Chief Forester's Standards for Seed Use

Training Session

Date: April 20, 2011

Time: 1:30 to 3:30 pm

Video: via Live Meeting

Audio: Conference Call: 1-877-353-9184 ID: 8975849#

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Ministry of
Forests, Lands and
Natural Resource Operations

What are the Chief Forester's Standards for Seed Use?

- *The Chief Forester (CF) is provided authority to establish standards for seed use in BC in the Forest and Range Practices Act.*
- *Because of the technical nature of seed use and transfer, the CF established a set of Standards rather than including the requirements in FRPA.*
- *Were developed with 40+ years of research and stakeholder input.*
- *Are a legal document, hence the language can be difficult to understand.*
- *Are legally enforceable.*
- *Are distinct from other "standards" that are part of a Forest Stewardship Plan (FSP) e.g. stocking standards.*

What did BC use before FRPA and the Chief Forester's Standards for Seed Use?

- *Prior to FRPA, the Forest Act, Tree Cone, Seed and Vegetative Material Regulation and the Forest Practices Code of BC Act, Silviculture Practices Regulation were in force from 1995 to 2005.*
- *The Seed and Vegetative Material Guidebook (April 1995) supported the above regulations.* http://www.for.gov.bc.ca/hti/publications/misc/legs&standards.htm
- *Note that Cone Collection Permits and Seed Dealer's Licences, which were required under the Code, are not required under the CF Standards.* http://www.for.gov.bc.ca/code/cfstandards/

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Chief Forester's Standards for Seed Use

Changes and Amendments

- Amendment to the Standards – June 2010
- Amendment to the Standards – November 2008
- Amendment to the Standards – June 2008
- Amendments to the Standards – November 2006
- Changes to Seed Transfer Limits – April 2005
- Notice from Jim Snetsinger, Chief Forester – November 29, 2004
- Seed Standards to Help Protect BC Tree Gene Resources – November 26, 2004

Policies & Procedures

Title	Download	
Chief Forester's Standards for Seed Use	HTML	PDF
Updating Parent Tree and Lot information	HTML	PDF
Alternatives Policy	HTML	PDF
Amendment Policy	HTML	PDF
Parent Tree Information Policy	HTML	PDF

Publications

Title	Download
Seed and Vegetative Material Guidebook	HTML
Methods for Estimating Gamete Contributions to Orchard Seed Crops and Vegetative Lots in British Columbia	HTML
Parent Tree Areas of Use	HTML
FRPA General Bulletin #1: Collection, Registration, Processing and Disposition of Seed	PDF

Sections within the Chief Forester's Standards for Seed Use

1. *Definitions*
2. *Application*
3. *Purpose*
4. *Effective Date*
5. *Registration*
6. *Storage and Testing of Registered Lots*
7. *Selection and Use of Seeds and Vegetative Material*
8. *Transfer Limits for Registered Lots*

- *Appendices*

Chief Forester's Standards for Seed Use

Appendices:

1. *Registration Information*
2. *Seed Planning Zones*
3. *Lots from Natural Stands*
4. *Lots from Untested Parent Trees*
5. *Superior Provenances*
6. *Non-BC Seed Sources*
7. *Parental Contribution, Effective Population Size and Genetic Worth*

Note: other documents are referenced by the Standards but are not contained within the Standards

eg . Tested Parent Tree Area of Use tables

Part 1 - Definitions

This section provides the legal definitions of the terms used. Note that terms such as origin and tested parent tree are very detailed and capture all of the specific sources of seed.

Parent Trees– are created from the forest genetics program, usually are tested for one or more traits, which gives them breeding values.

Tested Parent Trees are planted in seed orchards. Cones are collected each year to produce a seedlot. This is a Class A seedlot in SPAR. An orchard seedlot will have one or more genetic worth values.

A seedlot can be from a collection area in a natural stand. This is a Class B seedlot in SPAR.

A seedlot can also be from a superior provenance collection area. This is a Class B+ seedlot in SPAR.

Part 2 - Application

a) to persons who use seed to establish a free growing stand under FRPA

b) to persons who register seedlots for use as per (a)

c) to register parent trees, so that seedlots produced from parent trees can be registered

Part 3 - Purpose of the Chief Forester's Standards for Seed Use

- *Maintain identity, adaptability, diversity and productivity of Province's forest tree genetic resources*
- *Ensures tree seed:*
  - *is identified and tracked from origin to planting site*
  - *meets minimum levels of genetic diversity and physical quality*
  - *is adapted to planting site to maintain forest health and productivity*

Part 4 - Effective Date

- *CF Standards came into effect April 1, 2005.*
- *Note that for Forest Practices Code blocks, the transfer limits are the same as the limits for the CF Standards.*

Part 5 – Registration

Section 5.1 – General Requirements

- *There is a specific application process for seedlot registration.*
- *The information listed in Appendix 1 must be provided.*
- *Most cone collectors enter the required information directly on the SPAR Seedlot Registration screen.*
- *Seedlots must be submitted to the Tree Seed Centre either as:*
  - *cones for processing (seed extraction) or*
  - *seed that has been extracted at another facility.*

Section 5.2 – Collection Criteria

- Lots collected from natural stands in BC:
  - *Minimum of 10 trees in a natural stand (must be a wild stand, not a plantation)*
  - *Must be from within the same Seed Planning Zone and biogeoclimatic zone*
  - *Must be from within an 8 km radius*
  - *Elevation range of collection is specified in App. 3.*
  - *Lots can be collected from outside BC if they are listed in Appendix 6 (table 6.1).*

Section 5.2 – Lots collected from parent trees

- *This section is very technical – seed orchard managers ensure that the lots they produce follow the criteria in this section.*
- *Formulas in Appendix 7 –Parental contribution, effective population size and genetic worth are used for calculations.*
- *Vegetative lots also have specific criteria. They are collected from production facilities (most common is yellow cedar hedges).*
- *Lots can be collected from outside BC if they are listed in Appendix 6 (table 6.2).*

What is Genetic Worth (GW) ?

- *The average expected genetic gain for a specific trait at rotation expressed as percent.*

G = growth (volume gain)
R = resistance to pests (e.g. weevil, blister rust)
D = wood density
M = western white pine (MGR gene present)

Section 5.3 – Parent Tree Information

- *Forest genetics group applies for registration for the parent trees they use in their breeding programs.*

Section 5.4 – Determining Breeding Values or Clonal Values

- *Forest genetics group plant field trials, collect data regularly from them and calculate breeding values from the data. When a cone collection from a seed orchard is made, the contribution from each parent tree and the breeding values are used to calculate seedlot genetic worth.*

Part 6 – Storage and Testing of Registered Lots

- *Collector must maintain interim storage records*
- *Registered seedlots must be tested & stored at TSC*
- *Seedlots are tested for purity, moisture content, weight, germination, etc.*

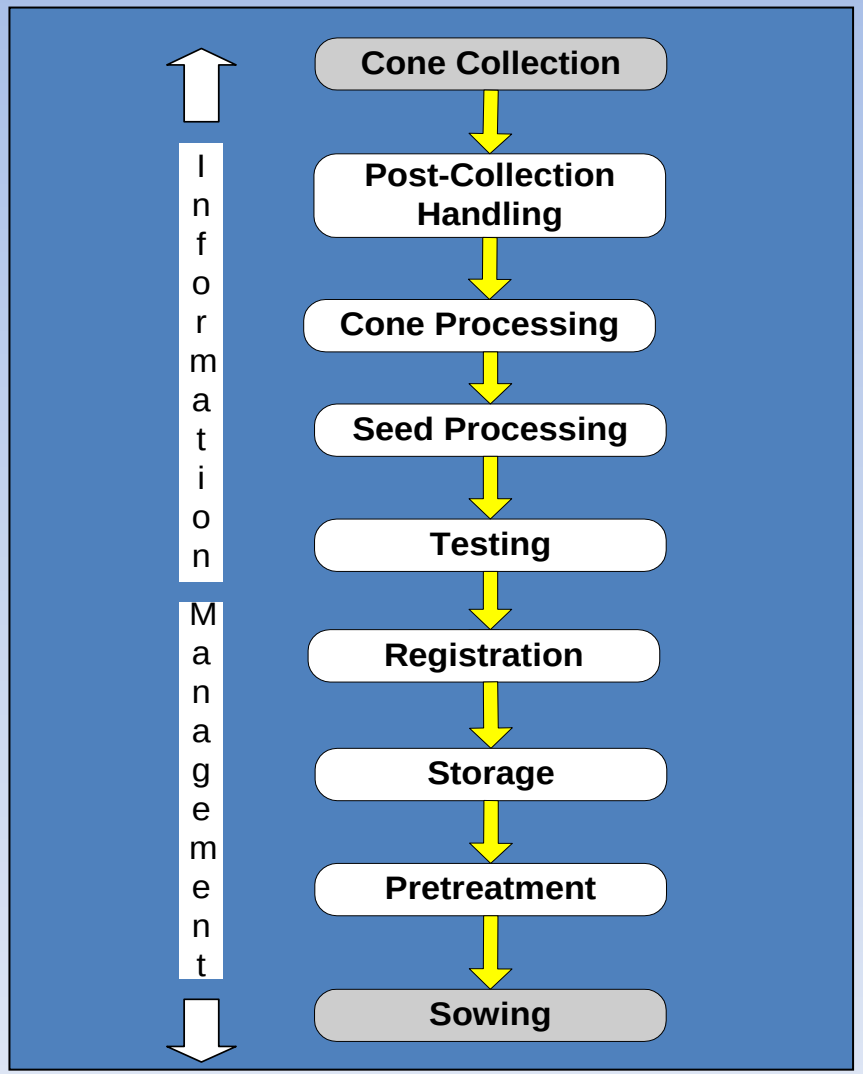
- *No fees ($) for registration, testing, storage and scheduled retesting while in storage.*
- *Nurseries must return unused seed to TSC if leftover after sowing.*

Tree Seed Centre - Delivering the Standards

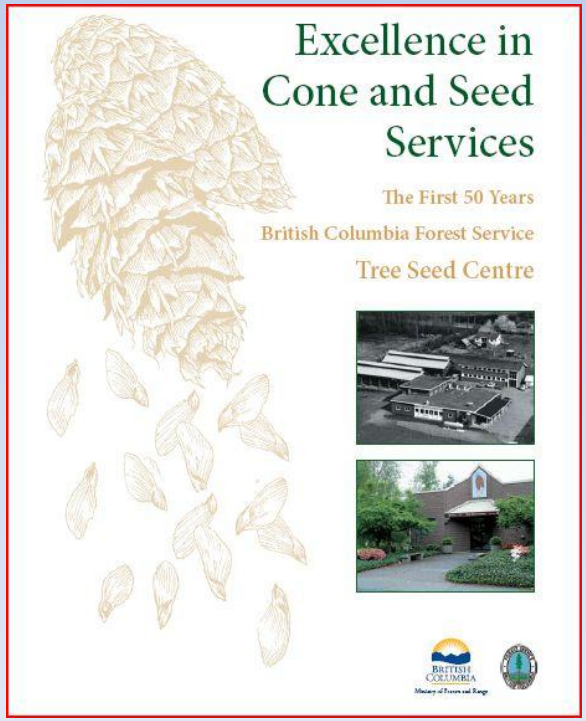
- *Process tree seed to international standards for moisture content and purity*
- *Test tree seed*
  - *Moisture content (between 4 and 9.9%)*
  - *Purity (minimum of 97%)*
  - *Germination capacity*
  - *Total seedlot weight*
  - *Average seed weight*
- *Register seedlots on SPAR*

- *Provide long term seed storage to maintain identity, integrity, and optimum physical quality*

Tree Seed Centre - Chain of Custody



- *Ensure seedlot has:*
  - *Identity*
  - *Integrity*
  - *Information*



Part 7 – Selection and Use of Seeds and Vegetative Material

- 7.1 describes Time of selection
  - *for Seedlots, this is when a Seedling Request is 'approved' in SPAR*
  - *for Vegetative lots, this is when when material is collected*
- 7.3 Select Lot with Genetic Worth (GW) ≥ 5%
  - *As determined at time of selection*
  - *That best meets forest management objectives for the stand*

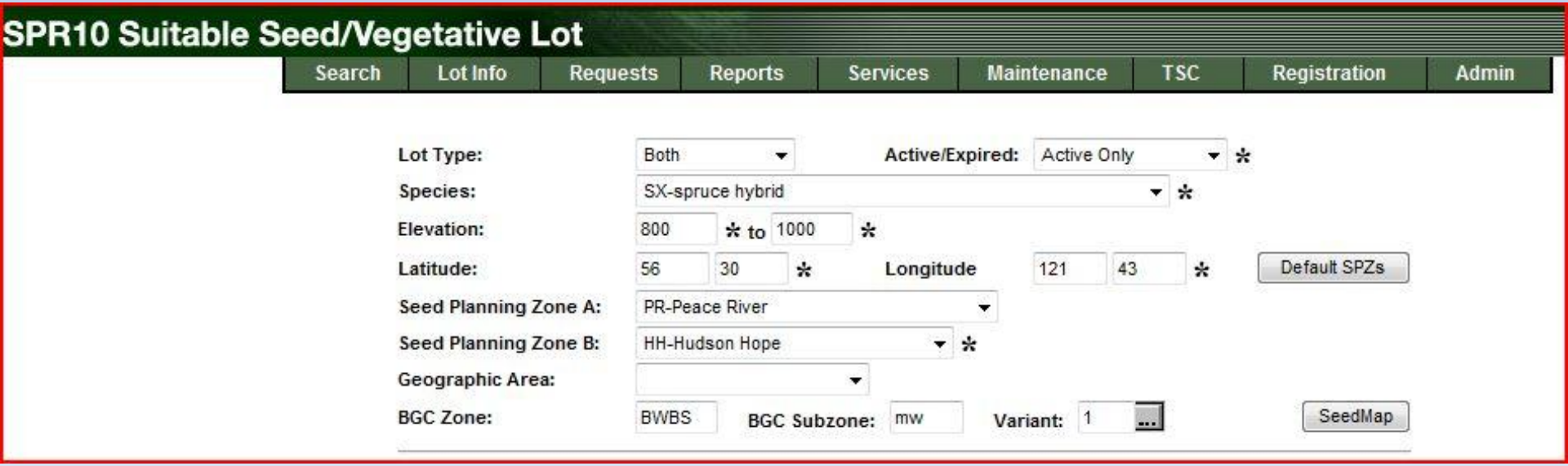
A lot is considered available for selection if:

- *it complies with transfer limits*
- *there is sufficient quantity for a seedling request*
- *the lot owned by the person (agency) making the request, or*
- *It is possible to purchase the seedlot:*
  - *identified on SPAR as surplus*
  - *price is considered fair*

Note: if there is insufficient quantity, a person could select a Class A seedlot to use up the available balance, then enter a 2nd seedling request for a different seedlot.

SPAR Suitable Seedlot Selection Example

SPAR has the Chief Forester Standards for Seed Use built in to various parts of the application, including the Suitable Seed/Vegetative Lot Search and Seedling Request Lot Selection.



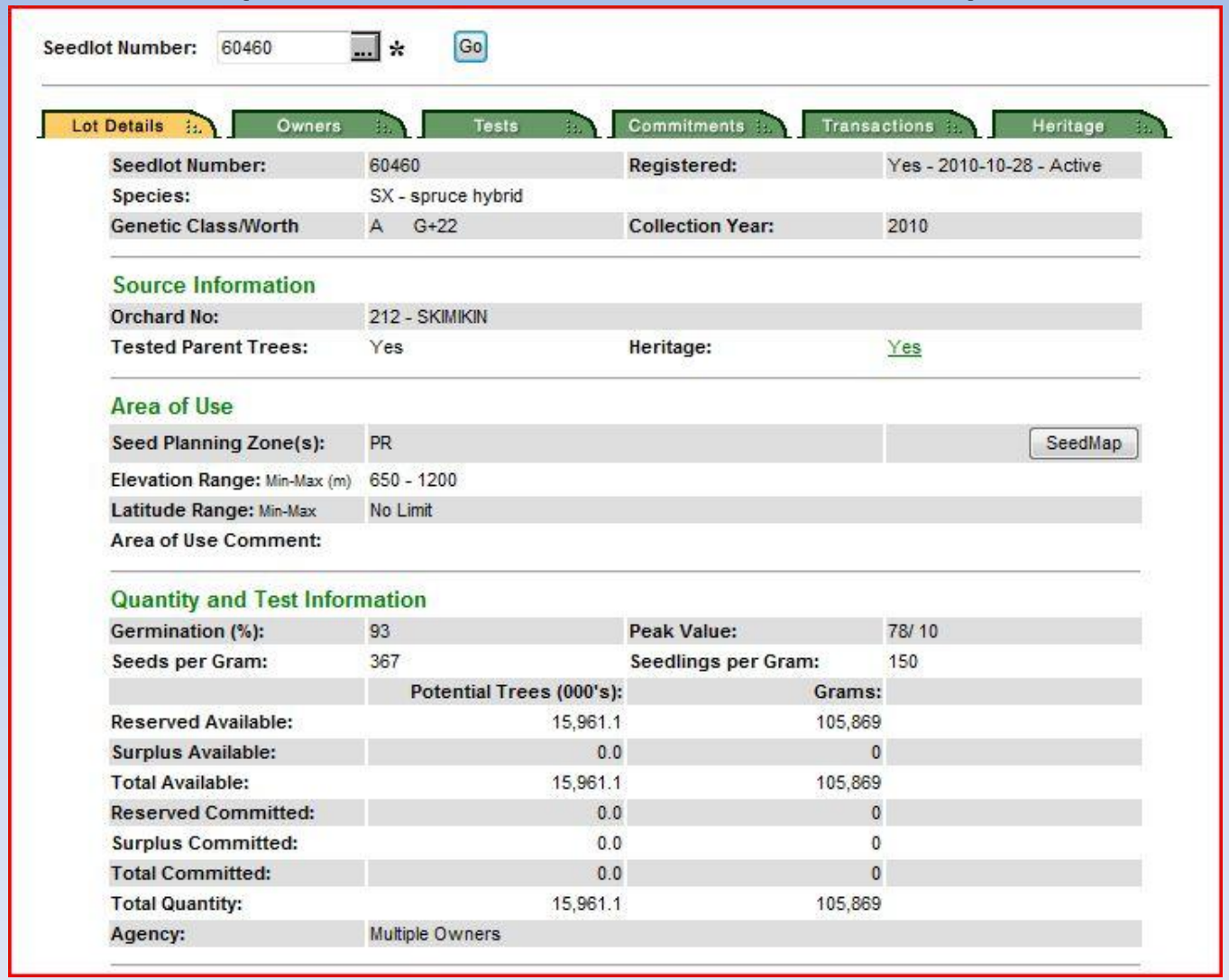
	Lot No.	SPZ	Genetic Class & Worth	Germ. %	C/P	Agency	Mean Elev.	Orchard No. / Location	Coll. / Prod. Year	Reserve Trees (000's)	Surplus Trees (000's)	
	60460	PR	A G+22	93	P	LPCAN 00	820	212 - SKIMIKIN	2010	41.6	0	TG DT
	60460	PR	A G+22	93	C	MOF 20	820	212 - SKIMIKIN	2010	15919.5	0	TG DT
	62282	PR	A G+22	91	P	LPCAN 00	820	212 - SKIMIKIN	2010	40	0	TG DT
	60455	PR	A G+19	92	C	BCTS 00	789	212 - SKIMIKIN	2008	10608.5	0	TG DT
W	39426	HH	B	94	C	MOF 01	1200	EMERSLUND LAKES	1993	0	1139	TG DT
	40125	HH	B	94	C	MOF 01	1000	NABESCHE VALLEY	1993	0	3833.3	TG DT
	48461	HH	B	94	C	BCTS 00	1000	BRASSEY CREEK	2007	5027.8	0	TG DT
	52229	HH	B	94	P	WFM 04	875	CALAZONE	1997	246.6	0	TG DT
	39427	HH	B	93	C	MOF 01	900	EMERSLUND LAKES	1993	0	8580.9	TG DT
	52105	HH	B	93	P	WFM 04	875	CALAZONE	1997	203.4	0	TG DT
	31308	HH	B	92	C	BCTS 00	800	COLT CREEK CP64	1991	3302.5	0	TG DT
	31308	HH	B	92	C	MOF 01	800	COLT CREEK CP64	1991	0	10491.3	TG DT
	39433	HH	B	92	C	BCTS 00	900	EMERSLUND LAKES	1993	287.9	0	TG DT
	39433	HH	B	92	C	MOF 01	900	EMERSLUND LAKES	1993	0	701.5	TG DT
	40123	HH	B	92	C	BCTS 00	1000	NABESCHE VALLEY	1993	5619.6	0	TG DT
	40123	HH	B	92	C	MOF 01	1000	NABESCHE VALLEY	1993	0	5078.2	TG DT
	39422	FIN	B	91	P	CONIFEXM 00	900	EMERSLUND LAKES	1993	4963.4	0	TG DT
	52084	HH	B	91	P	CANFOR 07	800	COLT CREEK CP64	1991	244.8	0	TG DT
	31311	HH	B	90	P	CANFOR 02	1000	COLT CR. CP 62	1991	30942.7	0	TG DT

Part 8 - Transfer Limits for Registered Lots

- *Transfer limits are identified in the Appendices for:*
  - *Lots from Natural Stands (Appendix 3),*
  - *Lots from Untested Parent Trees (Appendix 4),*
  - *Superior Provenances (Appendix 5)*
  - *Non-BC Seed Sources (Appendix 6)*
- *Seedlots from tested parent tree have transfer limits based on Parent Tree Area of Use (combination of Seed Planning Zone and elevation range).*
- *Section 8.5 does not reference an Appendix. One must refer to the Parent Tree Area of Use tables at:*

http://www.for.gov.bc.ca/hti/seedplanning/parenttree-aou.htm

SPAR Seedlot Detail for a Class A lot (from a seed orchard)



Seedlot Number: 60460 ... * Go

Lot Details | Owners | Tests | Commitments | Transactions | Heritage

Seedlot Number:	60460	**Registered:**	Yes - 2010-10-28 - Active
Species:	SX - spruce hybrid		
Genetic Class/Worth	A G+22	**Collection Year:**	2010

Source Information

Orchard No:	212 - SKIMIKIN		
Tested Parent Trees:	Yes	**Heritage:**	Yes

Area of Use

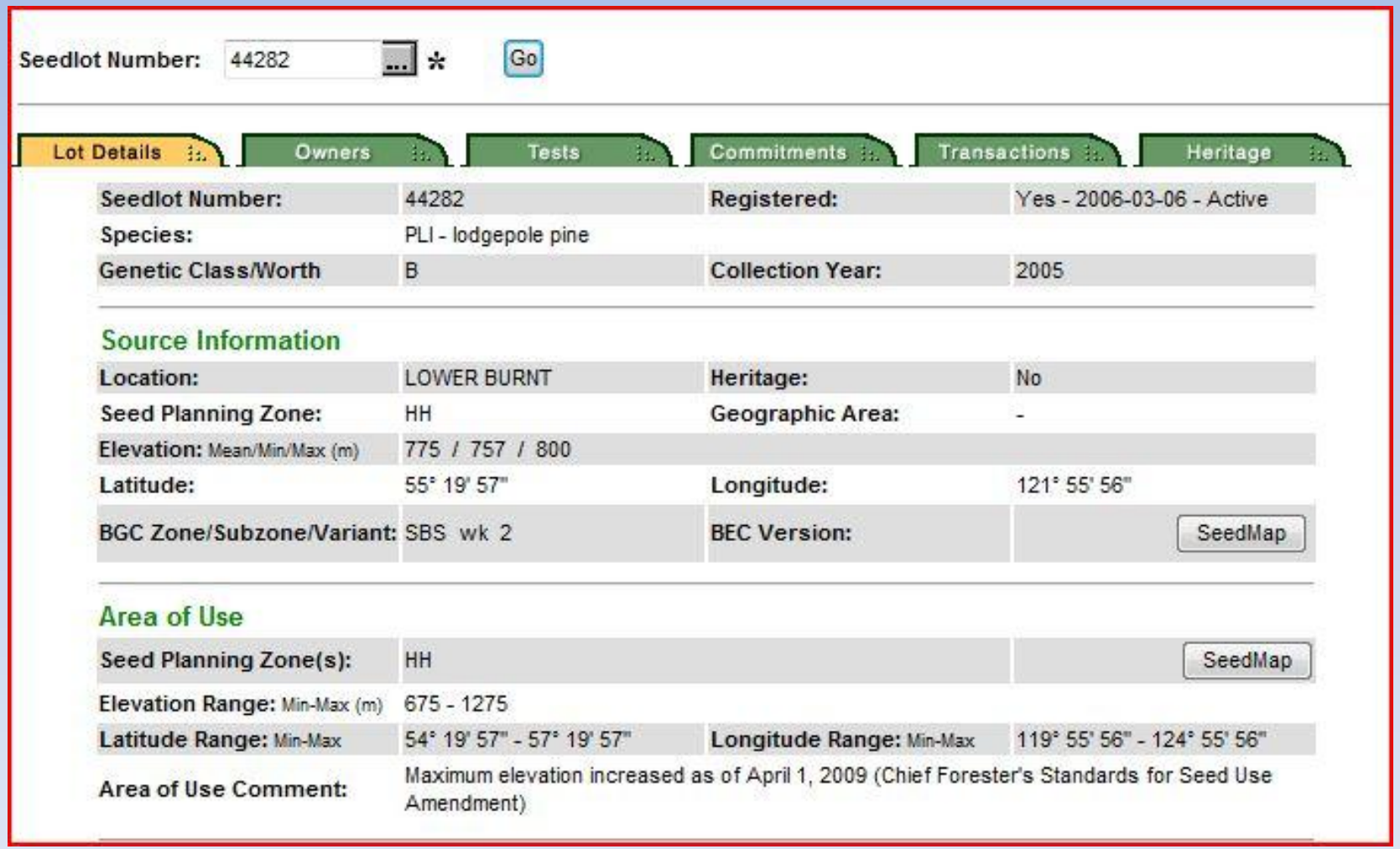
Seed Planning Zone(s):	PR	SeedMap
Elevation Range: Min-Max (m)	650 - 1200	
Latitude Range: Min-Max	No Limit	
Area of Use Comment:		

Quantity and Test Information

Germination (%):	93	**Peak Value:**	78/ 10
Seeds per Gram:	367	**Seedlings per Gram:**	150

	Potential Trees (000's):	Grams:
Reserved Available:	15,961.1	105,869
Surplus Available:	0.0	0
Total Available:	15,961.1	105,869
Reserved Committed:	0.0	0
Surplus Committed:	0.0	0
Total Committed:	0.0	0
Total Quantity:	15,961.1	105,869
Agency:	Multiple Owners	

SPAR Seedlot Detail for a Class B lot (natural stand)



Seedlot Number: 44282 ... * Go

Lot Details | Owners | Tests | Commitments | Transactions | Heritage

Seedlot Number:	44282	**Registered:**	Yes - 2006-03-06 - Active
Species:	PLI - lodgepole pine		
Genetic Class/Worth	B	**Collection Year:**	2005

Source Information

Location:	LOWER BURNT	**Heritage:**	No
Seed Planning Zone:	HH	**Geographic Area:**	-
Elevation: Mean/Min/Max (m)	775 / 757 / 800		
Latitude:	55° 19' 57"	**Longitude:**	121° 55' 56"
BGC Zone/Subzone/Variant:	SBS wk 2	**BEC Version:**	SeedMap

Area of Use

Seed Planning Zone(s):	HH		SeedMap
Elevation Range: Min-Max (m)	675 - 1275		
Latitude Range: Min-Max	54° 19' 57" - 57° 19' 57"	**Longitude Range:** Min-Max	119° 55' 56" - 124° 55' 56"
Area of Use Comment:	Maximum elevation increased as of April 1, 2009 (Chief Forester's Standards for Seed Use Amendment)		

SPAR Seedlot Detail for a B+ (Superior Provenance) lot

Seedlot Number: 44822 ... * Go

Lot Details | Owners | Tests | Commitments | Transactions | Heritage

Seedlot Number:	44822	**Registered:**	Yes - 2002-06-03 - Active
Species:	PLI - lodgepole pine		
Genetic Class/Worth	B+ G+03	**Collection Year:**	2002

Source Information

Provenance:	Udy Creek	**Heritage:**	Yes
Seed Planning Zone:	CHL	**Geographic Area:**	-
Elevation: Mean/Min/Max (m)	1100 / 1050 / 1150		
Latitude:	53° 01' 00"	**Longitude:**	123° 09' 00"
BGC Zone/Subzone/Variant:	SBPS mk	**BEC Version:**	SeedMap

Area of Use

Seed Planning Zone(s):	BB BLK CHL CT MRB NCH QL		SeedMap
Elevation Range: Min-Max (m)	900 - 1400		
Latitude Range: Min-Max	No Limit	**Longitude Range:** Min-Max	No Limit
Area of Use Comment:	April 1, 2009 - BB added to Area of Use SPZ as per Chief Forester's Standards Amendment. The upper elevation transfer limit for this seedlot is increased by 200 m when deployed in the provenance's SPZ of origin (Chief Forester's Standards for Seed Use Amendment effective April 1, 2009).		

Sec. 8.8 and 8.9 - Transfer Limits

- *A licensee must ensure that 95% of the combined total of trees planted in each fiscal year and within a management unit (TSA or TFL), comply with sec. 8.2 through 8.7 (transfer limits).*
- *Likewise, BC Timber Sales must do the same within a management unit (TSA)*

Reporting Requirements in RESULTS (FPPR s. 86)

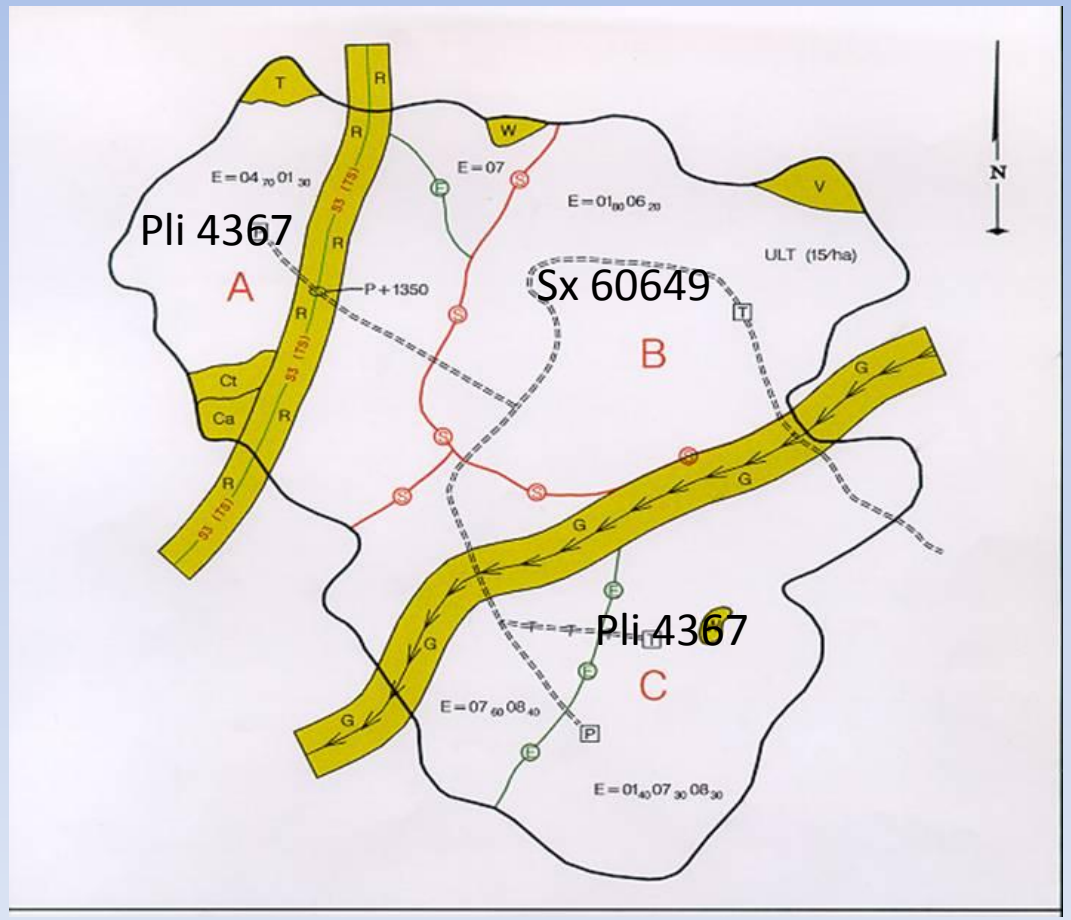
Record Planting Activities by Opening:

- *Species*
- *Lot registration number*
- *# trees planted by lot*
- *# trees planted outside transfer limits by lot*

Species	Number Planted	Number Beyond Transfer Limit	Request ID	Lot	Stock		
					Type	Cntr	Age
SX - spruce hybrid	12980		2006DKL0157	61096	PSB	412A	100000
SX - spruce hybrid	5060		2006DKL0158	60743	PSB	412A	100000
CW - western redcedar	9090		2006DKL0159	05323	PSB	412A	100000
SX - spruce hybrid	15440		2006DKL0156	60743	PSB	515A	100000
SX - spruce hybrid	440		2006DKL0035	35071	PSB	415D	100000
CW - western redcedar	1100		2006DKL0173	47222	PSB	412A	100000
CW - western redcedar	30		2006DKL0078	05209	PSB	512A	100000

Record Keeping Requirements
FPPR s. 43(8) & WLPPR s. 32(8)

- *Keep records of lots planted*
- *Maintain planting map showing location of lots*



Alternatives

- *Persons subject to FRPA may propose an alternative to the Standards*
- *Proposals must include detailed information and assessment. CF will review based on a number of criteria.*
- *CF may approve if it consistent with the intent of the Standards.*
- *Cannot be approved by DMs in Forest Stewardship Plans (FSP)*
- *Not intended for block-by-block "variances". The 95% rule should be used for operational flexibility.*

Amendments to Standards

Only the Chief Forester can amend the Standards

- *Ministry committee reviews and provides recommendations to Chief Forester.*
- *There is a 4 month notification period before amendments take effect, but this period can be waived.*

Significant amendments have been made:

April 1, 2009 – Climate Based Upward Elevation Changes

June 2010 – Assisted Range and Population Expansion of Western Larch

Summary - Key Points

- *Selection*
  - *Select any lot with GW ≥5% if available*
- *Transfer limits*
  - *Identified in Appendices or SPAR*
- *Reporting*
  - *Record # trees planted beyond limits*
- *Alternatives*
  - *Not for block-by-block variances*
- *Amendments*
  - *4 month notification provided*

Questions?

If you have further questions about the Chief Forester's Standards for Seed Use, contact:

Lee Charleson 250-387-4839 Lee.Charleson@gov.bc.ca

Susan Zedel 250-356-1598 Susan.Zedel@gov.bc.ca

Links

Tree Improvement Branch website
http://www.for.gov.bc.ca/hti/

Chief Forester's Standards for Seed Use
http://www.for.gov.bc.ca/code/cfstandards/

Tree Seed Centre
http://www.for.gov.bc.ca/hti/treeseedcentre/index.htm

Seed Planning Reference
http://www.for.gov.bc.ca/hti/seedplanning/reference.htm

Chronology of Transfer Rule and Seed Planning Zone Changes
https://www.for.gov.bc.ca/hti/spar/chronologySZ.htm