



Kootenay-Boundary BEC Update



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Background

- BEC mapping and site classification are fundamental to many forestry, planning, conservation, and environmental assessment initiatives.
- Due to improved knowledge and information, BEC has changed considerably over the past 15 years.
- The most current version of BEC mapping is version 8, released in January 2012 and available on GeoBC and BECWeb - <http://www.for.gov.bc.ca/hre/becweb/>. Users should check this site for updates each year or use the GeoBC (LRDW) website for the "official" version. NOTE: *no new changes have occurred in the Kootenay-Boundary region in this version.*
- In the Kootenay Boundary area, the most recent site series classifications are LMH 20 – Braumandl and Curran 1992 and, for the IDFxh4, ICHdw2, ICHdm, and ESSFdm, a supplement to LMH 20 – Braumandl and Dykstra 2005. These are available online at: <http://www.for.gov.bc.ca/hre/becweb/resources/classificationreports/regional/nequides.html>
- Over the next 1- 3 years, BEC users should expect changes to virtually all units in the Kootenay/Boundary.
- This update provides a summary of current and proposed changes to BEC in the Kootenay-Boundary Region.

BEC Revision Process and Progress

- The 1992 Field Guide for the Nelson Region was based on ~1250 sample plots.
- Between 1992 and present, ~ 8000 plots from a number of ecosystem mapping projects (TEM and PEM), SIBEC, environmental assessment, and others were obtained and incorporated into the Provincial Ecology Program database.
- Many of these data are not of sufficient detail for use in site series development, but can contribute to biogeoclimatic mapping.
- Additional, highly detailed data have also been collected by the Ecology program, including ~2300 new BEC plots.
- The database for the Kootenay Boundary Region now includes ~12,000 plots, almost 10 x the amount of data that was available when the last field guides were produced in 1992.
- The abundance of new information facilitates improved descriptions of units and supports both new subzone/variants and new site series.
- Changes have been done in consideration of extensive field data collection and in consultation with local terrestrial ecologists, foresters, and habitat specialists.

Anticipated Release

- Work is underway on production of a Field Guide for the West Kootenay – Boundary - Columbia portion of the Region.
- Work is beginning on production of a Field Guide for the Rocky Mountain Trench.
- It is hoped that both field guides will be completed and released in the 2013 or 2014 fiscal years
- No new mapping will be released until Field Guide materials are prepared and Chief Forester Reference Guide Stocking Standards have been revised.
- All new materials will be released with crosswalk tables linking the new system to the 1992 (and 2005) units.
- Please contact me if you would like to review new site series and mapping. Your input would be appreciated before new products are published.

Changes to Rocky Mountain Forest District (DRM)

- New BEC variants (MSdk1/dk2, ESSFdk1/dk2, IDFxh, IDFdK5, ICHmk4) were identified and mapped in BECv6 (2006) but official site classifications were not produced at that time and have yet to be completed.
- Draft site series were developed for all BEC units, new and existing, in DRM except ESSFwm, ICHdw1, ICHmw1, and ESSF woodland and parkland (Lloyd et al. 2006, updated in July 2007).
- These new classifications are currently undergoing review, adjustment, and correlation. Pending funding, a final classification is anticipated in 2013.

The following table summarises links between past and current *names* for each of the BGC units in DRM:

| Current BEC unit (mapped since 2008) ¹ | Historic BEC unit | Date name changed | Current Site Series classification to use (1992 ² unless noted) |
|---|-------------------|---|--|
| PPdh2 ³ | PPdh2 | No change since 1990s | PPdh2 |
| IDFdm2 | IDFdm2 | No change since 1990s | IDFdm2 |
| No longer exists | IDFdm2a | 2008 | IDFdm2 |
| IDFfk | IDFun | 2006 | ??? ⁵ |
| IDFdK5 | IDFdm2N | 2008 | IDFdm2 |
| ICHmk4 | ICHmk1 | 2008 | ICHmk1 |
| MSdk1 | MSdk | 2008 | MSdk |
| MSdk2 | MSdk | 2008 | MSdk |
| ESSFdk1 | ESSFdk | 2008 | ESSFdk |
| ESSFdk2 | ESSFwm and ESSFdk | 2006, 2008 | ESSFdk ⁶ |
| ESSFwm | ESSFwm | Currently under review | ESSFwm |
| ESSFdm | Mostly ESSFwm | 2003, site series Nov 2005 ⁴ | ESSFdm (Braumandl and Dykstra 2005) |
| ICHdm | ICHmw2 / MSdk | 2003, site series Nov 2005 ⁴ | ICHdm (Braumandl and Dykstra 2005) |
| ICHdw1 | ICHdw | dw1 in 2003; | ICHdw |
| ICHmw1 | ICHmw1 | No change since 1990s | ICHmw1 |

¹ As of BEC version 7; March 2008

² Use LMH 20 – Braumandl and Curran 1992 unless otherwise stated

³ Unresolved suggestion to change name to IDFxh3

⁴ An updated site classification will be released for these units with the next Field Guide.

⁵ Contact Deb MacKillop, Ecologist in Nelson if you have questions

⁶ ESSFwm is recommended for areas that were mapped as such in BEC v5 (2003); ESSFdk is recommended for the remainder.

Expected changes – IDFdm2, IDFdK5

- Based on field work and data analysis, we are currently proposing to extend the southern boundary of the IDFdK5 (previously mapped as IDFdm2N) to the Canal Flats / Columbia Lake area.
- This will separate the IDF into two units: one in the south that contains extensive Py and Lw; one in the north where these tree species are regionally sparse and where Fd growth is considerably improved.

Expected changes – ICHdm, ICHmk4, ICHmw2

- Small polygons of ICHmk4 in the southwest portion of the Cranbrook TSA will be included in the ICHdm. This includes the areas in the St Mary's River, Moyie Lake, Gilnockie/Yahk River, and Hawkins.
- There is currently a proposal to split the ICHmk4 in the Fernie area out from the ICHmk4 in the Golden/Radium areas and create a new unit (ICHmk5).
- The St Mary's Westfork will be remapped from ICHdm to ICHmw2.
- An updated site series classification will be produced for all of these units.

Expected changes – ESSFwm, ESSFdk, MSdk

- The ESSFwm will be split into multiple variants.
- The ESSFwm1 will occur in the Fernie / Elk Valley.
- The ESSFwm2 will occur in the central Purcell Mountains in the St Mary's and upper Jumbo valleys (and in the Kootenay Lake TSA). The upper sections of the Dutch, Toby, and Horsethief may be added (currently ESSFdk2). Woodland and parkland boundaries (ESSFwmw) will be reviewed and adjusted
- The ESSFwm4 (likely to be renamed) will occur in the transition zone between the ICH and ESSFwm2.
- The ESSFwm3 will occur in the northern Purcell Mountains in the Invermere and Golden TSAs (in areas previously mapped as ESSFwm, but currently – since BECv6 – mapped as ESSFdk2).
- Final site series will be developed for the ESSFdk1, ESSFdk2, MSdk1, and MSdk2.

Changes to Arrow and Kootenay Lake TSAs

Draft site series and mapping changes have been completed for the following biogeoclimatic units: **ICHxw, ICHdw1, ICHdm, ICHmw2, ICHmw4, ICHwk1, ESSFdm, ESSFwc1, ESSFwc4, ESSFwc5, ESSFwc6, ESSFwm.**

- Official mapping and site series will be released once correlation is complete and a new Field Guide is written.

ICHmw4, ESSFwc5, ESSFwc6

- South of the West Arm, the District Boundary has served as a BEC line since 2003.
- On the Kootenay Lake side, subzone/variants include the new ICHmw4, ESSFwc5, and ESSFwc6. In Arrow, similar units are still (officially) mapped as ICHmw2, ESSFwc1, ESSFwc4.
- Based on field sampling, the ICHmw4, ESSFwc5, and ESSFwc6 will be extended to include areas to the height of land north of the West Arm (in Kootenay Lake), from Coffee Creek to Slocan Ridge, and east to the Columbia River (in Arrow).
- A small area of ESSFwm was mapped near Kootenay Pass in DKL in 2003; this will be removed and remapped as ESSFwc5 and ESSFwc6.
- Following correlation, the ESSFwc5 and ESSFwc6 will likely be renamed (not wc).

ICHdw1, ICHxw, IDFun

- The ICHdw was separated into two variants when the ICHdw2 was mapped in Boundary in 2003. The existing dw classification was retained for the newly named ICHdw1.
- The classification for the ICHdw (dw1) was always quite sparse, with only 4 site series used to describe a highly variable unit.
- The ICHxw was mapped in the 1990s, but has never had a classification.
- The IDFun was mapped in the Syringa / Deer Park area, but also has never had a classification.
- Based on extensive field sampling, the ICHxw will be expanded to cover lower portions of what was previously ICHdw1 from the US border north to the Deer Park area, east along the north side of the West Arm to Balfour, north on the west side of the Creston Valley to Next Creek, east along Highway 3 from Creston to Goatfell, and along the lower elevations of Christina Lake.
- The previously mapped IDFun has been grouped with the east side of Christina Lake and the lower Pend d'Oreille into the ICHxw – warm phase.
- New site classifications will be provided for the ICHxw and ICHdw1. The ICHxw classification will be used for the ICHxw-warm phase, although a description of minor differences will be provided in the new field guide to help users identify site series and management differences.

ICHmw2, ICHwk1, ICHvk

- Draft site series were developed for these units as part of the Kamloops “wet belt” project (Lloyd et al. 2005).
- These drafts have been reviewed and changed; new versions have been completed for the ICHmw2 and ICHwk1 and are in progress for the ICHvk1.
- Minor mapping changes are expected with the ICHwk1 expanding into ICHvk1 areas in the upper Incomappleaux and Revelstoke reservoir.
- Significant changes to the ICHmw2 mapping are planned for Arrow/Boundary. A new unit will be described from the Monashee pass south to the US border and from Fauquier to Castlegar on the east side of Arrow Lake. This new unit, tentatively called ICHmw5, reflects a drier climate where PI and Lw are considerably more common and abundant. Cold air sites are also more frequent due to subdued terrain.

ESSFdc1, ESSFdw, ESSFwc1, ESSFwc4

- The ESSFdc1 has been mapped in the Okanagan Highlands since the 1990s.
- In 2003, the ESSFdc1 was expanded into the southern Monashees as part of BEC mapping updates for the Boundary TSA.
- The ESSFdc1 concept and existing boundaries will be shifted.
- The new ESSFdc1 will cover significant portions of the ESSFwc4 in the southern Monashee Mountains from Innonoaklin Mountain south to the US border as well as the Norns Range on the east side of Arrow Lakes.
- Areas in the eastern portion the Okanagan highlands will move to ESSFdc2 (largely in the Okanagan TSA and along the western edge of the Boundary TSA).

- In the southern Monashees and Norns Range, the ESSFwc1 has been mapped below the ESSFwc4 for many years. A change in this concept and pattern will correspond to the new ESSFdc1 mapping with a new unit tentatively called ESSFdw mapped below the ESSFdc1; this new unit will be expanded and will occur between the ICHmk1 or ICHmw5 (see above under ICHmw2) and the ESSFdc1.

ESSFwm, ESSFdm

- The ESSFwm is currently mapped in the Purcells, Fernie area, Beaver River (Glacier National Park), and South Selkirks.
- New mapping will remove the ESSFwm from the South Selkirks (replacing it with ESSFwc5 and ESSFwc6), and will split the remainder into several new variants.
- New variants will be mapped in the Fernie/Elk Valley (ESSFwm1), and northern Purcell Mountains (ESSFwm3). In the central Purcell Mountains, two variants will be mapped: the ESSFwm2 will cover the mid to upper areas, while the ESSFwm4 (likely to be renamed) will be mapped in the area transitional between ICH and ESSF (similar in concept to the existing ESSFwc1).
- New site series classifications will be provided for each of these variants.
- Mapping for the ESSFdm has only had minor changes, but a new set of site series will be released that clarifies the 01 and 03 variations and improves the characterization of the zonal ecosystem.

Woodland, parkland, Alpine (IMA)

- The "ESSF Woodland" concept was introduced to BEC in 2002 to describe the upper portion of the ESSF.
- Woodland stands have lower productivity and are considered beyond the upper "biological" operability line for timber harvest.
- In contrast, to the more open parkland above, the woodland has continuous or nearly continuous, open or clumpy canopies.
- Woodland is considered important habitat for caribou and grizzly bears.
- Woodland has been mapped throughout much of the province, including Kootenay Lake and Rocky Mountain districts. Woodland has not been mapped in Arrow (or Revelstoke).
- Using extensive field sampling, existing data, remote sensing, and modeling, the woodland boundary has been mapped in Arrow and adjusted (slightly) in Kootenay Lake.

Consistency between BEC lines at adjacent Districts

- Historically, BEC mapping revisions were developed on a district-by-district basis.
- Arrow and Columbia were last mapped in 2001, Kootenay Lake in 2003, and Rocky Mountain in 2008. In some areas, this has led to differences in mapped elevation boundaries between adjacent districts.
- BEC lines have been matched for consistency between districts and adjusted to create seamless boundaries across district, TSA, and TFL boundaries.

Changes to Boundary

Background

- The most recent mapping updates for the Boundary portion of DAB were completed in 2003.
- Major changes included the introduction of the IDFxh4 and separation of the ICHdw2 from the remaining ICHdw1. Although mapped in 2003, site series were not released until November 2005.
- The MSdm1a was also mapped in 2003 to differentiate areas with extensive cedar within the MSdm1. No site series have been developed for this unit, but interim direction has been to use the site classification from the ICHmk1 (from LMH 20 – 1992).
- Mapping changes in 2003 also increased the area of ESSFdc1 (and dcw, dcp), particularly to the east, reduced the area of ICHmw2, and eliminated the IDFxh1 (replaced with IDFxh4, which also now includes areas previously mapped as ICHdw and IDFd1).
- In 2008, the PPdh1 was renamed PPxh3.

ICHdw1, ICHxw, ICHxw-warm phase

- A new site series classification will be released for the ICHdw1.
- Lower elevation areas below the ICHdw1 will be remapped as ICHxw, a unit that will also become more widespread in Arrow and Kootenay Lake.
- The east side of Christina Lake was mapped as IDFxh4 in 2003; this area will be re-mapped as ICHxw-warm phase along with the warm-aspect area from Deer Park south to Robson and the lower elevations of the Pend d'Oreille. This new biogeoclimatic phase will use the same site series framework as the ICHxw, but the Field Guide will include a section describing differences in vegetation and management.

ICHdw2

- The ICHdw2 was first mapped in 2003 and described in 2005 (Braumandl and Dykstra 2005).
- An updated site series classification will be released for the ICHdw2 that includes better descriptions of wetter and drier units.

ICHmw5, ICHmk1, MSdm1a

- The areas currently mapped as ICHmw2 in the Boundary will be changed to a new ICHmw5; this unit is drier than the remaining ICHmw2, has more PI and Lw, and occurs within more subdued terrain with frequent cold air and higher SxBl. New site series will be developed.
- Areas mapped as ICHmk1 in the Granby Valley with abundant Hw will be included with the new ICHmw5.
- This will result in a reduced area of ICHmk1, although the MSdm1a will be remapped as ICHmk1, along with minor areas of MSdm1 where Cw is abundant.
- New site series will be developed for the ICHmk1.

ESSFdc1, ESSFdw, ESSFdc2

- The ESSFdc concept and existing boundaries will change.
- The new ESSFdc1 will cover the southern Monashee Mountains from Innonoaklin Mountain south through the Granby and Kettle to the US border.
- A new unit tentatively called ESSFdw will be mapped below the ESSFdc1 and above the ICHmw5 and ICHmk1 (see Arrow-Kootenay Lk section for more details on the ESSFdc1 and ESSFdw).
- Areas in the eastern portion the Okanagan highlands will be mapped and classified as ESSFdc2. Most of this area will be in the Okanagan TSA with small areas along the western edge of the Boundary TSA.
- The ESSFdc2 is much drier than the ESSFdc1, occurs in more subdued, plateau terrain, and has abundant grouseberry on most sites.

PPxh3, IDFxh4

- The PPxh3 (formerly PPdh1) is a very small unit that primarily occurs on warm aspects near the US border. Work is currently underway to reduce the area mapped as PPxh3, and to shift some areas into IDFxh4.
- IDFxh4 mapping is being adjusted with reductions in the Granby Valley (change to IDFd1 from X south) and removal of IDFxh4 north of Christina Lake townsite (change to ICHxw-warm phase).

IDFd1, MSdm1

- New draft site series were developed by Mike Ryan and Denis Lloyd (Kamloops) and will be released as part of the upcoming Kamloops Field Guide.

Changes to the Golden TSA

- For the Golden portion of DCO, most changes were last made in 2001, although extensive changes to the southern area were made in 2008 (BECv7) in conjunction with changes to DRM.
- Changes in 2008 are summarised in the following table:

| Current BEC unit as of BEC ver7, March 2008 | Historic BEC unit | Date name changed | Current Site Series classification to use (from LMH 20 – 1992¹ unless noted) |
|--|--------------------------|--------------------------|--|
| IDFdk5 | IDFdm2N | 2008 | IDFdm2 |
| ICHmk4 | ICHmk1 | 2008 | ICHmk1 |
| MSdk2 | MSdk | 2008 | MSdk |
| ESSFdk2 | ESSFwm and ESSFdk | 2006, 2008 | ESSFdk or ESSFwm ² |

¹ Use LMH 20 (1992 Field Guide) unless otherwise stated; ² Use ESSFwm for areas previously mapped as such (BECv5) and ESSFdk2 in remaining areas. Contact Deb MacKillop if you have questions.

- Draft site series for the new variants were produced (Lloyd et al. 2006, updated in 2007), but are being reviewed and adjusted prior to an anticipated release in 2013.

ICHmw1, ICHmk4, ICHwk1, ICHvk1, IDFdk5

- Pending funding, review of the ICHmw1 is scheduled to begin in 2012.
- A new site series classification is in progress for the ICHvk1.
- A new draft classification is complete for the ICHwk1.
- Minor mapping adjustments will be made for these units.
- There is currently a proposal to split the ICHmk4 in the Fernie area out from the ICHmk4 in the Golden/Radium areas and create a new unit (ICHmk5).
- The IDFdk5 southern boundary is expected to move from Brisco to Canal Flats with a new site classification expected (see Rocky Mountain District changes)

ESSFwm, ESSFmm

- Areas previously mapped as ESSFwm (BECv5 and earlier), but changed to ESSFdk2 (BECv7; 2008) will be mapped as a new ESSFwm3 with a new set of site series (see Rocky Mountain section for more details).
- New site series classifications will be produced for the ESSFwm3 and ESSFdk2.
- Site classification for the ESSFmm will be reviewed in conjunction with re-classification in the Robson Valley (date unknown).

ESSFwc2

- Mapping and site classification for the ESSFwc2 is under review.
- In the Kootenay-Boundary Region, the ESSFwc2 is extensive in the Golden TSA.
- In the Thompson-Okanagan Region, the ESSFwc2 is the dominant ESSF unit in the former Clearwater District, and occurs at the northern extent of the Okanagan TSA and former Kamloops District.
- The current ESSFwc2 includes an area of extensive mountainous terrain (the Golden TSA, the northern and eastern portion of the former Clearwater District, and the Okanagan TSA east of Seymour Arm) and an area of more subdued terrain (Kamloops and Okanagan TSAs south of Myrtle Lk).
- Data are being reviewed to determine if a variant split is necessary between these areas.

Woodland, parkland, Alpine (IMA)

- The "ESSF Woodland" concept was introduced to BEC in 2002 to describe the upper portion of the ESSF.
- Woodland stands have lower productivity and are considered beyond the upper "biological" operability line for timber harvest.
- In contrast, to the more open parkland above, the woodland has continuous or nearly continuous, open or clumpy canopies.
- Woodland is considered important habitat for caribou and grizzly bears.
- Woodland has been mapped throughout much of the province, including Kootenay Lake and Rocky Mountain districts.
- The ESSFv was essentially a woodland unit that occurred above the ESSFwc2 and was renamed ESSFwcv in BECv5 (2003).
- Woodland was not mapped in the southeast portion of the Golden TSA (or Revelstoke), although mapping is nearly complete.

Changes to the Revelstoke TSA

- The most recent mapping updates for the Revelstoke portion of DCO were completed in 2001.

Interim Draft Site Series for the "wet belt"

- Draft interim site classifications were developed for the following BEC units in 2005 (Lloyd et al): ICHmw2, ICHmw3, ICHwk1, ICHvk, ESSFwc1, ESSFwc4, ESSFvc, ESSFwc2, ESSFwcw, and ESSFvcw.
- Based on feedback from the Provincial Ecology Program, licensees, parks, and other agencies, some revisions were required and are currently underway.
- The interim site series that were previously available on a government FTP site have been rescinded and are not to be used for any new mapping or management applications.

ICHwk1, ICHvk1

- New site series are being developed for the ICHwk1 and ICHvk1.
- Mapping will change slightly, with expansion of the ICHwk1 from the Goldstream to Mica Village, including the warm aspect face of the Bigmouth.

ICHmw2, ICHmw3

- The ICHmw2 covers a very small portion of the old Revelstoke District.
- Proposed new mapping will change the polygon on the east side of Arrow Lakes to ICHmw3; the polygon on the west side will remain ICHmw2.
- New site series have been developed for the ICHmw2.
- The ICHmw3 will also expand slightly along the Revelstoke reservoir.
- New site series will be developed in conjunction with Mike Ryan, Ecologist in Thompson-Okanagan Region.

Woodland, Parkland, Alpine (IMA)

- One of the most significant issues with BEC in Revelstoke is the lack of ESSF woodland mapping, especially in the extensive area that should be mapped as ESSFvcw (see Woodland mapping in Arrow section for a description of woodland issues).
- Work to identify the woodland boundary is underway, using existing data, remote sensing, field work, and modeling.
- Re-evaluation of parkland and alpine (IMA) boundaries is being done simultaneously.

ESSFvc

- The ESSFvc is the dominant ESSF unit in the Revelstoke TSA. With new woodland mapping, the upper (typically inoperable) portions have been removed.
- New site series are under development based on almost double the number of previously existing plots.
- Mapped boundaries between the ESSFvc and ESSFwc2 are also under review, given new information on the extent of Hm.

ESSFwc2, ESSFwc1, ESSFwc4

- The ESSFwc1 and ESSFwc4 are currently mapped south of Highway 1.
- Plot data and field sampling show extensive Hm south of the Illecillewaet River and east of Mt MacKenzie, suggesting a shift to ESSFvc or a new variant that includes the mountainous portion of the ESSFwc2 (see comments in the Golden section above).
- The ESSFwc1 and ESSFwc4 are planned to remain mapped on the west side of the Columbia south of Highway 1.
- New site series have been developed for the ESSFwc1 and ESSFwc4.
- Site series for the ESSFwc2 will be developed once mapping issues are resolved.

