

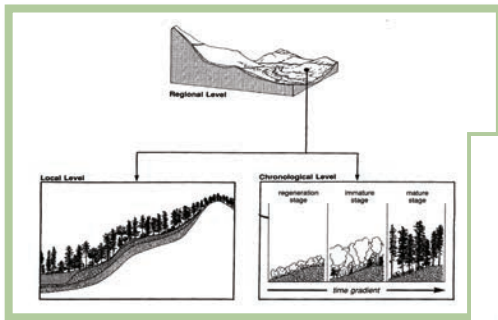
Ecosystem Mapping

What is Ecosystem Mapping?

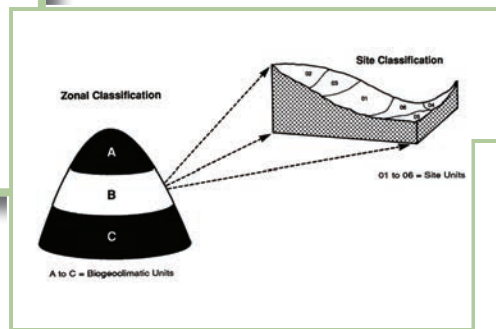
Ecosystem mapping is the stratification of the landscape into logical units based on ecological criteria and relationships over time and space.

An ecosystem can be any size or shape but its boundaries usually coincide with one or more natural boundaries. The entire planet is an ecosystem that is comprised of countless smaller, interconnected ecosystems.

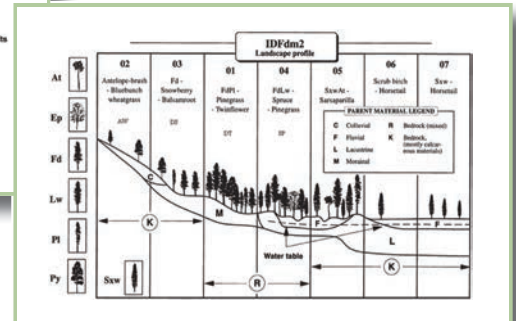
Ecosystems are a function of climate, topography, geology, soil, hydrology, vegetation, animals, microorganisms, and time. Ecosystem Mapping in British Columbia is built upon these relationships and the hierarchical Biogeoclimatic Ecosystem Classification (BEC) system. In different climates and sites, the same climax vegetation can occur because of the compensating effects of environmental factors. Ecosystem mapping links the regional climate and the local factors by mapping the 'site unit' (or map unit). Sites are mapped according to their potential to produce similar 'stable' plant communities given a regional climate. Site units are distinct communities – and form ecologically equivalent portions of the landscape that are relatively uniform in composition, structure and function.



Regional to local level



Relationship to site



Site classification level





Why Map Ecosystems?

- Provides knowledge of ecosystems and ecological relationships (both locally and regionally)
- Increases ability to communicate about the natural environment
- Is a framework for species assessments, wildlife interpretations, land planning, and resource management
- Improves ability to predict outcomes of various management scenarios on specific sites.

Key Considerations

- Common scales of ecosystem mapping are 1:20,000-1:50,000
- All ecosystem mapping, regardless of approach used, is only as good as the field data used to support it (i.e. the quality of the data collection program, the abundance and distribution of field plots), and understanding of ecological relationships within the mapping landscape.
- In addition, any ecosystem mapping should:
 - contain spatially explicit ecological information (as much as possible)
 - include information on map accuracy; preferably include an independent accuracy assessment
 - consider long-term data management, and
 - allow for updates as improved information becomes available.



Use Ecosystem Mapping for:

- ✓ Landscape planning
- ✓ Wildlife habitat identification and use
- ✓ Species and communities at risk conservation
- ✓ Site productivity estimates
- ✓ Wetland mapping and classification
- ✓ Traditional use site evaluation
- ✓ Reclamation/restoration planning
- ✓ Biodiversity monitoring

BC Terrestrial Ecosystem and BEC Links (2021):

<https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/ecosystems/tei-standards>

<https://www.for.gov.bc.ca/hre/becweb/>

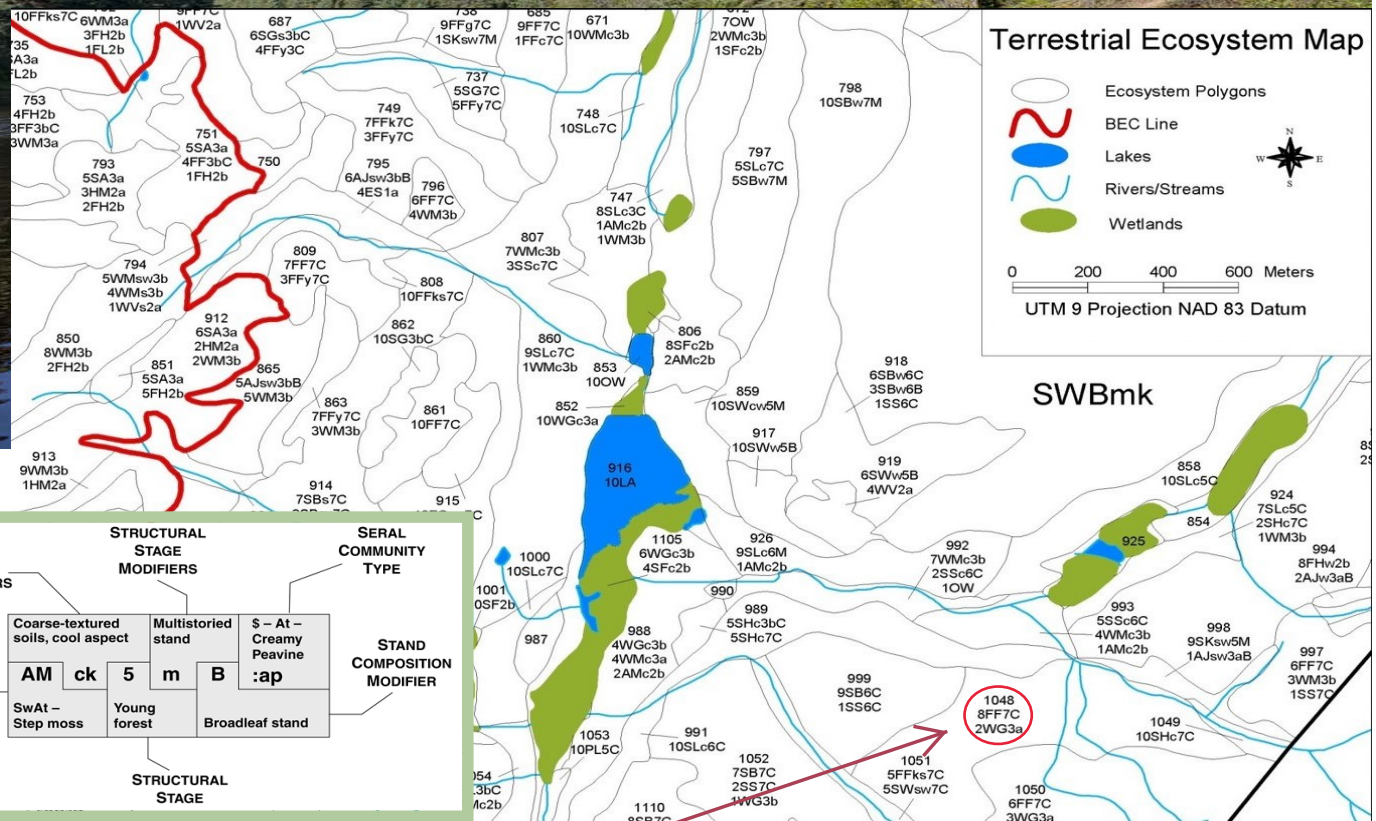


Terrestrial Ecosystem Mapping

What is Terrestrial Ecosystem Mapping (TEM)?

TEM is a standard approach to stratifying the entire landscape into map units according to ecological features using a combination of manual air photo interpretation and ground sampling (Province of BC).

TEM identifies, maps, and describes bioterrain features and ecological characteristics while interpreting the complex relationships within and among terrestrial and aquatic environments.



Typical TEM Map Unit Label

Keys to a Quality TEM Product :

- ✓ Appropriate field information (e.g., site, soil, vegetation, and wildlife data) collected at a level that matches mapping scale
- ✓ Digital aerial photographs obtained at a suitable scale for mapping
- ✓ Bioterrain mapping
- ✓ Ecosystem knowledge (understanding of ecological relationships in the area to be mapped)

Map Label Example: 8FF7C
2WG3a

*This drawn polygon contains two ecosystems:
80% is an upland (FF) unit that is old (7) coniferous forest (C), and 20% is a wetland unit (WG) that has a low shrub (3a) vegetation succession.*

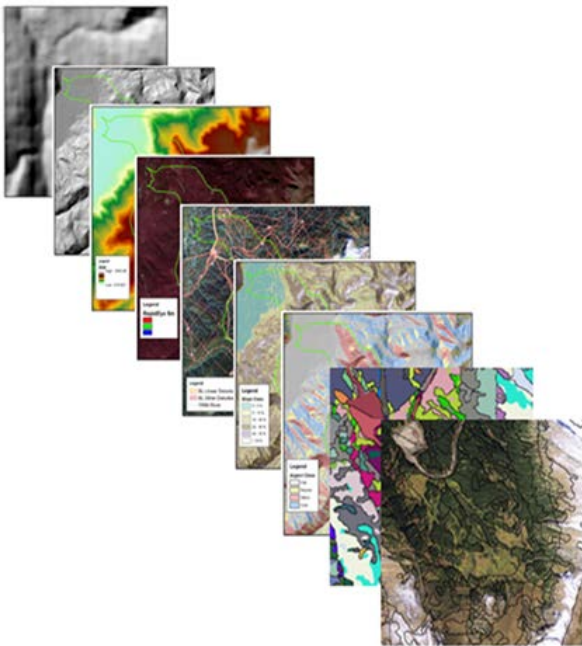
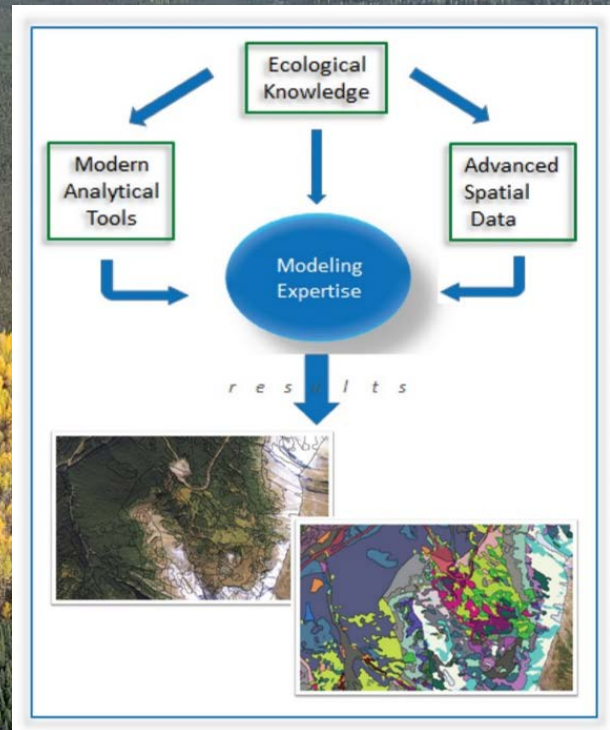


Predictive Ecosystem Mapping

What is Predictive Ecosystem Mapping (PEM)?

PEM is a method of ecosystem mapping that relies on a computer automated approach to predict ecosystems rather than manual photo interpretation methods to assign an ecosystem unit to a location.

PEM uses a combination of modern decision making tools, expert knowledge, and a combination of input data sources (such as: digital elevation modeling, remote imagery, forest inventory and soil data, and/or bioterrain material information), to derive ecosystem units



- Most modern PEM approaches predict a single ecosystem unit at each discrete location (pixel/raster) on the landscape.

- In PEM, ecosystem groups/classes may be mapped, rather than detailed ecosystem site units.

- Vegetation succession is often modeled separately.

Keys to a Quality PEM Product :

- ✓ Quality of input data used in modeling (currency, resolution, accuracy, coverage)
- ✓ Knowledge of ecological relationships in the area to be mapped supported by field data
- ✓ Modeling tools and skills



Sensitive Ecosystem Inventory

What is Sensitive Ecosystem Inventory (SEI)?

SEI is usually a photo-interpreted map product (developed similar to TEM), but can also be partially developed through modeling.

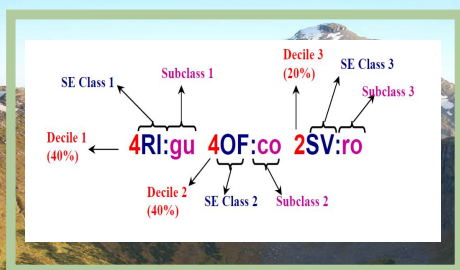
The primary objective of any SEI mapping is to focus on mapping only those ecosystems and features deemed to be the most vulnerable and rare in the landscape; thereby providing information for the conservation of ecological diversity.

Sensitive ecosystems include:

- a wide range of sites that are deemed important and unique within a particular geographical region
- those identified by the BC Conservation Data Center as endangered (red) and vulnerable (blue-listed)
- wetlands, old forest, riparian/floodplain units, alpine and subalpine areas, and grassland/brushland environments.

Rare ecological communities and ecosystems at risk are often poorly mapped and incompletely documented.

More About SEI:



This typical example SEI label contains three ecosystems:
40% is river (RI) that is gullied (gu), 40% is old (OF) coniferous forest (co), and 20% is sparsely vegetated (SV) rock outcrop (ro).

- ✓ SEI generally follows a standardized mapping approach similar to TEM
- ✓ The first step of SEI is to evaluate the sensitive ecosystems likely to occur in the landscape
- ✓ Clear objectives and plan is required prior to completing an SEI project
- ✓ The mapping level and map scale can vary, but may often range from 1:5,000-1:20,000
- ✓ Suitable digital aerial photographs are required
- ✓ SEI should be supported by field sampling.

