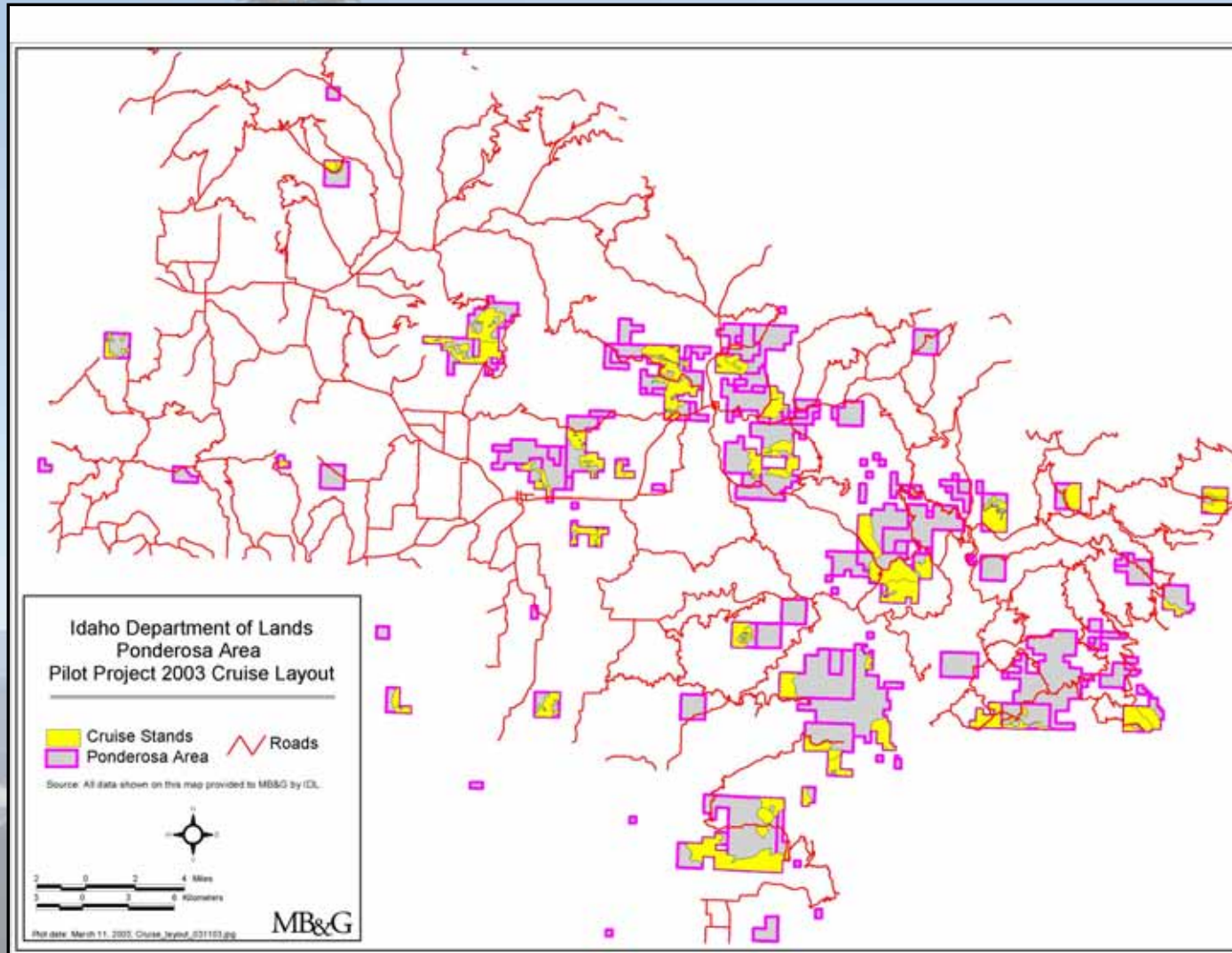




***The "Quick Cruise" Option
for the Idaho Department
of Lands***

***Steve Fairweather
Mason, Bruce and Girard, Inc.
Portland, OR***

MB&G helped IDL develop a stand-based inventory in 2002/03 –



***Pilot
project:
848
stands
on
70,000
acres***

IDL's Stand-based inventory –

- Goal was to eventually cruise every stand
- Stand would carry a stratum average until it was actually cruised
- After 3 years, 28,800 acres (178 stands) had been cruised
- By Spring 2007, IDL was looking for a faster and less expensive approach

'MBG Tools' is used to manage the data –

StandID	Sel	Src	Net Acres	ExpCode	Photo	Invy Yr	Grown	Basal	Volume
141010001	1	E	42.42	11MX01	11MX	2003	2006	68.0	9552.7
141010002	1	E	32.85	13MX01	13MX	2003	2006	222.4	36189.9
141010003	1	N	51.41	52PI01	52PI	2003	0	0.0	0.0
141010004	1	C	118.48	11MX	11MX	2005	2006	23.0	3988.3
141010006	1	E	3.00	12MX01	12MX	2003	2006	74.6	7424.4
141010007	1	E	13.56	13MX01	13MX	2003	2006	222.4	36189.9
141010008	1	N	78.94	52PI01	52PI	2003	0	0.0	0.0
141010009	1	E	4.52	11MX01	11MX	2003	2006	68.0	9552.7
141010010	1	E	6.78	12MX01	12MX	2003	2006	74.6	7424.4
141010011	1	E	458.82	13MX01	13MX	2003	2006	220.8	31528.6
141010012	1	D	95.03	12MX01	11MX	2003	2006	28.7	2799.9
141010013	1	E	92.11	26MX01	26MX	2003	2006	220.8	31528.6
141010014	1	C	437.34	26MX01	26MX	2003	2006	201.4	28415.7
141010015	1	E	26.51	26MX01	26MX	2003	2006	220.8	31528.6
141010016	1	E	10.68	25MX01	25MX	2003	2006	119.8	15826.9
141010017	1	E	50.00	26MX01	26MX	2003	2006	220.8	31528.6
141010018	1	E	10.11	13MX01	13MX	2003	2006	222.4	36189.9
141010019	1	C	54.36	11MX	11MX	2003	2006	68.1	9598.5
141010020	1	E	39.96	12MX01	12MX	2003	2006	74.6	7424.4

	Count	Gross Acres	Net Acres	User Acres
All Stands	848	70657.42	66668.97	0.00
Selected Stands	848	70657.42	66668.97	0.00

The solution had to work with MBG Tools

The inventory database carries detailed tree lists for every stand -

StandID	TreeID	TPA	Species	DBH	TotalHt	BFVoIN	Defect1
141010002	151	0.09	DF	24.2	138.6	808.785	0.0
141010002	152	0.231	DF	15.2	82.7	164.576	0.0
141010002	153	0.223	DF	15.4	91.7	189.422	0.0
141010002	154	0.146	DF	16.1	94.8	215.300	0.0
141010002	155	0.164	DF	17.8	96.5	271.591	0.0
141010002	156	0.486	DF	18	105.6	305.723	0.0
141010002	157	0.448	DF	18.9	106.6	341.964	0.0
141010002	158	0.078	DF	22	135.6	625.814	0.0
141010002	159	0.328	DF	23.1	119.6	608.297	0.0
141010002	160	0.072	DF	22.9	132.6	663.605	0.0
141010002	161	0.206	DF	24.1	125.4	695.499	0.0
141010002	162	0.298	DF	24.3	123.7	697.531	50.0
141010002	163	0.171	DF	26.6	132.6	898.551	0.0
141010002	164	0.257	DF	25.9	133.4	856.599	10.0
141010002	165	0.069	DF	27.5	132.6	961.010	0.0
141010002	166	0.165	DF	26.8	119.5	821.226	0.0
141010002	167	0.462	DF	28.2	137.4	1047.955	0.0
141010002	168	0.143	DF	28.9	139.4	1117.245	0.0
141010002	169	0.143	DF	28.9	135.5	1085.733	23.3
141010002	170	0.039	DF	31.1	124.3	918.195	8.4
141010002	171	0.103	DF	34.1	140.3	1248.563	6.1

The solution had to keep all the detail.

The 'Quick Cruise' –

- Take advantage of stratification
- Tally trees by species, or by species and dbh class, to save time; no heights, no defect deductions.
- Take advantage of the relationship between basal area and volume:

$$V_q/V_s = BA_q/BA_s$$

$$\text{Or, } V_q = V_s \times BA_q/BA_s$$

Quick Cruise example -

- Stand in stratum 23MX
- Stratum average BA = 120 sq. ft.
- Stratum average V = 23 mbf/acre
- "Quick Cruise" the stand; tally BA only; stand average BA = 80 sq. ft.

$$V_q = V_s \times BA_q / BA_s$$

$$V_q = 23 \times 80 / 120 = 23 \times .667$$

$$V_q = 15.3 \text{ mbf/acre}$$

Quick Cruise example -

- Stand in stratum 23MX
- Stratum average BA = 120 sq. ft.
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*This ratio
can be
used to
adjust
the TPA
values in
the
database*

$$V_q = V_s \times BA_q / BA_s$$

$$V_q = 23 \times 80 / 120 = 23 \times .667$$

$$V_q = 15.3 \text{ mbf/acre}$$

The TPA values in the database can be adjusted up or down using the ratio -

StandID	TreeID	TPA	Species	DBH	TotalHt	BFVoIN	Defect1
141010002	151	0.09	DF	24.2	138.6	808.785	0.0
141010002	152	0.231	DF	15.2	82.7	164.576	0.0
141010002	153	0.223	DF	15.4	91.7	189.422	0.0
141010002	154	0.146	DF	16.1	94.8	215.300	0.0
141010002	155	0.164	DF	17.8	96.5	271.591	0.0
141010002	156	0.486	DF	18	105.6	305.723	0.0
141010002	157	0.448	DF	18.9	106.6	341.964	0.0
141010002	158	0.078	DF	22	135.6	625.814	0.0
141010002	159	0.328	DF	23.1	119.6	608.297	0.0
141010002	160	0.072	DF	22.9	132.6	663.605	0.0
141010002	161	0.206	DF	24.1	125.4	695.499	0.0
141010002	162	0.298	DF	24.3	123.7	697.531	50.0
141010002	163	0.171	DF	26.6	132.6	898.551	0.0
141010002	164	0.257	DF	25.9	133.4	856.599	10.0
141010002	165	0.069	DF	27.5	132.6	961.010	0.0
141010002	166	0.165	DF	26.8	119.5	821.226	0.0
141010002	167	0.462	DF	28.2	137.4	1047.955	0.0
141010002	168	0.143	DF	28.9	139.4	1117.245	0.0
141010002	169	0.143	DF	28.9	135.5	1085.733	23.3
141010002	170	0.039	DF	31.1	124.3	918.195	8.4
141010002	171	0.103	DF	34.1	140.3	1248.563	6.1

Example adjustment by species -

Stratum 26MX Results			
Species	TPA	BA	Bd. Ft.
DF	70	72	10,679
WL	18	19	2,678
GF	193	100	17,868

Example adjustment by species -

Stratum 26MX Results			
Species	TPA	BA	Bd. Ft.
DF	70	72	10,679
WL	18	19	2,678
GF	193	100	17,868

Species	"Quick" Ba _q
DF	23
WL	5
GF	104
	132

Example adjustment by species -

Stratum 26MX Results			
Species	TPA	BA	Bd. Ft.
DF	70	72	10,679
WL	18	19	2,678
GF	193	100	17,868

Species	"Quick" Ba_q	BA_s	Ratio	"Quick" V_q
DF	23	72	0.319	3,411
WL	5	19	0.263	705
GF	104	100	1.040	18,583
	132	191		22,699

Example adjustment by species -

Stratum 26MX Results			
Species	TPA	BA	Bd. Ft.
DF	70	72	10,679
WL	18	19	2,678
GF	193	100	17,868

Species	"Quick" Ba _q	BA _s	Ratio	"Quick" V _q	"Quick" TPA _q
DF	23	72	0.319	3,411	22
WL	5	19	0.263	705	5
GF	104	100	1.040	18,583	201
	132	191		22,699	228

Example adjustment by species and DBH class-

Stratum 26MX Results				
Species	DBH	TPA	BA	Bd. ft.
DF	14 - 16	8	9	1,223
	16 - 18	7	11	1,594
	18 - 20	7	13	2,069

DBH	"Quick" Ba _q
14-16	1
16-18	8
18-20	4

Example adjustment by species and DBH class-

Stratum 26MX Results				
Species	DBH	TPA	BA	Bd. ft.
DF	14 - 16	8	9	1,223
	16 - 18	7	11	1,594
	18 - 20	7	13	2,069

DBH	"Quick" Ba _q	BA _s	Ratio	"Quick" V _q	"Quick" TPA _q
14-16	1	9	0.111	136	0.9
16-18	8	11	0.727	1,159	5.1
18-20	4	13	0.308	637	2.2

Results using the Quick Cruise Method –

- We compared estimates from a “full cruise” of several stands with the stratum estimate and the Quick Cruise estimates -

Stand	% Error in TPA			% Error in Sawtimber Volume		
	Stratum Estimate	Quick BA by species	Quick BA by dbh and species	Stratum Estimate	Quick BA by species	Quick BA by dbh and species
40251	58%	11%	-15%	54%	3%	2%
20303	-46%	-47%	-12%	18%	23%	-11%
10132	30%	17%	-9%	4%	-10%	-6%
40211	20%	76%	-6%	-44%	-4%	4%
40262	6%	246%	31%	-86%	-55%	-21%
30475	20%	83%	-10%	-43%	-8%	7%

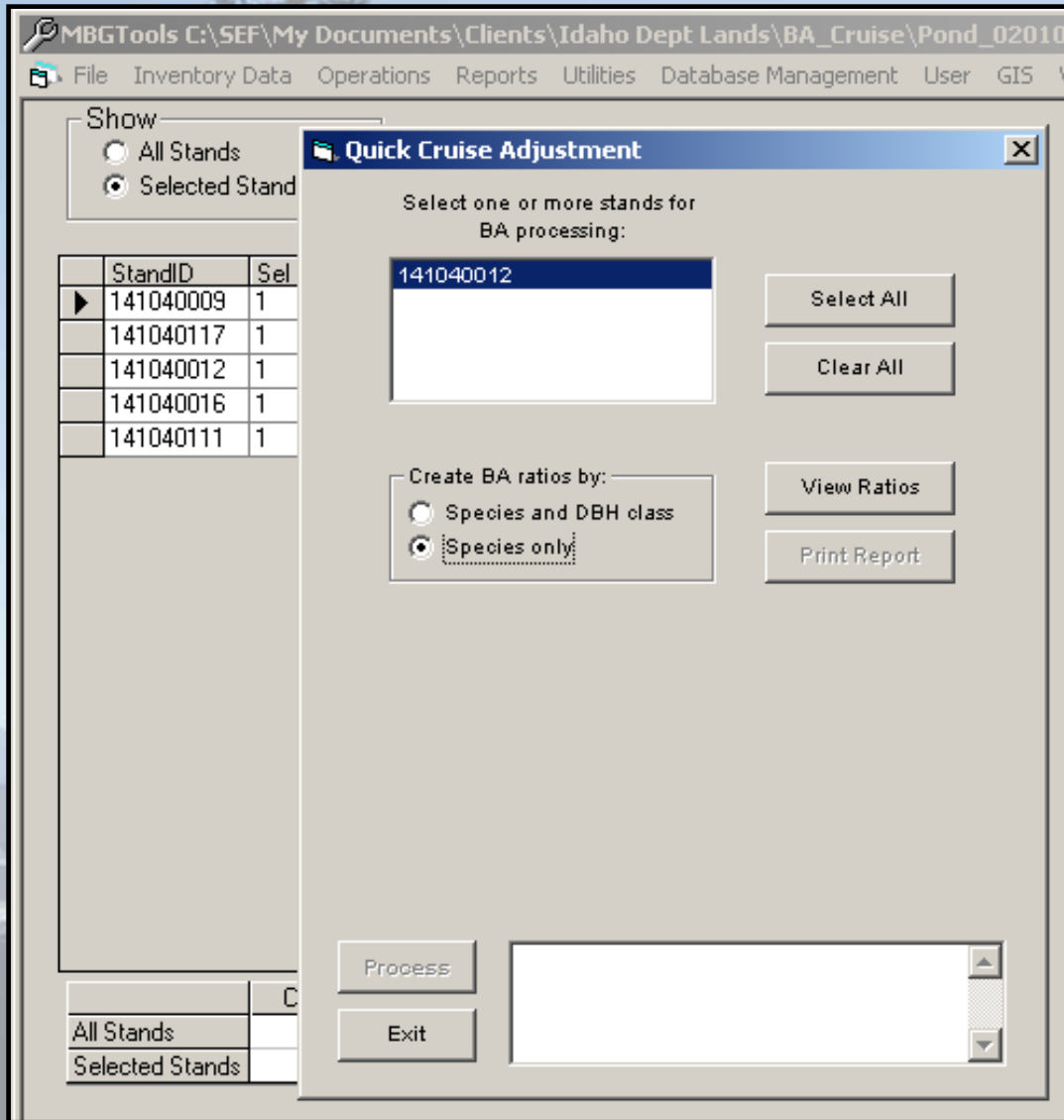
"Quick Cruise" methods in MBG Tools –

The screenshot shows the 'Stand Selector' window in MBGTools. The window title is 'MBGTools C:\SEF\My Documents\Clients\Idaho Dept Lands\BA_Cruise\Pond_020107.mdb - [Stand Selector]'. The menu bar includes File, Inventory Data, Operations, Reports, Utilities, Database Management, User, GIS, Window, and Help. The 'Show' section has two radio buttons: 'All Stands' (unselected) and 'Selected Stands' (selected). The main table displays stand data with columns: StandID, Sel, Src, Net Acres, ExpCode, Photo, Invy Yr, Grown, Basal, and Volume. The 'Stand Selection' panel on the right contains buttons for 'Select All', 'Unselect All', 'Reverse Selection', 'Select By Cruise Date', 'Select By Location', 'Select by Vegetation Class', 'Select by Stand Attributes', and 'Select By SQL'. A summary table at the bottom shows counts and acreages for 'All Stands' and 'Selected Stands'. The status bar at the bottom left reads 'Ready'.

StandID	Sel	Src	Net Acres	ExpCode	Photo	Invy Yr	Grown	Basal	Volume
141040009	1	C	210.28	12MX04	12MX	2002	2006	67.0	9094.0
141040117	1	C	33.71	12MX04	12MX	2006	2006	131.4	21552.0
141040012	1	E	29.33	12MX04	12MX	2006	2006	75.6	10685.9
141040016	1	E	26.54	12MX04	12MX	2006	2006	75.6	10685.9
141040111	1	E	38.59	12MX04	12MX	2006	2006	75.6	10685.9

	Count	Gross Acres	Net Acres	User Acres
All Stands	848	70657.42	66668.97	0.00
Selected Stands	5	361.47	338.44	0.00

“Quick Cruise” methods in MBG Tools –



***“Quick
Cruise
Adjustment”
is an option
on the
Operations
Menu***

“Quick Cruise” methods in MBG Tools –

Select one or more stands for BA processing:

141040012

Select All

Clear All

Create BA ratios by:

Species and DBH class

Species only

View Ratios

Print Report

	StandID	Species	QC_BA	StrataBa	Ratio
▶	141040012	DF	20.00	45.24	0.44
	141040012	GF	25.00	19.62	1.27
	141040012	PP	15.00	7.56	1.98
	141040012	WL	25.00	4.56	5.49

Process

Exit

Clicking on the “View Ratios” button gives us a preview of the ratios that will be used to adjust the stratum estimate.

Clicking on the “Process” button makes it happen.

"Quick Cruise" methods in MBG Tools –

The screenshot shows the MBGTools Stand Selector interface. The title bar indicates the file path: C:\SEF\My Documents\Clients\Idaho Dept Lands\BA_Cruise\Pond_020107.mdb - [Stand Selector]. The menu bar includes File, Inventory Data, Operations, Reports, Utilities, Database Management, User, GIS, Window, and Help. The interface is divided into several sections:

- Show:** Radio buttons for "All Stands" and "Selected Stands".
- Table:** A table with columns: StandID, Sel, Src, Net Acres, ExpCode, Photo, Invy Yr, Grown, Basal, and Volume. The row for StandID 141040012 is highlighted with a red circle, showing values: Sel=1, Src=Eba, Net Acres=29.33, ExpCode=12MX04, Photo=12MX, Invy Yr=2006, Grown=2006, Basal=81.4, and Volume=11760.4.
- Stand Selection:** A vertical stack of buttons: Select All, Unselect All, Reverse Selection, Select By Cruise Date, Select By Location, Select by Vegetation Class, Select by Stand Attributes, and Select By SQL.
- Summary Table:** A small table at the bottom left showing counts and acreages for "All Stands" and "Selected Stands".
- Status Bar:** Displays "Gathering information on selected stands".

StandID	Sel	Src	Net Acres	ExpCode	Photo	Invy Yr	Grown	Basal	Volume
141040009	1	C	210.28	12MX04	12MX	2002	2006	67.0	9094.0
141040117	1	C	33.71	12MX04	12MX	2006	2006	131.4	21552.0
141040016	1	E	26.54	12MX04	12MX	2006	2006	75.6	10685.9
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▶ 141040012	1	Eba	29.33	12MX04	12MX	2006	2006	81.4	11760.4

	Count	Gross Acres	Net Acres	User Acres
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