iPad Decision Support Tools for GLSL Forest Management

eFRI Knowledge Transfer and Tool Development Symposium
Thunder Bay
Nov 2 2017

- Introduction
- Project Goals & Rationale
- Project Partners
- Operational Cruise App
- eFRI Validation App
- Transfer of Knowledge
- Uses of Data & Lessons learned

Project Goals

- Confirm accuracy of eFRI, and understanding of photointerpretation anomalies.
- Development of two iPad Apps to enhance data collection, imagery display, and in-field data compilation.
- Tech transfer to practising GLSL foresters to assist in FOP decision making, and FMP development.

Project Rationale

- Inexpensive and openly available technology
- Easily Adopted and intuitive
- Expansive platform – many other apps can be built easily on same technology.

Project Partners

- Marty Martelle, R.P.F. as lead developer

- MITIG Forestry Services Ltd.
- Nipissing Forest Resource Management
- Westwind Forest Stewardship
- Vermilion Forest Management Company

- In-Kind Contributions made by all Partners

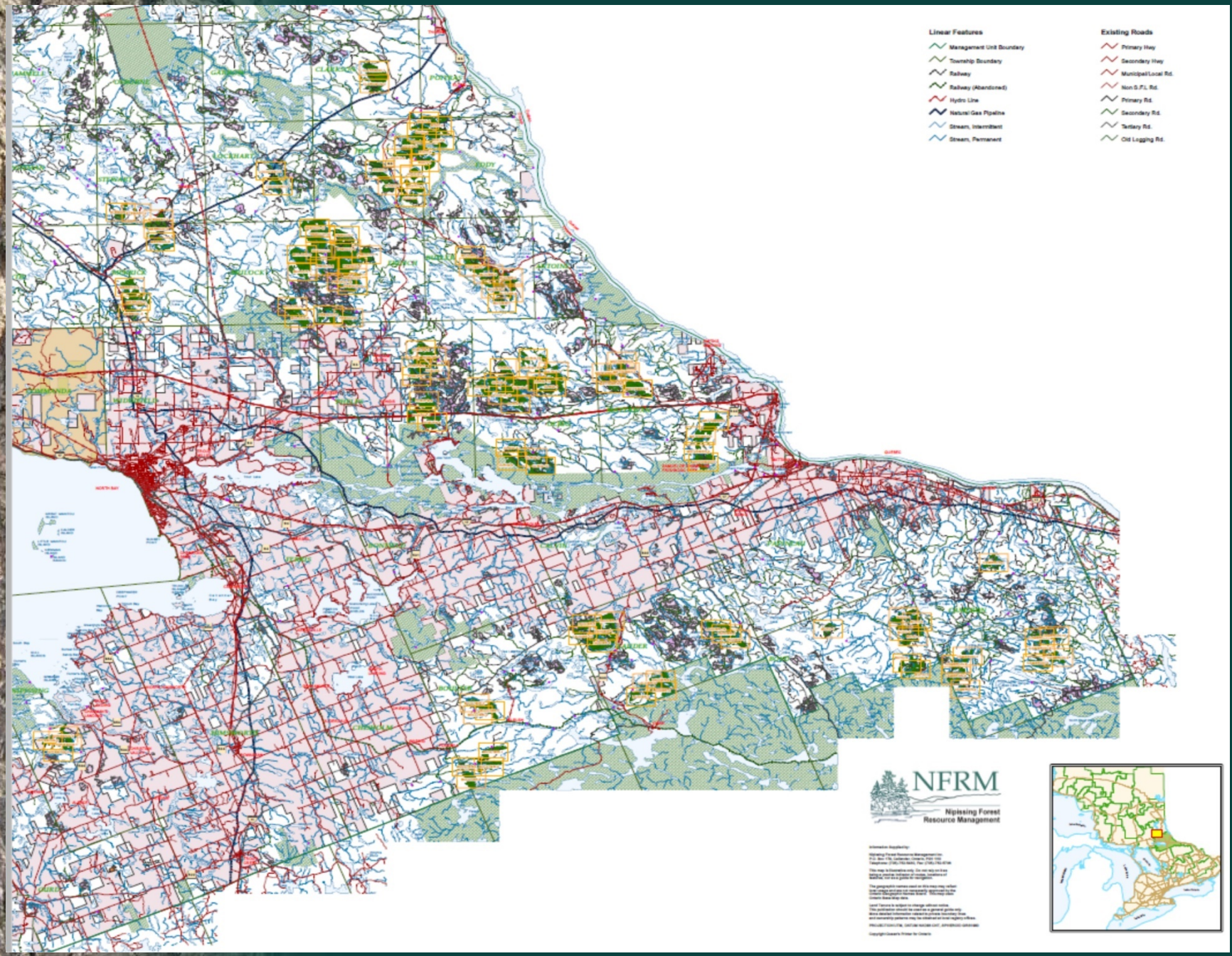
Project Milestones

- 2 iPad Apps developed and used extensively on 3 GLSL Forests in support of 3 FMPs
- Identification of eFRI anomalies and targeted cruising to validate / correct anomalies
- 3 Forests have planning inventories that are more accurate as a result
- Tech transfer to GLSL foresters
- FOP prescription support
- Expandable tech platform toward the development of other iPad apps

Operational Cruise App (OCApp)

- Detailed User Manual to be released with software, Dec 2017, upon project completion
- Hardware and Software used: iPad Mini-4 tablets with External GPS adapters, Avenza Maps, FileMaker Go 16
- Custom GIS map uses
- Sample Screen Shots of app

Survey Index Map: Nipissing Forest over 2 years. HDUS focus (GOLD BOXES)



Operational Cruise App: Custom .PDF Survey map showing eFRI imagery

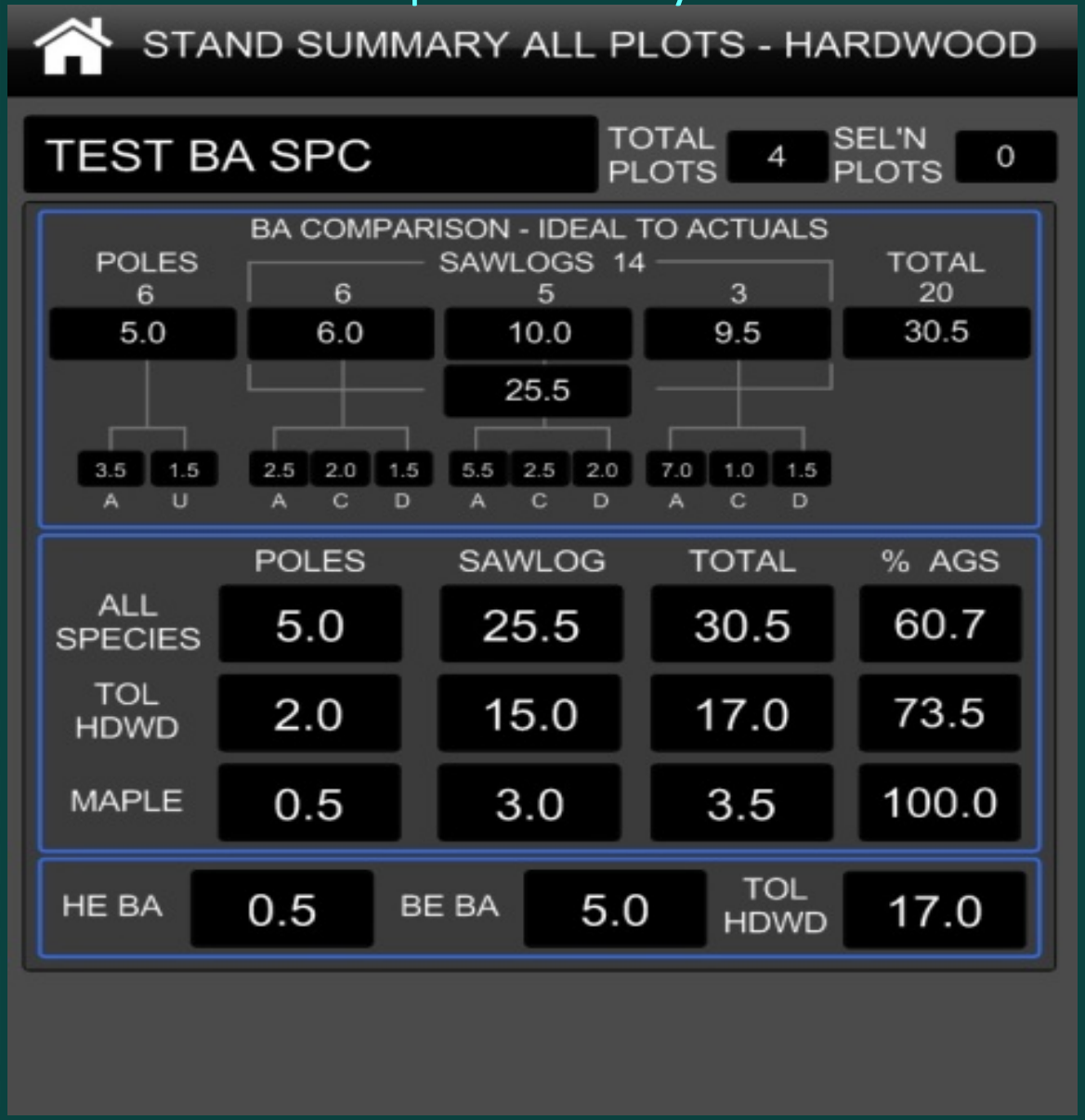

Westwind
Westwind Forest Stewardship Inc.
NFRM
vfm
FORESTRY FUTURES
TRUST ONTARIO
OPEN eFRI DATA
COLLECTION
APPLICATION
VERSION 2015.1.0
Developed by MITIG Forestry Services, (M.Martelle) Parry Sound Office
MITIG
Forestry Services Ltd.

Operational Cruise App Main Page

Operational Cruise App Tree Tally Page

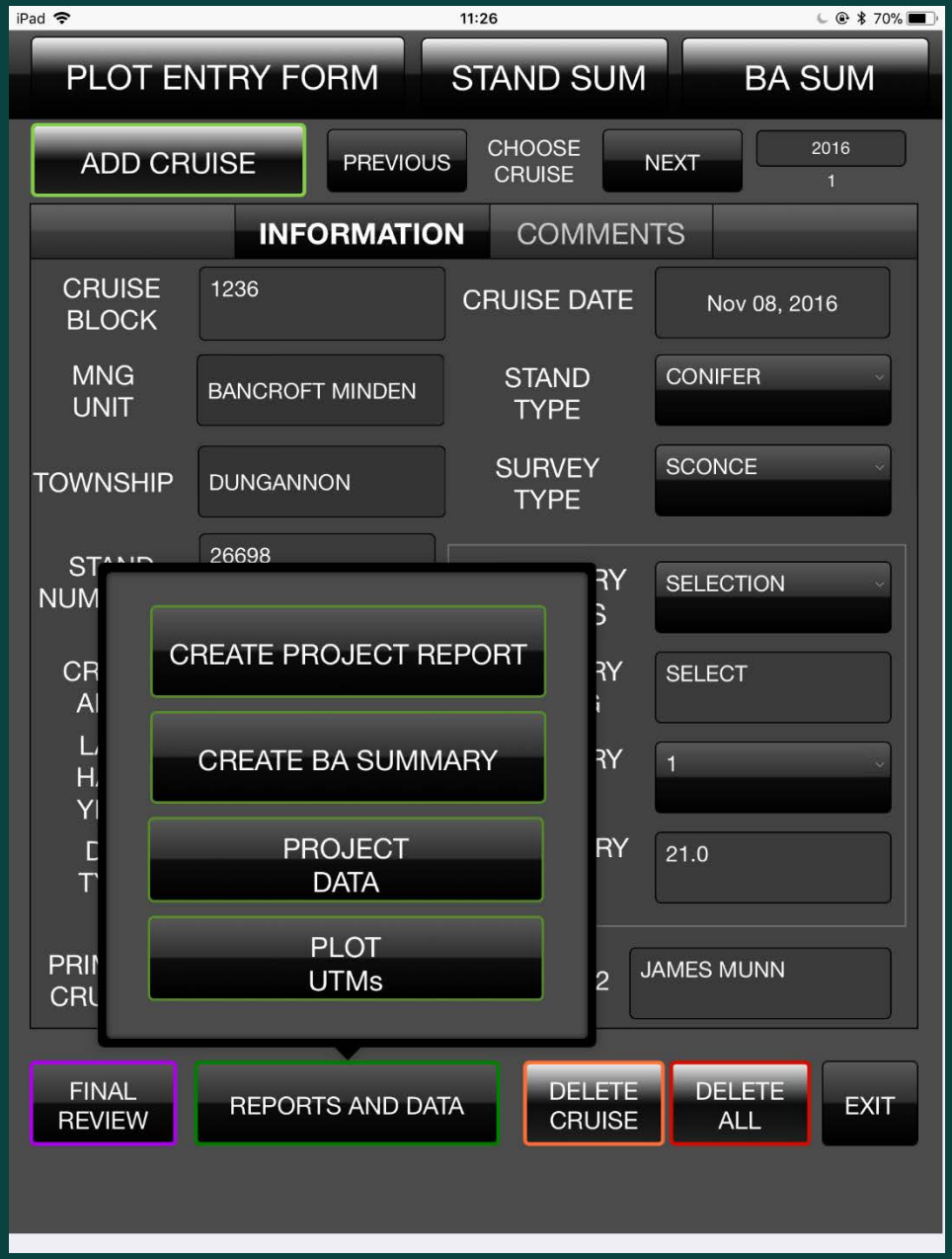
Poles 10-24 cm
Small 26-36 cm
Medium 38-48 cm
Sawlog 50+ cm

Operational Cruise App Quick Summary Page sample data only.



Operational Cruise App Regeneration Pages

Operational Cruise App: Generate Reports/Summary Pages



Operational Cruise App Individual Plot Summary Report

12MILEBAY	PLOT LIST - DETAILS						CRUISEDATE	Dec 10, 2015				
	BASAL AREA						REGENERATION				IGNR	SELN
PLOT#	TOTAL	POLES	SAW LOG	BE	ALL SIZES TOL	HDWD HE	REGEN SP	REGEN HT	REGEN DENSITY	MID-TOL SP	PLOT	PLOT
PLT-1	32	10	22	8	18	14	BE	1-3	LIGHT	BY	N	N
							FU	HDUS	DEVSTG	LASTCUT		
PLT-2	38	22	16	0	30	8	BE	3-6	MEDIUM	BY	N	N
							FU	HDUS	DEVSTG	LASTCUT		
PLT-3	30	18	12	0	20	4	BY	6+	MEDIUM		N	N
polewood (p) bypass (BP)							FU	HDUS	DEVSTG	LASTCUT		
PLT-4	32	18	14	0	30	2	MH	1-3	LIGHT		N	N
							FU	HDUS	DEVSTG	LASTCUT		
PLT-5	28	12	16	2	22	6	MH	6+	MEDIUM	BY	N	N
p bp							FU	HDUS	DEVSTG	LASTCUT		
PLT-6	48	6	42	8	22	24	BE	1-3	LIGHT	BY	N	N
							FU	HE1	DEVSTG	SEEDCUT		
PLT-7	26	4	22	2	16	10	MH	3-6	LIGHT	BY	N	N
							FU	HDUS	DEVSTG	LASTCUT		
PLT-8	30	8	22	0	28	2	MH	1-3	MEDIUM		N	N
							FU	HDUS	DEVSTG	FIRSTCUT		
PLT-9	22	12	10	0	22	0	MH	3-6	LIGHT	BY	N	N
bp polewood							FU	HDUS	DEVSTG	THINCOM		
PLT-10	18	10	8	0	18	0	MH	3-6	MEDIUM		N	
pole BP shallow							FU	HDUS	DEVSTG	THINPRE		
PLT-11	24	6	18	2	16	4	MH	3-6	LIGHT	BY	N	N
							FU	HDUS	DEVSTG	THINCOM		
PLT-12	32	8	24	0	24	6	MH	1-3	LIGHT		N	N
							FU	HDUS	DEVSTG	IMPROVE		
PLT-13	0	0	0	0	0	0	HE	3-6	MEDIUM		Y	N
							FU	HE1	DEVSTG	FIRSTCUT		

Operational Cruise App Full Summary Report for Stand

Stand Data Collection Report - Hardwood

Cruise Area	12MILEBAY FRE2589 HARDWD	Cruise Date	Dec 10, 2015	Survey Type	SCONCE
Stand #	FRE2589	Township	FREEMAN	Last Hrv Yr	
				Silv System	SHELTERWOOD
				Mng Stg	SEEDCUT

Total Plots	Sel Plots	Ignore Plots	Cruise Year	FRI SC	Actual SC	Area (Ha)
31	0	10	2015	2		130

Stand Summary: Stand # FRE2589 — MR3 MH2 HE2 BY2 OH1

Area (Ha) 130

Basal Area	Poles Total	Poles AGS	Sawlog Total	Sawlog AGS	Total	Total AGS	% AGS
All Species:	10.8	5.9	19.4	10.0	30.2	15.9	52.7
Tolerant Hardwood:	9.4	5.3	13.1	6.0	22.6	11.3	50.2
Maple:	1.8	1.8	1.9	1.0	3.7	2.9	76.9

BEECH %:	Poles	Sawlog	Total	Total BA	Total BE BA	Total HE BA
	2.5%	2.5%	5.0%	30.2	1.5	6.2

BA Comparison All Species:

	Poles	Sawlogs 14			
Ideal	6	6	5	3	20
Actual	10.8	9.3	4.5	5.6	30.2
			19.4		
	5.9 A, 4.9 C	5.3 A, 2.9 C, 1.1 D	1.9 A, 1.9 C, 0.7 D	2.8 A, 1.7 C, 1.1 D	

Stand Summary [Including BBD trees]:

	Total BA	BA BBD	BA No BBD	% with BBD
All	30.2	0.0	30.2	0.0
Swlg	19.4	0.0	19.4	0.0

Regeneration & Mid-Tolerant Summary:

	Species	Ht (m)	Density
Regen	MH	6+	MEDIUM
Regen2	BE	6+	MEDIUM
Mid-Tol	BY	6+	PATCHES

Comments:

While entire west main piece surveyed as a whole, this is a summary of hardwood plots. most of small sawlog ba small end of smalls. some by but mainly mr and mh. regen mostly mh but with pockets of by poles (central portion low wet dominated by poles) and with some be and he. mh 17% of ba, mr 33%.

distribution of timber in smaller end smalls, shorter timber, common patches of polewood, combined with presence of mid tolerants, Hdus first removal recommended RX.

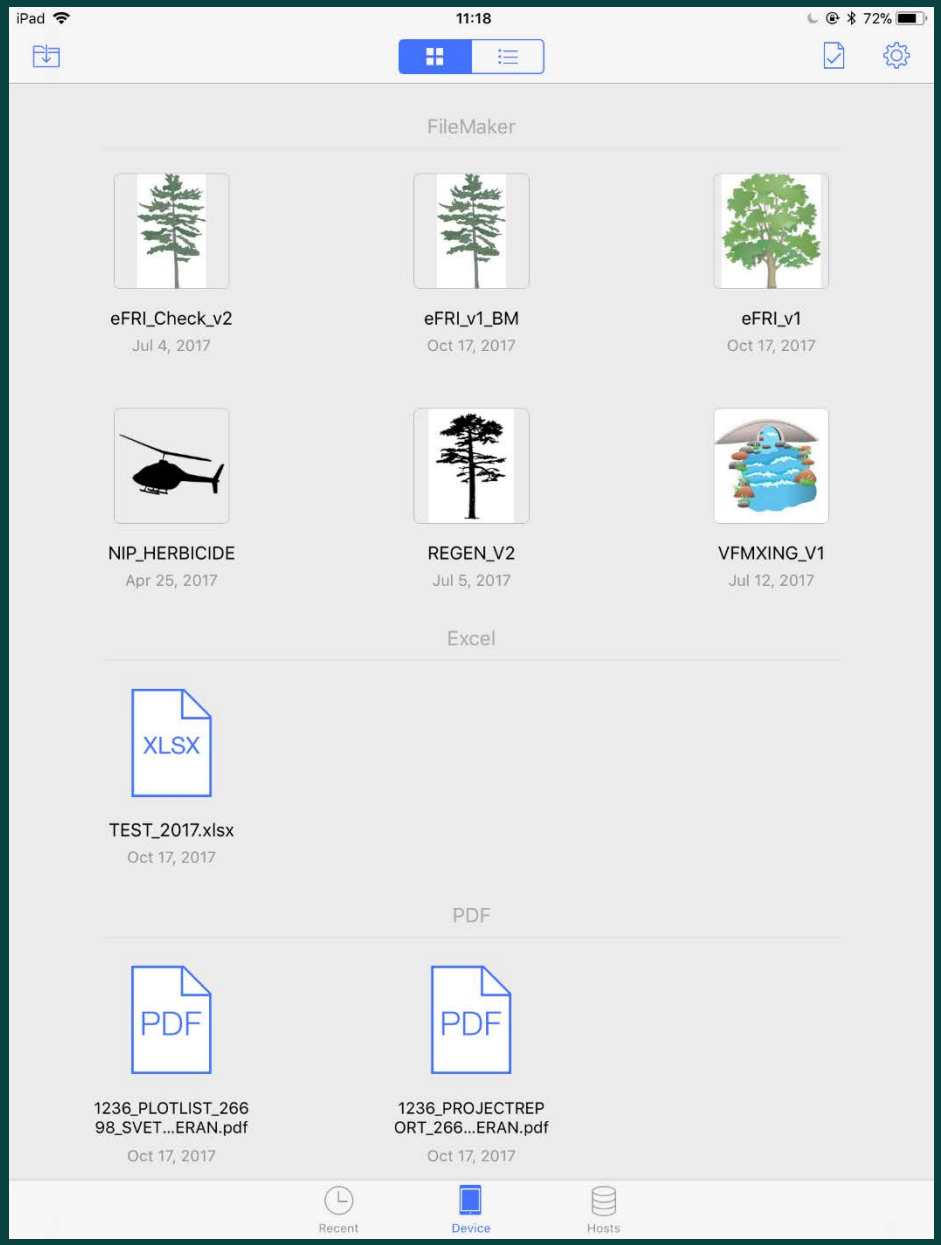
Next SilvSys: SHELTERWOOD

Next ManStg: FIRSTCUT

CRUISER 1: MICHAEL HENRY

CRUISER 2:

Operational Cruise App: Export Reports and Excel format Data



eFRI Validation App Overview

- Initial GIS analysis and description of Vflags
- 4 Example Vflags
- Sudbury Forest experiences

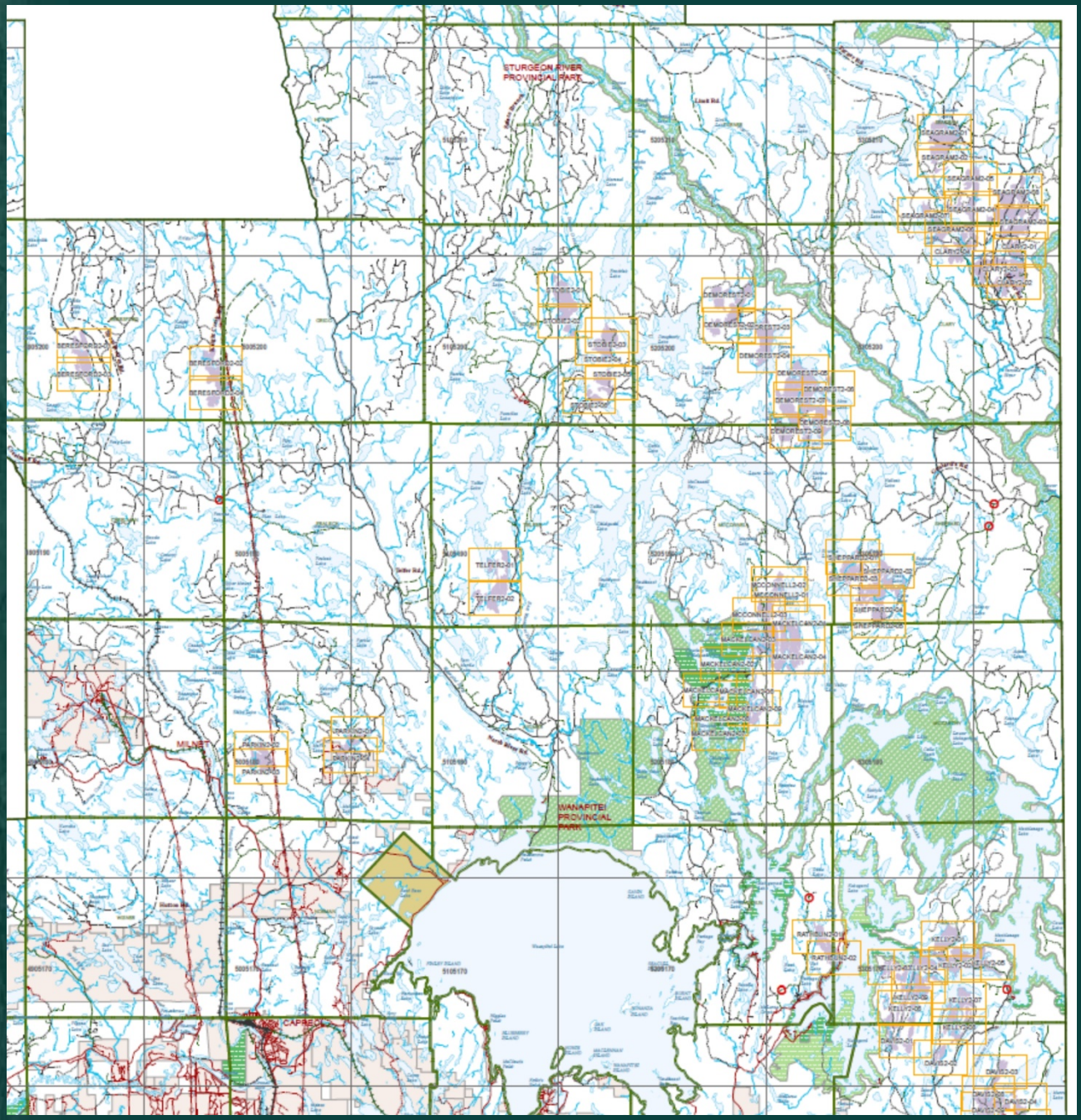
  2100 ha ‘unknown’ Pw Surveyed

  (Age)eligible areas were classed into Vflags

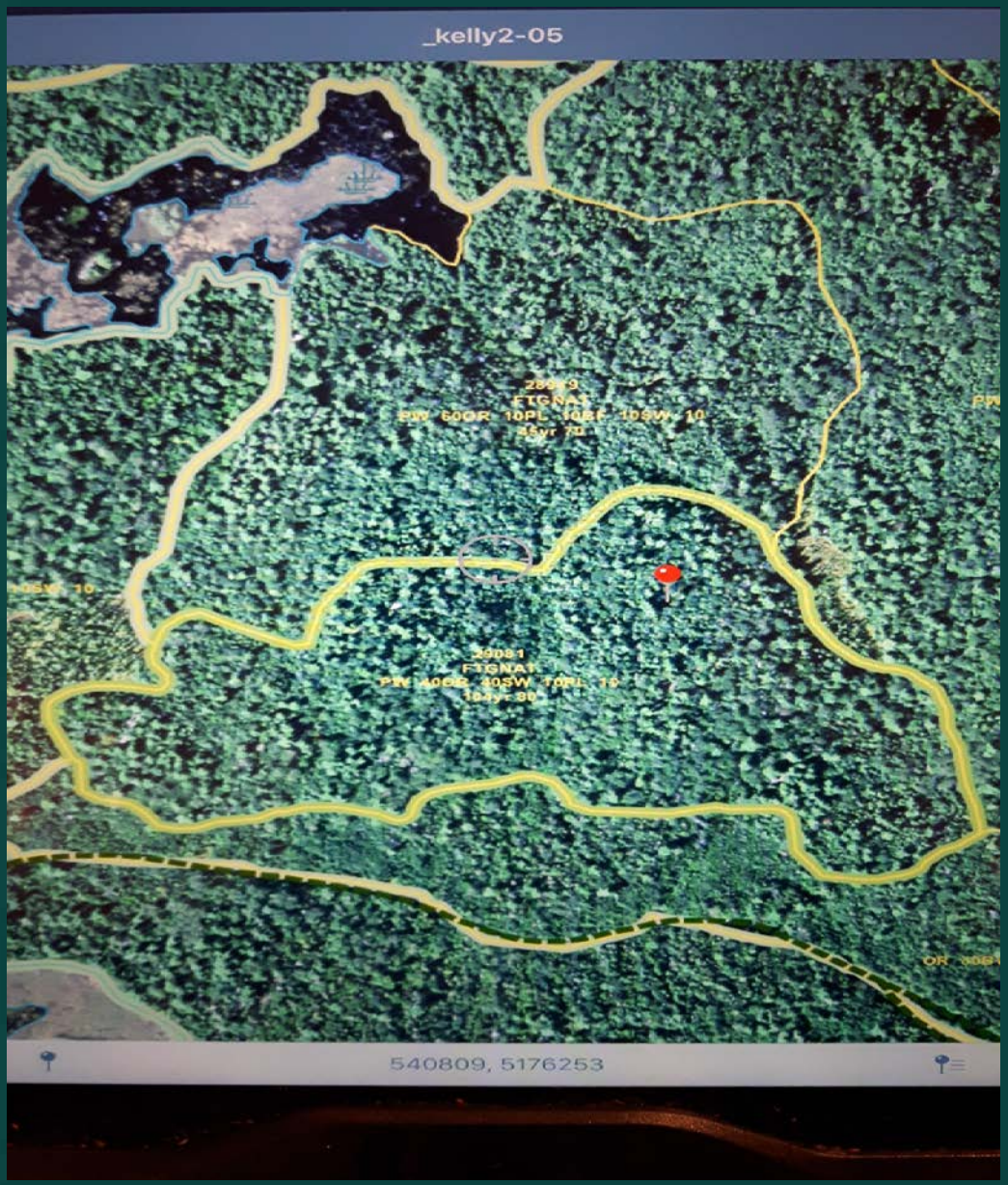
  Some Vflag sites determined unsuitable for 2020 FMP allocation due to eFRI typing anomalies: Two-tier typing of age/OCCLo/UCCLo inconsistent

  Confidence in revised-DEVSTAGE/AGE data is improved

Validation Survey Index Map: Sudbury Forest . Pw focus (GOLD BOXES)



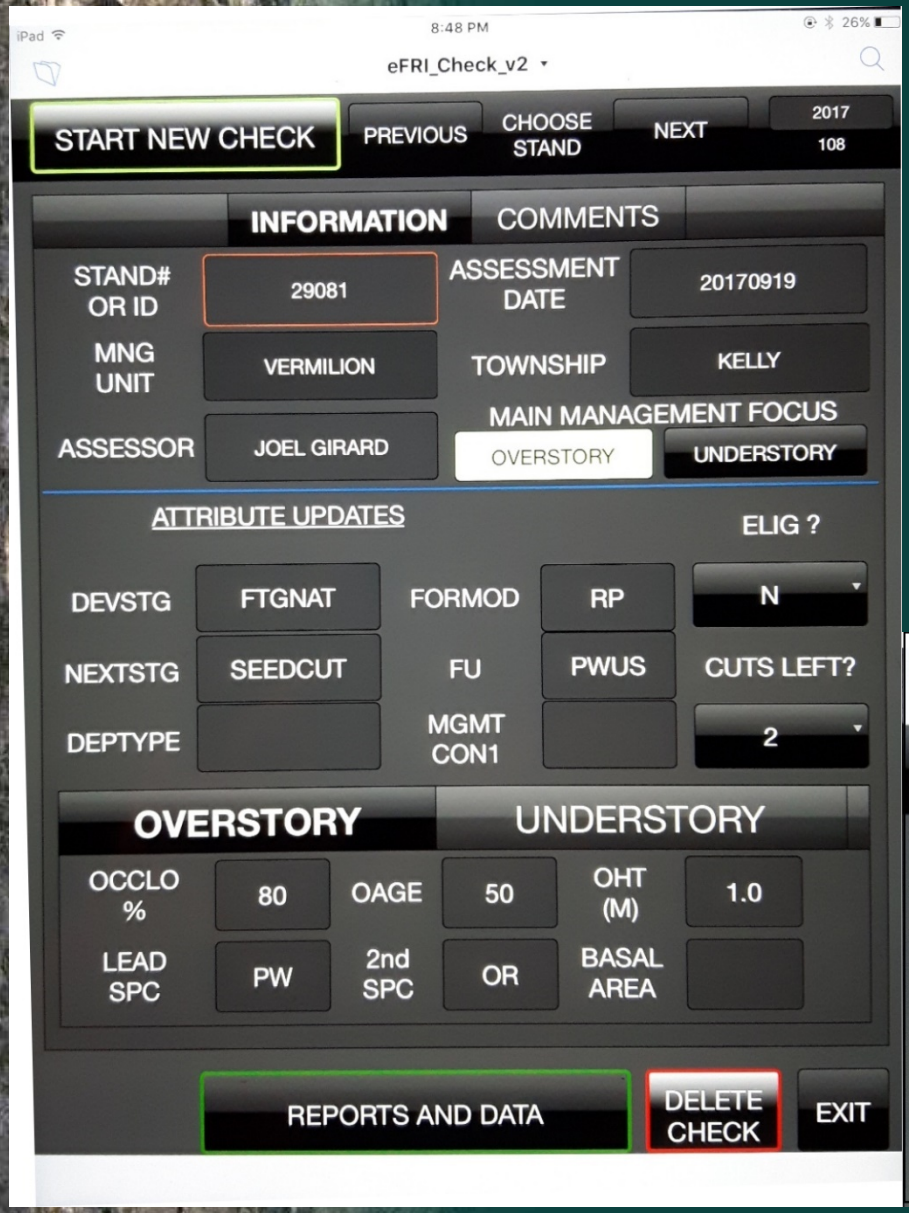
eFRI Validation App: Map of ‘Eligible’ Pine Investigation

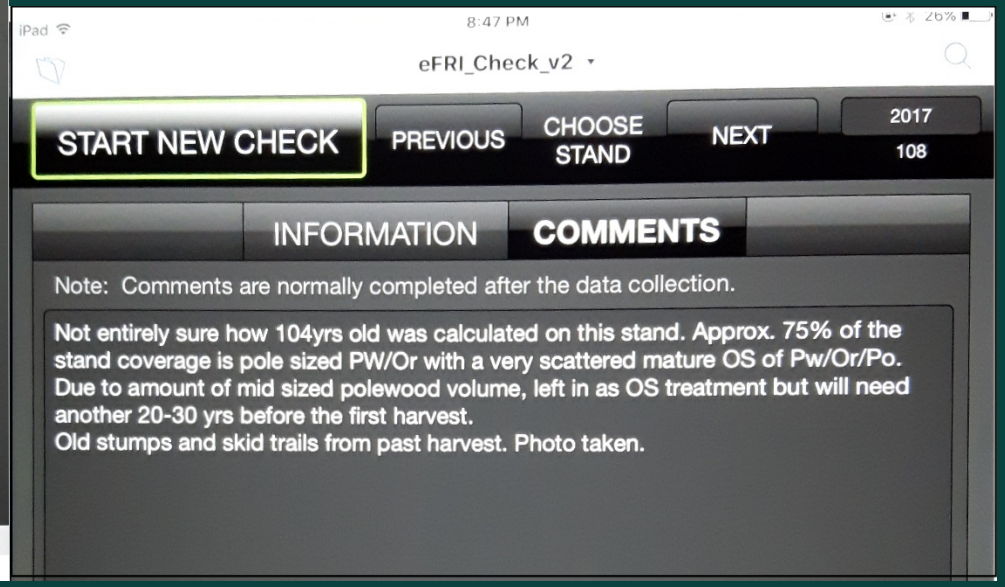


eFRI Validation App Stand level Photo of Age/Stkg

This stand is typed:
Pw40Or40Sw10Pt10
Age : 104
Stocking: 80

eFRI Validation App: Screenshot & Comments





eFRI Validation App: Excel output

MNG_UNIT	IPADID	TOWNSHIP	CRUISEYEAR	CRUISEDATE	CRUISER1	MGMTSTORY	DEPTYPE	DEVSTG	NEXTSTG	ELIGIBLE	CUTSLEFT	MGMTCON1	FORMOD	FU	OAGE	OHT	OCCLO	OLEAD	OLEAD2	BASALAREA	TIMING	UCCLO	UHT	UAGE
VERMILION	88691	CHERRIMAN	2017	2017-07-06	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	N	1		RP	PWST	50	1	60	PW	PO		DELAY			
VERMILION	88343	CHERRIMAN	2017	2017-07-06	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	1	60	PW	OR		DELAY	3	12	
VERMILION	89227	CHERRIMAN	2017	2017-07-06	JOEL GIRARD	OVERSTORY		FTGNAT	CONVENTN	N	1		RP	MW2	50	2	80	MR	PO		DELAY			
VERMILION	88845	CHERRIMAN	2017	2017-07-06	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	2	80	PW	OR		DELAY	2	10	
VERMILION	89851	HOSKIN	2017	2017-07-06	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	M	2		RP	PWUS		15	70	PW	PR					
VERMILION	88782	HOSKIN	2017	2017-07-10	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	M	1		RP	PWUS	100	2	70	PW	PJ					
VERMILION	88469	HOSKIN	2017	2017-07-10	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	Y	1		RP	PWUS	100	2	80	PW	BF					
VERMILION	88550	HOSKIN	2017	2017-07-10	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	Y	1		RP	PWST	100	2	70	PW	PO					
VERMILION	88000	HOSKIN	2017	2017-07-10	JOEL GIRARD	UNDERSTORY		FTGNAT	FIRSTCUT	N	2		RP	PWUS	50	1	70				DELAY	2	12	
VERMILION	87930	HOSKIN	2017	2017-07-10	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	Y	1		RP	PWUS	100	3	80	PW	PR					
VERMILION	88347	HOSKIN	2017	2017-07-10	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	M	1		RP	PWUS	100	2	70	PW	PR					
VERMILION	89407	HOSKIN	2017	2017-07-10	JOEL GIRARD	OVERSTORY		FTGNAT	CONVENTN	M	1		RP	MW1		2	60	PO	PJ		DELAY			
VERMILION	85494	HENDRIE	2017	2017-07-11	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	1	50	PW	PO		DELAY	2	12	
VERMILION	85016	HENDRIE	2017	2017-07-11	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	M	1		RP	PWUS	100	2	60	PW	PO					
VERMILION	85216	HENDRIE	2017	2017-07-11	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	N	1		RP	PWST	50	1	40	PW	PO		DELAY			
VERMILION	85929	HOSKIN	2017	2017-07-11	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	2	70	PW						
VERMILION	85630	HOSKIN	2017	2017-07-11	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	1	60	PW	BF		DELAY	2	11	
VERMILION	86146	HOSKIN	2017	2017-07-11	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	Y	1		RP	PWUS	100	2	80	PW	PR					
VERMILION	85733	HOSKIN	2017	2017-07-11	JOEL GIRARD	UNDERSTORY		FTGNAT	CONVENTN	N	1		RP	MW1	50	1	40	PW	PO		DELAY	2	12	
VERMILION	86667	HOSKIN	2017	2017-07-13	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	M	1		RP	PWUS	100	2	50	PW	SW					
VERMILION	86685	HOSKIN	2017	2017-07-13	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	Y	1		RP	PWUS	100	3	70	PW	PR					
VERMILION	86113	HOSKIN	2017	2017-07-13	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	M	2		RP	PWUS	100	2	70	PW	PO					
VERMILION	86280	HOSKIN	2017	2017-07-13	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	M	1		RP	PWST	50	2	70	PW	PO					
VERMILION	84961	HENDRIE	2017	2017-07-13	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	100	2	60	PW	SB		DELAY	2	10	
VERMILION	85785	HOSKIN	2017	2017-07-13	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	M	1		RP	PWUS	100	2	50	PW	PJ		DELAY	3	5	
VERMILION	86303	HOSKIN	2017	2017-07-13	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	2	70	PW	OR		DELAY	2	8	
VERMILION	90631	CHERRIMAN	2017	2017-07-13	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	Y	1		RP	PWST	100		70	PW	PO					
VERMILION	90233	CHERRIMAN	2017	2017-07-13	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	1	50	PW	PO		DELAY	3	12	50
VERMILION	79430	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	FIRSTCUT	N	2		RP	PWUS	50	1	80	PW	PJ		DELAY			
VERMILION	79500	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	FIRSTCUT	N	2		RP	PWUS	50	2	80	PW	BW		DELAY			
VERMILION	79244	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	FIRSTCUT	N	2		RP	PWUS	50	1	70	PW	PJ		DELAY			
VERMILION	79108	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	1	70	PW	PO		DELAY			
VERMILION	80132	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	N	1		RP	PWST	50	2	70	PW	PO		DELAY			
VERMILION	80523	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	2	70	PW	PO		DELAY			
VERMILION	81427	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	M	1		RP	PWUS	50	2	70	PW	SB		ANYTIME			
VERMILION	81956	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	M	1		RP	PWST	100	2	60	PW	PO		ANYTIME			
VERMILION	81980	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	M	2		RP	PWUS	100	2	70	PW	PR		ANYTIME			
VERMILION	81800	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	M	2		RP	PWUS	50	2	70	PR	PW		ANYTIME			
VERMILION	81619	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	Y	1		RP	PWST	100	2	60	PW	PO		ANYTIME			
VERMILION	78534	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	1	70	PW	PO		DELAY			
VERMILION	78233	HENDRIE	2017	2017-07-20	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS	50	1	80	PW	PJ		DELAY			
VERMILION	83402	HENDRIE	2017	2017-07-25	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	N	1		RP	PWST	50	2	60	PW	PO		DELAY			
VERMILION	83615	HENDRIE	2017	2017-07-25	JOEL GIRARD	UNDERSTORY		FTGNAT	CONVENTN	N	1		RP	MW2							DELAY	2	12	30
VERMILION	84112	HENDRIE	2017	2017-07-25	JOEL GIRARD	UNDERSTORY		FTGNAT	CONVENTN	N	1		RP	MW2							DELAY	2	14	30
VERMILION	84210	HENDRIE	2017	2017-07-25	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	N	1		RP	PWUS	50	2	70	PW	SB		DELAY			
VERMILION	84332	HENDRIE	2017	2017-07-25	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDTREE	N	1		RP	PWST							DELAY	2	4	15
VERMILION	84220	HENDRIE	2017	2017-07-25	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDTREE	N	1		RP	PWST							DELAY	2	5	15
VERMILION	84612	HENDRIE	2017	2017-07-25	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	Y	1		RP	PWUS	100	2	80	PW	PO		ANYTIME			
VERMILION	84892	HENDRIE	2017	2017-07-25	JOEL GIRARD	UNDERSTORY		FTGNAT	CONVENTN	N	1		RP	SF							DELAY	2	10	30
VERMILION	84498	HENDRIE	2017	2017-07-25	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	N	1		RP	PWST	50	2	70	PW	SB		DELAY			
VERMILION	84255	HENDRIE	2017	2017-07-25	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	M	1		RP	PWST	100	2	60	PW	BF		DELAY			
VERMILION	84257	HENDRIE	2017	2017-07-25	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDCUT	N	1		RP	PWST							DELAY	3	12	30
VERMILION	83600	HENDRIE	2017	2017-07-25	JOEL GIRARD	UNDERSTORY		FTGNAT	CONVENTN	N	1		RP	SF							DELAY	2	14	30
VERMILION	83257	HENDRIE	2017	2017-07-25	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDTREE	N	1		RP	PWST							DELAY	2	10	30
VERMILION	34013	DAVIS	2017	2017-07-26	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	Y	2		RP	PWUS	100	2	80	PW	PR		URGENT			
VERMILION	33624	DAVIS	2017	2017-07-26	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	M	2		RP	PWUS	100	2	70	PR	PW		ANYTIME			
VERMILION	34120	DAVIS	2017	2017-07-26	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	Y	1		RP	PWUS	100	2	80	PW	PR		ANYTIME			
VERMILION	33847	DAVIS	2017	2017-07-26	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	M	1		RP	PWUS	50	1	70	PW	PR		ANYTIME			
VERMILION	34615	DAVIS	2017	2017-07-26	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDCUT	Y	2		RP	PWUS	100	3	80	PW	PR		URGENT			
VERMILION	34767	DAVIS	2017	2017-07-26	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	Y	1		RP	PWUS	100	2	80	PW	PR		URGENT			
VERMILION	34835	DAVIS	2017	2017-07-26	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	Y	1		RP	PWST	100	2	70	PW	PO		URGENT			
VERMILION	34141	DAVIS	2017	2017-07-31	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	Y	1		RP	PWUS	100	3	70	PW	PR		URGENT			
VERMILION	33739	DAVIS	2017	2017-07-31	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	M	1		RP	PWUS	100	1	70	PW	PR		ANYTIME			
VERMILION	33516	DAVIS	2017	2017-07-31	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	M	1		RP	PWUS	100	4	70	PW	PR		ANYTIME			
VERMILION	32861	DAVIS	2017	2017-07-31	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS							DELAY	2	12	30
VERMILION	32292	DAVIS	2017	2017-07-31	JOEL GIRARD	OVERSTORY		FTGNAT	LASTCUT	M	1		RP	PWUS	100	2	60	PW	PR		ANYTIME			
VERMILION	81221	HENDRIE	2017	2017-08-14	JOEL GIRARD	OVERSTORY		FTGNAT	SEEDTREE	N	1		RP	PWST	50	4	70	PW	PO		DELAY			
VERMILION	81757	HENDRIE	2017	2017-08-14	JOEL GIRARD	UNDERSTORY		FTGNAT	SEEDCUT	N	2		RP	PWUS							DELAY	3	10	30

Data Uses & Lessons Learned

- Immediate data use in decision making and FOP development
- In-Forest summary compilation is a huge improvement
- Standardized outputs improve GIS efficiency
- iPad platform is inexpensive, versatile, and easily adopted
- Tech transfer to other GLSL forests has successfully happened
- Additional App development on this platform is easy, inexpensive and yields similar benefits (AFA and others experience)

Thank You to FFT for Support of this Project

Tangible, timely results have been achieved that have improved decision making in 3 GLSL Forests