

Module 3.4: VRI Load Business Process

Module Introduction & Learning Objectives

This module outlines the key steps in the VRI Load business process.

Upon completion of this module, the learner will be able to:

- Understand when the VRI load process is implemented.
- Recognize who is responsible for the process.
- Understand the VRI load business process steps.
- Understand what tools are used to complete the process.
- Understand the various validation rules and how to fix integration errors

What are the key objectives and outcomes of this process?

The key objectives are to review VRI digital deliverables for compliance with contract standards, quality assure the deliverables using VRIMS validation tools and integrate the new VRI data.

When is this process implemented?

At the completion of a VRI contract, the VRI contractors send the digital deliverables to the appropriate Regional Inventory Forester for review. The Regional Inventory Forester forwards the deliverables to the Forest Inventory Update Team Leader who tracks all the projects in a TSA VRIProjectsActive spreadsheet on the VRIMS sharepoint site:

<https://sharepoint.forests.gov.bc.ca/vrims/TSA%20INV%20Load/Forms/AllItems.aspx>

Who is responsible for completing this process?

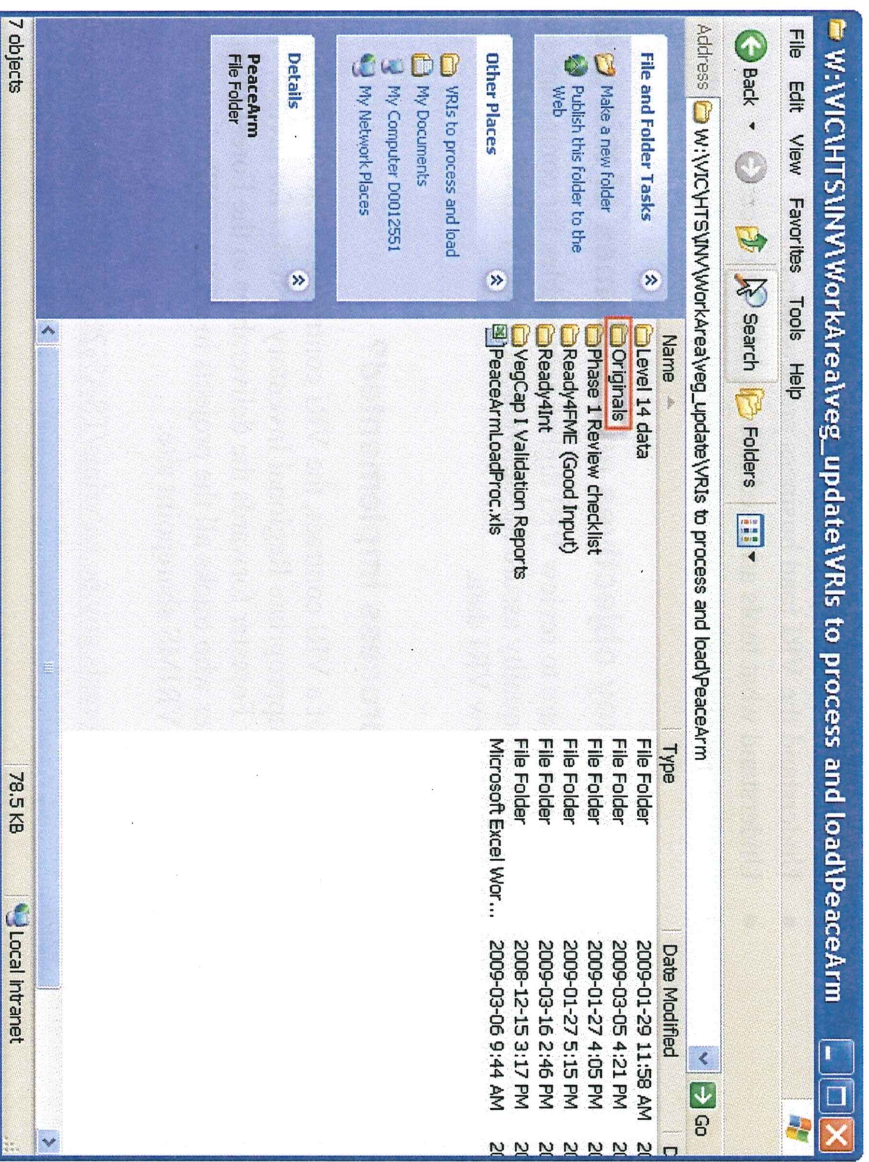
The Team Leader assigns the VRI validation and load project to one of the Forest Inventory Update Specialists (usually the one who provided the VRI source data to the VRI contractor).

The Forest Inventory Update Specialists are responsible for completing the entire process and reporting to the Forest Inventory Update Team Leader upon completion.

The Team Leader sends a completion report that includes a copy of the Phase 1 Review Checklist and a copy of the TSA Project Tracking spreadsheet to the Regional Inventory Forester (Appendix A).

How do I prepare data for this process?

The Team Leader copies the original files into standard project directories as follows:



The Team Leader also creates a project Load Processing spreadsheet that lists the all the mapsheet files.

FCI/MDB VRIMS Load Processes																																			
Project: TFL 18														Date: Started March 12, 2009																					
Maps														Copy files to your H: drive 3D-2D if necessary (NT)																					
092P068														Ren MDBs if needed																					
092P069														VEGCAP Validate																					
092P070														VEGCAP BCLCS																					
092P078														FME																					
092P079														Fix FME errors, reprocess																					
092P080														Visual check in ARC																					
092P088														Check/Repair Geometry																					
092P089														VEGCAP II BVRs																					
092P090														Opening ID's okay																					
092P099														Set Reference Year																					
														Check Interp & Project																					
														Check BCLCS Lvl <>U																					
														Check for FCIDs=0																					
														Transfer to Drop Box																					
														Check for clean prep																					
														Audit for integration																					
														Check for integration																					
														Visual integration check																					
														Extract level 14																					

The Forest Inventory Update Specialist copies the original files into their working directories on H: drive using the FME_VG1 Directory Structure.

What are the steps to complete this process?

Using the Process Overview Map

The current VRI Load Business Process Map includes all the steps that used to be performed on NT computers and needs to be revised to reflect this updated process.

Pre FME File Preparation

The following steps prepare the files for FME translation. The FME translator is coded to expect files in a certain format, naming convention, and specifications.

- Copy the input file pairs to a CD and transfer them to an NT computer.
- View file properties and unselect Read-Only.

- Use Maps3D to translate from 3D to 2D if necessary.
- Rename spatial files to a .FC1 extension and attribute files to a matching .mdb name as FME requires both the .FC1 and the .MDB files to have exactly the same name
i.e. 082F098.FC1 and 082F098.MDB
- Start VegCap 2.5.
- Open an .mdb attribute file and run validate. Fix any validation errors that occur and ignore all warnings. *Note: you can validate all files at one time but you need to review each report for errors.*
- Run BCLCS under the Go menu to populate the British Columbia Land Classification System fields in each .mdb file.

When new VRLs come in, the BCLCS fields are generally not populated. Under the current VRIMS release, if a file that has no BCLCS is run through VegCap II, the error file created will contain 5 errors, one for each BCLCS level, for every polygon in the entire file. When this occurs, it is extremely difficult to track down valid errors because the error file is so large. Also, the current version of VegCap II will only run BCLCS for one polygon at a time. The VegCap 2.5 BCLCS routine produces a few results that are not allowed by VegCap II, so there are generally still a few BCLCS errors that need to be fixed later.

When VRIMS version 1.5 is in production, this VegCap 2.5 step can be eliminated.

- Copy your files to CD and transfer them back to your workstation.

Tips to avoid overwriting important data!

- ! Delete areas included in the .FC1 files that are outside of the area of interest of the project. Contractors often provide square edged 1:20000 files for every map even though many, especially along project boundaries, are only partial maps and the rest of the map area is included but defined as unreported or no typing available (NTA). These NTA areas must be removed from the file pair before further processing.

This editing can be done in Microstation on either the NT computer or on DTS. In some cases, you may be able to translate the pair to a PGDB and then delete the unnecessary polygons.

Using Custom FME translator to convert .FC1/.MDB Inventory Files into VRIMS Personal Geodatabase Format

The FME_VG1 translator was custom designed by SALF to take a matched pair of spatial and attribute Inventory files, (.FC1/.MDB) and convert them into an ARC GIS Personal Geodatabase (PGDB) that conforms to the new Vegetation Resources Inventory Management System (VRIMS). These routines were needed to enable the Branch to continue to accept deliverables from current contracts specifying old standards and transform this data for integration into the new VRIMS operational database. The input spatial file is a 2D Microstation file containing levels 9, 10, 14, 19, and 56, with an .FC1 or .VG1 extension and the attribute file is in VEGCAP MS Access97 format.

Installing FME Translator

- Copy FME_VG1 directory structure to your H: drive, in the root directory.
- Open ARC 9.1 desktop. These FME scripts were written for 9.1 and need to be run in that environment.
- Open Windows Explorer on 9.1 desktop and copy the file VG1.fds from the H:\FME_VG1\Scripts\Formats directory to C:\Documents and Settings\your username\My Documents\FME\Formats (e.g. C:\Documents and Settings\Decunning\My Documents\FME\Formats). If this directory does not already exist, then create it.
- Right click on VG1.fds on the C: drive and select 'Install into FME Workbench' to install.

FME_VG1 Directory Structure

- Input – Place source data .FC1/.MDB pairs to be translated here. A .VG1 extension for spatial files is also permissible.
- Good_Input – Files from Input that go through the validation routine cleanly go into this directory before they are translated into PGDBs.
- Bad_Input – Files from Input that fail the validation routine go into this directory along with an .XLS spreadsheet listing the errors and an ARC shape file containing the errors only.
- Output – This directory contains the PGDBs that have been successfully created by the translator. These files are in Albers projection.
- Logfiles – The log files that are produced by the validation and translation routines go into this directory.
- PGDBRounder and Rounder – These 2 directories contain the files required to change the precision (decimal places) of the output data to match VRIMS specifications.

- Scripts – Contains 3 subdirectories, Batchfiles, Formats, and Workspaces, which contain the translation scripts.
- Templates – Contains the template used by FME for the above scripts.
- Documentation – A word file describing how to install and run this software.
- Test_Data – Some clean .FCI/MDB pairs that have already gone through FME to use as a test to check your own installation.

Add directories as needed to facilitate the process. It is recommended that backup of Good Input and Output files be created during processing so that you can retrieve data if mistakes are made.

Name	Type	Date Modified
backup of good inputs	File Folder	2009-03-03 12:07 PM
backups of outputs	File Folder	2009-03-17 11:53 AM
Bad_Input	File Folder	2009-03-03 11:57 AM
Documentation	File Folder	2008-11-18 2:07 PM
from NT	File Folder	2009-01-28 2:39 PM
Good_Input	File Folder	2009-03-17 11:55 AM
Input	File Folder	2009-03-03 4:56 PM
Logfiles	File Folder	2009-03-03 12:08 PM
OrigMDB	File Folder	2009-03-17 11:55 AM
Output	File Folder	2009-03-17 11:56 AM
PGDBRoulder	File Folder	2008-05-13 4:22 PM
Roulder	File Folder	2008-05-13 4:22 PM
Scripts	File Folder	2008-09-11 12:51 PM
temp	File Folder	2009-01-29 5:03 PM
Templates	File Folder	2008-05-13 4:22 PM
Test_Data	File Folder	2009-03-17 8:36 AM
To be returned to contractor	File Folder	2009-01-20 1:35 PM
VRIMSLoadProc.xls	Microsoft Excel Wor...	2008-09-05 9:56 AM

Running Conversion Process

- Copy "old format" VRI files (FCI/MDB) to H:\FME_VG1\Input.
- Open DOS window on ARC GIS 9.1 server window (Start-Programs-Accories-Command Prompt) and set the directory to H:\FME_VG1\Scripts\Batchfiles.
- Start FME batch translator by keying in "ValidateandTranslate UTMdatum-zone #" (e.g. *UTM83-10 for NAD83 zone 10 files*) and process will run on all files in the Input directory. Remember that you can only process files that have the same datum and UTM zone at any one time.

- Check Validate and Translate .log files for errors when processing is complete. These logs are quite long but as a rule, problems will show at or near the end.

Good translation example:

```

094H064 - translate.log - Notepad
File Edit Format View Help
2008-12-22 13:45:01 41.2 0.0 Transaction #13 (final transaction) was successfully committed.
2008-12-22 13:45:01 41.2 0.0 INFO
2008-12-22 13:45:01 41.2 0.0 STAYS Closing the geodatabase writer.
2008-12-22 13:45:01 41.2 0.0 STAYS
-----
2008-12-22 13:45:01 41.2 0.0 STAYS Features Read Summary
2008-12-22 13:45:01 41.2 0.0 STAYS
-----
2008-12-22 13:45:01 41.2 0.0 STAYS
10
2008-12-22 13:45:01 41.2 0.0 STAYS
36
2008-12-22 13:45:01 41.2 0.0 STAYS
9
2008-12-22 13:45:01 41.2 0.0 STAYS FOREST_COVER_OBJECT
2008-12-22 13:45:01 41.2 0.0 STAYS LAND_COVER_COMPONENT_EST
2008-12-22 13:45:01 41.2 0.0 STAYS NON_VEGETATIVE_COVER_EST
2008-12-22 13:45:01 41.2 0.0 STAYS TRANSACTIONS
2008-12-22 13:45:01 41.2 0.0 STAYS TREE_COVER_LAYER_ESTIMATED
2008-12-22 13:45:01 41.2 0.0 STAYS TREE_SPECIES_ESTIMATED
2008-12-22 13:45:01 41.2 0.0 STAYS VEGETATION_COVER_POLYGON_EST
2008-12-22 13:45:01 41.2 0.0 STAYS
-----
Total Features Read 11928
-----
Features Written Summary
-----
FOREST_COVER_OBJECT 1099
LAND_COVER_COMPONENT_EST 1115
NON_VEGETATIVE_COVER_EST 87
TRANSACTIONS 1
TREE_COVER_LAYER_ESTIMATED 1036
TREE_SPECIES_ESTIMATED 2169
VEGETATION_COVER_POLYGON_EST 1099
-----
Total Features written 6606
-----
Transaction was SUCCESSFUL (6606 Feature(s)/436834 coordinate(s) output)
FME Session Duration: 1 minute 48.8 seconds.
```

Bad translation example:

[illegible]

- Check "Good_Input", "Bad_Input", and "Output" directories for successful and unsuccessful file translations.
- Fix unsuccessful files. For spatial errors, use a combination of the FME Universal Viewer to locate the errors and Microstation to fix them.

- For the Viewer, in the ARC GIS 9.1 window, select 'Start-Programs-FME-Universal Viewer.
- Open a dataset, in this case the .FC1 file, specifying the format as Microstation Design and the Coordinate System to UTM83(or27)-zone#.
- When the .FC1 is displayed, use 'Add dataset' to add the Arc shapefile containing the errors from the Bad_Input directory. This file will always be in NAD83 Albers projection.
- Turn off the .FC1 to see where the errors are and then zoom in to determine exactly what is causing them.
- Open the .FC1 in Microstation (use the DTS version) and fix the errors that you have located.
- Attribute problems will need to be fixed in MSAccess97 and VegCap 2.5 and this entails transferring the .MDB input file over to an NT box again.

If new linework or new attribute information is required to fix the errors, return the files to the contractor for correction.

- Move successful PGDBs out of the Good_Input directory into a backup directory, delete the log files, and delete the .XLS files and ARC shape error files from the Bad_Input directory.
- Return fixed files to FME_VG1\Input directory and re-run the Validate and Translate process until all files are translated into the Output directory.

Post FME File Checking and Validation

The new PGDBs (*mapsheet_geodb.mdb*) need to have further checking and validation processes run before they are ready for VRIMS preparation and integration. This checking is done in a VRIMS ArcMap 9.1 session.

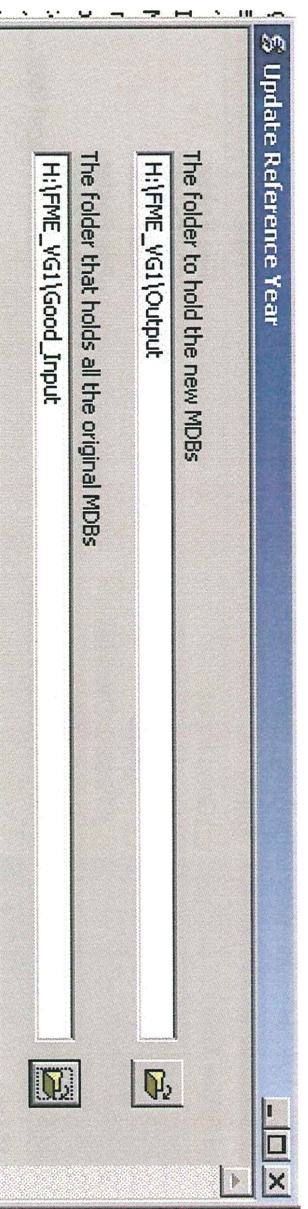
- Open ArcMap and visually check each PGDB for spatial completeness and to ensure that it is in the correct location against 1:20000 grid.
- Run the ArcToolbox-Data Management Tools-Features-"Repair Geometry" to find and fix any multi-part or self-intersecting polygons.
- Validate each file using VegCap in VRIMS ArcMap session and fix all errors that occur. Warnings can be ignored.
- Check file against RESULTS spatial file to ensure that opening ID's have been included in the .mdb files.
- Set the Reference year. The current version of the FME translator that we are using is not setting the reference year properly. Until we get this fixed, we have to run a reference year fix script.

1. Copy **W:\Work\FOR\VIC\HTS\INV\WorkArea\dunning\Toolboxes\Toolbox92.tbx** to the same location in your own directory (e.g. ahammert instead of dunning).
2. Copy **W:\Work\FOR\VIC\HTS\INV\WorkArea\dunning\PythonScripts\updating_reference_year.py** to the same location structure in your own directory.
3. Open a new empty map in ARC 9.2.
4. Open your toolbox menu and right click on ArcToolbox at the top and select 'Add Toolbox'. Navigate to your own Toolboxes directory described in step one and attach your own Toolbox92.tbx.
5. Right click on Toolbox92, select properties, and make sure that under 'Properties' the Location reflects the location of the Toolbox92.tbx file in your directory.
6. Click on the + next to Toolbox92 on the menu to expand the directory, and right click on "Update Reference Year", click on 'Properties', and under the 'Source' tab, set the 'Script File' to be the file 'updating_reference_year.py' file in your own Python Scripts directory as shown in step 2.
7. Run the script by double clicking on 'Update Reference Year' in your Toolbox92.

 Remember that:

The folder to hold the new MDBs' should contain the new PGDB MDBs (*mapsheet_geodb.mdb*) that you have created through the FME process

The folder that holds the original MDBs' should be the 'Good Input' folder that contains the validated MSAccess97 MDBs that were brought over from the NT box along with the clean FCIs.



No separate files will be created as a result of this script but the files in the Output folder will be updated.

- Check each PGDB in MS Access for the following:

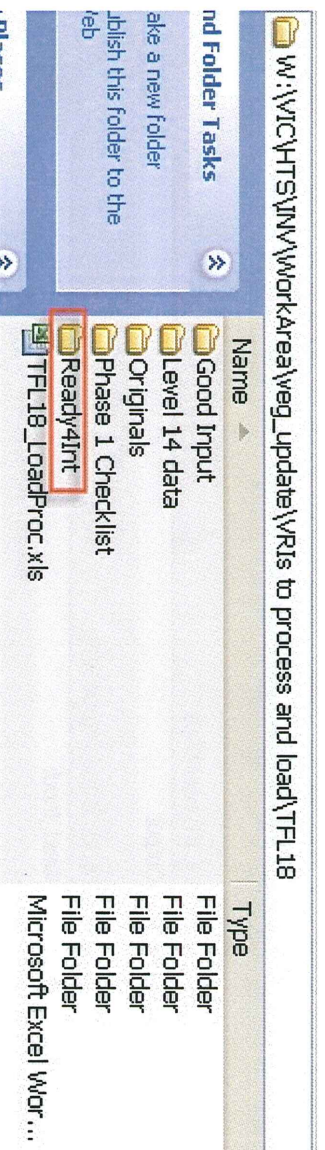
- Check Interpreter and Project Name
Open the Forest_Cover_Object table and check the Interpreter and the Project Name fields to make sure that these have been populated correctly and consistently. Fix if necessary.
- Check for Unreported Polygon Records
Open the VEGETATION_COVER_POLYGON_EST table and check the field BCLCS_Level1_Code column to make sure that there are no "U"s for unreported in the file. New VRIs should not have unreported shapes, so the existence of these can indicate one of two things: a valid polygon has not been attributed correctly or an area of the file is still included for which no new VRI has been done (e.g. outside of area being inventoried). A "U" polygon should be deleted from the PGDB.

- Check for Orphaned Records
Under certain circumstances, FME will bring orphaned records from the source .mdb files that are not attached to any spatial polygon. It gives these records a Forest_Cover_Object_ID of 0.

To find these records, open the VEGETATION_COVER_POLYGON_EST table and sort descending the Forest_Cover_Object_ID column. If you see a 0 or 0's at the top, you have orphaned records that need to be deleted as FME numbering starts at -1 and there should not be any 0's. If you find and delete FCID=0 records from this table, also open the LAND_COVER_COMPONENT_EST table and delete any FCID=0 as well.

VRIMS Preparation and Integration Process

- Copy the validated PGDB's from your H:\FME_VG1\Output directory to the Ready4Int directory in your VRI Load project directory.



- Copy the files from Ready4Int into the VRIMS dropbox. It is recommended to do small groups of files during the day so that you don't impact other VRIMS users. Large groups can be submitted at the end of the workday as well.

- Use the VRIMS System Management Tool or VRIMS Audit Tool in ArcMap to check that the files have Prepared. Note that VRI PGDBs are coded as Net New Transactions (NNT) in VRIMS.
 - Fix Failed Preparation files using the guidelines in Best Practices.
 - Accept the Prepared files for integration in the Audit Tool.
 - Use the VRIMS System Management Tool or VRIMS Audit Tool in ArcMap to check that the files have Integrated.
 - Fix Failed Integration files using the guidelines in Best Practices.
It is best to purge both Failed Preparation and Failed Integration files before you re-submit them to the dropbox. If you don't, you will have multiple transactions for the same NNT and it may be confusing.
 - After the NNT has integrated, visually check that the file has properly integrated into the provincial forest cover. Open a VRIMS ArcMap session and attach the file that you have integrated (from Ready4Int directory). Turn on the VRIMS provincial forest cover layer, set the input file and the provincial forest cover layer to different colours and line weights, zoom in to about a quarter of a 1:20000 tile and scan the entire mapsheet. The linework for the integrated file and for the provincial forest cover layer should be exactly the same.
- If you see linework changes along neatlines that create unmatched polygons, you will need to correct the provincial forest cover layer. Select the polygons to be corrected as per the “Creating a Personal Geodatabase” in Module 2.5.
- Complete the project Load Processing spreadsheet and keep track of all files that are returned to contractors for correction.
 - Ensure that all required files are copied from your H: drive to the appropriate project directories on W: drive. There should only be one set of “Original” file pairs.
 - Notify the Team Leader that the project has been completed.

Working with Personal Geodatabases

Creating Personal Geodatabases for VRI contracts

this process needs to be developed and documented

it is likely that small units such as mapsheets will still be appropriate but it would be nice to move away from neatline polygon divisions

Transferring a Personal Geodatabase to the client

