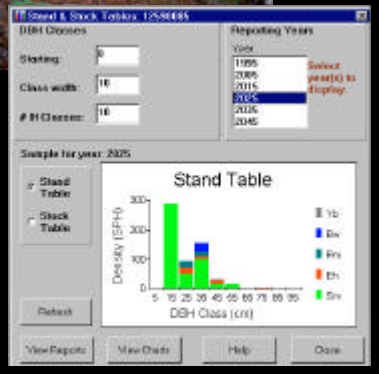
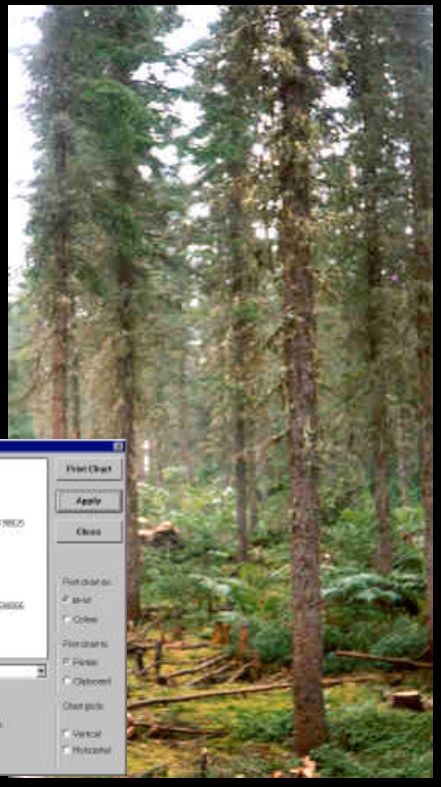
FVS Ontario

A Forest Vegetation Simulator for Ontario





FVS Ontario

- What is FVS?
- History of FVS
- Why FVS?
- Peek at FVS Ontario
- Next Steps
- Future steps...

FVS Ontario

What is FVS?

- individual tree growth model
- simulates the interactions between species in mixed species and multi-aged (complex) stands
- great flexibility in scheduling a variety of thinning regimes
- model partial harvest systems

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What is FVS?

- an “empirical” model that predicts the change in crown length, diameter (dbh) and height over time
  - **large-tree model - grows diameter**
  - **small tree model - grows height**
- the spatial position of the competing trees is ignored

FVS Ontario

What is FVS?

- it was designed to project a ground based inventory
- linked to woodsupply modeling in the US
- FVS Ontario could provide a growth engine for Ontario's future woodsupply modeling

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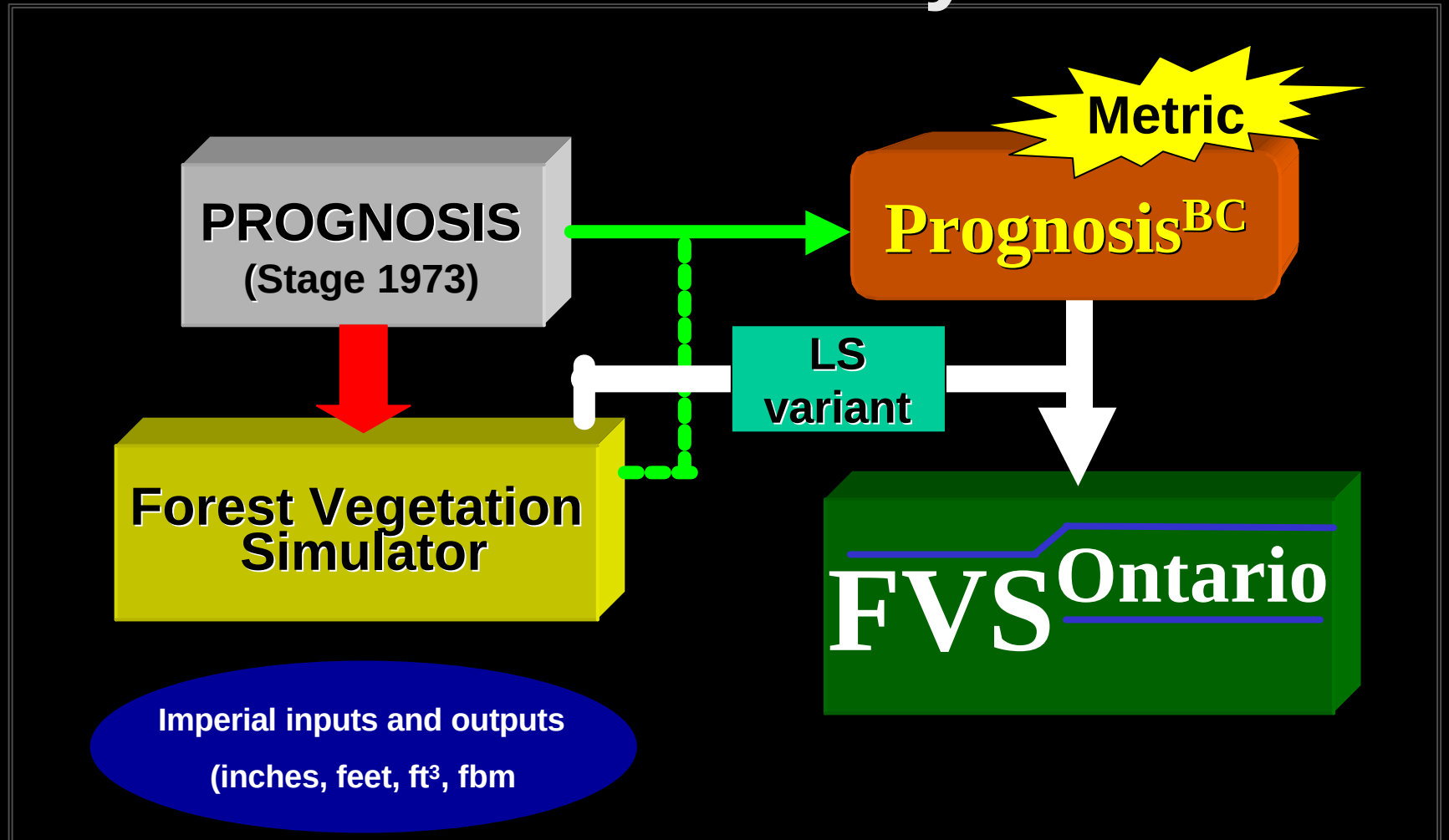
History of FVS?



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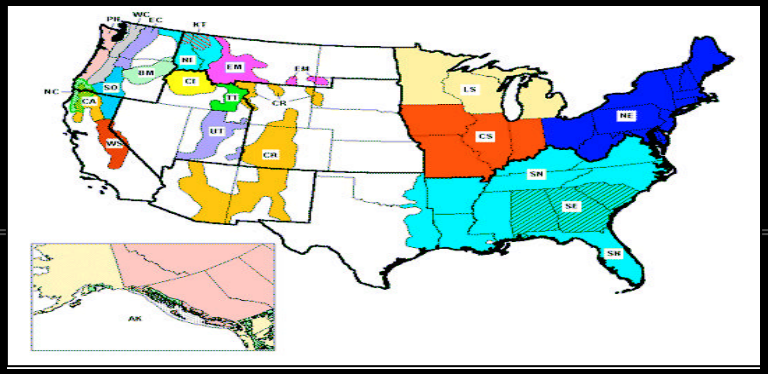
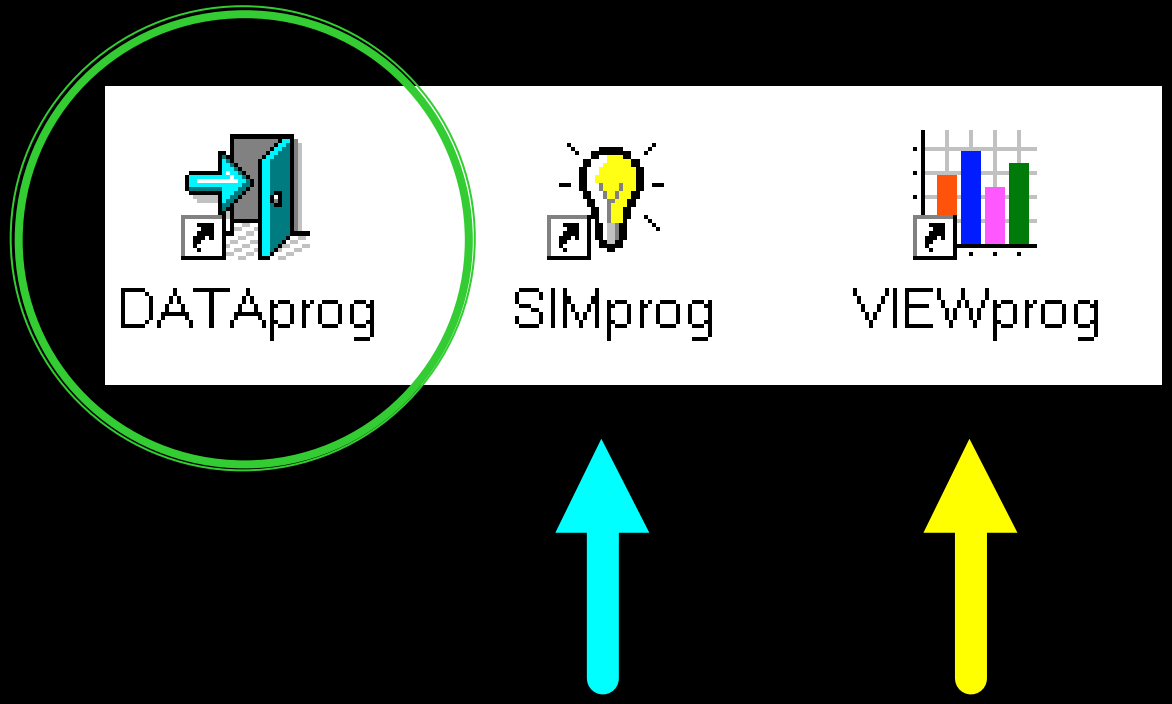


Why FVS?

- 22 variants of the model currently exist and still expanding
  - dedicated development staff
  - US National Inventory model (annual update)
  - modular design
  - model source code available
- **PROGNOSIS^{BC}** 1st metric variant
  - model source code available

FVS Ontario

version 1.0 ..a peek



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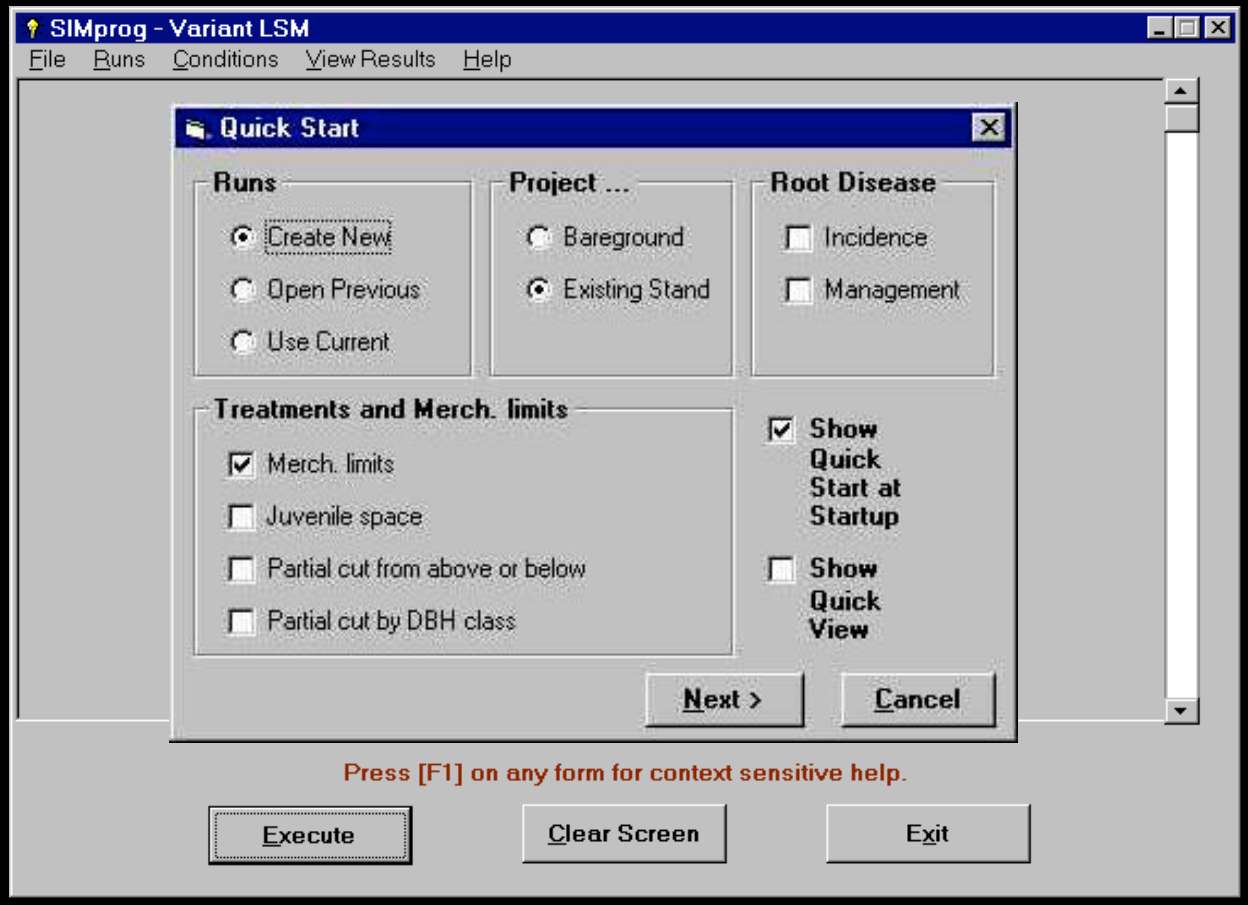
version 1.0



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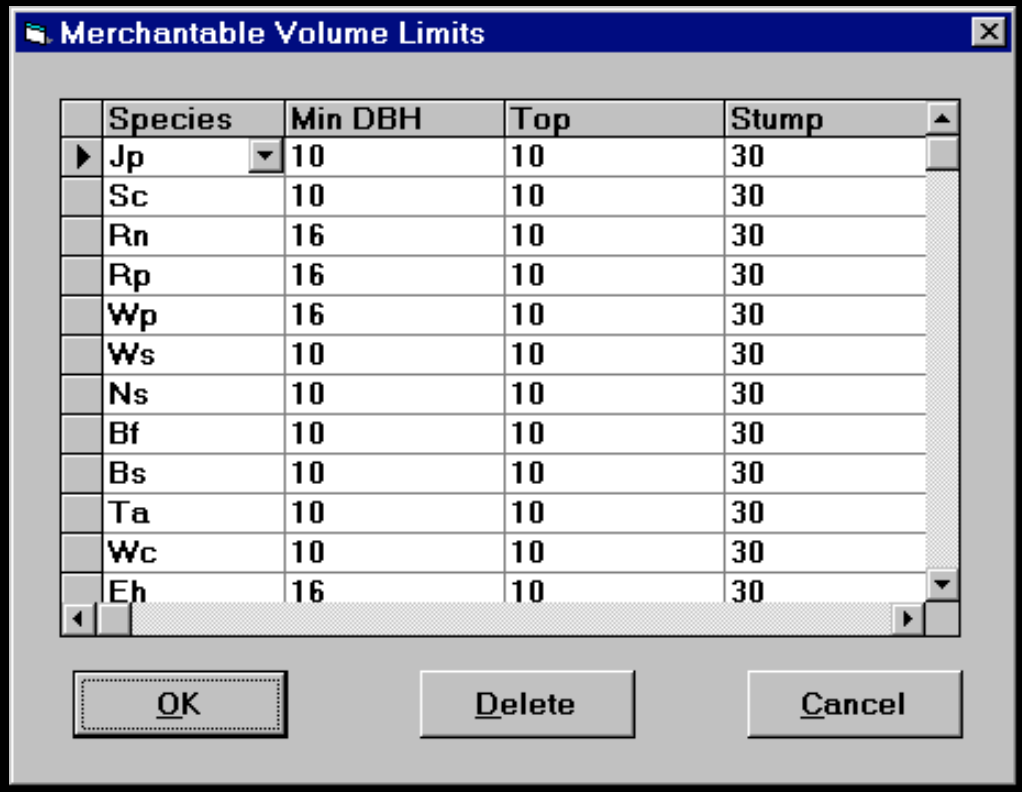

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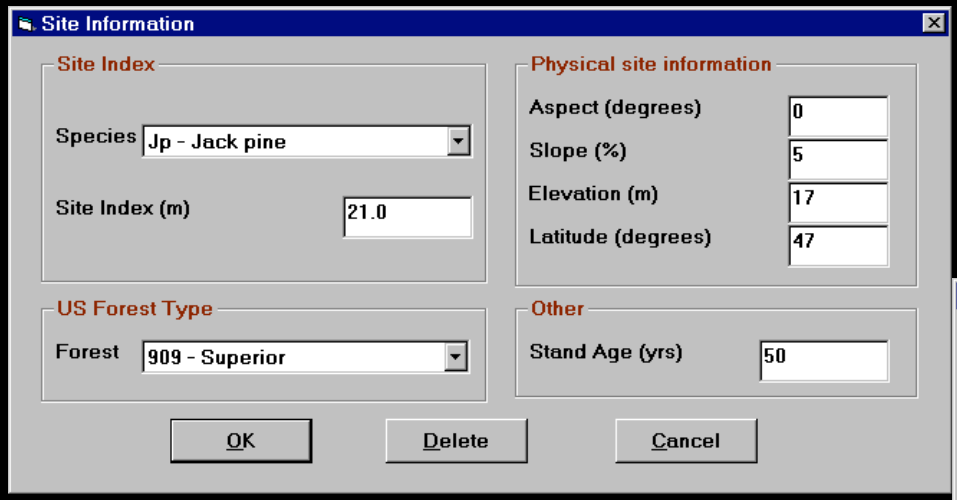
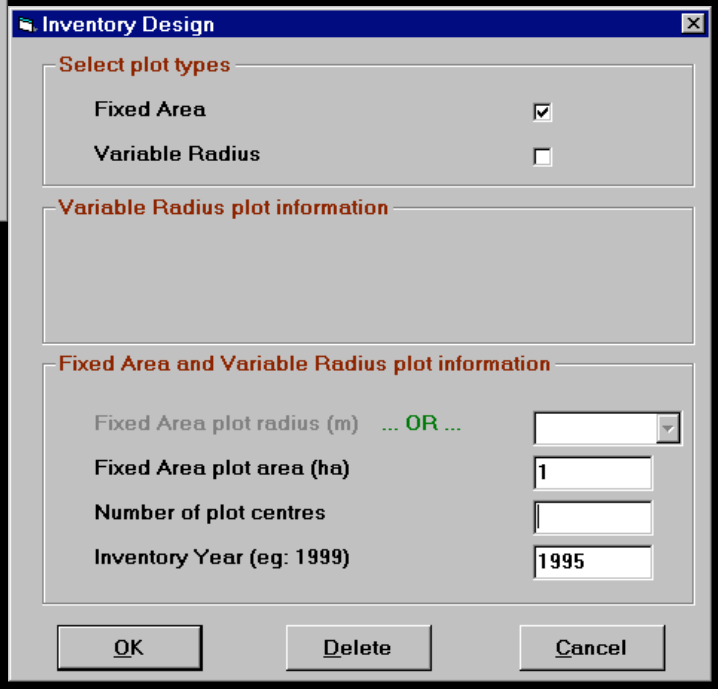
version 1.0





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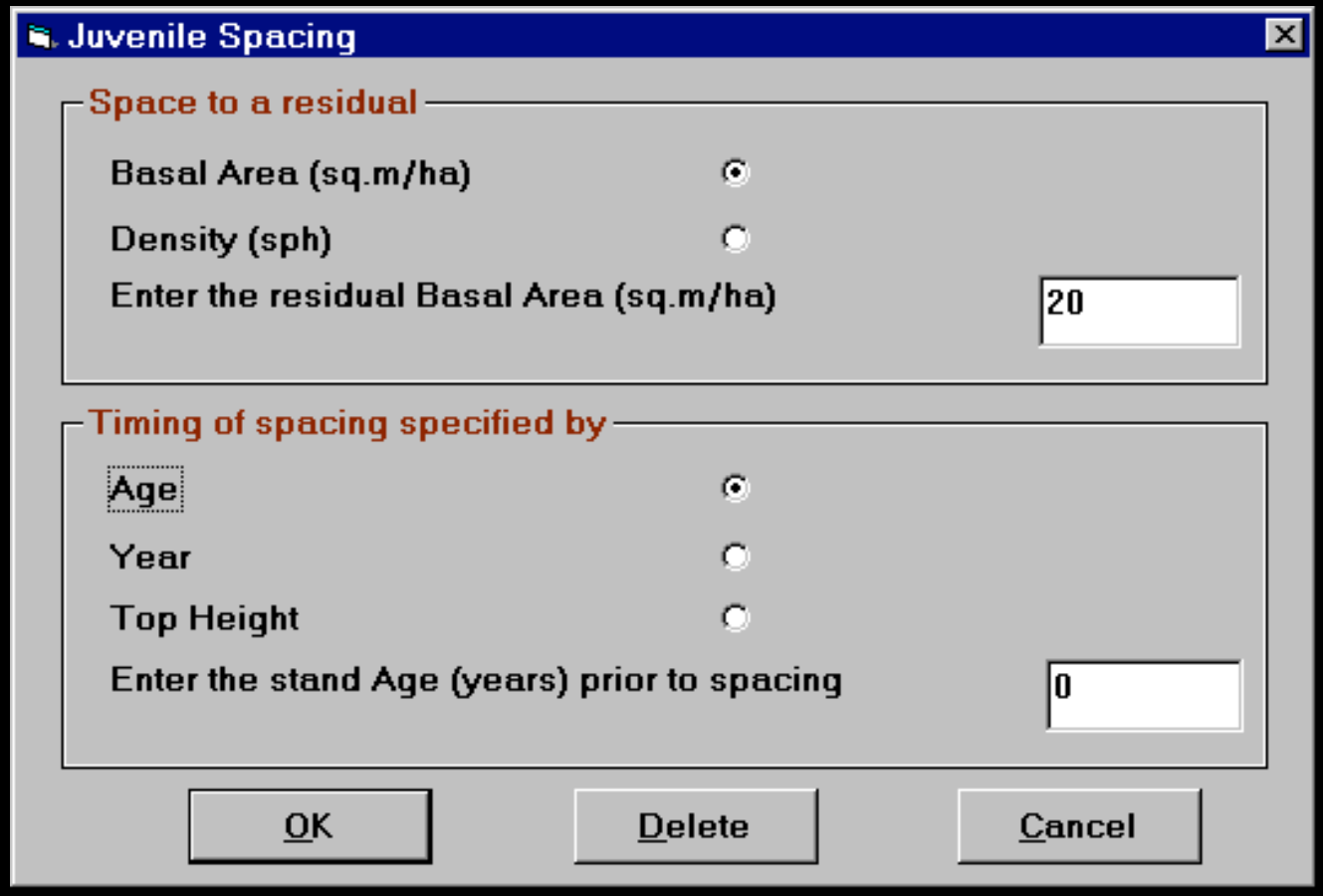

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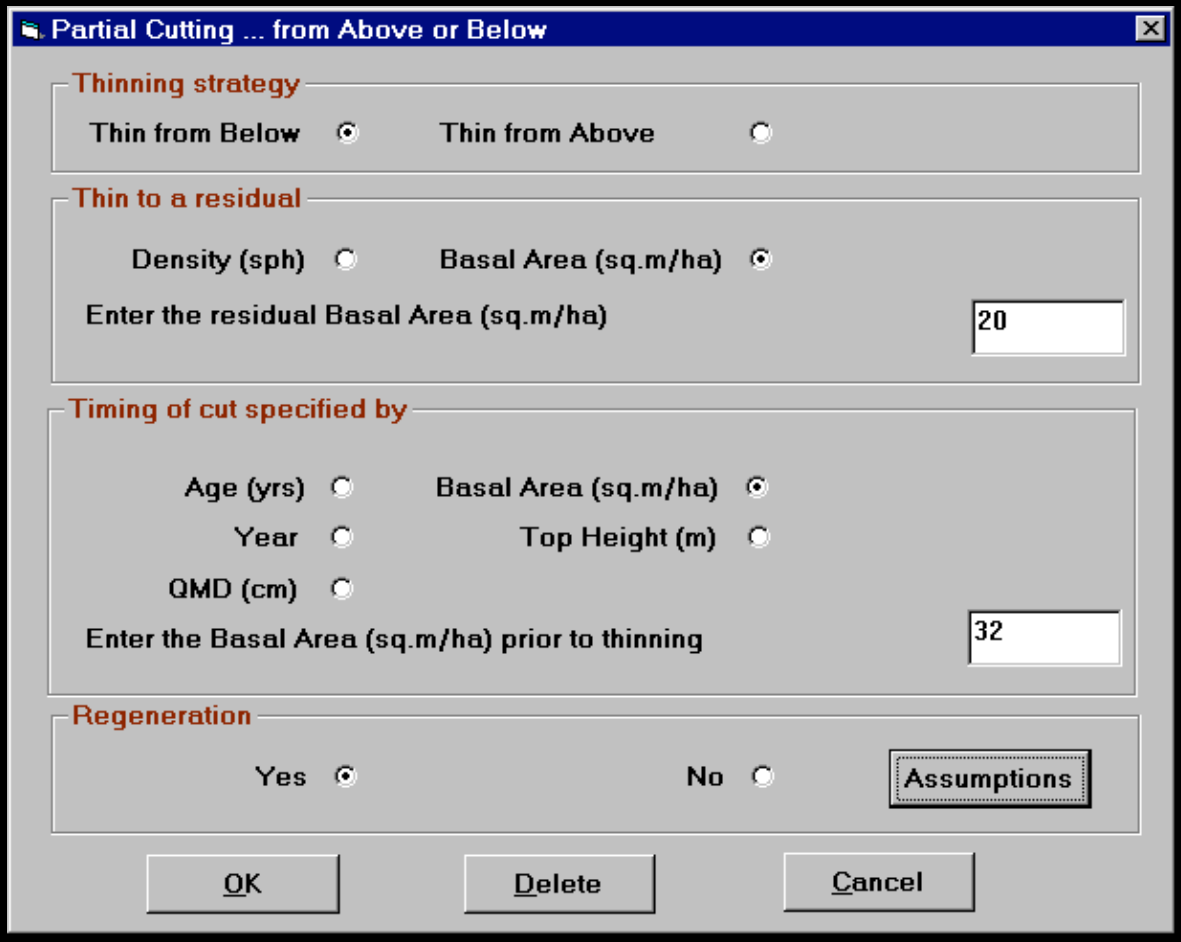

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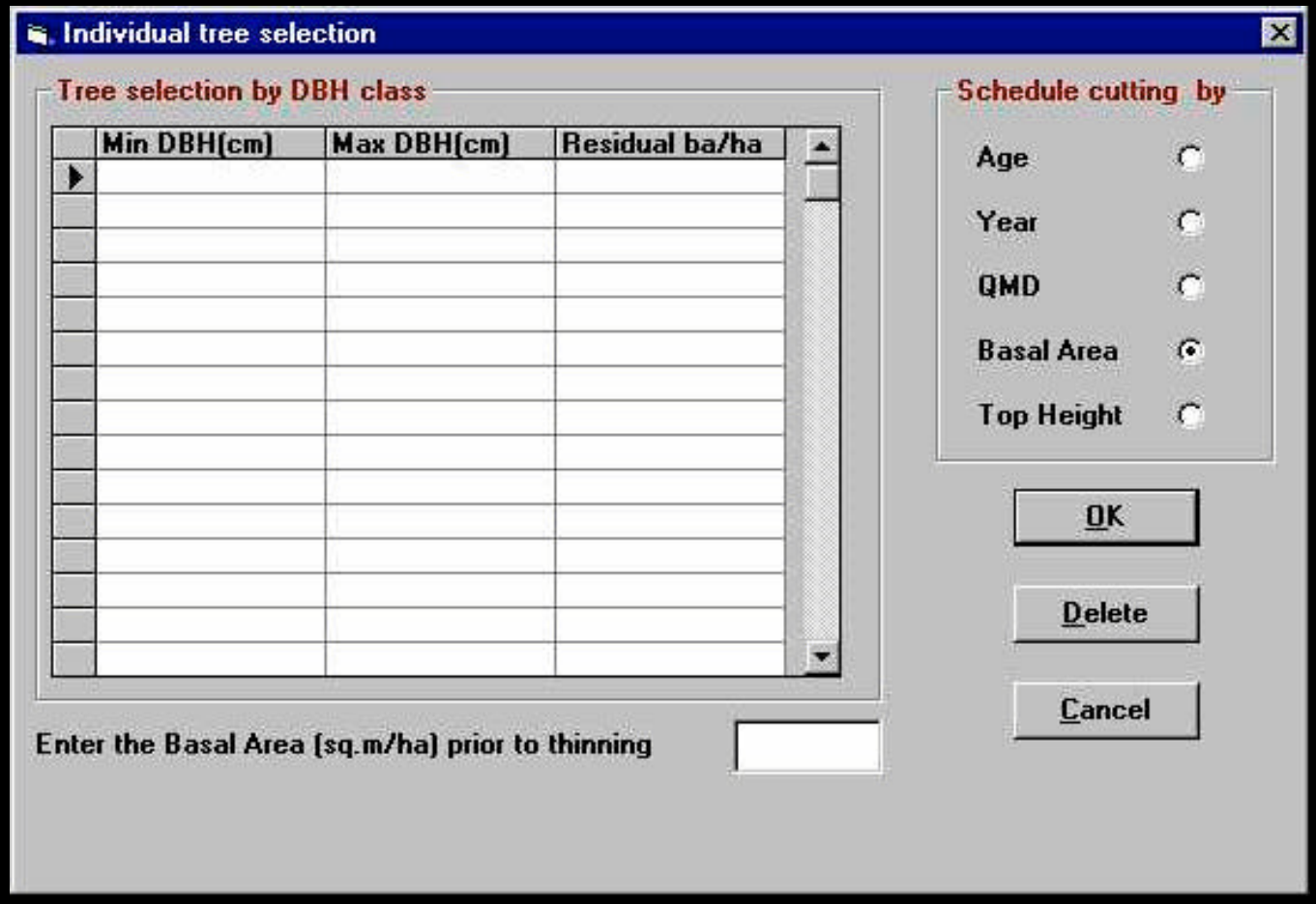

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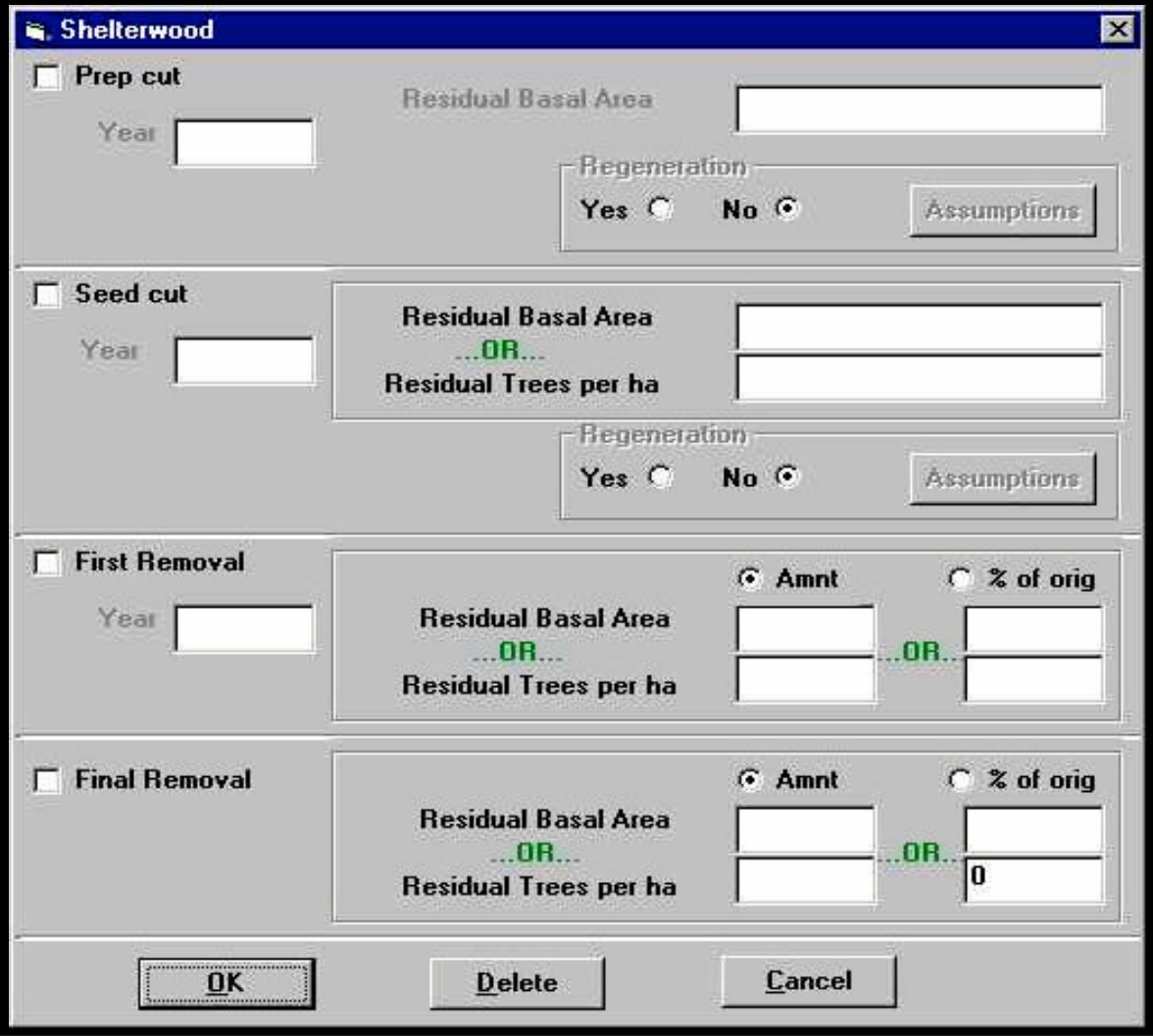

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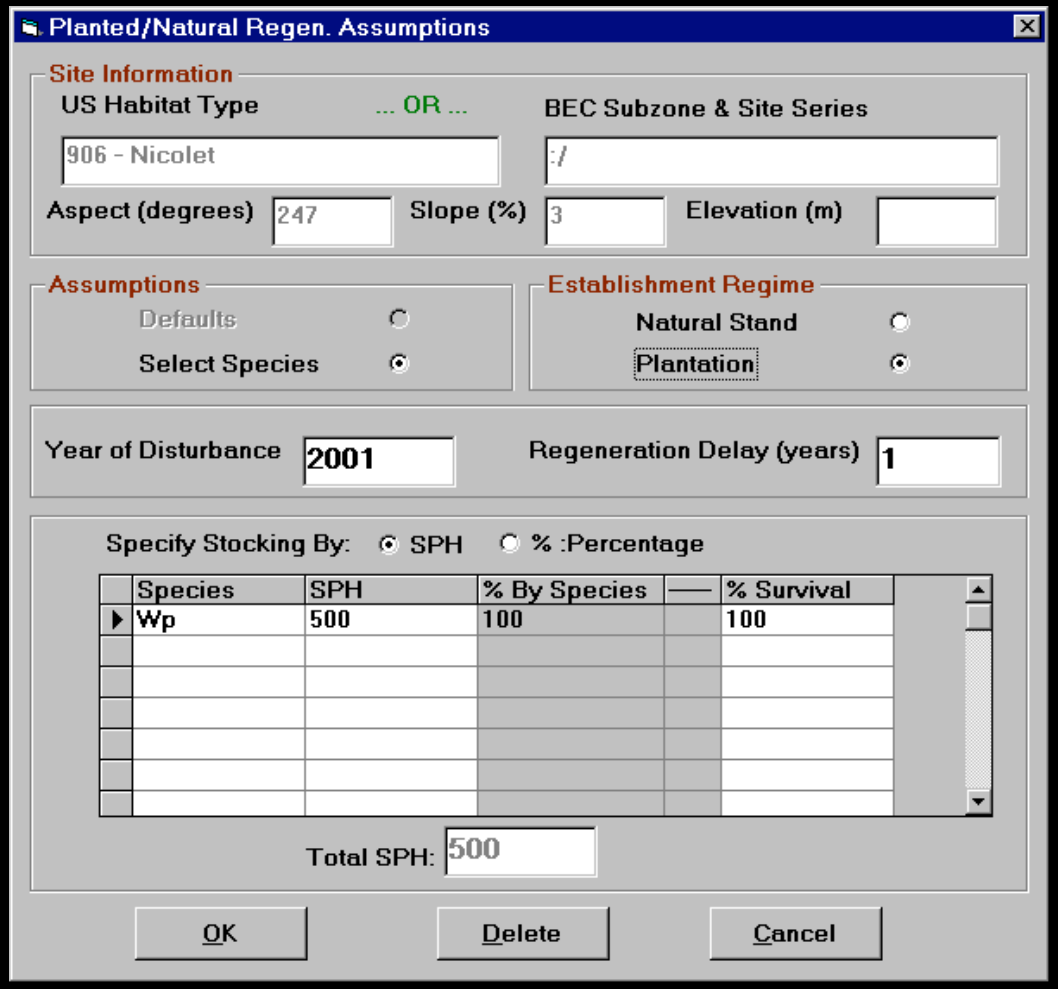

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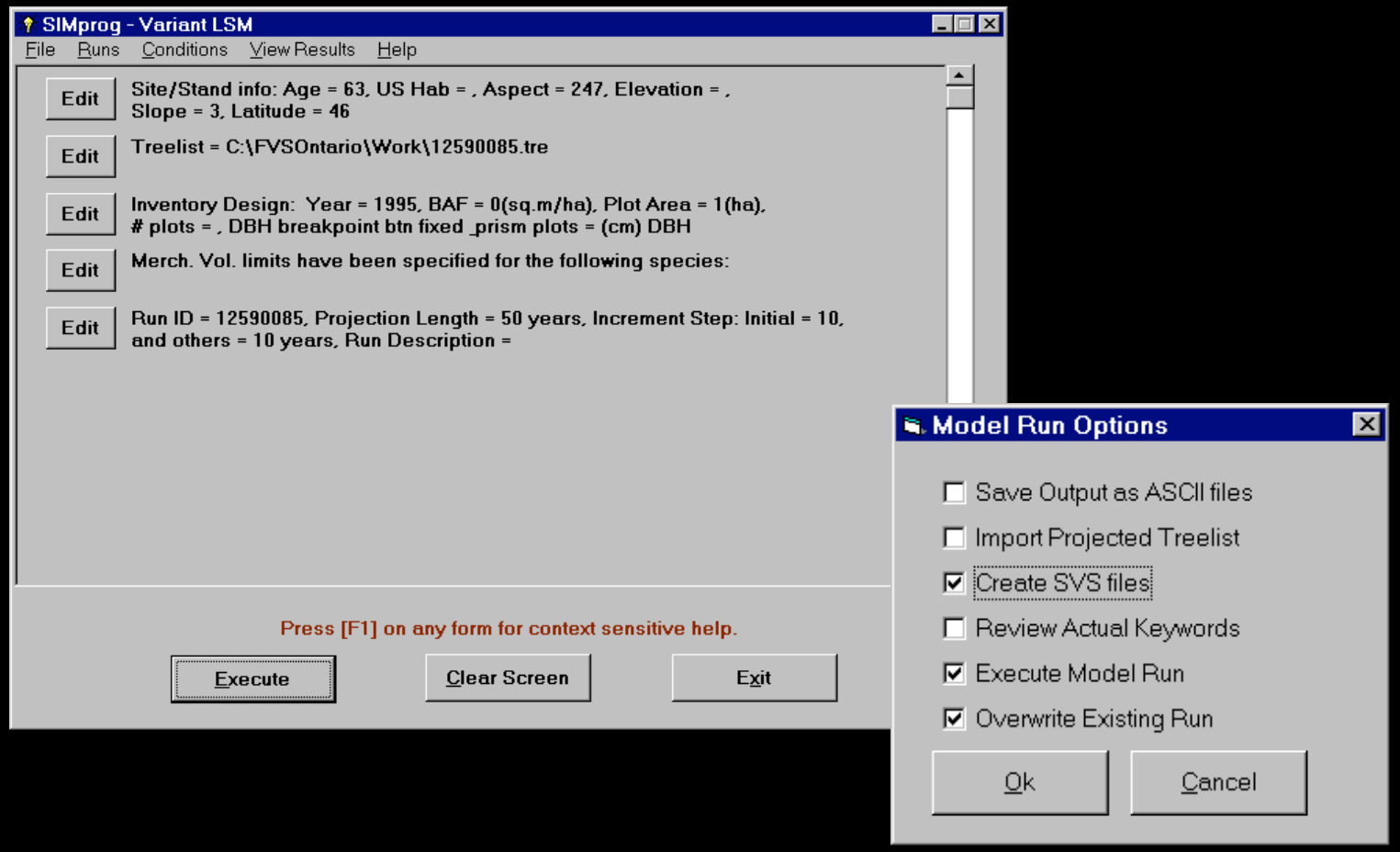

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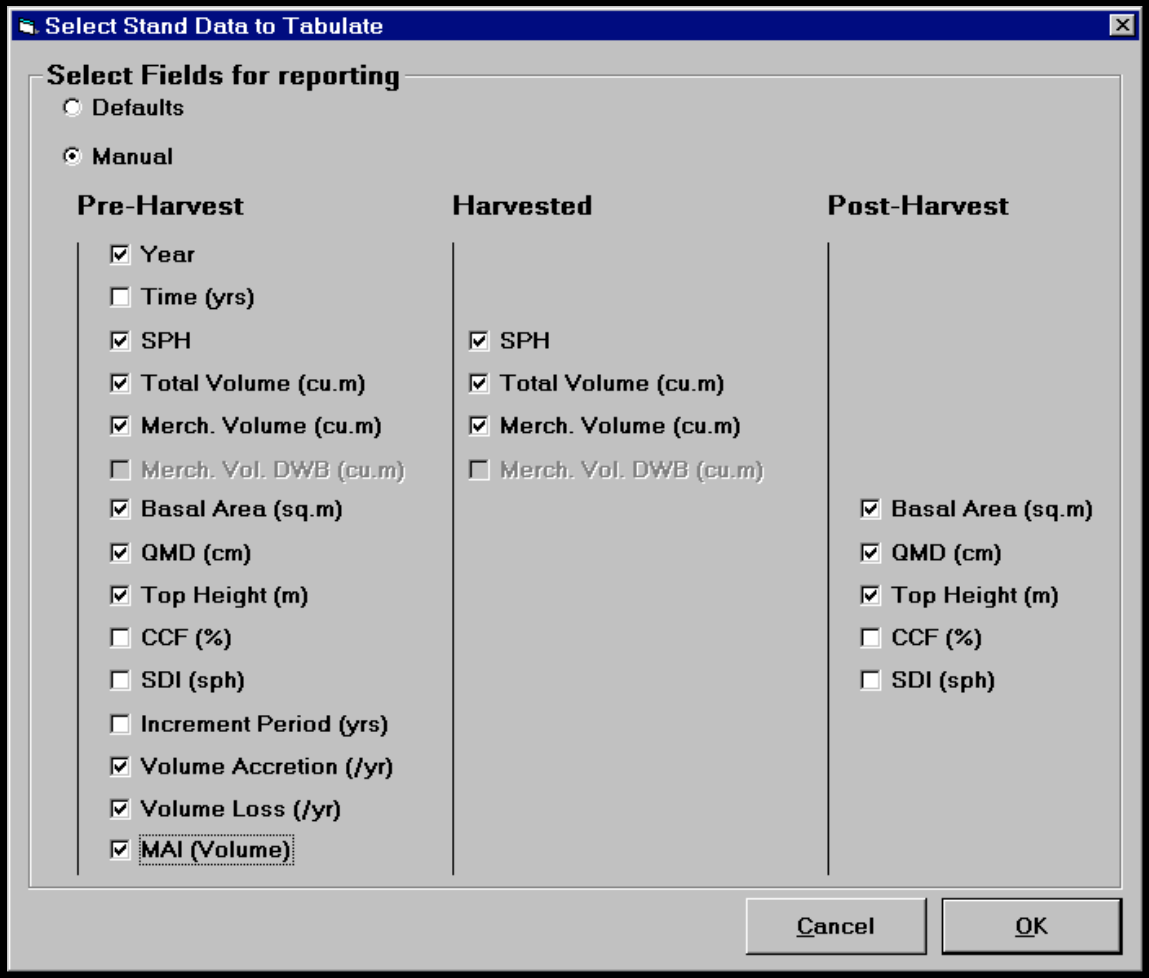

FVS Ontario

version 1.0

View Text

File Edit

All statistics are reported on a per hectare basis.

Run_ID	Year	SPH	Basal Area (sq.m)	Top Height (m)	QMD (cm)	Total Volume (cu.m)	Merch. Volume (cu.m)	SPH (harv.)	Total Volume (harv.)	Merch. Volume (harv.)	Basal Area (resid.)	Top Height (resid.)	QMD (resid.)	Vo Accre (
12590085	1995	704	22.7	17.7	20.3	116.2	43.7	0	0	0	22.7	17.7	20.3	
12590085	2005	670	27.5	18.3	22.9	172.2	77	0	0	0	27.5	18.3	22.9	
12590085	2015	633	32.4	18.9	25.5	211.5	114	0	0	0	32.4	18.9	25.5	

Run parameters for run: 12590085

1) Site/Stand info: Age = 63, US Hab = , Aspect = 247, Elevation = ,
Slope = 3, Latitude = 46
2) Treelist = C:\FVSOntario\Work\12590085.tre
3) Inventory Design: Year = 1995, BAF = 0(sq.m/ha), Plot Area = 1(ha),
plots = , DBH breakpoint btn fixed & prism plots = (cm) DBH
4) Merch. Vol. limits have been specified for the following species:
Jp,Sc,Rn,Rp,Wp,Ws,Ns,Bf,Bs,Ta,Wc,Eh,Os,Rc,Ba,Ga,Cw,Sv,Rm,Bc,El,Se,Re,Yb,Bw,Sm,Bm,Ab,Wa,Wo,Sw,Br,Ck,

Keyword Field Descriptions

Species#	Min DBH	Top Diam	Stump Ht
1	10	10	30
2	10	10	30
3	16	10	30
4	16	10	30
5	16	10	30
6	10	10	30
7	10	10	30
8	10	10	30
9	10	10	30
10	10	10	30
11	10	10	30
12	16	10	30
13	10	10	30
14	10	10	30
15	20	10	30
16	20	10	30
17	20	10	30
18	20	10	30
19	20	10	30

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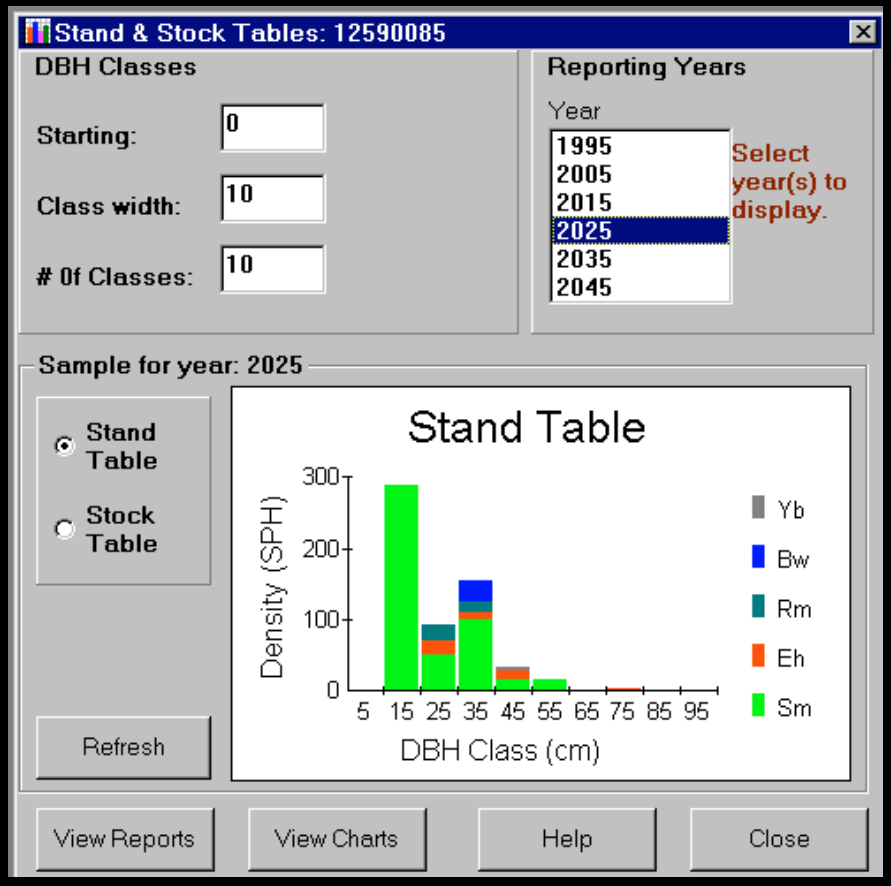
version 1.0



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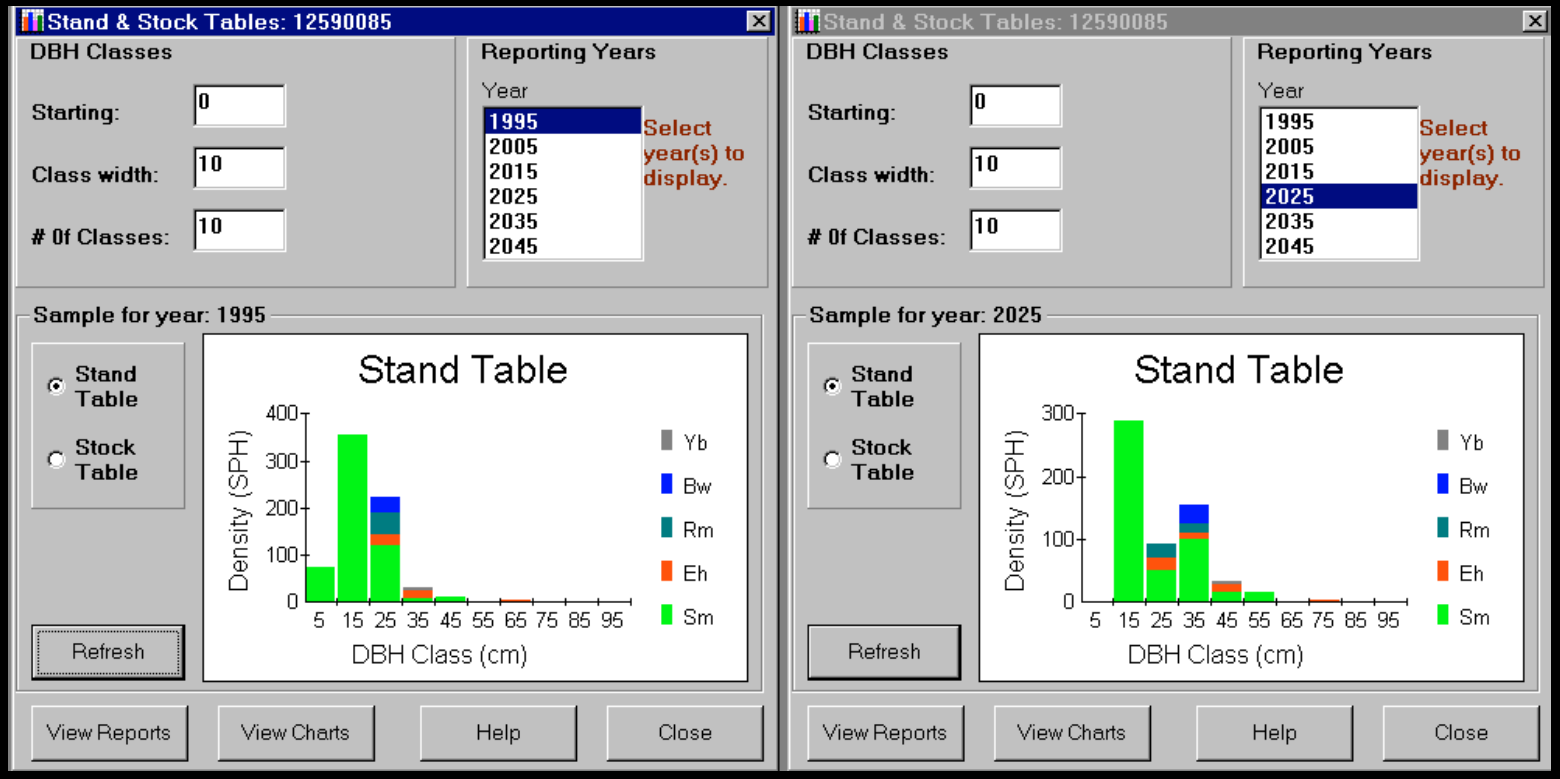

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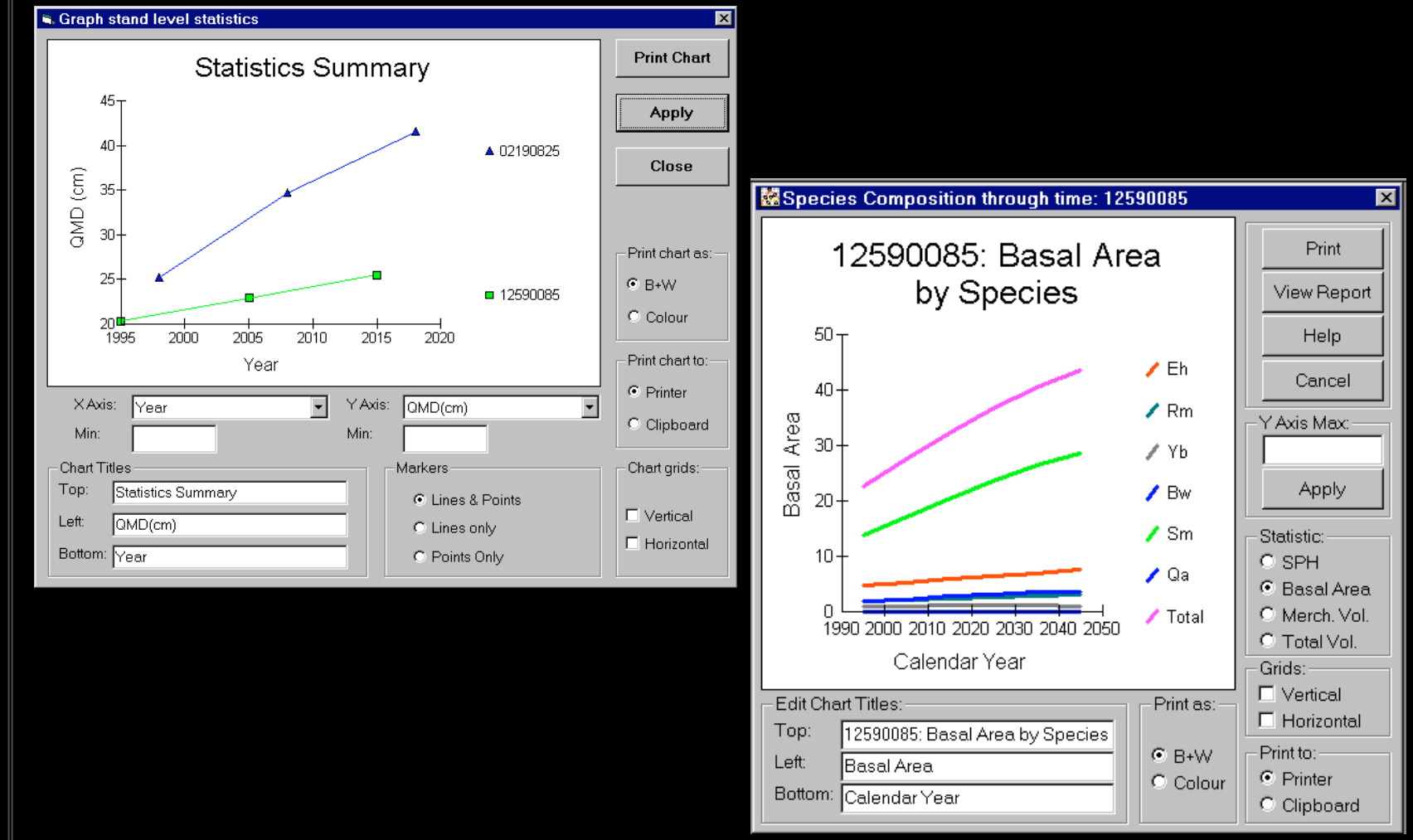

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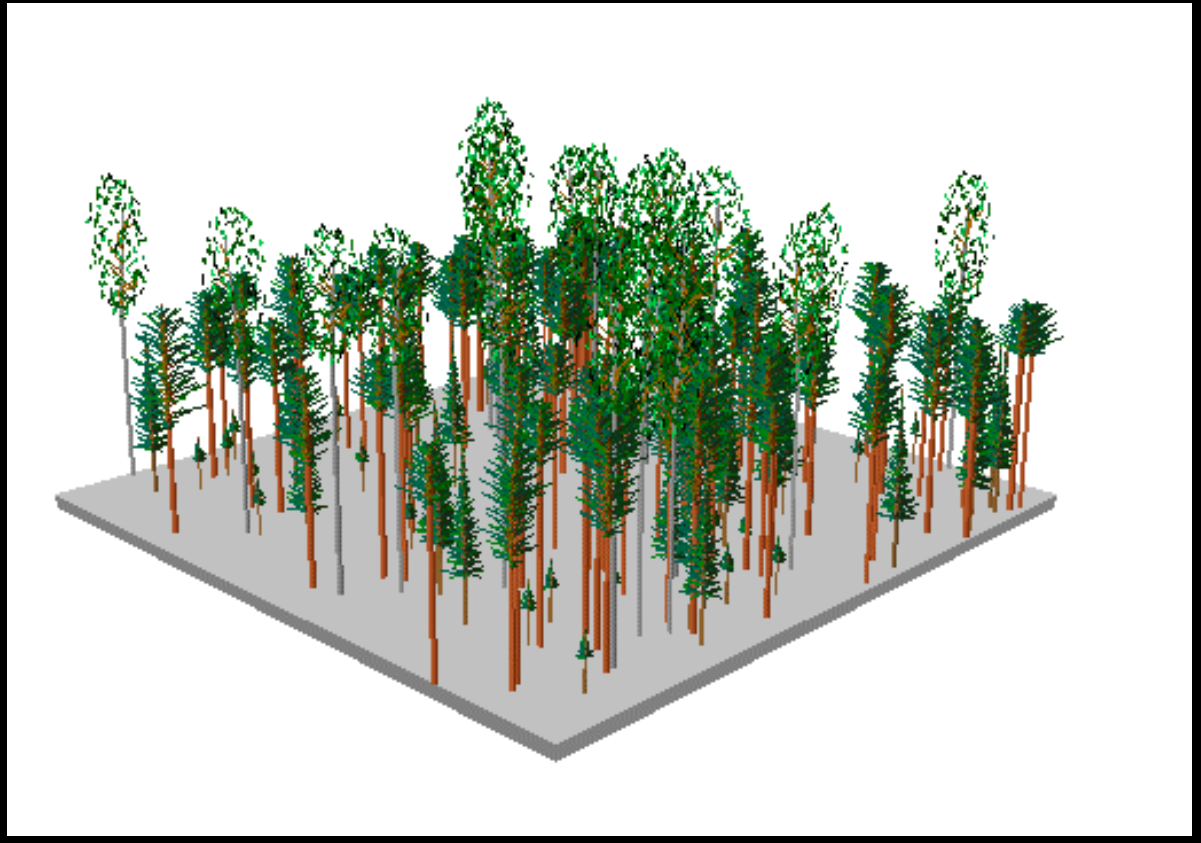

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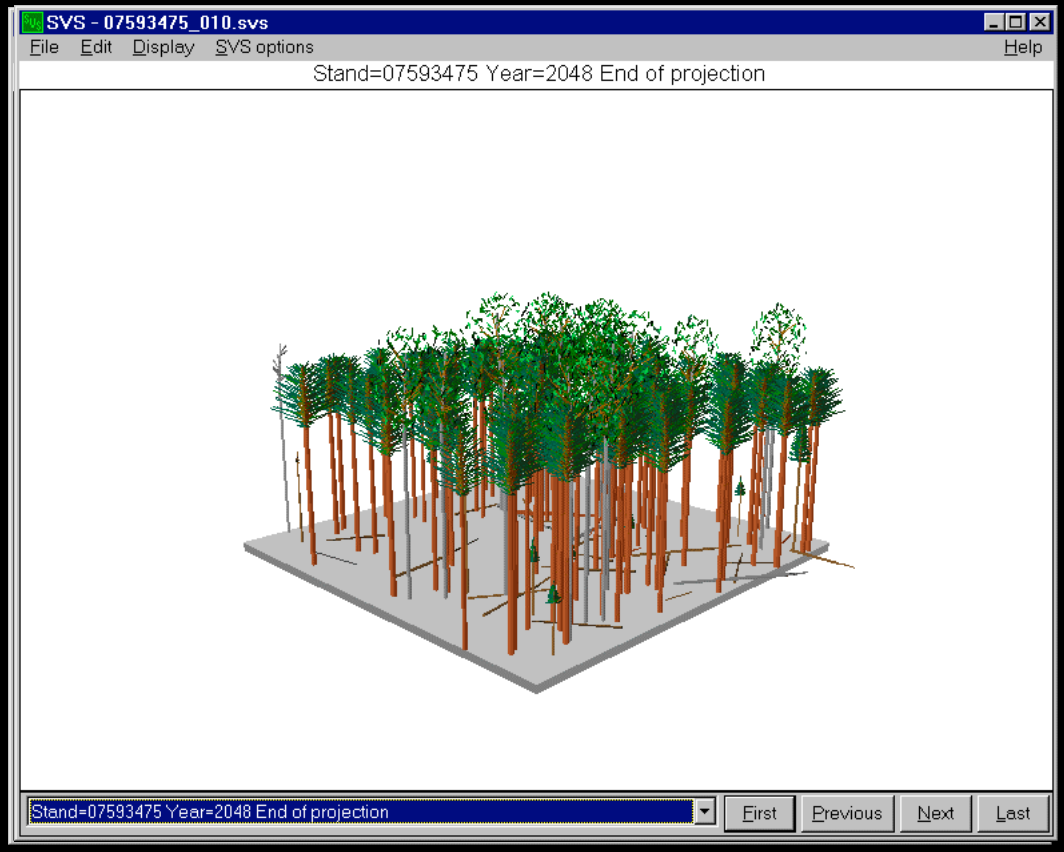

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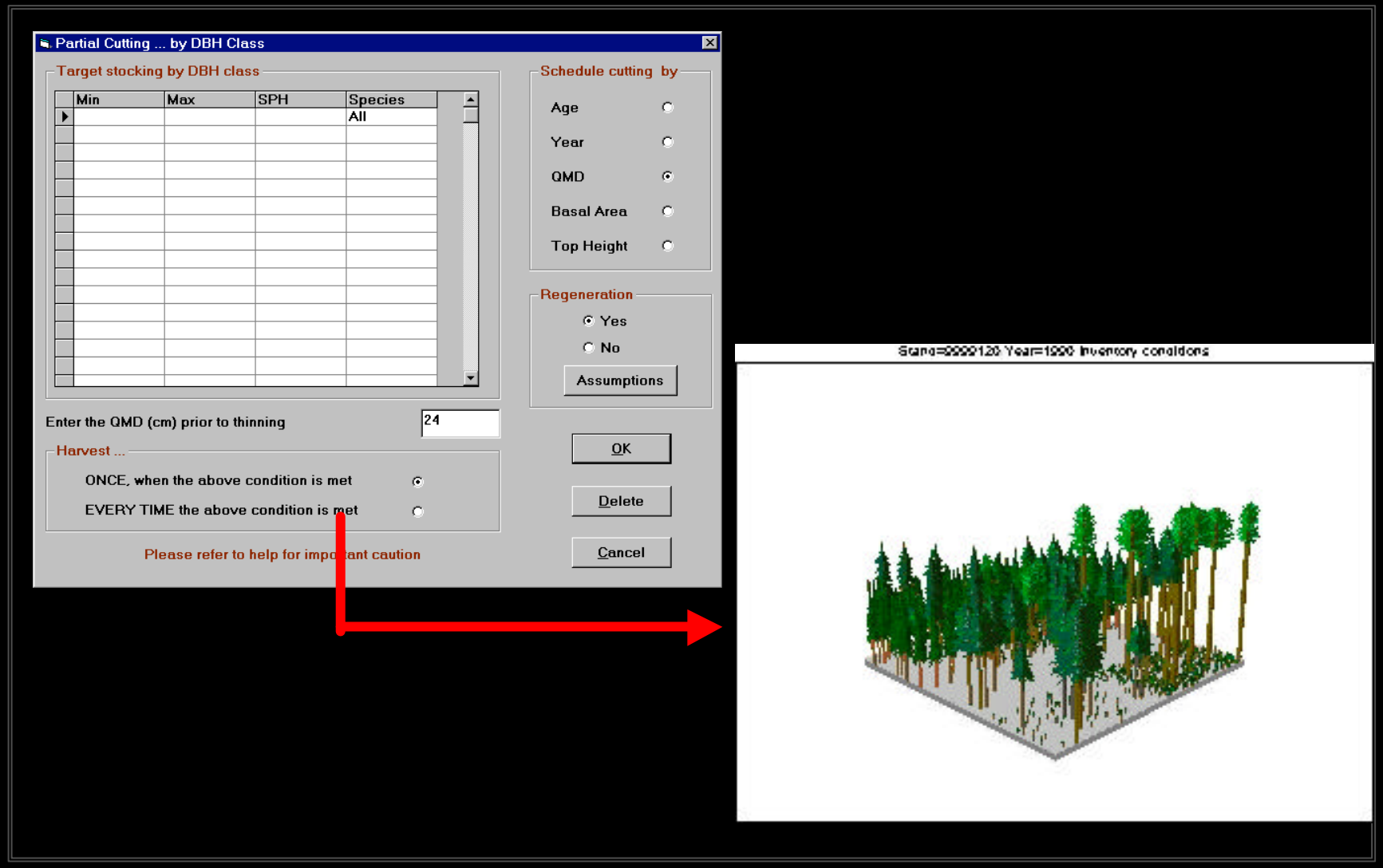


FVS Ontario

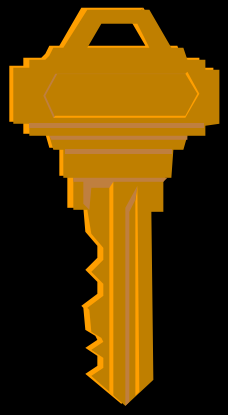
Next Steps?

Validation of FVS Ontario

- Model forms are from the Lake States
  - How well do the site index curves work in Ontario?
  - How well does the model represent thinning in our stand conditions?

Pw PSPs
Sb PSPs
Pj PSPs
Mh PSPs

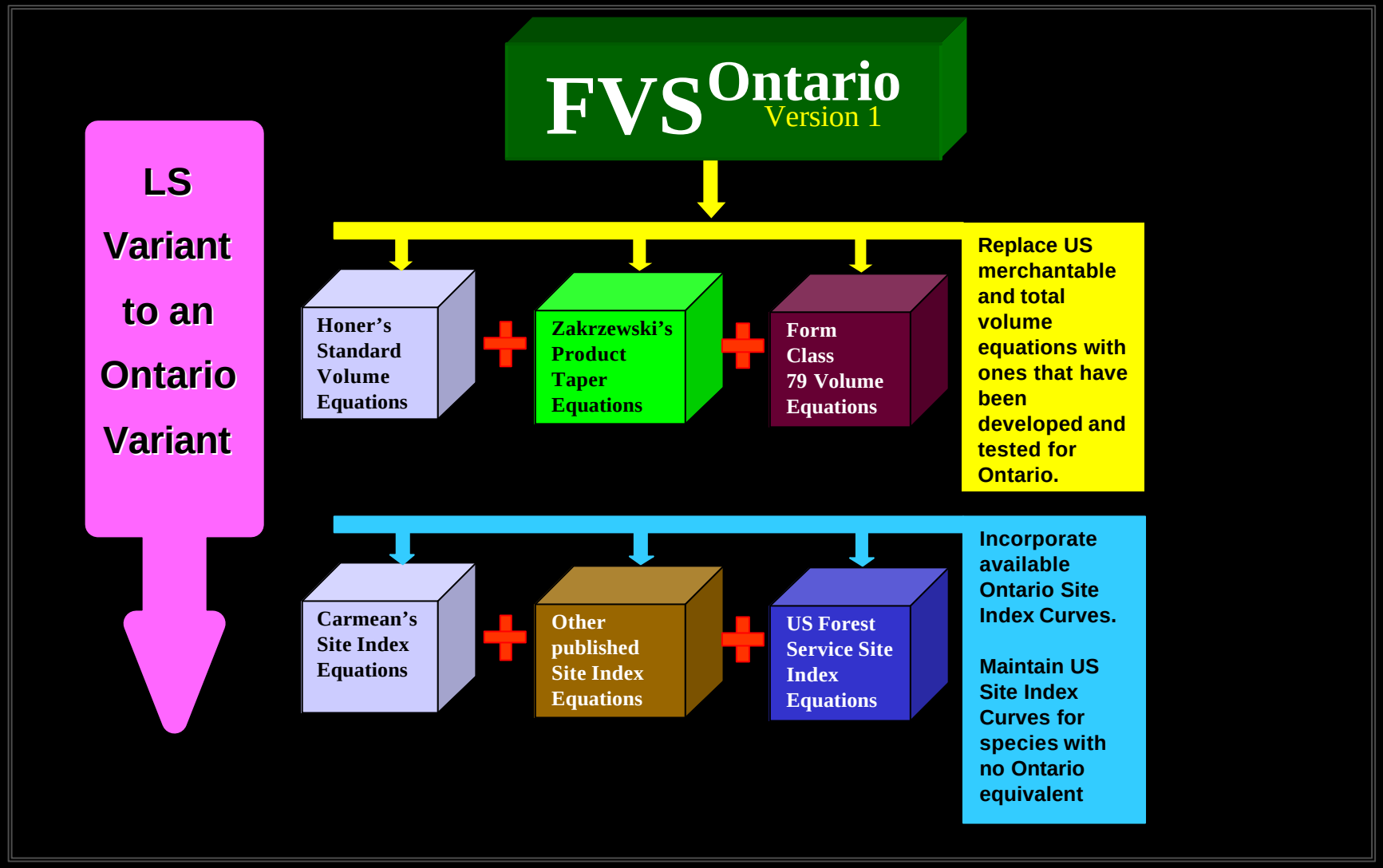
=



to testing and adjusting

FVS Ontario

Next Steps?

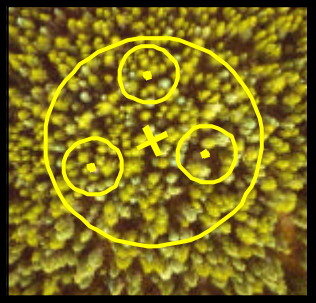


FVS Ontario

TREE LIST GENERATION

DATA SOURCES

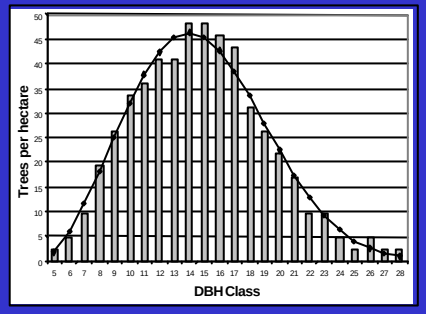
PSP



INVENTORY/ECOLOGICAL

OPERATIONAL CRUISING

MODELLING



Estimated Tree List

Class (cm)	Species	Height (m)	per ha
4	Sb	3.7	75
5	Sb	4.6	60
6	Sb	5.5	54
7	Pj	6.4	18
8	Pj	7.4	25
9	Pj	8.5	32
10	Pj	9.6	38
11	Pj	10.7	42
12	Pj	12.1	58
13	Pj	13.3	67
~	~	~	~

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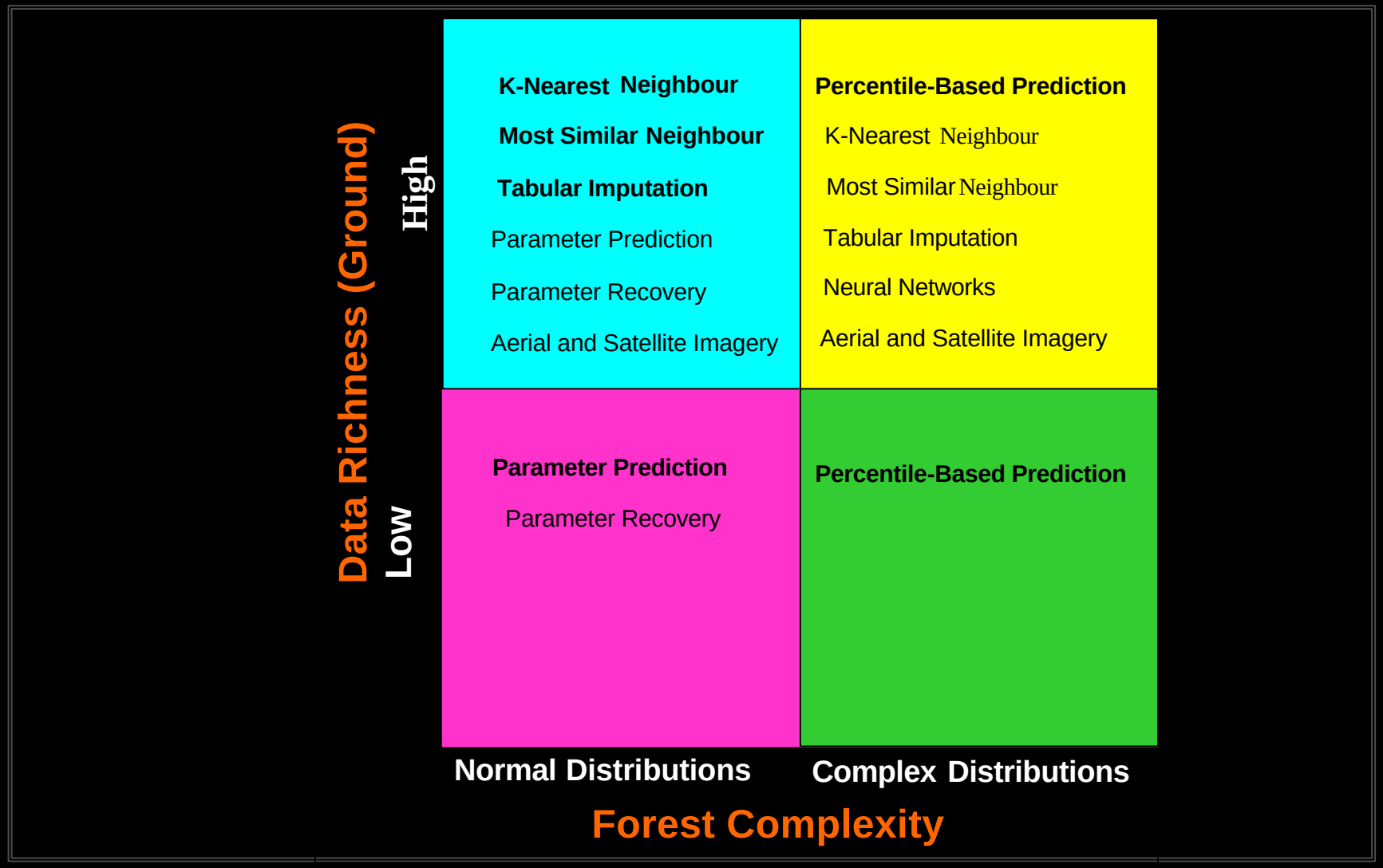
Tree List Generation Methods



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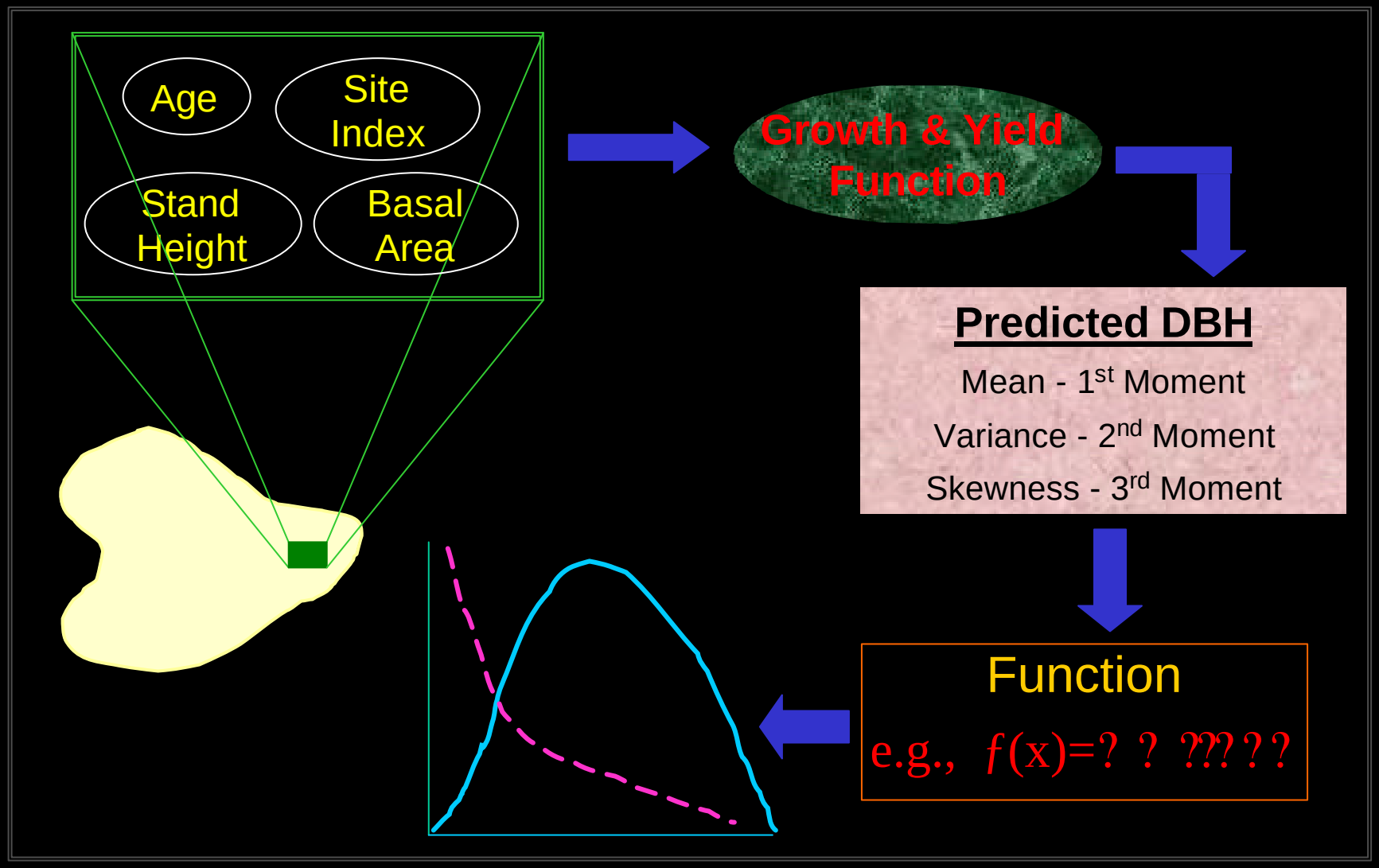
Parameter Recovery



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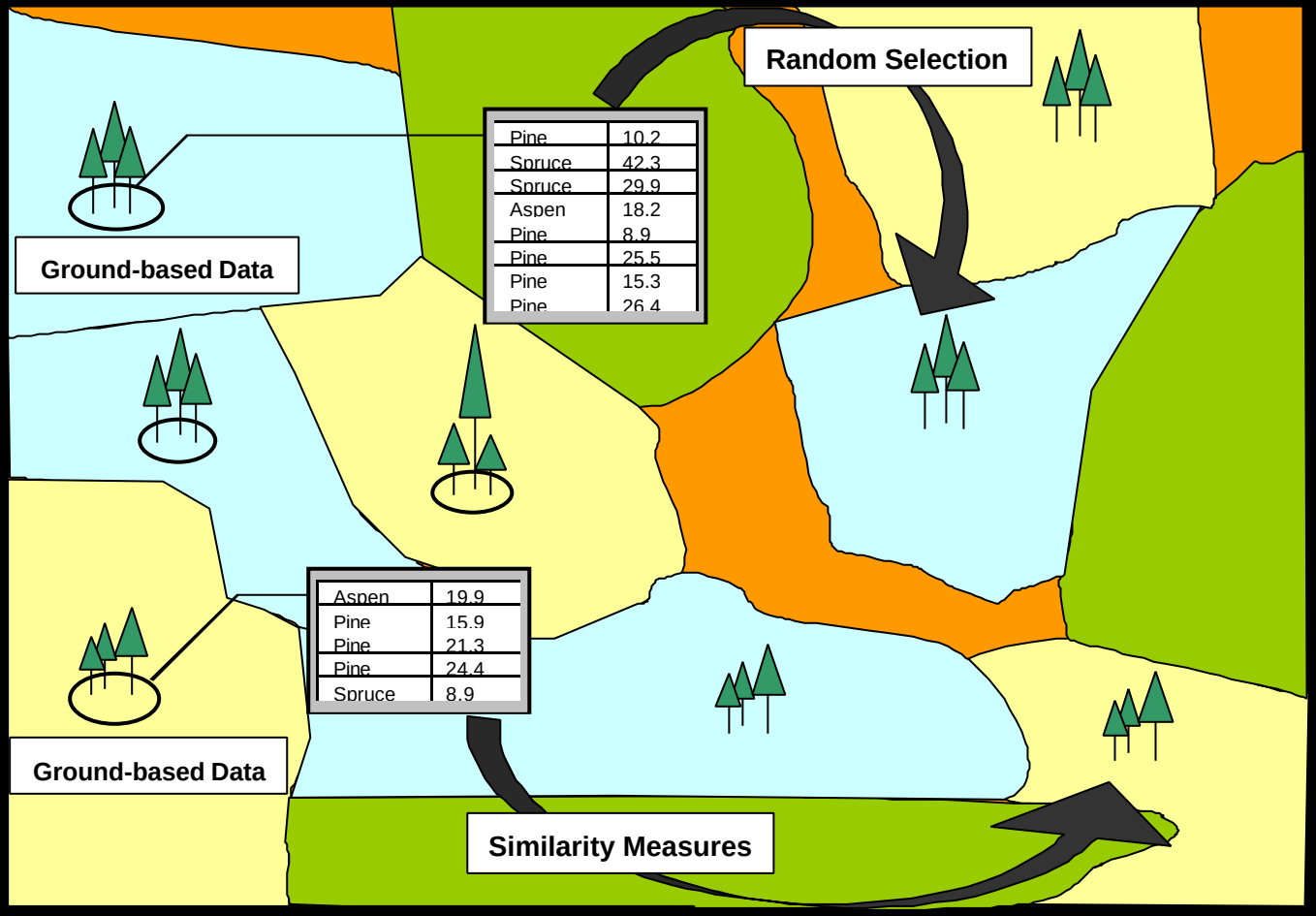
Imputation



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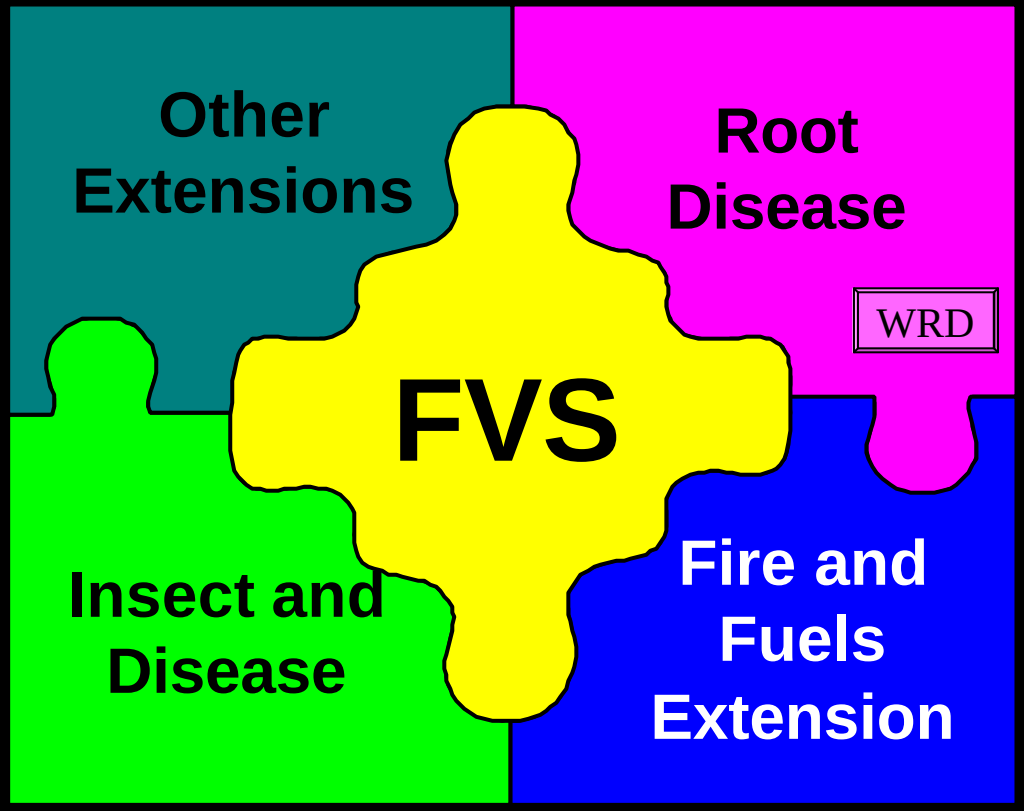
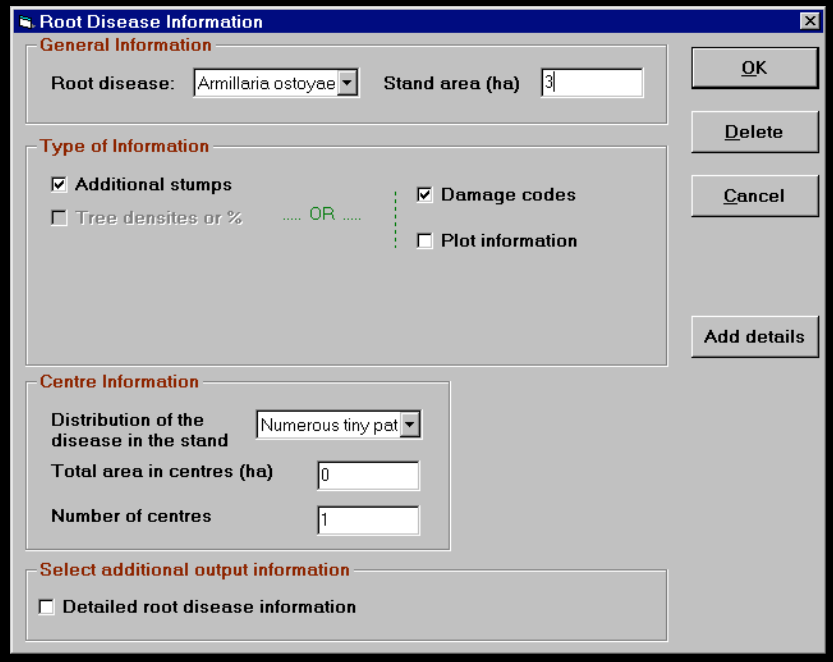
The future...



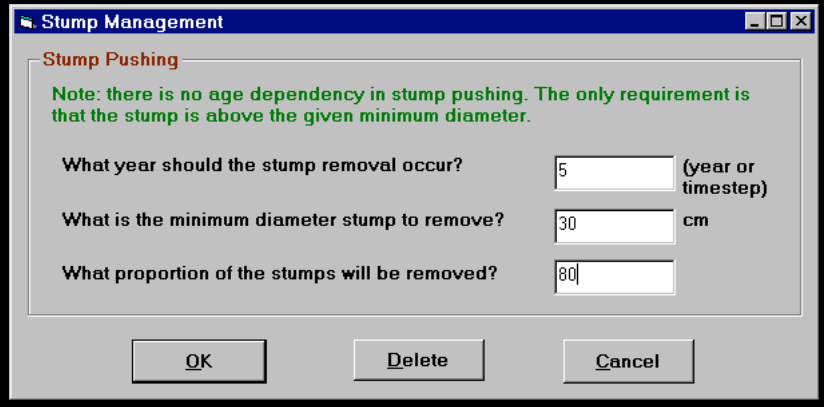
Modules and Extensions

FVS Ontario

Western Root Disease Module

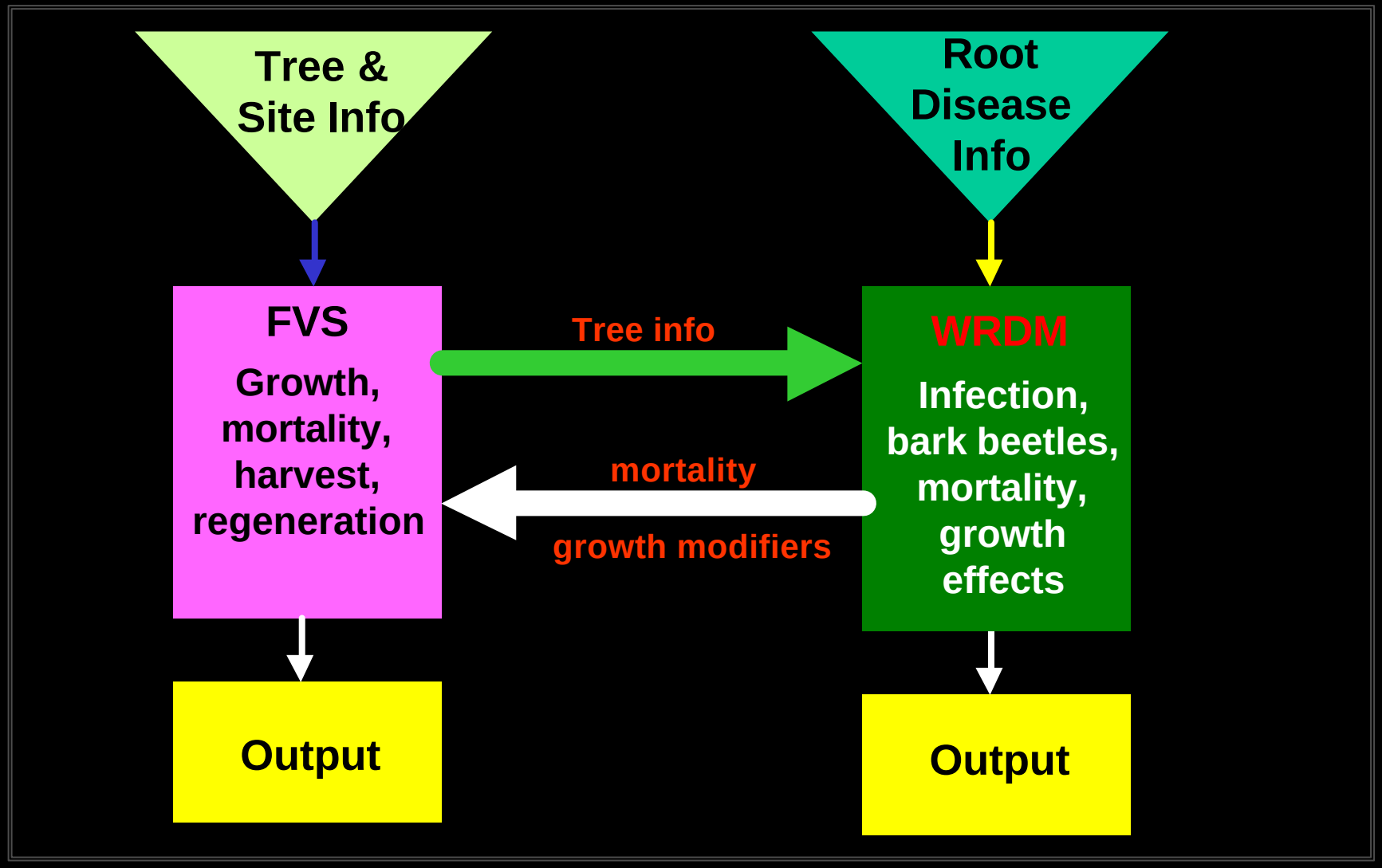


Screens currently in FVS^{Ontario} - but model developed for Western species



FVS Ontario

Western Root Disease Module



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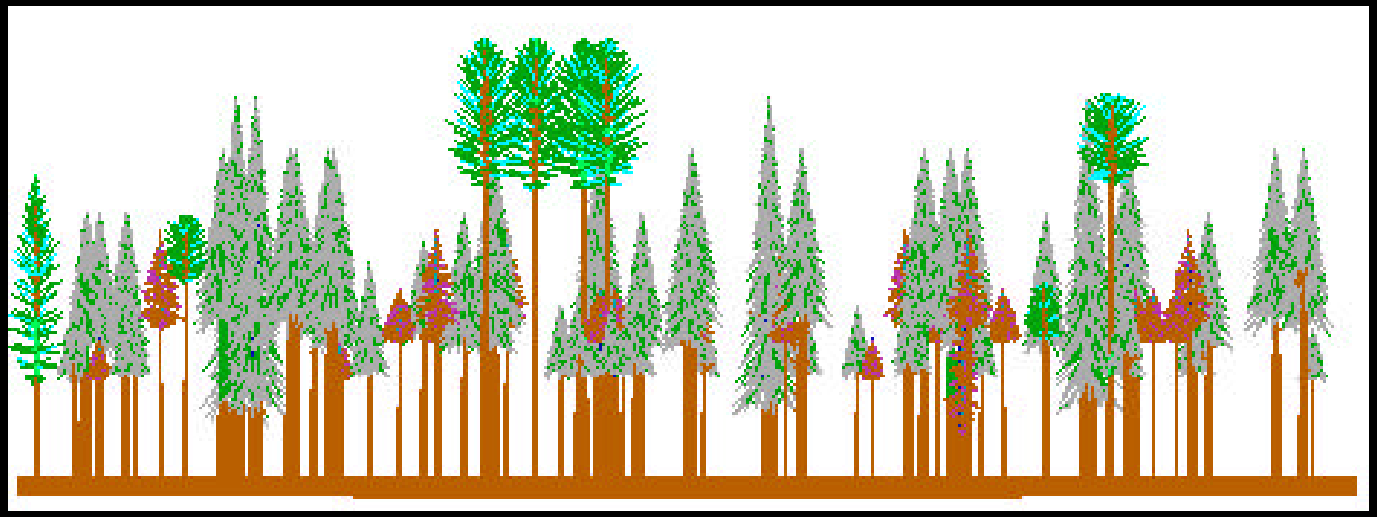
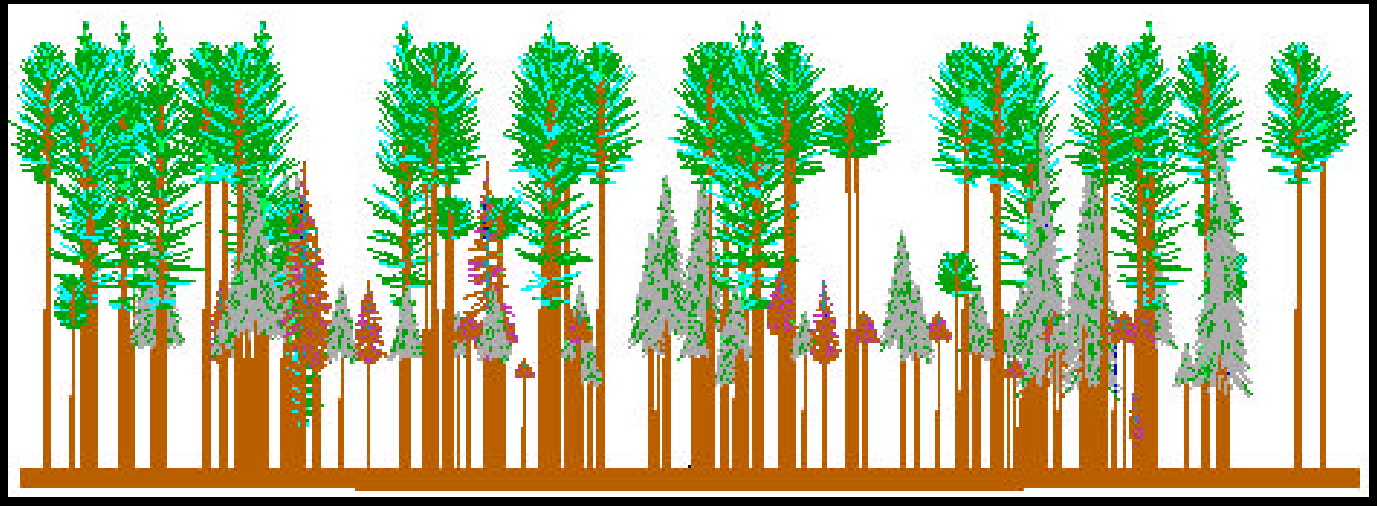
Western Root Disease Module

No Root Disease

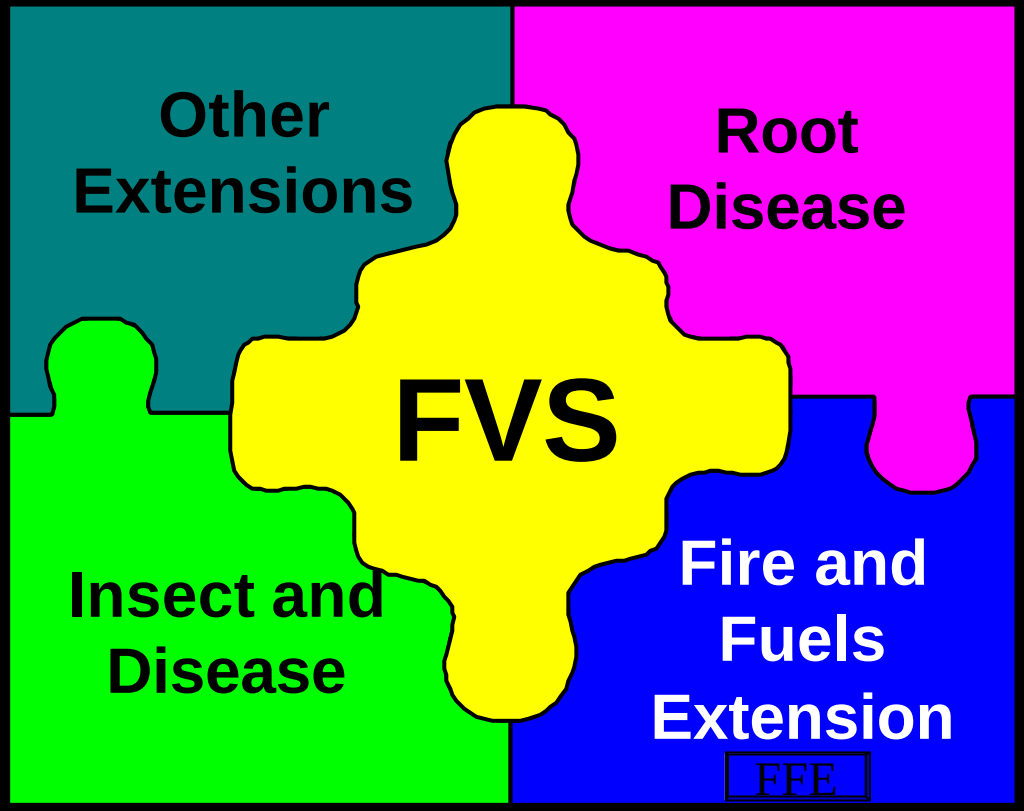


With Root Disease



FVS Ontario

The future...



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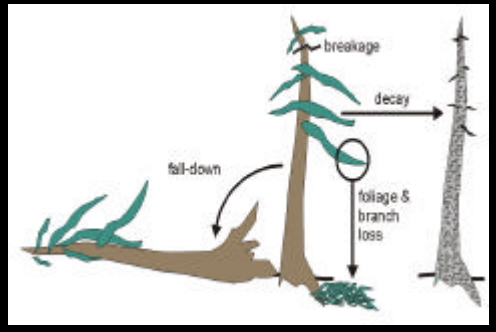
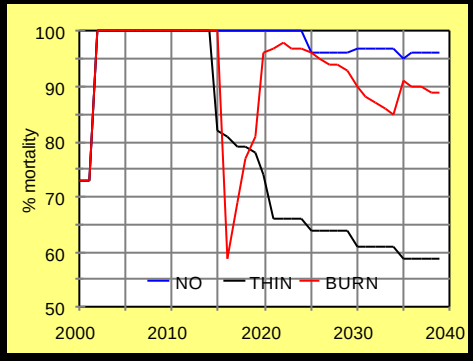
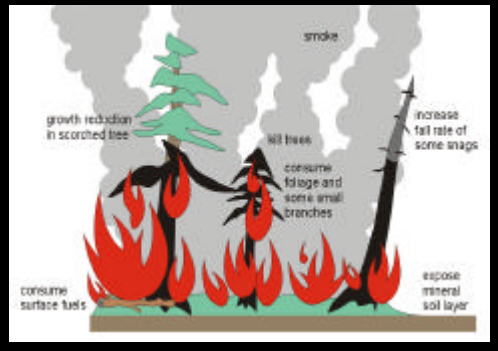
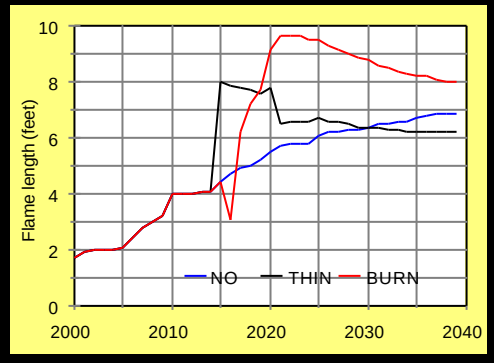
The Fire & Fuels Extension

A model intended to simulate the effects of vegetation dynamics and management actions on fuel loadings and fire effects









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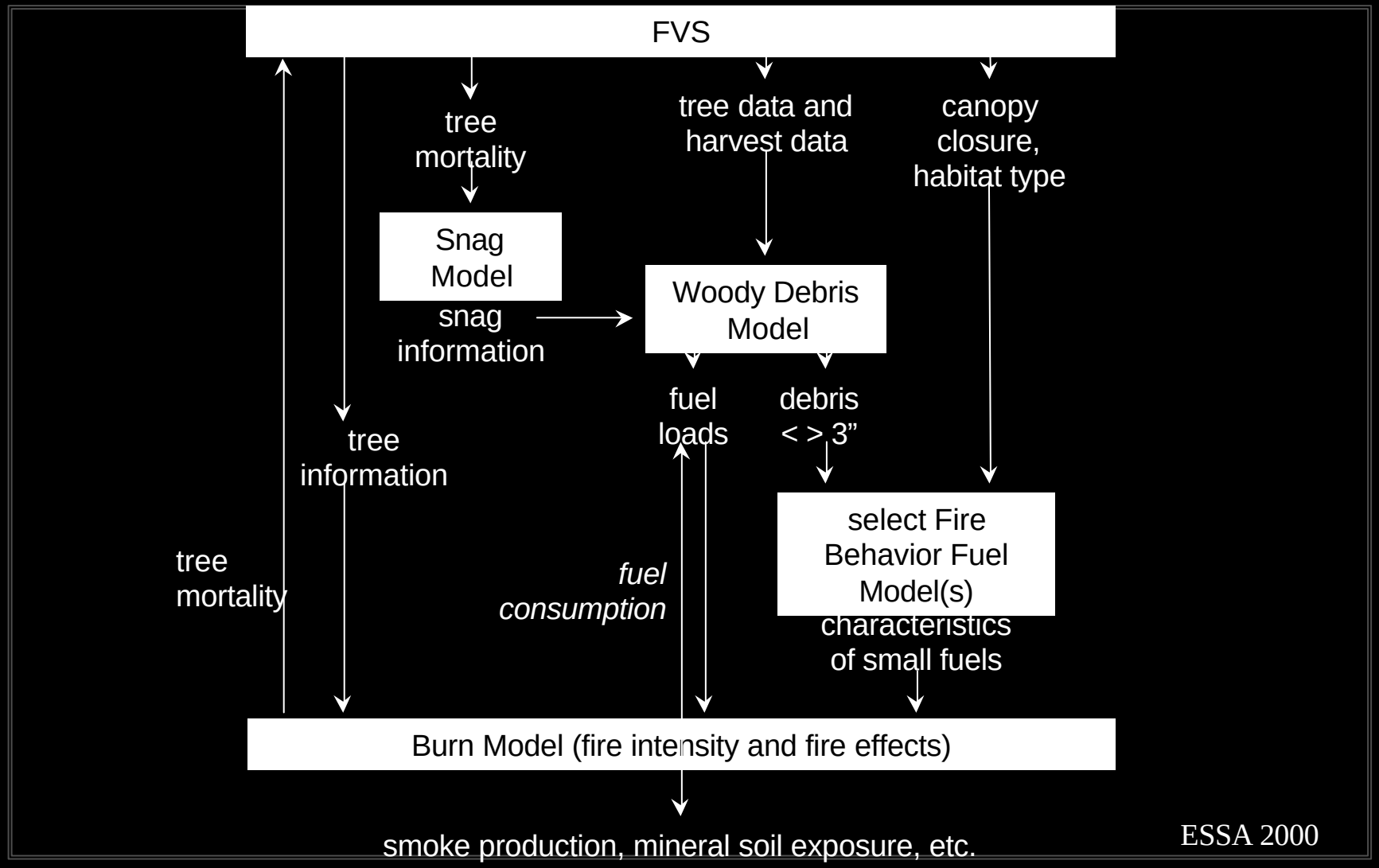
The Fire & Fuels Extension



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Fire & Fuels Extension

The FFE Model CAN:

- simulate snag and fuel dynamics, with or without fires
- predict changes in fuel levels due to management, fire, or natural aging
- calculate the potential fire severity for the stand or landscape
- predict the effects of fire on various indicators

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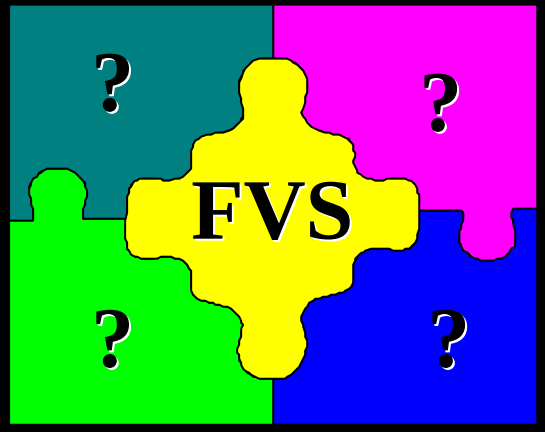
Future Modules...



- Validation of US modules?
- Development of new modules for:
  - vegetation control - or not?
  - Impacts of logging and site damage?
  - fertilization?
  - tree improvement?

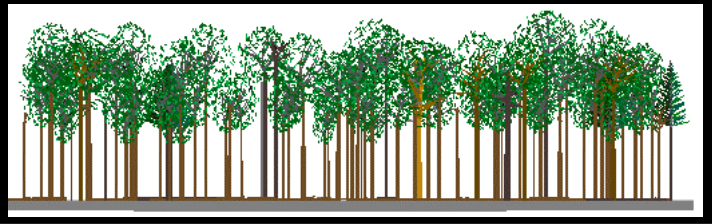
US Post Processor Software for FVS

- Stand Visualization System (SVS)
- FVSStand - Stocking and Yield Tables
- Vegetation Structural Stage calculations
- SPECTRUM Export Tables - US Woodsupply
- Elk Hiding Cover calculations
- Tables of Computed Variables
- Mountain Pine Beetle Risk Rating
- Economic Analysis (CHEAPO)

FVS Ontario

Why am I here ?

- Introduce you to this modelling approach and hopefully pique your interest
- Get you thinking about the benefits and opportunities of Ontario having a modelling tool like FVS Ontario
- Get some feeling on your support of this type of modelling efforts
- Suggestions on how this type of project forward



FVS Ontario

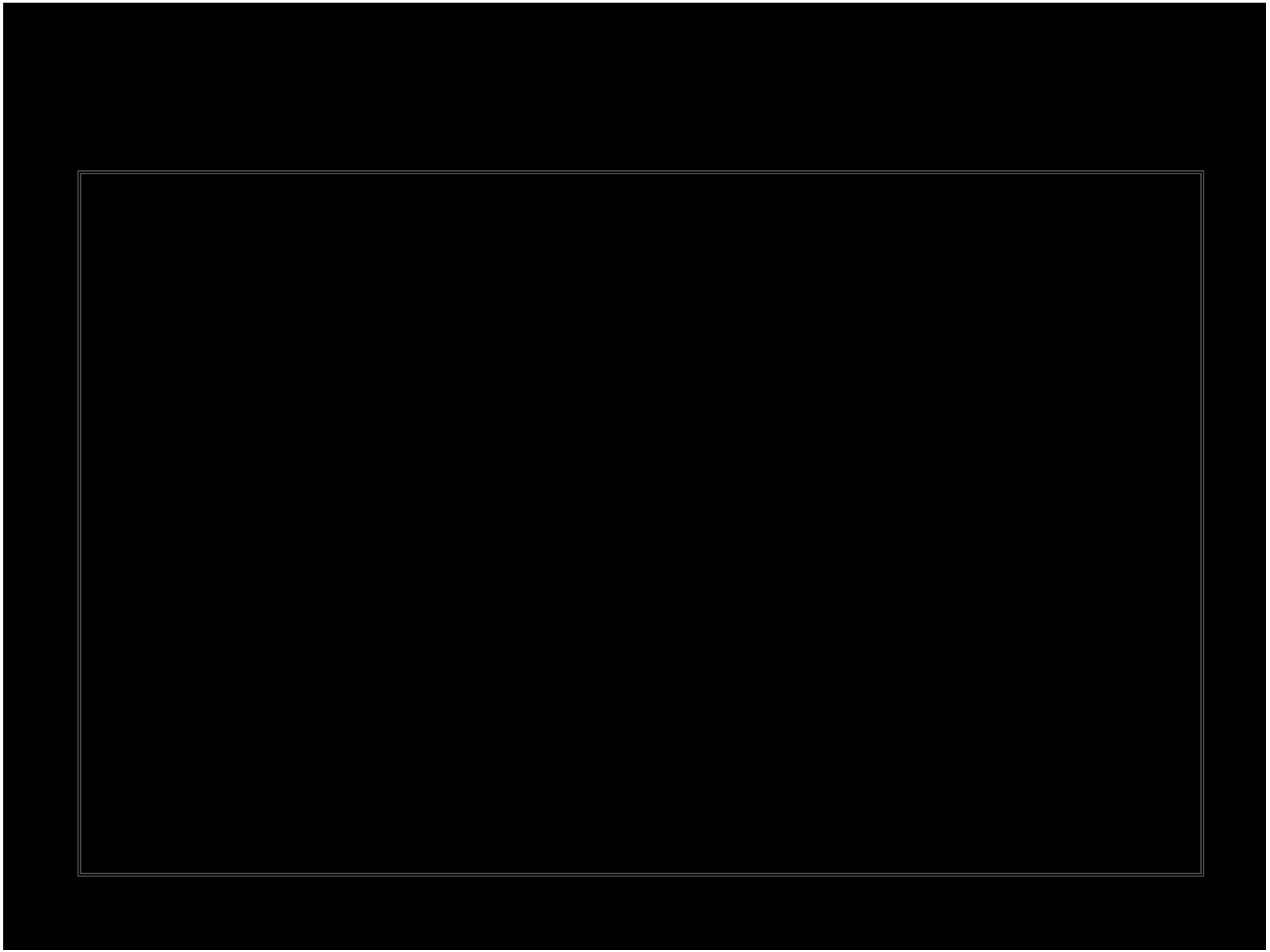
Thank You

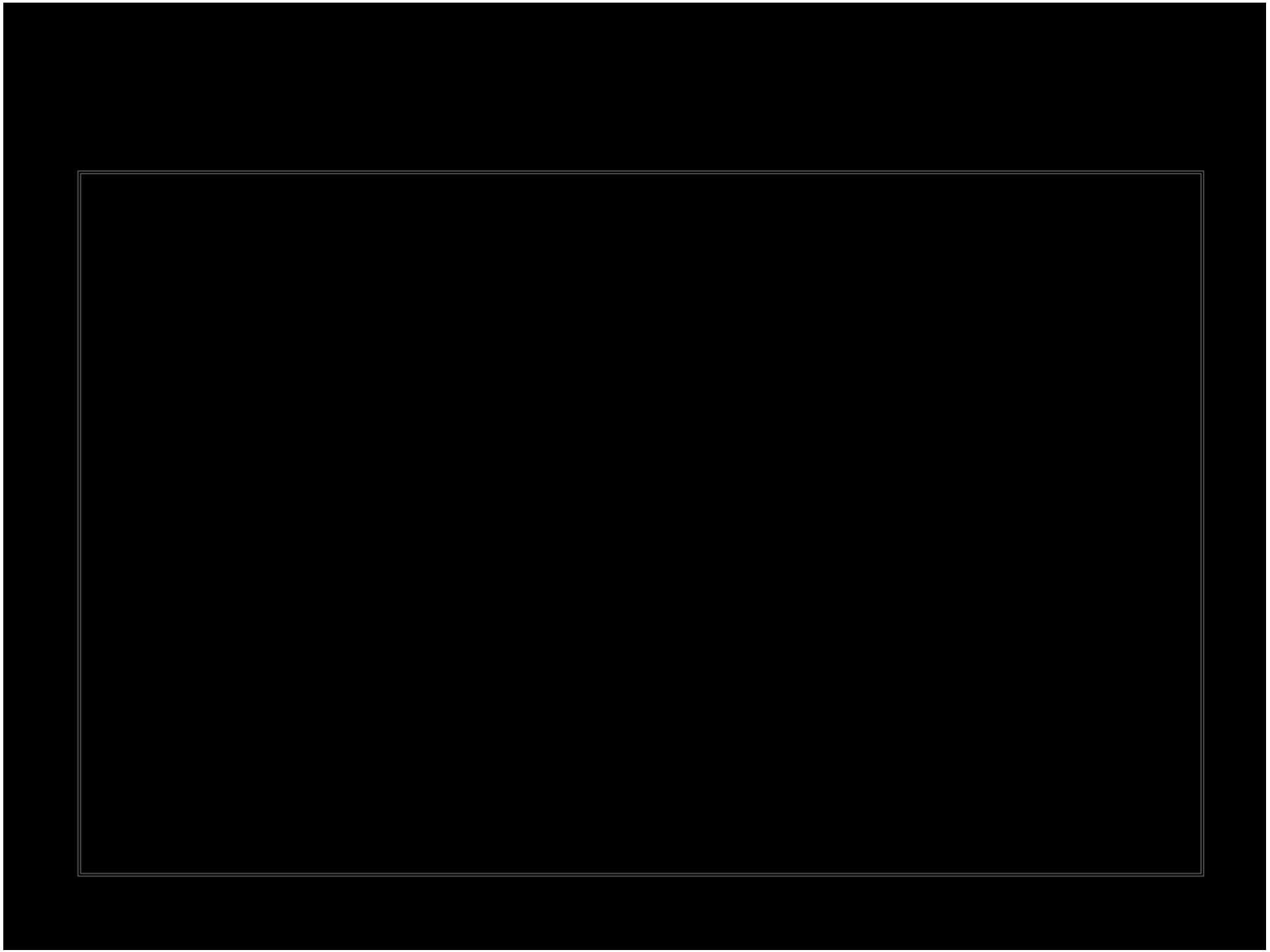
Murray Woods - John Parton

Ontario Terrestrial Assessment Program

Special Thanks to:

- BC Ministry of Forests
- ESSA Technologies Ltd. (Vancouver, BC)





Tree Level Input Data

- Plot ID
- Tree ID
- * Tree count
- Tree history
- * Species code
- * DBH
- Diameter increment
- Live height
- Height to topkill
- Height increment
- Damage and severity
- Tree value class
- Prescription code

* Required field

Input files are simple ASCII text files.

Required fields must be supplied for FVS to run. FVS will dub in any other needed information which is missing from the tree data file.

Stand Level Input Data

* Stand ID
  Inventory year
  Latitude
  Longitude
  Location code
  Plant association
  Stand origin year
  Aspect
  Slope
  Elevation
* Basal area factor
* Fixed plot size
* Breakpoint DBH
  Number of plots
  Number nonstockable plots
  Stand size
  Stockable percent
  Diam. growth meas. method
  Diam. growth meas. period
  Ht. growth meas. method
  Ht. growth meas. period
  Mortality meas. period
  Maximum basal area
  Maximum SDI
  Site species
  Site index
  Model type
  Physiographic region
  Forest type
  Grouping code

* Required field