**Soil Layers**

Habitat use for many species is directly affected by the type of soil and the vegetation that grows on that soil. As a result, soil information was used by ABMI when modeling variation in species abundance throughout Alberta. In addition, soil characteristics were used in gap analyses to priorize management actions. A variety of soil layers were used by ABMI.

*Surficial Geology of Alberta*

This GIS layer is a generalized compilation of the surficial geology of Alberta using published Alberta Geological Survey, Geological Survey of Canada, and Environment Canada information, as well as university theses data. Boundary discrepancies between information sources were largely resolved during the process of reclassifying the input data to a common legend with only limited remapping. This GIS layer was created at a scale of 1:1,000,000 and can be accessed at <http://www.ags.gov.ab.ca/publications/abstracts/Map_601.html>.

*Bedrock Geology of Alberta*

This GIS layer is a generalized compilation of existing geological maps and original geological mapping by Alberta Geological Survey staff. Mapping included field observations and creating three-dimensional models of subsurface stratigraphy based on the interpretation of geophysical logs from oil and gas wells. Each three-dimensional formation surface was projected to a model of the bedrock surface and the intersection formed the first approximation of the position of the geological contact at the base of the surficial deposits. These preliminary contacts were then adjusted to honour outcrop data and the interpretation of the bedrock unit immediately below surficial deposits in individual wells. This GIS layer was created at a scale of 1:1,000,000 and can be accessed at <http://www.ags.gov.ab.ca/publications/abstracts/MAP_600.html>

*Soil Landscapes of Canada*

Soil Landscapes of Canada version 3.2 was developed by Agriculture and Agri-Food Canada to provide information about the country's agricultural soils at the provincial and national levels. This GIS layer was created at a scale of 1:1,000,000 and can be accessed at <http://sis.agr.gc.ca/cansis/nsdb/slc/v3.2/index.html>.

*ABMI Soil Layer*

The Agricultural Region of Alberta Soil Inventory Database (AGRASID) was created by a collaboration involving the Alberta Research Council, Alberta Agriculture Food and Rural Development, Agriculture and Agri-Food Canada - Land Resource Unit, and private sector consulting firms. AGRASID consists of seamless GIS coverages and relational data files that describes the soil landscapes for the agricultural area of Alberta. The AGRASID soil landscape polygons and attribute data were compiled at a scale of 1:100,000 and can be accessed at <http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/All/sag14653>.

To enhance AGRASID for some counties in southern Alberta, the Government of Alberta created a soil polygon layer that has less detail, but higher spatial resolution (scale 1:50,000 for GOA higher resolution layer [unpublished information] versus 1:100,000 for AGRASID). The higher resolution information was interpreted based from remote sensed images with little or no ground truthing.

ABMI created a simplified GIS polygon layer to describe general soil characteristics throughout the Grassland, Parkland and Dry Mixedwood regions of Alberta. Based on soil name and soil correlation area from AGRASID, ABMI classified polygons to the 24 natural soil types used by GVI (Table 1). The crosswalks used to convert AGRASID information to GVI soil type are described in Excel tables (Grassland 2012, Parkland 2012, Dry Mixedwood 2013). For the counties with higher resolution information, that information rather than ARGASID information, was used to create the ABMI soil layer.

Only natural soil types were included In the ABMI’s soil layer. For polygons where natural soil type was missing, ABMI used historical information where possible (McNeil 2014). When historical information was not available ABMI used topography soil information from the surrounding area to assign natural soil types. The ABMI Soil layer can be accessed at (Peter upload the GIS layer from Daiyuan and include URL here).

**Table 1.** Description of the 24 native land/soil classes used by GVI, and mapped in the ABMI Soil layer.

| **Primary Class** | **Land Sub-Class** | **Site Type** | **Description** | **ABMI Code** |
| --- | --- | --- | --- | --- |
| Open Water | Lentic | Standing water | Permanent open standing-water with no emergent vegetation, generally larger than 1.0 ha and >15 cm deep. | LenW |
| Lotic | River | Open water of rivers, generally rivers wider than 20 m. | LtcR |
| Native / Natural  Lentic | Lentic | Temporary | Water present <3 weeks (dry by July) <15 cm deep. | LenT |
| Seasonal | Water usually present >3 weeks (usually dry by July) >15 cm deep. | LenS |
| Alkali | Water present >3 weeks and >15 cm deep | LenA |
| Semi-Permanent to Permanent | Throughout the year except during periods of extreme drought (present in autumn in 70% of the years); often occurs adjacent to LenW; includes the march zones; water is generally >15 cm deep; if open water is present it is smaller than 1.0 ha | LenSP |
| Native / Natural  Lotic | Lotic | Coniferous | Coniferous trees with a combined canopy cover of greater than 25%. | LtcC |
| Deciduous | Deciduous trees with a combined canopy cover of greater than 25%. | LtcD |
| Shrub | Shrubs have a combined cover of at least 10%. | LtcS |
| Herbaceous | Herbaceous species (including sedges) have a combined cover of at least 5%. | LtcH |
| Native / Natural  Grassland | Grassland | Subirrigated | Water table is close to surface during growing season, but rarely above. Does not have a defined depressional edge. | Sb |
| Overflow | Areas subject to water spreading and sheet flow. Typically on gentle inclines or terraces above the frequent flood zone. For locations where flood frequency is less than once every ten years. | Ov |
| Clayey | Clayey-textured soils including silty clay, sandy clay, clay, and heavy clay. Generally >40% clay. | Cy |
| Loamy | Includes loam, silt loam, silt, clay loam, sandy clay loam, and silty clay loam. | Lo |
| Sandy | Sandy-loam-textured soils. | Sy |
| Limy | Eroded or immature soils with free lime (CaCO3) at the soil surface. Soil pH generally >7.5. | Li |
| Sand | Loamy sand and sand soils, and not with a duned surface. | Sa |
| Blowouts/ Solonetzic Order | Areas with Solonetzic (hardpan) soils. The surface may or may not have eroded pits. | BlO |
| Choppy Sandhills | Loamy sand and sand soils with a duned land surface. | CS |
| Thin Breaks | Areas with bedrock at or near the soil surface. Amount of vegetation is intermediate between Limy and Badlands. TB may include thin, eroded or immature soils on gentle to steep slopes. | TB |
| Shallow to Gravel | Soil with 20 to 50 cm of a sandy or loamy surface overlying a gravel or cobble- rich substrate. | SwG |
| Saline Lowland | Areas with negligible vegetation due to electrical conductivity (salts) and/or sodium adsorption ratio limitations. | SL |
| Gravel | Dominated by gravels or cobbles (>50% coarse fragments). May be covered by a mantle <20 cm thick with some gravels. | Gr |
| Badlands/ Bedrock | Nearly barren or barren lands, with exposures of soft rock, hard rock, or surficial geology. Includes steep valley walls. | BdL |