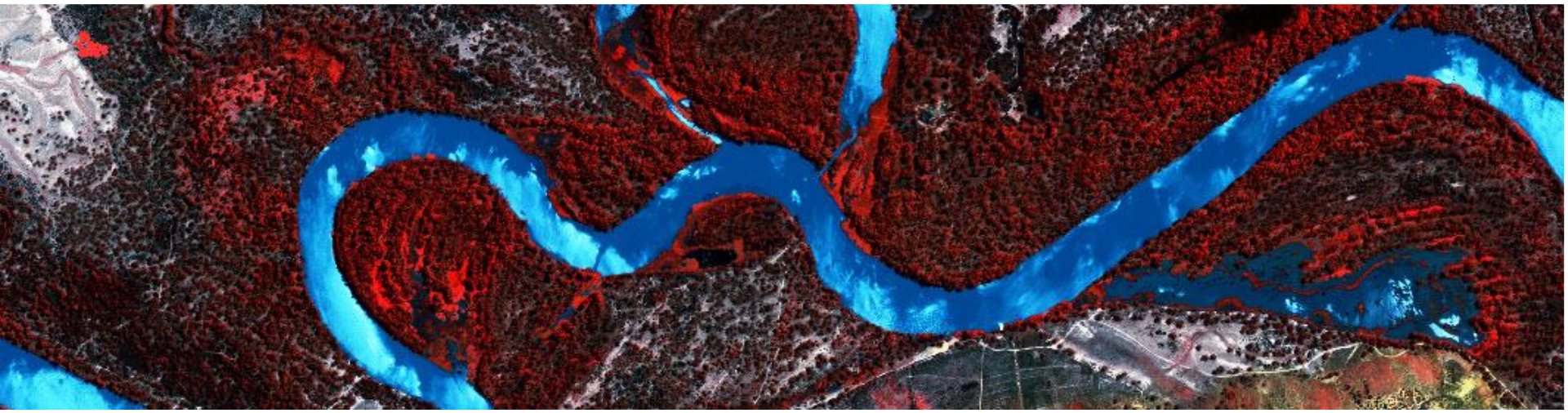
Where are the trees?
Even more sources of remotely sensed information to find them…



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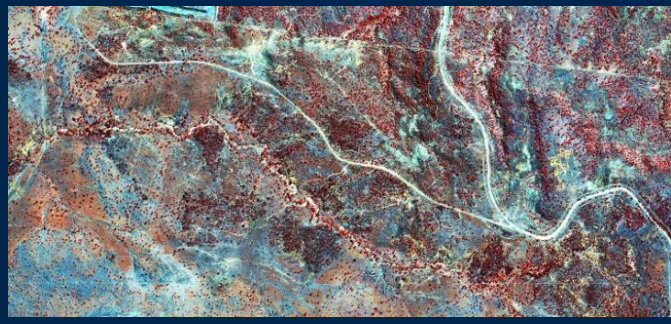
Additional datasets to inform desktop analysis

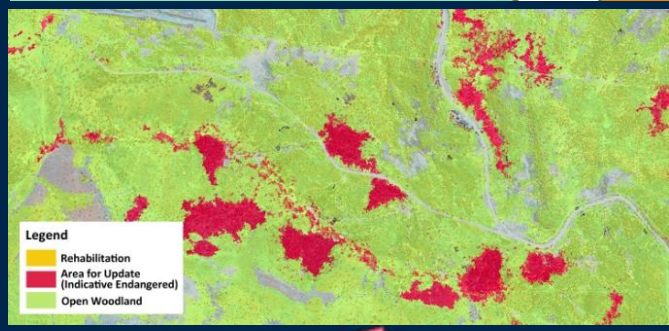
Constraints	Moderate Resolution derived Vegetation products (Landsat-derived)	Very High-Resolution derived Vegetation products (GeoEye-1, IKONOS, WorldView-2, Quickbird, Pleiades)
Spatial Scale	Landscape scale 1:100,000 (1ha)	Site scale 1:4,000 (0.004ha)
Temporal Scale	Bi-annual release of FPC (up to 2 years old)	Ad-hoc / on-demand
Classification Scale	Woody Vegetation: Presence/Absence Foliage Projective Cover	Detailed extraction of vegetation: Presence/Absence and Dominant Community Type
Benefits	Statewide Large area coverage	Detail at tree patch scale Refined delineation of Impact Area

Additional datasets to inform desktop analysis

Information from VHR satellite imagery can assist in providing:

- Refined and updated vegetation extent mapping to 1:4,000 scale
- Extraction of unique vegetation signatures from satellite imagery to assist in locating key communities of interest
- Can be used to refine total Impact areas





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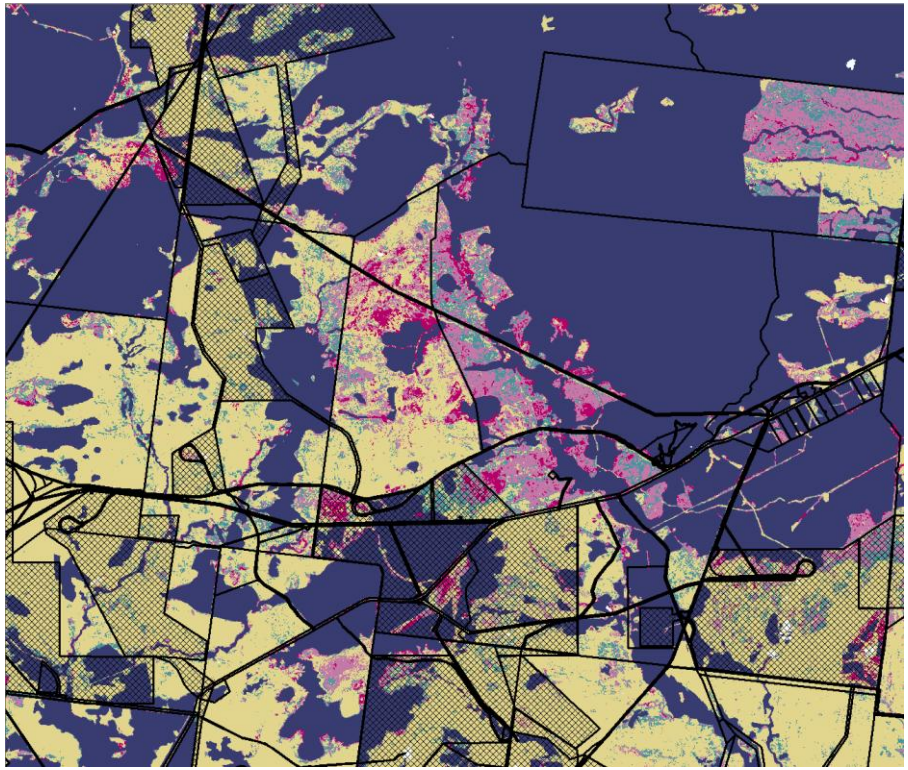
Woody Vegetation + Offset Value(s)

Desktop GIS:

- Intersection of “Trees” with vector layers (Pre-clearing RE, Watercourse buffers, Habitat modelling)



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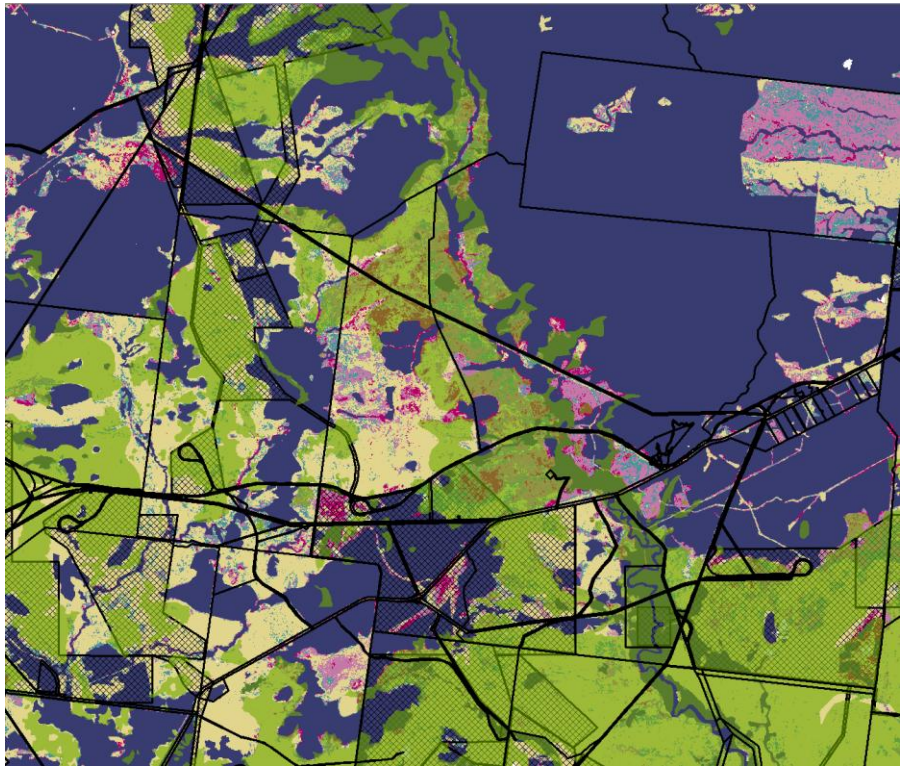

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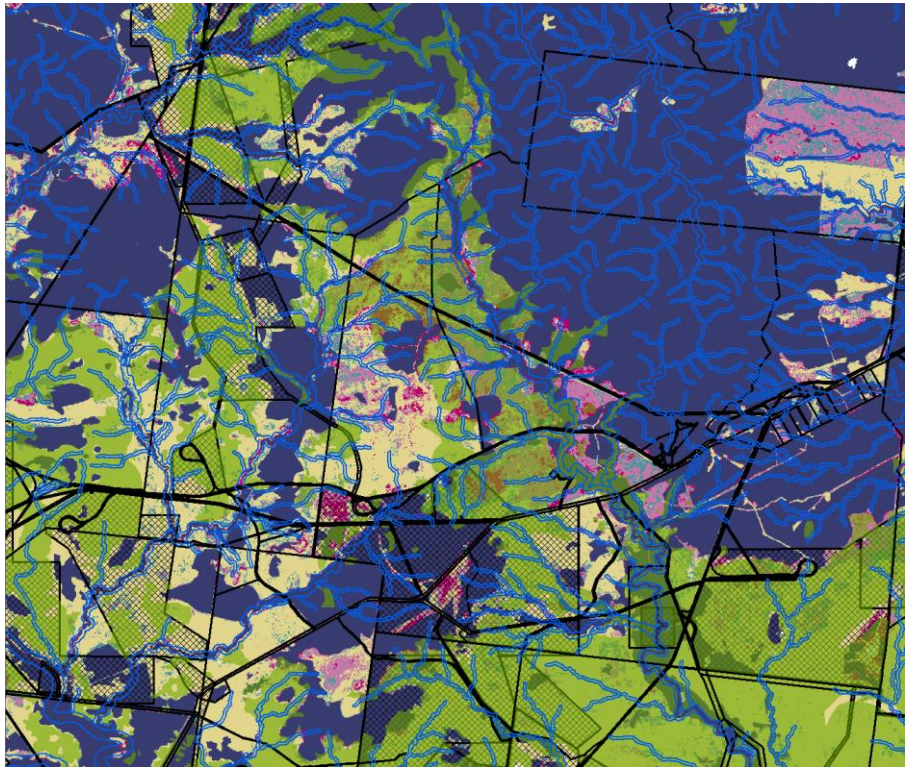
- Watercourse Buffers



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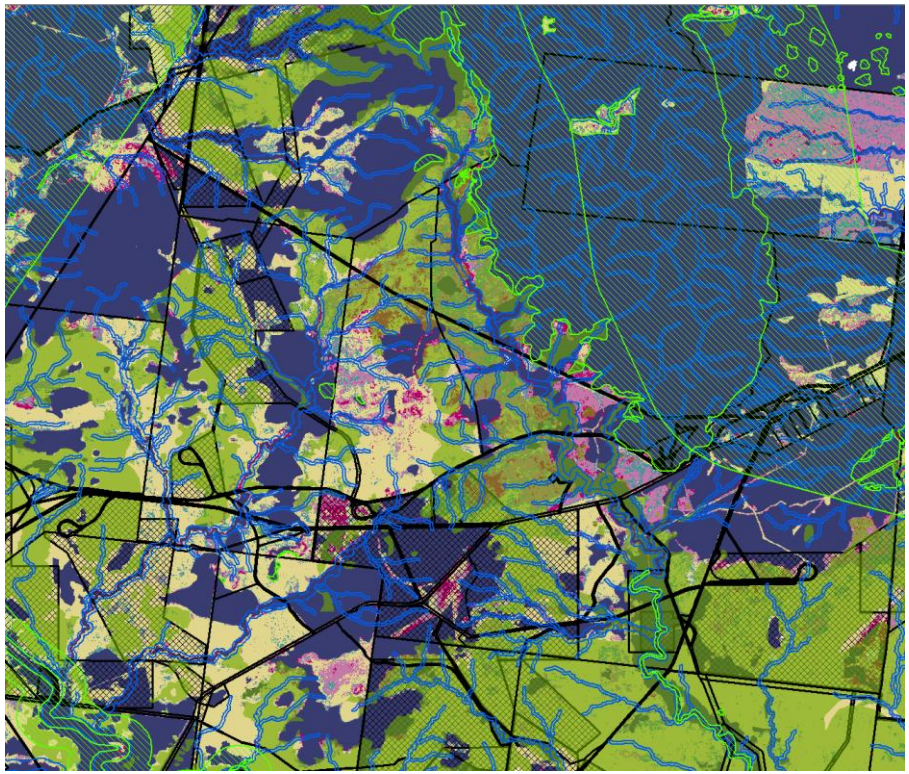
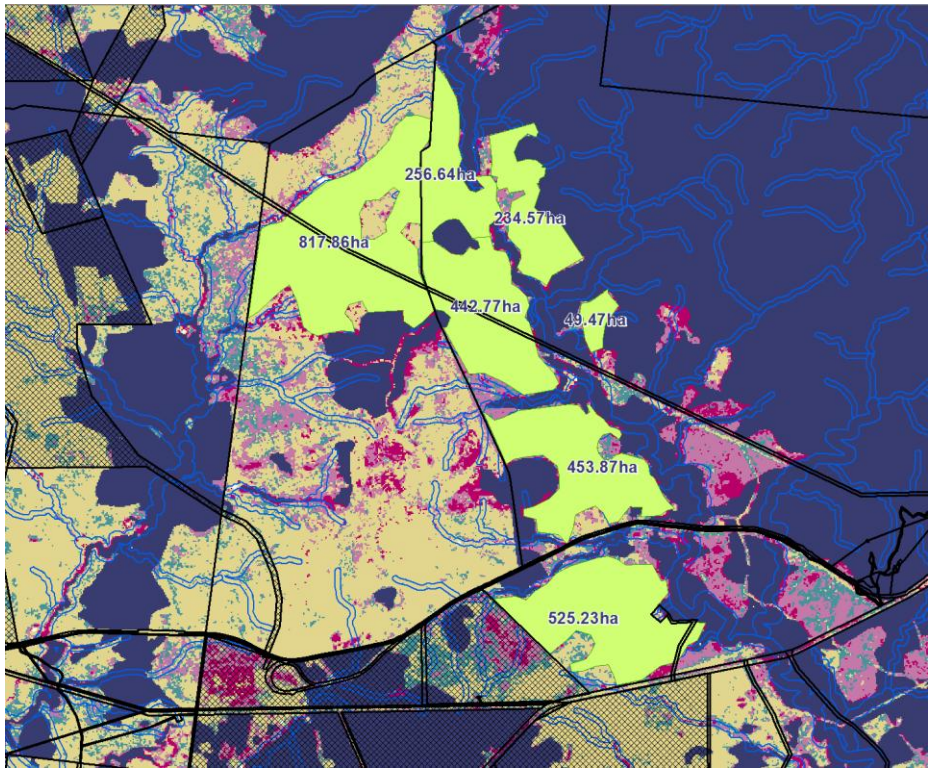
- Assign Priority based on Values (Special Features, Connectivity, etc)
- Summarise by Lot on Plan



Woody Vegetation + Offset Value(s)

- 3 Sites with over 500ha of potential habitat
- Refinement of areas with more detailed imagery
- Proximity to mining leases can be an advantage
- Only need one landowner to say yes to progress the process



BUT…

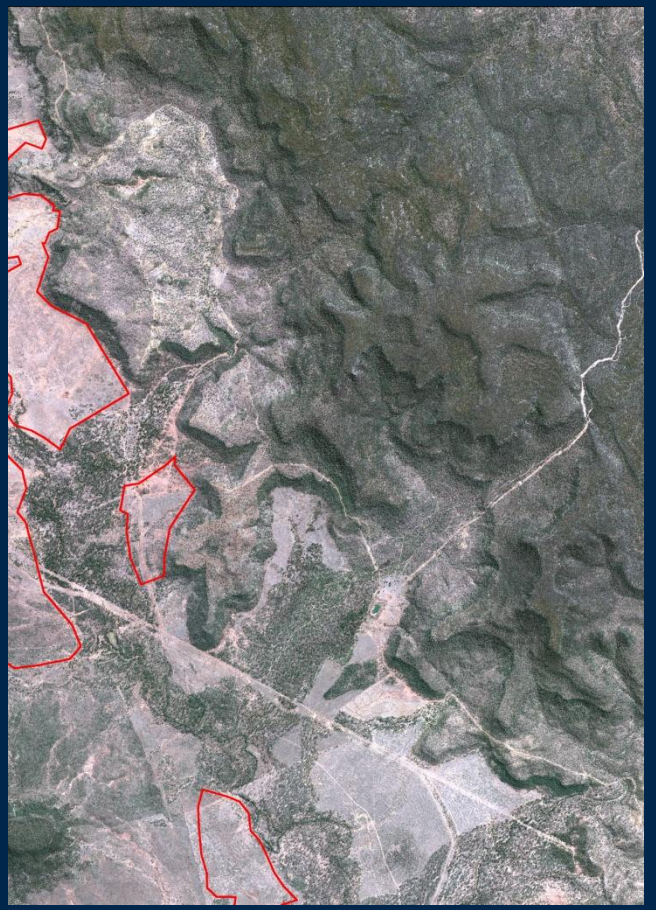
Less reliable in marginal/sparse communities (ie regrowth areas)

It is not the original intended use of the state-wide data

(room to be optimised for this purpose)

FPC <12% IS NOT woody vegetation

Pushing landscape-scale information to beyond its limits



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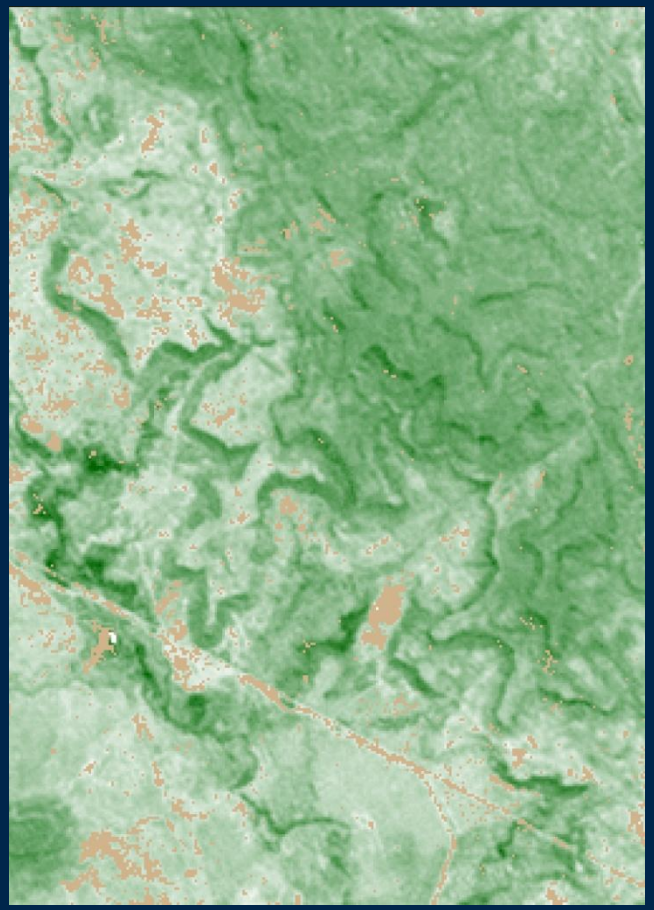
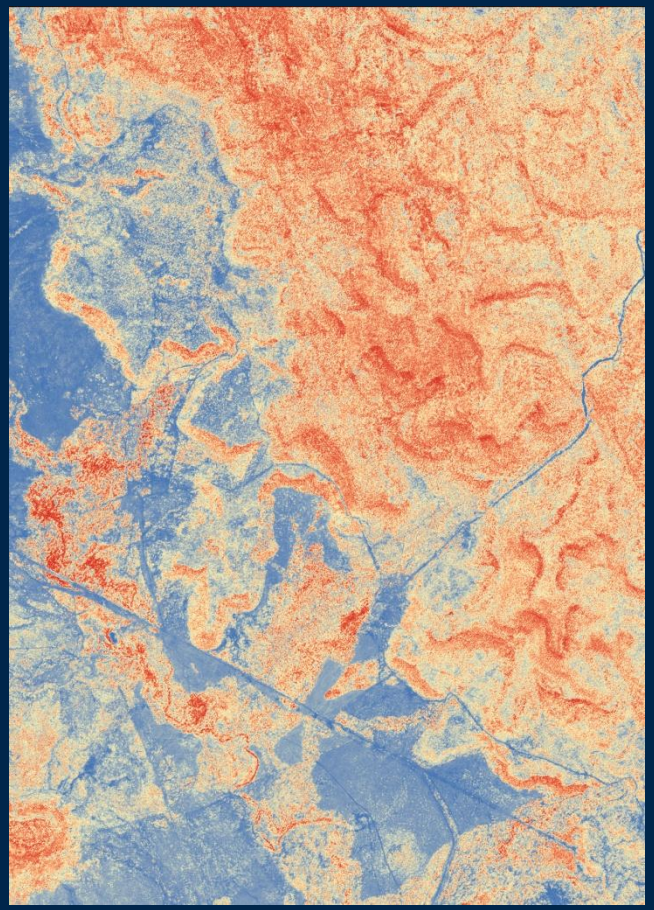
FPC Woody Extent and the Geoimage Detailed Vegetation Extent Product





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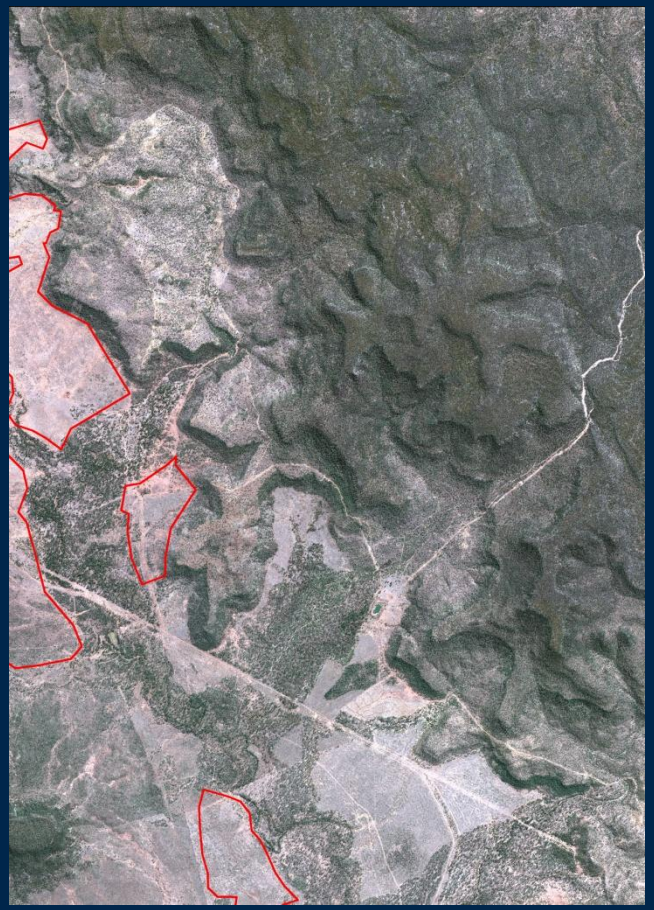
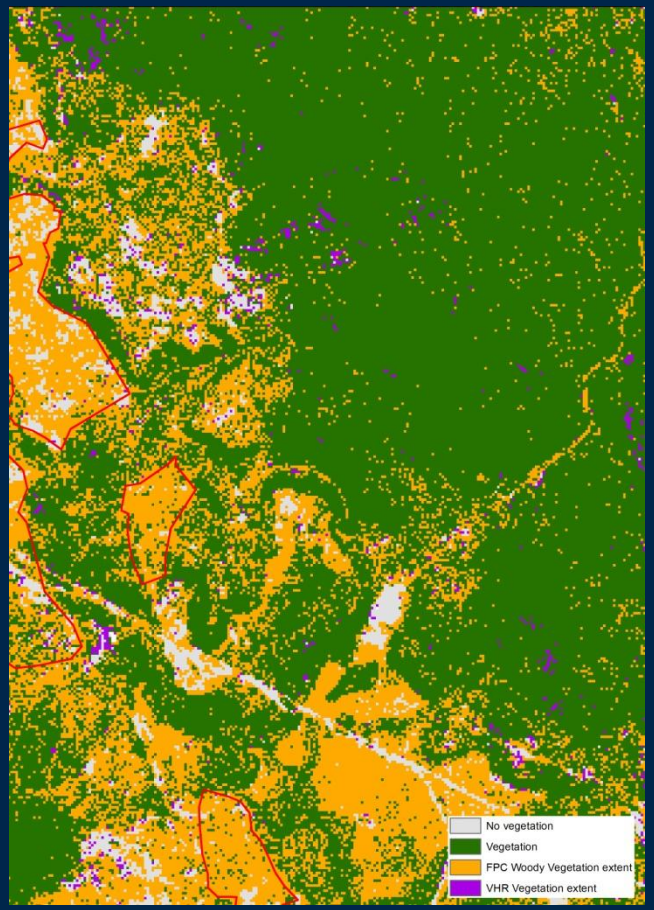
Geoimage Woody Vegetation + Offset Value(s)





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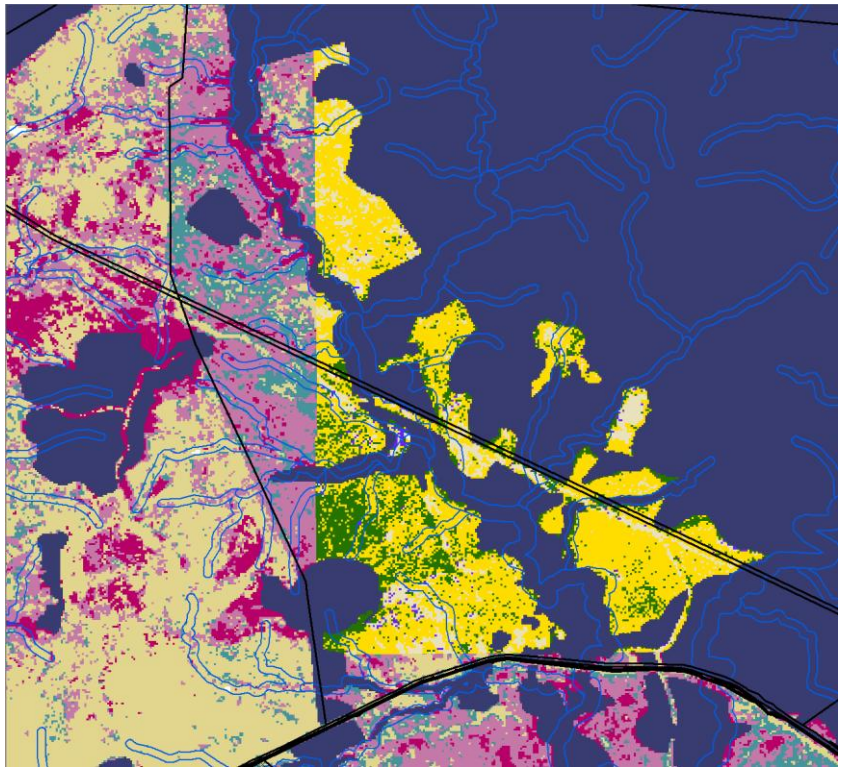
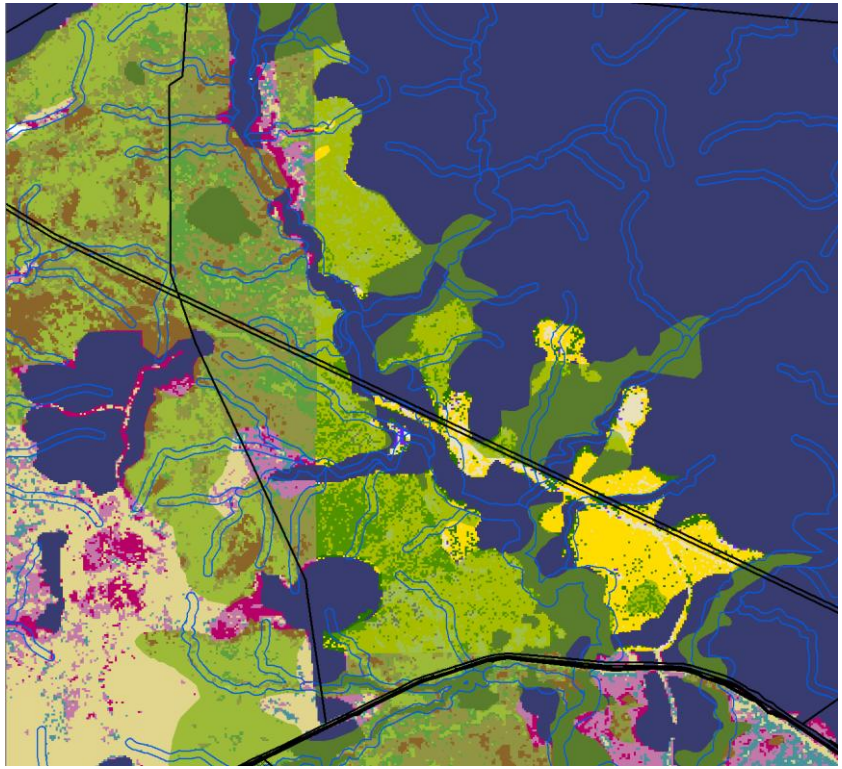
Woody Vegetation + Offset Value(s)

- Moderate match of SLATS FPC to VHR woody vegetation



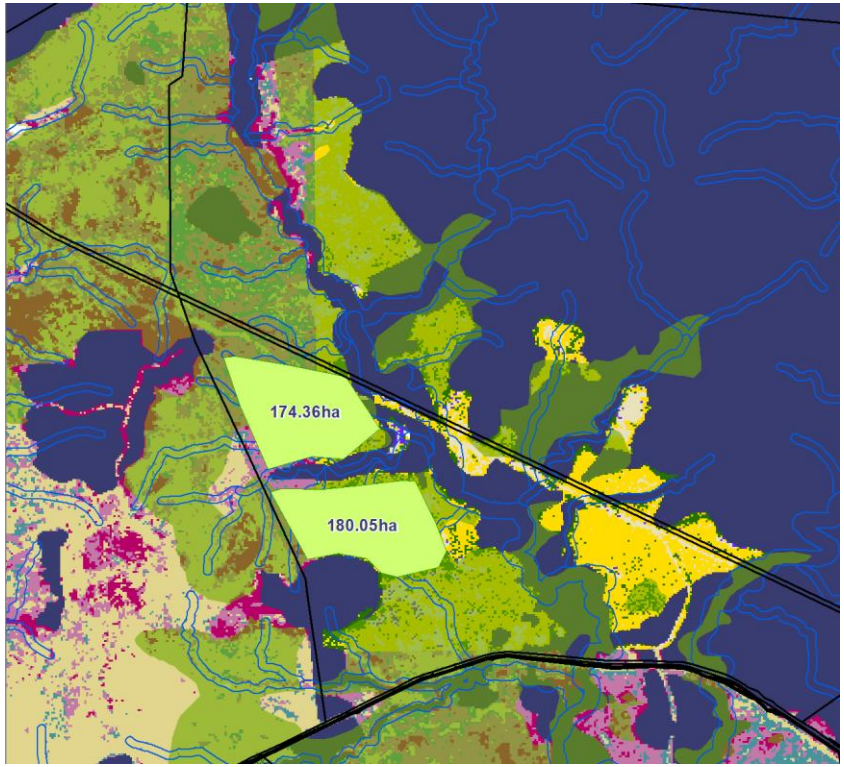
Geoimage Woody Vegetation + Offset Value(s)

- Moderate match of SLATS FPC to VHR woody vegetation
- Green areas highest confidence there are trees AND the desired offset values



Geoimage Woody Vegetation + Offset Value(s)

- Moderate match of SLATS FPC to VHR woody vegetation
- Green areas highest confidence there are trees AND the desired offset values
- Smaller offset site, but high confidence woody vegetation is present



Offset Availability Summary

- Analysis only represents approx. 25% of the offsetting process
- Demonstrate area (ha) of offsets contained within properties
- Additional Desktop analysis can be undertaken to improve your confidence in potential Offset sites prior to field.
- Outputs can be used to inform efficient and priority planning of field validation sites
- By use of the Geoimage Vegetation Extent Product in combination with Offset Value information:
  - We are locating extra sites that were not previously found using state-based data alone
  - Time (and money) is not wasted in the field by visiting sites that do not contain trees viable for use as Offsets

THANK YOU FROM AMEC AND GEOIMAGE

Contacts

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