Kamloops Future Forest Strategy II – K2
Business-as-Usual Regeneration Strategy & Stand Unit Descriptions

June 7, 2011

BUSINESS-AS-USUAL (BAU) REGENERATION STRATEGY BY STAND UNITS AND ECO GROUP

The following summary explains the method of regeneration first, followed by the planted trees that were forced as regeneration on the site (averaged by area across the unit). This is followed by the average inventory breakdown of trees that successfully established based on follow-up regeneration surveys. More information on the data used is found in the footnotes.

A. DRY Fd Dominated Group (IDFxh, PPxh) – 4% of Case Study Area:

Fd-Broadleaf (20% or more broadleaf) – use TACA IDFxh mesic

(8% of Eco group by area, and 0.3% of Case Study Area)

Regeneration - NO or very limited harvesting is presently done in this stand unit – natural regeneration is a result of disturbance or pulses during years of accommodating spring conditions.

Inventory Ep 2366[1], At 1775, Fd 1183 (can add in *Py 300 sph*) – this is from two stands ~ 9% of the area

Fd-Py & Py-Fd (at least 20% Py) – use TACA PPxh mesic

(21% of Eco group by area, and 1% of Case Study Area)

Regeneration – often single tree selection or some variation thereof. No harvesting reported in PP, this direction is from the IDFxh.

Planted – Fd 53% Py 36% Pl 8%(?) not sure where the Pl was planted – it is not on the BEC list for this subzone other than for hygric sites – so not sure why it was planted? MAY WANT TO IGNORE THE Pl FOR THIS.

Inventory – Fd 667, Py 296, At 84 (~ 13% of the area)

[1] The value provided after the species is an average of stems per ha from a listing of inventory labels for this type since January 1, 2000 to September 2010 as provided from RESULTS. Summary numbers were created for similar species mixes provided by BEC units from RESULTS. Average sph provided is either the average for the species mix (weighted by area for sph by standards unit) or a composite of similar species combinations (estimated). Additionally species not identified in the inventory but are considered ecologically suited are provided in italics with a nominal sph value. These are put in to test suitability.

Fd dominated (Fd>80%) – use TACA IDFxh mesic

(54% of Eco group by area, and 2% of Case Study Area)

Regeneration – often single tree selection or some variation there of

Planted[2] – Fd 53% Py 36% Pl 8% - not sure where the Pl was planted – it is not on the BEC list for this subzone other than for hygric sites – so not sure why it was planted? MAY WANT TO IGNORE THE Pl FOR THIS.

Inventory – Fd 1000 (est) – this is for layers 1-4, layer 1 averages between 100 and 400 sph. *Py 200* (~ 20% of the area).

Conifer-other. – use TACA IDFxh subhygric

(18% of Eco group by area, and 1% of Case Study Area)

Regeneration – Very minor area (approximately 3% based on planted stems) would likely be small openings. Very little in the xh2 is logged.

Planted – Fd 25% Pl 75%

Inventory – Pl 1038, Fd 390, Sx 349, At 175 (< 3% of the area)

BEC Guidance[3]***: Only Fd and Py are considered as primary and secondary species for the IDFxh and PPxh, except on the wettest sites where Pl and Sx are added, Lw is considered tertiary on the wettest sites***

B. Dry Fd and Pli Group – IDFdk / (MSxk) – 6% of Case Study Area:

Fd-broadleaf (20% or more broadleaf) – use TACA IDFdk mesic

(12% of Eco group by area, and 1% of Case Study Area)

Regeneration – usually clearcut and planted to Pl

Planted – Pl 63%, Fd 28%, Sx 9%,

Inventory – predominantly Pl (1200 or so) *Fd 400 with some Sx – 100 (Bl 400, At 400) (combo from leading inventory label from IDFdk (35% or area) and MSxk (36% of area)*

Fd-Pli / Pli-Fd (at least 20% Pli) – use TACA IDFdk submesic

(20% of Eco group by area, and 0.3% of Case Study Area)

Regeneration – usually clearcut and planted to Pl

Planted – Pl 84%, Fd 13%, Sx 2%, Py 1%

Inventory – Pl (1200), Fd 400, Sx 100*, At 100, Py 100*

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[2] Planted percentages are based on the number of stems per ha of stems by species by area within the specified BEC stand units and site series. The proportions by BEC and site series are provided in a separate document.

[3] From Guidelines for Tree Species Selection by BEC units and site series. Note there may be caveats for establishment for various species site series combinations, e.g., on elevated microsites, on south aspects…these have not been provided here.

Fdi dominated (Fd> 80%) – use TACA IDFdk mesic

(31% of Eco group by area, and 2% of Case Study Area)

Regeneration – usually clearcut and planted to Pl (Fd at 10 – 20%)

Planted – Pl 75%, Fd 17%, Sx 8%

Inventory - Pl (1200), Fd 400, Sx 100*, At 100, Bl 100* relatively large areas are Pl only at approximately1200 sph ~ 18% of area, or Fd only at about 800 sph for 16% of the area.

Conifer-other. – use TACA IDFdk subhygric

(38% of Eco group by area, and 2% of Case Study Area)

Regeneration – not sure the extent of this type – would likely be clearcut and planted to Pl

Planted – Pl 84%, Fd 13%, Sx 2%, Py 1%

Inventory – Pl (1200), Fd 400, Sx 100*, At 100, Py 100*

*C. **Dry Transition-** (ICHdw, IDFmw) – 25% of Case Study Area:*

Pli – 80% of inventory is dead (20 years+) from MPB.

Broadleaf dominated (> 50% broadleaf component) – use TACA IDFmw mesic

(10% of Eco group by area, and 2% of Case Study Area)

Regeneration – usually clearcut and planted to Pl and or Fd

Planted – Pl 57%, Fd 36%, Py 2%, Sx 3%, Lw 2%

Inventory - At 3106, Ep 1264, Pl 400, Cw 300, *Fd 400, Sx 200* – older sites, newer sites that were brushed – Pl 1377, Fd 845, Ep 100, At 100, Cw 100

Mixedwood (with 50-80% conifer component) – use TACA IDFmw mesic

(22% of Eco group by area, and 5% of Case Study Area)

Regeneration – usually clearcut and planted to Pl and or Fd – broadleaved may be left unharvested

Planted – Pl 57%, Fd 36%, Py 2%, Sx 3%, Lw 2%

Inventory – Fd 1063, Ep 659, *At 200, Cw 200, Ep 200, Sx 200, Ac 200* (17% of area)

Fd dominated (Fd > 80%) – use TACA IDFmw mesic

(18% of Eco group by area, and 5% of Case Study Area)

Regeneration – usually clearcut, mainly planted to Pl and or Fd

Planted – Pl 43%, Fd 50%, Py 5%, Sx 1%, Lw 2%

Inventory - Fd 1063, Pl 659, *Lw 200* (Fd and Pl regenerate naturally here)

Fd-Pli / Pli-Fd – use TACA IDFmw submesic

(20% of Eco group by area, and 5% of Case Study Area)

Regeneration – usually clearcut and planted to Pl and or Fd with some Lw

Planted – Pl 43%, Fd 50%, Py 5%, Sx 1%, Lw 2%

Inventory - Pl 1400, Fd 850, *Lw 200*, *Py 100 (estimated forest cover)*

Conifer-other – use TACA IDFmw subhygric

(30% of Eco group by area, and 7% of Case Study Area)

Regeneration – usually clearcut and planted to Pl with Sx and or Lw – usually wetter portions of block, not unique openings.

Planted – Pl 67%, Lw 24%, Sx 9%

Inventory - Pl 1000, Sx 300, *Cw 200, At 200, Ep 500, Ac 200, Pw 100*

D. Moist Transition – ICHmw, ICHmk (ICHwc)- 28% of Case Study Area

Pli – 80% of inventory dead (20 years+) from MPB.

Mixedwood (with 50-80% conifer component) – use TACA ICHmw mesic

(12% of Eco group by area, and 3% of Case Study Area)

Regeneration – usually clearcut and planted to Pl, Fd or Sx

Planted –Pl 47%, Fd 31%, Sx 14%, Cw 4%, Hw 2%, Lw 1%

Inventory - Fd 729, Pl 428, At 150, Ep 150*, Cw 100, Sx 100 Lw 100* ***or if older*** At 6209 Ep 6200 Pl 4139, *Fd 400, Sx 200*

Fd, Cw, Sx – use TACA ICHmw mesic

(18% of Eco group by area, and 5% of Case Study Area)

Regeneration – usually clearcut and planted to Pl or Sx

Planted – Pl 38%, Sx 37%, Fd 22%, Cw 3%

Inventory - Pl 1068, Sx 435, Fd 84, *Cw100, At 200, Ep 200, Ac 200, Pw 100*

Fd-Pli / Pli-Fd – use TACA ICHmw submesic

(18% of Eco group by area, and 5% of Case Study Area)

Regeneration – usually clearcut and planted to Pl and or Fd

Planted –Pl 45%, Fd 40%, Sx 9%, Cw 3%, Hw 1%, Lw 1%

Inventory - Pl 822, Fd 709, *At 150, Ep 150*, *Cw 100, Sx 100*

Conifer-other – use TACA ICHmw mesic

(52% of Eco group by area, and 15% of Case Study Area)

Difficult to tease out of data – A guess would be to use Fd50%, Sx40% (Cw10%) for Planted and Inventory.

BEC Guidance: Primary and secondary species for ICHmw3 – Fd primary on mesic, with Pl and Sx as secondary. Bl, Cw, Hw, Lw and Pw are tertiary. On drier sites Pl is considered primary with Py as secondary. Wetter sites have Cw, Hw, Pl and Sx as primary. At, Ep and Act are identified as hardwoods. In the ICHmk2 Fd and Lw are considered primary for mesic sites with Pl as secondary. Bl, Cw, Hw, Pw, Py, and Sx are tertiary. Wetter sites have Cw, Pl and Sx as primary. ICHwk1 has Cw, Fd, Hw and Sx as primary for mesic with Bl secondary and Lw, Pl and Pw as tertiary. Fd is primary on drier sites, Cw and Sx for wetter. Act, At and Ep are mentioned as hardwoods.

E. Dry Plateau (ESSFdc, MSdm, SBSmm)- 21% of Case Study Area

Bl dominated (>=75% (IU types) – were originally Sx leading) – use TACA ESSFdc mesic

(9% of Eco group by area, and 2% of Case Study Area)

Regeneration – naturals from IU logging

Planted – Older IU logging left for naturals

Inventory - Bl 800, Sx 300 (estimated)

SxBl or BlSx (with <10% of Pli or Fd) – use TACA ESSFdc mesic

(30% of Eco group by area, and 6% of Case Study Area)

Regeneration – usually clearcut and planted to Sx

Planted – Sx 100%

Inventory - Sx 1112, Bl 400, Fd 200

Other – use TACA MSdm mesic

(62% of Eco group by area, and 13% of Case Study Area)

Regeneration – usually clearcut and planted to Pl or Sx

Planted – Pl 65%, Sx 23%, Fd 11%

Inventory - Pl 871, Sx 423, Hw 34, *Bl 400, Fd 200*

BEC Guidance: Primary and secondary species for the ESSFdc2 and xc – Pl and Se with Bl as secondary for mesic and wetter sites. Pl only for dry sites. No hardwoods identified. The MSdm is similar adding Fd as secondary for mesic and wetter. Fd Pl are primary on drier, Bl and Sx are tertiary on drier. At and Act are mentioned as hardwoods. SBSmm is similar to the MSdm with Ep on the wettest sites.

F. Wet ESSF (ESSFwc) – 16% of Case Study Area

1. Spruce and Balsam (or BlSx) – use TACA ESSFmw mesic

(100% of Eco group by area, and 16% of Case Study Area)

Regeneration –clearcut and planted to Sx (may leave scattered unmerch Bl and or Sx)

Planted – Sx 100%

Inventory - Sx 1426 (75% of area), Sx 1184, Bl 227 (13%) Sx 1303, Pl 105 (7%)

BEC Guidance: Primary and secondary species for the ESSFwc2 are Bl Se on mesic and wetter with Pl as tertiary Pl is considered a primary species on drier sites. No hardwoods identified.

STAND UNIT DESCRIPTIONS WITH INTERPRETATIVE NOTES:

A. DRY Fd Dominated Group (IDFxh, PPxh):

Py – About 80% of inventory is dead (20 years+) from bark beetles.

- **Fd-Broadleaf (20% or more broadleaf) – usually mesic**

(Inventory Average by Area – **At(Ac)-42%/ Fd-39% / Ep-14% (**Sx-2%, Py-1%, Cw-1%)

  - Broadleafs (mostly aspen, but some birch) mix through these stands generally at lower levels as distinct clumps (occasionally small clumps). Because true mixedwood is uncommon, just a presence of aspen is significant as a more diverse stand type.
  - Generally the aspen is not merch and is really only for biodiversity and amenity values.
  - **Some pure stands of aspen are evident** – usually on the less productive (non-economic) areas (scattered in a matrix of open grasslands).
  - Limited harvesting here in the past 30+ years.

- **Fd-Py & Py-Fd (at least 20% Py) – Usually mesic**

(Inventory Average by Area – **Fd-60% / Py-39%** (At-1%)

  - These stands were mixes of Douglas-fir and Ponderosa pine with the Py in them now mostly dead (70-80%). Some stands of mostly pure Py may be found in the PPxh close to the Thompson River Valley, especially on hot dry slopes.
  - Where these stands were open or gappy (mostly the PPxh) and young regen of Py is occurring, a considerable Py component may still be in the stand in the regen.
  - Where these are relatively dense stands, the loss of Py in many is not hugely significant except in localities with almost pure Py – low down near private lands.
  - A number of these stands have been hit with tussock moth in patches in the past several years – mostly within a km of the Thompson Valley. With the Py hit by MP Beetle and the Fd hit with tussock moth, most trees are dead in these patches.
  - Data shows – mostly Fd planted with about one third as Py.

- **Fd dominated (Fd>80%) – Usually mesic**

(Inventory Average by Area –**Fd-95% (**Py-2%, At-2%, Sx-1%)

  - Relatively dense with a range of sizes – logged in the past and understory released so there are lots of ladder fuels etc.
  - A caution about fuel treatments – there seems to be a reluctance to open the stands up too much – curious due to the fact that this is not a highly important area for timber management. Where we observed fuel treatments along the Sun Peaks Road (though in the IDFdk) not enough trees were removed nor were they pruned high enough in our opinion to make a huge difference – would it make a big difference to open these stands significantly so it is Fd-parkland?
  - Data shows – mostly Fd planted with about one third as Py.

- **<u>Conifer-other.</u> Usually subhygric**

(Inventory Average by Area – **Fd-64%/ Py-12% / Pl-9?/ At-7% (Sx4%,** Ep2%, Cw1%)

  - Generally still have considerable Fd, but also Sx, often with At and Ep mixed in – these are the moist mesic to subhygric sites, usually on cooler aspects, or in swales.
  - <u>Note</u> – inventory has Pli in it even though it is not typically found in the PPxh or the IDFxh – likely a trans-boundary issue or some confusion with the two pines.
  - Data shows – mostly Pl planted with about one quarter as Fd?

B. Dry Fd and Pli Group – IDFdk / (MSxk):

NOTE – this is mostly IDFdk in the Case Study Area (with much more Fd than you would expect for the MSxk).

Pli – about 80% of the inventory is dead (20 years+) from bark beetles.

<u>Fd-broadleaf</u> (20% or more broadleaf) mesic

(Inventory Average by Area – **At(Ac)-47%/ Fd-34% / Ep-11% (**Pl-4%, Sx-4%)

  - Some of this – usually the At are much taller and more merch than in IDF – generally mesic to slightly wetter sites. These are mostly getting planted to Pli but the At is coming in naturally.
  - Data shows - Mostly Pli planted (some Fd)

<u>Fd-Pli or Pli-Fd</u> (at least 20% Pli) mesic to submesic

(Inventory Average by Area –**Fd-53% / Pl-39% (**S-3%, At-3%, Bl-1%, Ep-1%)

  - This is a common stand type, generally with Fdi leading. A high percentage of the pine has died (80-90%?) and/or has been salvaged.
  - Data shows - Almost all blocks here are planted to Pli even though Fd is very productive.
  - Mostly Pli has been planted here, switching the stand toward pure pine.
  - At the margin of Pli presence this stand type will resemble Fd dominated – we distinguished it so we could ID those types that will be more open with recent Pli mortality.

<u>Fdi dominated</u> (Fd> 80%) mesic

(Inventory Average by Area – **Fd-94% (**Pl-2%, Py-1%, Sx-1%, Ep-1%, At-1%)

  - Another relatively common type – pretty similar to the IDFxh except with better Fdi site indices.
  - There is still the same problem with ladder fuels – treatments don't seem too effective (see comments above which actually pertain to IDFdk going up to Sun Peaks).
  - Data shows - Mostly Pli planted (small amount of Fd and Sx)
  - Again, mostly switching species to pine even on these sites – see pictures. These are very good Fdi sites – excellent site indices.

Conifer-other.

(Inventory Average by Area – **Fd-41%/ Pl-27% / Sx-16%/ Bl-8%, At-5% (**Py-2%, Ep-1%)

- This is everything else – generally those stands in the IDFdk with more spruce and less pine and Douglas-fir, but usually with considerable aspen (possibly cottonwood) mixed in.
- These appear to be very productive sites for a range of species.
- Even aspen are exceptionally large where they are found – some of the best in the TSA.
- Sx (Bl) tends to dominate the understory.
- Stands may be a bit open with Pli salvage in the past couple years.
- Data shows - Mostly Pli planted (small amount of Fd and Sx)

C. Dry Transition- (ICHdw, IDFmw):

Pli – 80% of inventory is dead (20 years+) from MPB.

Broadleaf dominated (> 50% broadleaf component) mesic to possibly subhygric

(Inventory Average by Area – **Ep-42%/ At(Ac)-34% / Fd-15% (**Pl-3%, Cw-3%, Sx-2%)

- Mix of birch, aspen and in some cases cottonwood. Mostly dominated by birch (some Ac) lower down with more At higher up.
- Some older cutblocks have the heavier concentrations of these types. Also along old roads. In some old fires there is quite a high hardwood content – see pictures.
- Birch in the IDFmw and drier slopes of ICHdw are in rough shape – significant to severe top-dieback. Most 30+cm dbh birch have 25% or more of top dead.
- Aspen, more noticeable as small clumps on hot dry slopes, or as large trees with cottonwood on the subhygric sites.
- Data shows - More than half of planting is to Pli (the rest is Fd and other species)

Mixedwood (with 50-80% conifer component) mesic

(Inventory Average by Area – **Fd-42%, Ep-19%, At(Ac)-11%, Pl-10%, Cw-9% (**Pw-3%, Sx-3%, Hw-1%?)

- Similar in content to the hardwood dominated above – not so concentrated on old logging. Often is maintained by root disease.
- Generally it is Fd that is mixed in (with good growth etc) but likely hit by root rot.
- We found the activity of root disease to be highly variable but over most of the IDFmw and perhaps about half of the ICHdw it appeared in the mixedwood stands that root disease was occurring at about 10% mortality over the past 10 years – so about 1% per year.
- Fd is often mixed in these types broadly as bands or patches of pure Fd (1 to 5 ha) in a matrix of scattered birch, small Cw and scattered Fd (Sx, Pw and possibly Ac on wetter sites with higher levels of Cw, some merch – GS Forest Products only needs a fat 5 inch top)
- If there is enough conifer – they are logging and stumping if terrain is feasible, and mostly planting a mix of Pli (80%) and Fd (20%).
- Data shows - More than half of planting is to Pli (the rest is Fd and other species)

Fd dominated (Fd > 80%) - mesic to submesic

(Inventory Average by Area – **Fd-94% (**Pl-2%, Ep-2%, At-1%)

- The pine component in this type – would be nice to find out what the mortality rate on the pine is – looks variable (50-80%) but this is just a guess looking across a valley.
- This is still a strong type across the landscape. Cutblocks appear to have more planted Fd (often with 20-30% Pli mixed in) based on what was seen on the ground. Growing well. Often areas are stumped.
- Data shows - Slightly more Fd planted than Pli.

Fd-Pli & Pli-Fd (submesic sites)

(Inventory Average by Area – **Fd-47%, Pl-46% (**Ep-2%, Cw-1%, Pw-1%, Sx-1%, At-1%)

- Naturally **–** On dry flats and ridges etc. Generally beetle has hit this at about 70% mortality. Often little in understory to take over.
- The data shows - Slightly more Fd planted than Pli.
- What we noticed in the ICHdw - New Pli planted stands in cutblocks are more scattered as pure Pli – occasional and probably more than 6-7 years old.
- What we noticed in the IDFmw – most plantations are dominated by pine (Pl80% and Fd maybe 20%) with pure Pli plantations in some older 15+ year old stands. Most of these stands were stumped before planting.
    - This is significant. It means we are actively converting what were Fd stands to a Pli dominated type without much thought of the consequences on the landscape.
- Larch noted as tried in both the ICHdw and the IDFmw and are doing very well after 5-10 years. Note – it is not naturally found here.

Conifer-other - subhygric sites

(Inventory Average by Area – **Fd-40%, Pl-18%/ Cw-14%/ Sx-13%** (Pw-5%, Hw-4%, Ep-3%, Bl-3, At-1%)

- Subhygric sites – Considerable Sx-Cw with Fd, Ep, At, Ac, Pw. This is one of the few areas in these subzones where you may find pretty good merch cedar.
- Data shows - Mostly Pli planted here (Lw and Sx as well).

D. Moist Transition – ICHmw, ICHmk (ICHwc)

Pli – 80% of inventory dead (20 years+) from MPB.

Mixedwood (with 50-80% conifer component) mesic

(Inventory Average by Area – **Fd-30%, At(Ac)-17%, Ep-15%, Pl-14%, Sx-10%, Cw-9% (**Pw-2%, Hw-2%, Bl-2%)

- Seems to have less root disease here (than in ICHdw) – true mixtures where most tree species are doing well (except Pli if it is large enough to be hit by MPB -15 cm diameter plus) – Fd, Pw, Sx, Cw, Hw, At, Ep (possibly Ac).
- Still considerable Pl planted here with significant Fd and Sx mixed in.

Fd, Cw, Sx (mesic sites)

(Inventory Average by Area – **Fd-54%, Sx-18%, Cw-17%, (**Pl-3%, Bl-3%, Hw-2%, Pw-1, Ep-1%, At-1%)

- High diversity of species (many quite valuable) regenerating and growing well.
- Very productive for many of these species
- Data shows - Usually clearcut and planted equally (by proportion) to Pli and Sx.

Fd-Pli & Pli-Fd (submesic sites)

(Inventory Average by Area – **Fd-50%, Pli-42%, (**Sx-3%, Pw-1%, Bl-1%, Cw-1%, Ep-1%, At-1%)

- Data shows - Mostly planted to a mix of Pl (leading) with Fd.

Conifer-other - subhygric sites

(Inventory Average by Area – **Sx-24%, Fd-18%, Cw-15%, Bl-13%, Pl-11%, Hw-9% (**At/Ac-3%, Pw-2%)

- Likely Sx, Fd planted (maybe some Pli) – data not clear.

E. Dry Plateau (ESSFdc, MSdm, SBSmm)

Bl dominated (>=75% (IU types) – were originally Sx leading)

(Inventory Average by Area – **Bl-86%/ Sx-14%)**

- This is in the ESSFdc
- There is considerable old IU strip and partial-cuts from the 60's, with mostly balsam of many sizes left. The Bl is vigorous, healthy, growing well, fully stocked, but these stands are pretty much pure balsam – could be an issue with climate change.

SxBl or BlSx (with <10% of Pli or Fd)

(Inventory Average by Area – **Sx-59%/ Bl-41%**

Sx – about 15-20% of the inventory in SxBl/BlSx stands (200+ years-old) is dead from spruce beetle over the past couple years. This mortality is not even across the Plateau in

the case study area – it is concentrated in the ESSFdc in the Sun Peaks / Cahilty Basin area (about 80% mortality of Sx there).

- This type takes all the remaining stands after considering the one above and tries to capture the rest of the ESSFdc
- One third to one quarter of this unit in the case study area (in the Cahilty Creek basin) has been hit heavily by bark beetles. First the pine bark beetle took the pine out of the mixed conifer stands, now over the past 2-3 years spruce bark beetle has literally killed most of the mature spruce (70-80%).
- This beetle mortality first encouraged more harvesting in a landscape already hit hard by harvesting with not a lot of mature forest cover. Secondly, the mature stands that are left, mostly close to riparian, or less accessible/operable, have just scattered mature balsam in the overstory and a pretty solid layer of balsam in the understory.
- Anywhere logging has occurred in the past has mostly been planted to Se with some Bl infill. Planted Pli is more prevalent lower down in the ESSFdc, or on drier south slopes which we didn't really see.
- Data shows - Planted Sx 100%.

Other - mesic on average

(Inventory Average by Area – **Pl-41%/ Sx-23%/ Fd-22%/ Bl-10%** (At-3%, Ep-1%)

Pli – 80% of inventory in older stands are dead from MPB– see breakdown below for ages.

- These stands are MSdm mostly with some SBSmm on the west side.
- These are often mixed Sx, Pli, Fd Bl stands that are losing their Pli to MPB – 80% death.
- MPB mortality in pine – an ocular estimate...
  - Older stands (40 years plus) – 80%
  - Young stands (20-40 years) – 50%
  - Less than 20 years old – 0-10% mortality depending on size.
- Pure pine stands seems to often have Sx-Bl understory so all is not lost. Even smaller pine (20 cm diameter).
  - Some small pine stands have been treated where 50% mortality from MPB. The understory alder was cut to "release" the Sx and Bl in the understory. Not sure if it is really necessary?
- The smaller pine were hit down to 10-20 cm (maybe 15-20 years old)?
- Aspen patches throughout this zone makes it quite mixed.
- Some Fdi leading stands found lower down closer to IDFdk.
- Most planting up to about 5-6 years ago was pure pine. In the last six years about 20-25% of Sx (occasionally Fd) was mixed in, in most cases but this is not a rule – we did see a number pure Pli plantations that were 5 years old. The planting records for last 10 years matches this trend. There will generally be a conversion of stands from Sx dominated to pine, although there is a question of how understory Bl and Sx will mix in over time.
  - Data show that Pli is planted at 65% (with Sx and some Fd mixed in)

F. Wet ESSF (ESSFwc)

- **Spruce and Balsam (or BlSx)** mesic average

(Inventory Average by Area – **Sx-53%/ Bl-40%** (Pl-3%, Fd-2%, Cw-1%?)

Pli – 80% of inventory in older (20+ yrs) stands are dead from MPB

Bl – Maybe 10% of mature Bl have experienced mortality in the past couple years from Balsam bark beetle.

- Decent looking stands with pretty good looking Sx that will likely just do better, especially in the cooler areas (North slopes). Scattered Balsam bark beetle mortality in Bl.
- Young stands in cutblocks are dominated by good, vigorous, healthy spruce. Scattered natural balsam.
- Fire – generally thought of as not being a huge issue here, however we were reminded it is where you are positioned on the landscape that is important. A large fire started near the resort at North Barriere Lake in the hot dry year of 2003 and ripped through the ICHdw to the ESSFwc above. Generally we think of the ESSFwc as being buffered by the wet ICH, but that is not always the case.
- On the ESSFwc/ICHdw transition, there appears to be a fair degree of stress (drier) and we are seeing a number of dead Bl and Sx mixed with Pl. Likely the droughty conditions at times have made these trees more susceptible to bark beetles. This might give us a bit of glimpse into what climate change will do.
- Balsam has currently been hit at varying levels (5-30%) by balsam bark beetle (we think). Overall hit might be 10-20 % of the balsam so not too bad.
- But we also think this will get worse over time which could take out 20-30% of these mature stand types at some point past 2050.
- There are some old IU stands in this type (down near Johnson Lake) – likely dominated by Bl as in the dc near Sun Peaks.