2020

Forest Information Checker User Guide

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Background

The Forest Information Checker (FI Checker) is a business application designed and developed by the Ontario Ministry of Natural Resources and Forestry (MNRF) for the purpose of checking Forest Information Portal data submissions. This tool is intended as an interim solution to bridge the gap between the loss of check functionality for the initial version of the FI portal due to data structure changes precipitated by the move from FRI-derived background data to EFRI-derived background data, and the transfer of responsibility for the FI Portal from Policy Division (PD) to Regional Operations Division (ROD).

The primary purpose of the tool is to automate validation of FI Portal submissions to ensure that their format and contents meet the standards set out by the Forest Information Manual Technical Specifications (2009, 2018, 2020).

This tool is directly supported within MNRF by the 3 Regional Operations Division Resource Information and Analysis Units (RIAUs), but is also provided to forest industry partners for their own internal use without direct support.

Prerequisites

- **ArcGIS 10.3 or higher** (Please contact Daniel.kim2@ontario.ca for assistance if your ArcGIS version is below 10.3)
- The FI Checker tool was designed for users at a novice to familiar level of use in ArcMap or ArcCatalog.
- The checker program can check feature classes, shapefiles and coverages.
- If your file format is shapefile (or coverage), save all the shapefiles (or coverages) in a single folder and the tool will check through all the files in that folder.
- If your file format is a feature class, save all the feature classes in a single file geodatabase and the tool will check through all the feature classes in that file geodatabase.
- The submission files should follow the correct naming convention for the tool to recognize it. Refer to the FIM tech specs (Forest Information Manual – Technical Specifications) for submission naming conventions. Correct naming conventions must be used but the tool allows users to add a suffix.

- o This is the conventional name:
  - ✓ **MU175_19PCI00**
- o Lower cases are accepted and recognized:
  - ✓ **mu175_19pci00.shp**
- o Mix of upper and lower cases are recognized:
  - ✓ **Mu175_19Pci00**
- o AOCs have its own rule, so the following is also accepted and recognized:
  - ✓ **MU17519AOC001.shp**
- o Suffixes are recognized by the tool
  - ✓ **MU175_19PCI00_2017JUL6**
- o The tool will not recognize the following feature classes/shp/coverages as part of the submission:
  - ✗ **2017JUL6_MU175_19PCI00   *prefixes are not accepted**
  - ✗ **MU_175_19PCI00.shp   *extra underscore**
  - ✗ **175_19PCI00**
  - ✗ **PlanningCompsiteInventory .shp**
- o The tool will also recognize the layer even if the FMU code or if the file's submission year is inconsistent with the submission year user entered into the tool.

  ⚠ **MU175_17PCI00   *wrong submission year – in this case, the tool will check this submission anyway but the report will tell the user that the submission year is wrong.**

FI Checker Operation (ArcToolbox - Python Script)

1. Download the FI Checker tool from the FI Portal. Extract files from the zipped folder and save it somewhere on your C drive.
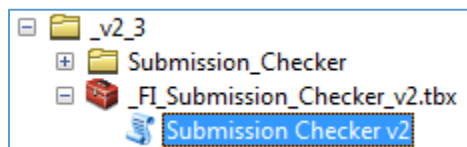
2. Open ArcMap.

3. Open ArcCatalog
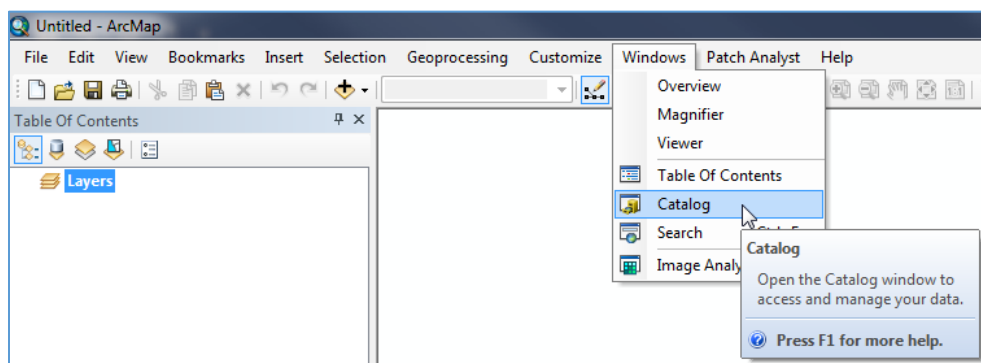
3. In ArcCatalog window in ArcMap. Click **Connect To Folder** .

4. On your Connect to Folder Window's Folder box, type in where you unzipped the downloaded tool.
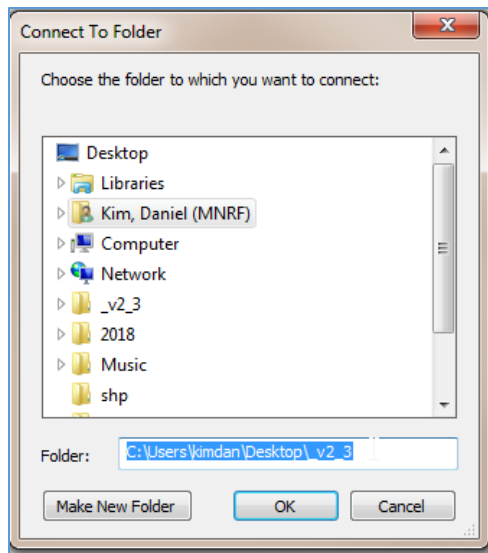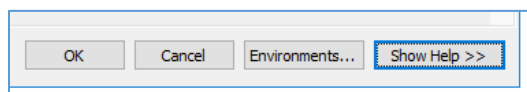
Click OK.

5. On your ArcCatalog window, locate the **_FI_Submission_Checker_v2020.tbx** toolbox and double click to expend it.

6. Double click the **Submission Checker v2020** to open the tool.

7. Make sure to turn on the help section by clicking the **Show Help >>** button on the bottom right.

Just like any other tool in arcmap, the help section is designed to guide the users through each parameter of the tool. Simply click on the input parameter box to view the associated help in the "Show Help" pane on the right.

If you are having difficulties turning on the help section, please refer to the HelpSection.pdf file included in the tool package.

8. Fill out all the parameters. Please read the associated help dialog for assistance and ease of use. For example, on the "Input Geodatabase or Folder" parameter, the help section indicates that if the input is a shapefile, use the folder icon and navigate to the *Folder* that contains the shapefiles. For the file geodatabase, navigate to the *Geodatabase* containing the feature classes that you want to check, not the actual feature class.

9. Click OK button on the bottom of the tool to run it.

A quick note about run time: PCI, BMI and OPI will take 20-30mins <u>each</u> to run. All other layers will take less than 30 seconds to run. If you are planning to run just a single layer such as OPI, you can save time by creating a new geodatabase and have the OPI the only feature class in that geodatabase (and run the tool on that geodatabase). Tool running time can be greatly increased if your spatial data is not in your local drive (i.e. on a network shared drive). The location of the tool itself won't affect the running time.

10. The output report will be automatically saved on the parent folder of your **Input Geodatabase or Folder.**

11. When the tool is successfully run, it will automatically open the Report using your computer's default internet browser.

 the FI Checker will open an output window as it scans through all of the records of your submission file, and reports errors and warnings where data details do not meet the requirements of the FIM Technical Specifications. Once the check process is complete, your web browser will automatically open the report. It can also be opened from the folder where your input inventory resides. Examine the report information as described in the FI Checker Output section described below, and make any necessary edits to your submission files in your GIS software.

Command Line Operation
The command line functionality is available through the batch file. The user guide portion of it should be completed here.

Batch Operation
- This can be done by right-clicking on the script in the toolbox and selecting "Batch"
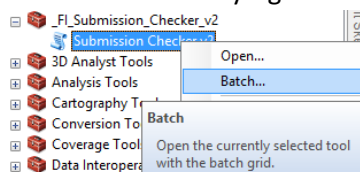
- This isn't usually necessary as it's usually one forest and one submission package at a time that needs to be checked.

FI Checker Output

Please refer to the FIM tech specs, planning team, Analysts and GSO for assistance when interpreting the Errors and Warnings found.

The output report can be found in the parent folder of the input geodatabase or the folder. An example of the output report filename is "MU930_2019_FMP_Report_8152.html".

Your computer will choose the default internet browser to open the report. The report can be opened using both Google Chrome and Microsoft Edge. Depending on your computer's settings, you may need to click "Allow blocked content" when you open the output report on a browser.

1. The General Information about the spatial data that's being checked.

Submission Type:	FMP
Submission Year:	2019
MU Name:	Romeo_Malette
Submission ID:	8152
Plan Start Year:	2019
MU Number:	930
Date Reviewed:	2018-06-26
Tech Spec Used:	2017 version
Data Format:	feature classes

2. The Report Summary contains the following information:

- List of layers that did not follow the naming convention.
- Missing layers that could've been included in the submission type (eg. If Scheduled Harvest is missing in AWS)
- If not all layers are using the same projection, it will show up in the Summary section.
- For each layer, list of missing mandatory fields.
- For each layer, list of stage 1 (Invalid-Critical) or stage 2 (Invalid-Minor) validation flags.
- For each layer, the report will let the user know if all the fields and records are **Valid**.
- For each layer, hyperlinks to the applicable section of the tech spec.
- Hover over the name of each layer to check the projection.

Layer File Name	Layer Name	Existing Mandatory Fields	Additional Fields	Field Validation	Field Comments	Record Validation	Record Validation Comments	Reference
MU390_18AGP00	Existing Forestry Aggregate Pits	['PITCLOSE', 'PITOPEN', '...	['OBJECTID', 'SHAPE']	Valid	N/A	Valid	- Total number of records checked: 43	4.2.19
MU390_18SAC001	Scheduled Area Of Concern	['AOCID', 'AOCTYPE']	['OBJECTID', 'SHAPE', 'SH...	Valid	N/A	Valid	- Total number of records checked: 6428	4.2.8
MU390_18SAC002	Scheduled Area Of Concern	['AOCID', 'AOCTYPE']	['OBJECTID', 'SHAPE', 'SH...	Valid	N/A	Valid	- Total number of records checked: 2178	4.2.8
MU390_18SAC003	Scheduled Area Of Concern	['AOCID', 'AOCTYPE']	['OBJECTID_1', 'SHAPE', '...	Valid	N/A	Valid	- Total number of records checked: 214	4.2.8
MU390_18SHR00	Scheduled Harvest	['AWS_YR', 'BLOCKID', 'SI...	['OBJECTID_1', 'SHAPE', '...	Valid	N/A	Invalid-Critical	- Total number of records checked: 2277 - Error on 315 record(s): SILVSYS must be populated if FUELWOOD is not Y. - Error on 80 record(s): SILVSYS must be CC when HARVCAT = SCNDPASS. - Error on 97 record(s): HARVCAT = BRIDGING is only available when the AWS start year is equal to the first year of the plan period. - Error on 315 record(s): The population of FUELWOOD is mandatory and must follow the correct coding scheme.	4.2.7
MU390_18SOR00	Scheduled Operational Road	['AWS_YR',	['OBJECTID',	Valid	N/A	Valid	- Total number of records checked: 106	4.2.11

Some general tips when interpreting the summary report:

- If the flagged error/warning is originated from the FRI (for example, errors in Ecosite fields), it is generally okay to ignore it (but confirm with the planning team).
- Try to focus on the Errors and not the Warnings.
  - Warnings refer to Stage 2 flags in the tech spec and it is often phrased "X should be Y".
  - Errors refer to Stage 1 flags in the tech spec and it is often phrased "X must be Y".
- If the report tells you that you are missing a mandatory field, it's most likely that you've misspelled that field. Correct the field name and re-run the tool.
- Use the Error Detail section if you need to find individual records that caused this flag.

3. The Error Details section is designed to help the user to find individual records that caused the flag. It contains the polygon ID and the reason why this record has been flagged.

Error Detail

MU390_18SHR00

Error on OBJECTID 1272: SILVSYS must be populated if FUELWOOD is not Y.
Error on OBJECTID 1273: SILVSYS must be populated if FUELWOOD is not Y.
Error on OBJECTID 1274: SILVSYS must be populated if FUELWOOD is not Y.
Error on OBJECTID 1275: SILVSYS must be populated if FUELWOOD is not Y.
Error on OBJECTID 1276: SILVSYS must be populated if FUELWOOD is not Y.
Error on OBJECTID 1277: SILVSYS must be populated if FUELWOOD is not Y.
Error on OBJECTID 1278: SILVSYS must be populated if FUELWOOD is not Y.
Error on OBJECTID 1279: SILVSYS must be populated if FUELWOOD is not Y.

Use ArcMap's Select By Attribute function to select the particular ObjectID (or FID) to select the flagged record. Examining the flagged records will give the user a better understanding of the cause of the error.

Appendix 1: Terms and Abbreviations

FI Portal/Forest Information Portal – the web application where forest management data submissions are made by the forest industry to the Ministry of Natural Resources and Forestry

eFMP – This site allows public access to draft and approved forest management plans prepared for Crown forests in all management units in Ontario. The details of the activities described in the plans are also posted to this site annually in what are called annual work schedules. These schedules describe all forestry activities to be carried out that year namely harvest, renewal, road construction, prescribed burns, aerial pesticide spraying projects and insect pest management programs. At the end of each year, an annual report of the completed activities for each management unit is posted. Plans, schedules and reports are made up of text tables and maps.

ST1/Stage 1: - Stage 1 validations ("checks") represent errors in data format, or missing mandatory data. These errors <u>must</u> be fixed for an FI Portal submission to be accepted by the MNRF.

ST2/Stage 2: - Stage 2 validations ("checks") represent warnings, where an item being validated *may* be problematic, or could simply be a result of specific differences with a particular forest that are known and acceptable. While a submission with Stage 2 warnings can still be accepted, the warnings should be discussed with an MNRF Forest Analyst prior to data submission.

Validation: – The process of checking an FI Portal submission for errors or inconsistencies by the FI Checker.

Appendix 2: Divergence from the Tech Spec

Current version of the checker tool is based on the Technical Specification document released in July 2017 (Information Posting #7847) through FI Portal. Since then, a number of validation statements has been altered where deemed necessary. This decision was made by the MNRF Crown Forest and Lands Policy Branch, taking suggestions from the Forest Information and Data Advisory Group (FIDAG). Here's a list of validation statements that has been altered and been acknowledged by the checker tool:

FMP

1. **PCI->SEC_ECO**
   Add the language "SEC_ECO may be blank or Null" to the list of validation statements for PCI->SEC_ECO

2. **PCI->UHT**
   Add the age test to the comparison of heights between canopies. The validation statement on PCI->UHT should be changed to "UHT must be at least 3m less than OHT, or UAGE must be at least 20 years less than OAGE" (In the section which specifies VERT is TO, TU, MO or MU)

3. **PRC->CONTROL**
   Remove "or ACCESS = REMOVE " from the validation statement in PRC->CONTROL(1,2) so it reads "The population of CONTROL1 or CONTROL2 is mandatory where ACCESS = BOTH or ACCESS = APPLY"

4. NULL testing for numeric fields accepts NULL or 0. This requires multiple corrections to the Tech Spec language, identified in an email July 16th. For all numeric fields (except OSC, USC, and SC), zero is equivalent to null.
   For example,
   Original: "When POLYTYPE is not FOR, OHT must be zero"
   Corrected: "When POLYTYPE is not FOR, OHT must be zero or null".

5. **WXI->RESPONS** tested for correct coding scheme -the Tech Spec provides the coding scheme, but does not require its use by a validation statement. See email of July 16th ("RE: found another conflict... (WXI RESPONS)") . Project determined that we would add a statement in the "Validation" section: "The attribute population must follow the correct coding scheme"

6. **PCI->DEVSTAGE** stocking validation should allow NEW* as well as DEP* for OSTKG + USTKG = 0. This has been implemented in both projects. It makes sense and was discussed with Hue at an early stage. The present revisions of the FMP Tech Spec include this.
   For Instance:
   OLD:
   > DEVSTAGE should be LOWMGMT, LOWNAT, DEPHARV or DEPNAT if POLYTYPE = FOR and if UCCLO + OCCLO < 25
   NEW:
   > DEVSTAGE should be NEWPLANT, NEWSEED, NEWNAT, LOWMGMT, LOWNAT, DEPHARV or DEPNAT, if UCCLO + OCCLO < 25 (when POLYTYPE = FOR)

7. **PCI/BMI -> AGE and OAGE field**
   AGE and OAGE validation statement is ambiguous (or simply confusing)
   OLD:
   > AGE can be zero only when DEVSTAGE is DEPHARV or DEPNAT (when POLYTYPE = FOR)
   NEW (confirmed by Hue and Angus):
   > A zero or NULL value is not a valid code, unless DEVSTAGE is DEPHARV or DEPNAT

AR

Divergence from (or different interpretation of) the AR Techspec 2017 - the Info Post #7847 posted in 2017

A note about zero values and numeric attributes (fields):
Since the implementation of 2017 tech spec, the SFLs can submit data in shapefile and file geodatabase format. One of the major repercussion is that with geodatabase and shapefile, a number field (integer, double) can have a value of NULL. This means that we should allow NULL value as zero value for most of the validation statements just like we allow both NULL and blank in a text field. So the following changes are necessary:
Old: "A zero value is a valid code"
NEW: "A zero or NULL value is a valid code"
Old: "A zero value is not a valid code"
NEW: "A zero or NULL value is not a valid code"
This logic should be applied to all the numeric fields where zero means 'nothing' or 'no data'.
This logic cannot be applied for an attribute such as OWNER since zero value actually has a meaning to it.
If we don't change this rule, the checker tool will unnecessarily flag a lot of NULL values.

AGG layer:
- REHABREQ - Stage 2 - Original: If the area requiring rehabilitation is greater than zero (REHABREQ>0) then the pit closure date should be null (PITCLOSE = null)
  PITCLOSE - Stage 1 - Original: When the final rehabilitation date is populated (PITCLOSE != null) then the required rehabilitation will be zero (REHABREQ = 0)

  Two seemingly different validation statements above raise flag when both REHABREQ and PITCLOSE are populated. Having two validation scripts that essentially catches the same error at different validation stage (stage 1 & 2) doesn't make sense. The above two statements are replaced by a single stage 1 validation statement:

  Stage 1 - PITCLOSE must be null if REHABREQ > 0 and REHABREQ must be zero when PITCLOSE is populated (error when both PITCLOSE and REHABREQ are populated)

- REHABREQ, REHAB and TONNES - NULL value is equivalent to zero. Where the validation statement says "A zero value is a valid code", the following statement is used instead: "A zero or Null value is a valid code".

FTG layer:
- YRDEP, HT, STKG- NULL value is equivalent to zero. Where the validation statement says "A zero value is a valid code", the following statement is used instead: "A zero or Null value is a valid code".
- FTGFU - Stage 1
  Original: "The presence of this attribute in the file structure of the layer is mandatory."
  In Checker Tool: "The presence of this attribute in the file structure of the layer is mandatory **if at least one record has FTG = Y**."

Same logic is applied to SPCOMP, HT, and STKG fields. These four fields are mandatory to exist only if at least one record in FTG layer has FTG = Y. (it always should have at least one FTG=Y anyways)

HRV layer:
- ESTAREA - 'A zero value is not a valid code' has been interpreted as 'A zero or null value is not a valid code'. This is also consistent with its data format description - "Default value is 1.00". The should put 1 as default value and use a number between 0.01 and 1 where HARVMTHD = BLKSTRIP

PRT layer:
- PRODTYPE
  Original: The product type must be null when all the treatment methods are manual.
  In Checker Tool: The product type must be null when none of the treatment methods are chemical.
  Same logic was applied to RATE_AI and APPNUM field.

PER layer:
- BHA (also HT, DENSITY and STKG)
  Original: The population of this attribute is mandatory where SILVSYS = CC and SH
  Edited: The population of this attribute is mandatory and a zero value is not acceptable where SILVSYS = CC and SH
  Same logic is applied to HT, DENSITY and STKG attributes.
- DENSITY
  Original:

  ① The population of this attribute is mandatory where SILVSYS = CC and SH.

  ② Where STKG is populated DENSITY will be equal to zero.

  In Checker Tool:

  ① The population of this attribute is mandatory when STKG is not populated and SILVSYS = CC or SH.

  ② Where STKG is populated DENSITY will be equal to zero or null.

  This is because the original ① and ② conflict with each other when STKG is populated.

  Same logic is applied for STKG
- AGS and UGS
  Original: A zero value is a valid code where SILVSYS != SE
  Edited: A zero or null value is a valid code where SILVSYS != SE
- SPCOMP
  The checker tool also checks the following in addition to all the validation statements in AR tech spec:
  "Stage 2 - WARNING: SPCOMP should have species listed in a descending order"

RGN layer:
- ESTAREA
  Original: 'A zero value is not a valid code'
  Edited: 'A zero or null value is not a valid code'.

- SP1 and SP2
  "If both species fields are populated, then the ESTAREA must be greater than zero and less than one and the treatment method should be plant."
  Above validation will not be checked because it's a slight variation to the following validation statement in ESTAREA and will almost always double flag same error:
  "ESTAREA must be > 0 and <1 when TRTMTHD1, 2 or 3 is PLANT and both SP1 and SP2 are populated."

- SP1 and SP2
  Original:
    - "The species fields (SP1 and SP2) should be null if all of the treatment methods are CLAAG, NATURAL, HARP, SCARIFY, STRIPCUT or SEEDTREE."
    - "The first species field may be populated if the treatment method is SEED or SEEDSIP." (Is this statement necessarily a Stage 1 check?)
  In Checker Tool:
    - The species fields (SP1 and SP2) should be null if none of the treatment methods is PLANT, SEED or SEEDSIP.

SIP layer:
- PRODTYPE
  Original: The product type must be null when all the treatment methods are mechanical or prescribed burn.
  Edited: The product type must be null when none of the treatment methods are chemical.
  Same logic was applied to RATE_AI and APPNUM field.

TND layer:
- TRTCAT1, 2 and 3
  There's no validation statement that states "If the treatment method is populated (TRTMTHD# ≠ null) then the associated treatment category must also be populated (TRTCAT# ≠ null)".
  Hue confirmed that this was an oversight.
  The above validation rule will be applied to the TRTCAT#.

WTX layer:
- REVIEW
  It appears that the following validation statement is missing in the tech spec:
  "The attribute population must follow the correct coding scheme (if populated)."

EST layer:
- The tech spec doesn't specify the format of AGEEST. (Not checking for AGEEST's format.)
- The tech spec doesn't specify the format of HT (the checker is using the standard 0 - 40 format).
- DENSITY and STKG
  - Added this validation:
    - Either DENSITY or STKG must be populated when ESTIND = Y.

Appendix 3: FI Checker Project Information

Project Owner/Manager: MNRF Regional Operations Division, Integration Branch

Tool Developer: MNRF Regional Operations Division Northwest, Northeast and Southern Regions – Regional Information and Analysis Units (RIAUs)

FI Checker Project Team:

Project Lead:	David David, Integration Branch
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