



Arlinger John

21 November 2018

StanForD minutes

2018-11-20

Place:	Skogforsk, Uppsala, 2018-11-20
Participants:	Lars Henriksson, SDC Tapio Räsänen, Metsäteho Timo Melkas, Metsäteho Antti Korkiakoski, JohnDeere Erik Kindlund John Deere Teemu Paldanius, Ponsse Jonas Gustafsson, Sveaskog Pasi Palonen, Parker Jonas Thorsson, Dasa Andreas Barth, CGI Fedor Stazenko, Ponsse Henrik Persson, LogMax Bengt Sörvik, Otmeka John Arlinger, Secretary Johan J. Möller, Chairman Skype participation: Fredrik Tjernberg, Komatsu Jean Plamondon, FP Innovation Niclas Eriksson, Komatsu Ian Wilson, Interpine (NZ) Juha Yli-Hemminki, Exertus(Log Set) Ângelo Conrado de Arruda Mour, Fibria (Brazil)

Decision summary:

- Next version to be implemented is 3.5.

- Element Extension to be added to following structures: Tracking, GeographicDirective, GISLayer in ogr/ogr.
- Element GISCoordinateReferenceSystem added to include information about coordinate system for each layer (under element GeographicDirective).
- Element GISLayerGroup (with childs GISLayerGroupUserID, GISLayerGroupName, GISLayerGroupUserID) added to have a new mechanism for grouping layers together in the GUI .
- Decided with the minutes that we add GISLayerUserID and GISLayerModificationDate.
- New repair reason added:
Repair- basemachine - mechanical -engine heater/motorvärmare
- Decided with the minutes that “Refilling addblue” is included under MaintenanceStandardCodes.
- Decided with the minutes that we include enumeration value “Waiting for other machine production”.
- Fedor Stazenko will discuss this issue of “engine time line” further with Mikhail Shilov and Teemu Paldanius in order to find out if there is a useful technical solution until next meeting.
- New enumeration value “Default” with the following new description in OtherMachineDownTimeStandardCode:
Allowed values: "Waiting for repair", "Trailer transportation", "Unproductive terrain work", "Other", "Default".
“Default” used only in cases where operators have not registered any reason at all.
“Default” not to be available in GUI and only generated by control system. “Default” to be used in system where down time reasons are disabled or there is a “time-out”.
- New enumeration “m3 (price) Estimated” added to attribute logVolumeCategory.
- Secretary to make a new delta-hpr proposal until next meeting which will only include the Stem structure as well as the MachineKey.
- Following updates in order to include feller-bunchers in Stanford:
Add new boi-schema (feller buncher instruction)
 - Add new messageType (boi)
 - Delete ProductUserID, DiameterSection (comparing with oin).
 - Add repeatable SpeciesGroupUserID instead of ProductUserID
 Add new bpr-schema (feller buncher production)
 - Add new messageType (bpr)
 - Add new machineCategory (FellerBuncher)
 - Delete Grades, EstonianVolume, BarkFunction, ProductDef, ProcessedStems (comparing with hpr).

Update of mom (operational monitoring)
- New machineCategory (FellerBuncher)

- Element “CableTractionAssist” was added to the Tracking in both hpr, fpr, bpr and mom schemas):
- The issue of updating DiameterSection was postponed to the February meeting.
- Definition of DiameterSectionLimitPosition updated according to the following text:
Height of the registered diameter section limit value of diameter sections. Height from the butt end of log. The last DiameterSectionLimitPosition for each log must be equal to the length of the log. DiameterSectionProduction never to include Unclassified logs.
- An updated nomenclature document (translation into English, Swedish and Finnish) will be published at www.skogforsk.se/StamForD. To be updated with French in 2019.

Action list:

- Make certain TopLogFreeBuck works according to specification (2018-11-20)
- The possibility of changing the products during harvesting using an oin will be a requirement on the Swedish market.
Updating oin should only affect product references (ProductUserID). It is NOT to be used for changing identities or sub-objects! (2018-04-17)
- It is strongly recommended that the control system does not automatically activate a modified pin if it is not active at the present harvesting object (2018-04-17)
- All randomly selected stems (both rejected and not rejected) must be saved in an hqc-file including a possible reason for rejection. This file should be possible to send directly to the forest company (in Sweden to SDC).
- Implementation of ProductClass will be important on the Swedish market since it will be used by SDC in the new VIOL3 platform (2018-04-17)
- Coordinates in production files should always be activated by default in all forest machines (especially important after software updates when coordinate registration is commonly lost) (2018-04-17)

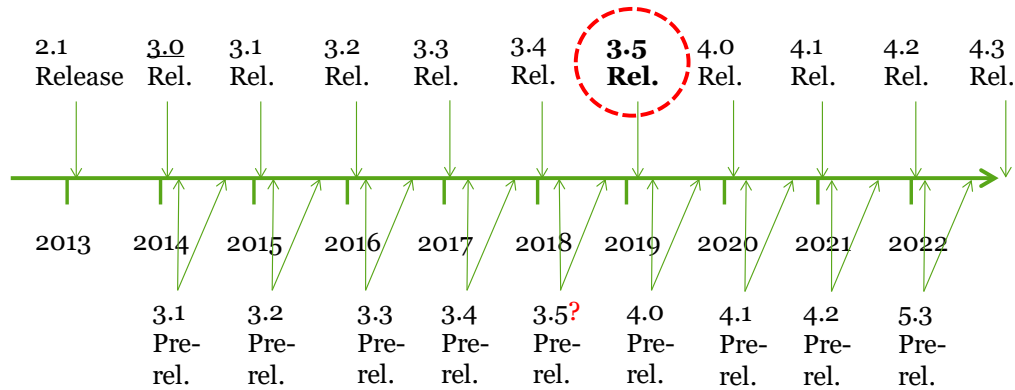
§ 1 Opening of meeting

Chairman Johan J Möller opened the meeting.

§ 2 Agenda

The agenda was accepted by the meeting.

Secretary John Arlinger went through the road map for implementing new standard versions.



There was a brief discussion regarding the next version. No one expressed a requirement for a new major version 4.0. It was decided to implement version 3.5.

§3 Information about decisions at previous meeting

Decisions at meeting 2018-04-17—18:

- Next version to be implemented is 3.5.
- Proposals to be created for the next meeting:
 - Time line for EngineTime in mom.
 - New schemas for feller bunchers and skidders
 - New element for TrackingAssist (tethering)
 - New schema for a delta-hpr
- Extensions to be added to following structures: Tracking, GeographicDirective, GISLayer
- New element MessageKey to be added to future version 4.0
- The following conclusions were reached regarding diameter positions in hqc files:
 - A linear interpolation is always to be used when interpolations are needed.
 - The preferred solution is alternative 1 where the diameter vector includes a diameter per cm. Whether to implement this or not is up to a discussion between manufacturers of control systems and calipers. This is not a StanForD requirement.

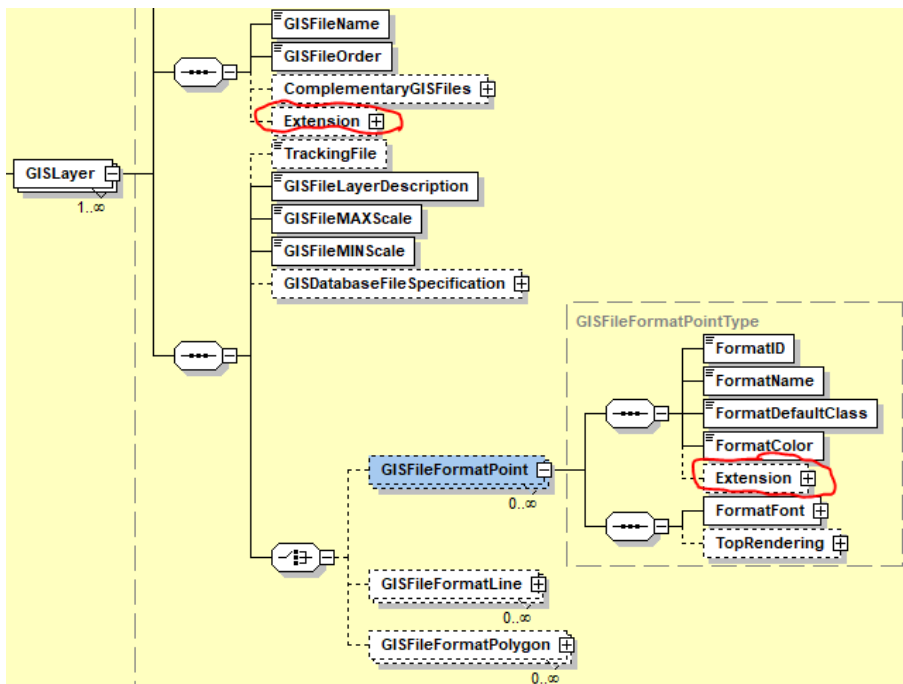
- Calipers must be able to handle also diameter vectors with a diameter per dm.

It is very important that the effect on standard deviation is analysed and discussed within the StanForD group when/if a harvester implements a more detailed diameter vector. If there is any manufacture that can generate diameter vectors per cm Skogforsk

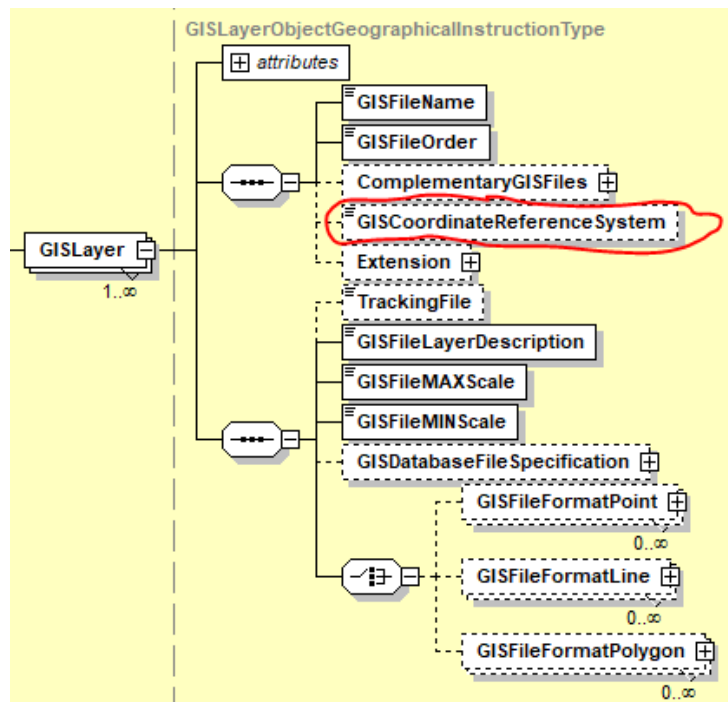
§ 4. Proposals

NEW ELEMENTS IN OGI

It was decided to add that the following new extensions to the ogi at last meeting:

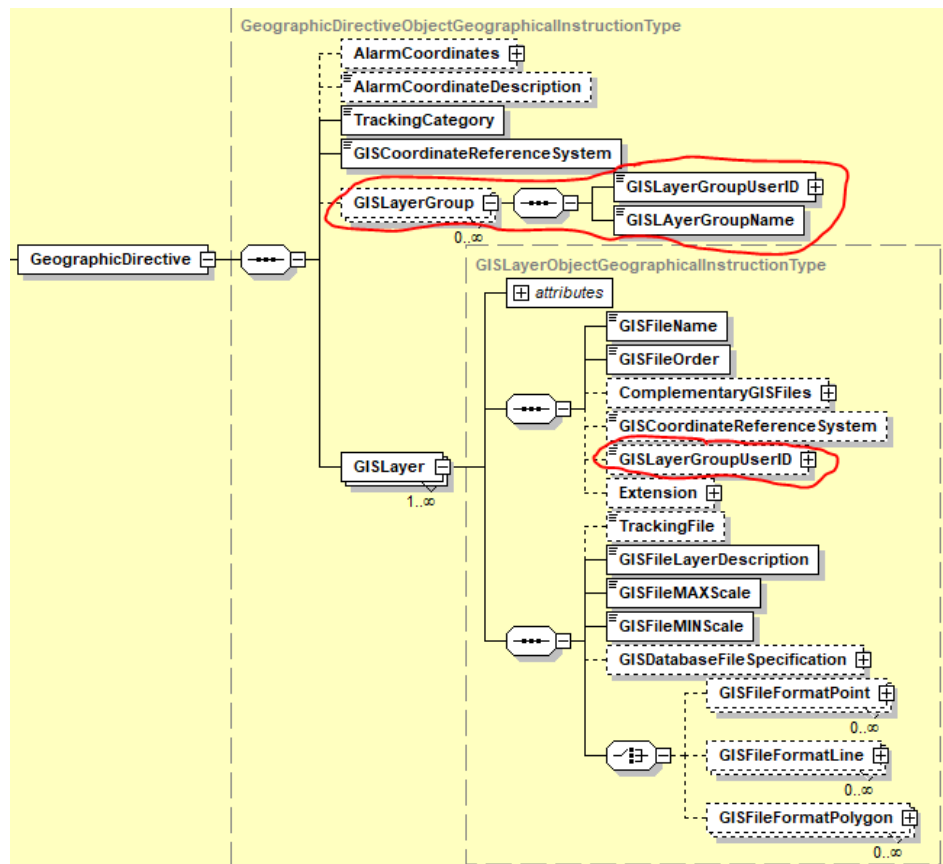


It was decided at this meeting that we make it possible (optional) to include information about coordinate system for each layer since we may find ourselves in a situation where e.g. different shp-files are based on different coordinate systems.



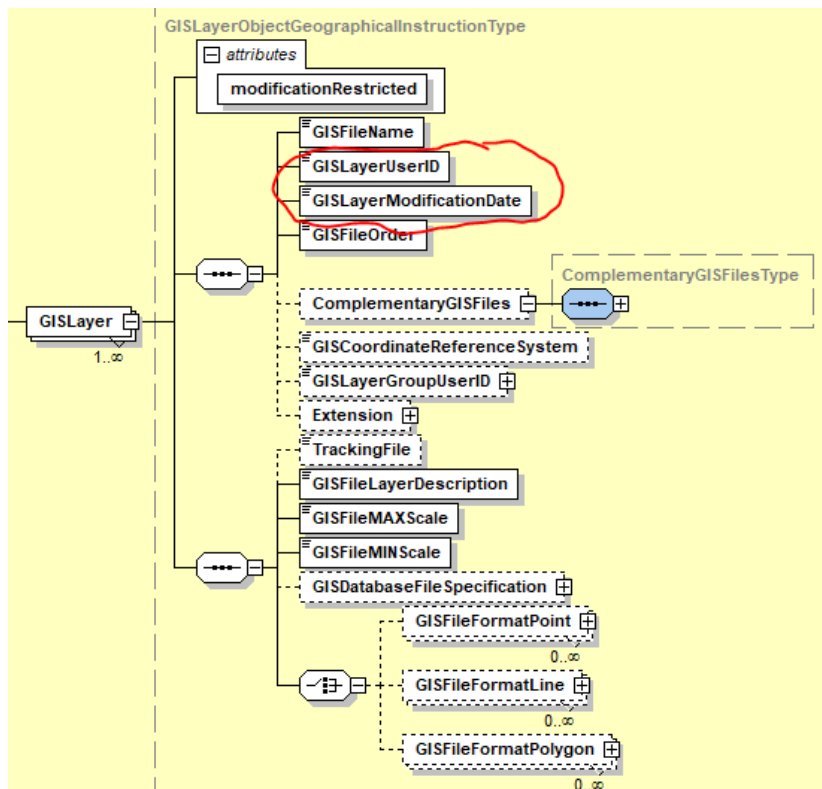
Name	Data type	Unit	Description
GISCoordinateReferenceSystem	String	list	Coordinate reference system used for all layers/gis-files, codes according to the EPSG database (http://www.epsg.org/), see also appendix. Does not affect coordinates registered in StanForD files.

It was also decided that we add a mechanism for grouping layers together in the GUI. It is not uncommon that several layers describe similar features (e.g. cultural heritage) using both a point, line and polygon layer. Making it possible to treat these layers as one layer-group in the GUI would simplify for the operator.



Name	Data type	Unit	Description
GISLayerGroup			Structure for grouping layers together in the GUI. It is not uncommon that several layers describe similar features (e.g. cultural heritage) using both a point, line and polygon layer.
GISLayerGroupUserID	String	Free text	Identity per GISLayerGroup defined by user of data, normally logging organisation.
GISLayerGroupName	String	Free text	Name of GISLayerGroup to be used in GUI
GISLayerGroupUserID	String	Free text	Identity per GISLayerGroup defined by user of data, normally logging organisation.

Based on a suggestion from Henrik Persson, LogMax, it was decided with the minutes that we also add a new optional elements GISLayerUserID and GISLayerModificationDate.in order to make it possible to update a specific layer in a transparent way:



Name	Data type	Unit	Description
GISLayerUserID	String	Free text	Identity per layer defined by user of data, normally logging organisation.
GISLayerModificationDate	String	yyyy-mm-ddThh:mm:ss[+ -]hh:mm	Date when layer was last modified. Time stamp must have the following times registered: local time ±offset from UTC.

NEW ENUMERATIONS SUGGESTED FOR MOM-FILE

New repair reasons

Suggestion from contractor Fredrik Gunnarsson, 8th of March 2018

It was decided to add the following repair reason:

Repair- basemachine - mechanical -engine heater/motorvärmare

It was also decided to let the secretary study where to register down time to refilling of “addblue”

It is decided with the minutes that “Refilling addblue” is included under MaintenanceStandardCodes.

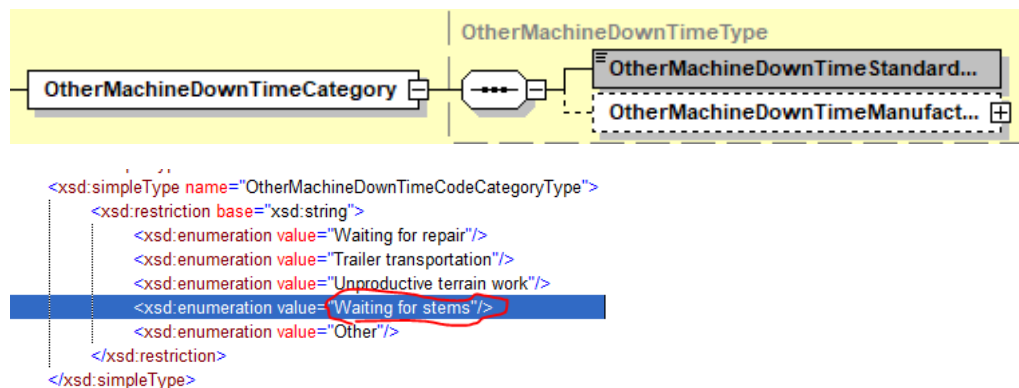
NEW DOWN TIME

Proposal from Antti Korkiakoski Antti, 25th of April 2018

Ian Wilson visited Tampere after last StanForD-meeting One idea that popped up was that now that we are thinking to add feller-bunchers and skidders into StanForD, we should not to forget how grapple yarding affects to workflow. If I understood correctly, when the stems are collected to the stem processing

machine from the site by grapple yarding, there are quite long waiting periods between the “loads”. Now that waiting time would be good to register into MOM in its own downtime category, for example “Waiting for stems”, so that the productivity would be easier to calculate. It would be easier for contractor to understand this and also operator to register the activity correctly.

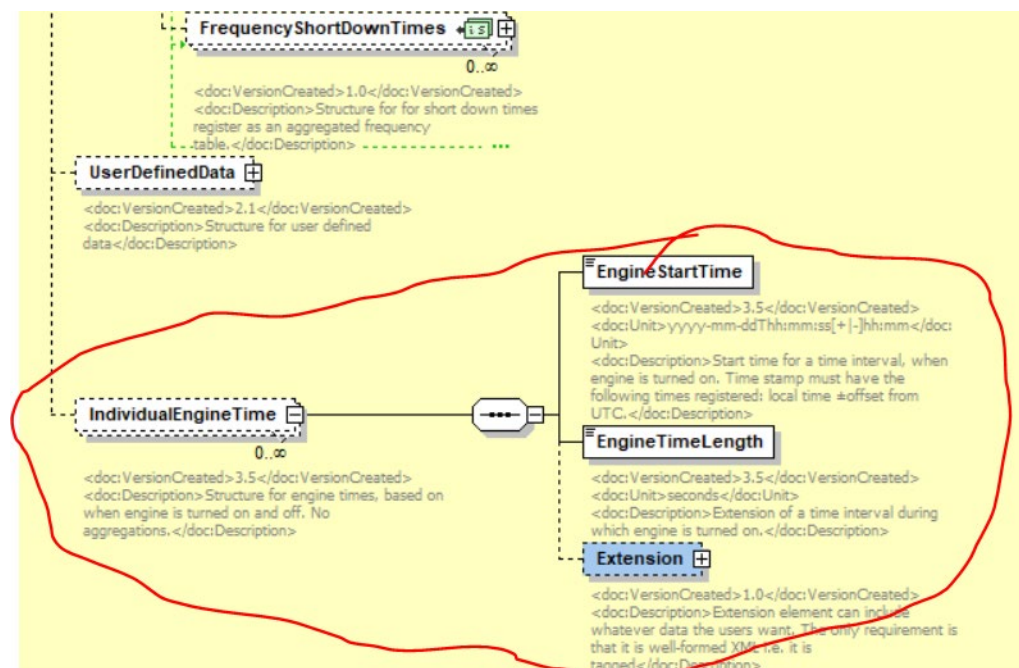
A possible solution could be to add enumeration “Waiting for stems” to “OtherMachineDownTimeStandardCode”



The meeting found the basic idea to be useful but the term “Waiting for stems” a bit limited since this type of waiting could be useful also for a forwarder waiting for logs to be harvested. It is thus decided with the minutes that we include enumeration value “Waiting for other machine production”.

TIME LINE FOR ENGINETIME IN MOM

A new detailed structure for registering when the engine was turned off or on is decided based on a presentation made by Mikhail Shilov, Ilim Group (StanForD meeting 2018-04-17—18).



Name	Data type	Unit	Description
IndividualEngineTime			Structure for engine times, based on when engine is turned on and off. No aggregations.
EngineStartTime	DateTime	yyyy-mm-dd Thh:mm:ss[+ -]]hh:mm	Start time for a time interval, when engine is turned on. Time stamp must have the following times registered: local time $\pm$ offset from UTC
EngineTime Length	positive integer	seconds	Extension of a time interval during which engine is turned on.

An important question was raised regarding how to register engine time in cases where the control system is turned off but the engine is on.

It was decided to let Fedor discuss this issue further with Mikhail Shilov and Teemu Paldanius in order to find out if there is a useful technical solution. This means that the proposal is postponed until next meeting and April meeting.

UNDEFINED DOWNTIMES IN MOM-FILES

The value “Other” exists in element ”OtherMachineDownTimeCategory”. A question is if this value should be possible for the operator to use at all since there exist some type of “other” under each main type of down time (Repair, Disturbance, Maintenance). Another alternative could be to add a new enumeration “Not manually defined by operator”.

This proposal is focused on how to handle “not defined down times”. The standard presently has a number of different “other” down time reason (figure 1).

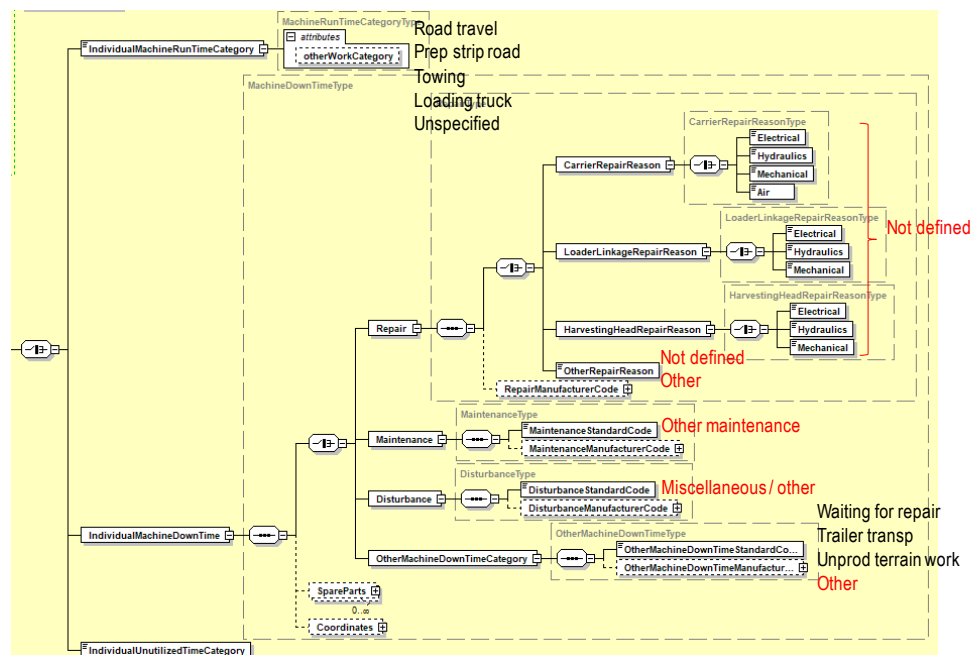


Figure 1. All down type reasons of type "other" in red text.

It is in many cases clear how these "other" down times are to be used. However, it is clear that there are some different situations when it is unclear how to use the down time reasons:

1. No reason defined by operator due to "time out" or unexpected shut down of control system.

It was therefore suggested that the definition of enumeration value "other" is improved according to figure 2.

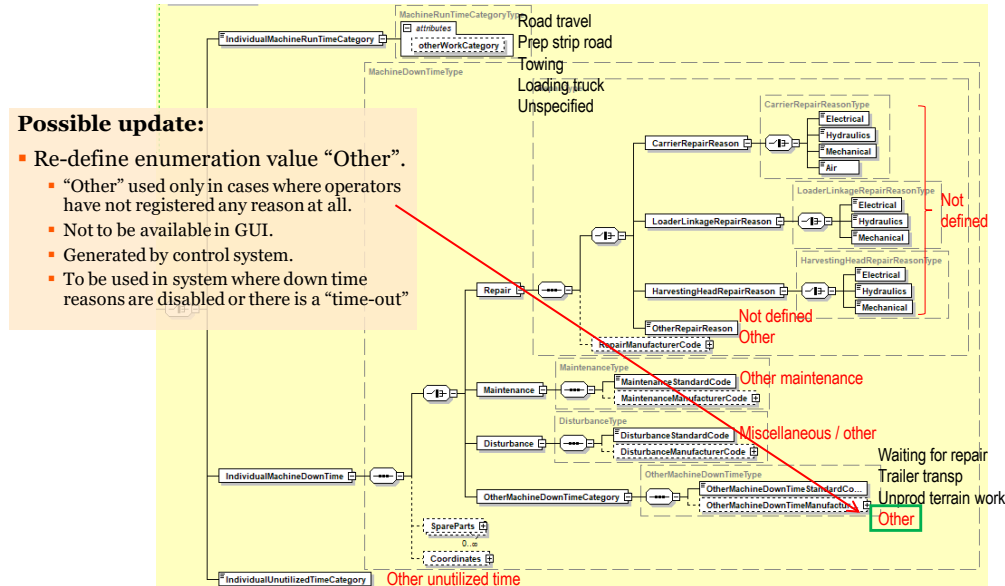


Figure 2. Suggested update to enumeration value, "Other" in element OtherMachineDownTimeStandardCode.

The suggested new description of OtherMachineDownTimeStandardCode is

<doc:VersionCreated>1.0</doc:VersionCreated>

<doc:VersionModified>2.0</doc:VersionModified>

<doc:Unit>list</doc:Unit>

<doc:Description>Allowed values: "Waiting for repair", Trailer transportation", "Unproductive terrain work", "Other".

"Other" used only in cases where operators have not registered any reason at all. "Other" not to be available in GUI and only generated by control system. "Other" to be used in system where down time reasons are disabled or there is a "time-out". </doc:Description>

Several participants noted that it would be preferable to keep the old enumeration as it is and instead add a totally new value "Default". It was thus decided to add enumeration value "Default" with the following new description of OtherMachineDownTimeStandardCode:

Allowed values: "Waiting for repair", Trailer transportation", "Unproductive terrain work", "Other", "Default"

"Default" used only in cases where operators have not registered any reason at all. "Default" not to be available in GUI and only generated by control system. "Default" to be used in system where down time reasons are disabled or there is a "time-out".

NEW LOGVOLUMECATEGORY FOR MULTITREEPROCESSED STEMS

Anders Nylund, Komatsu 2018-10-24.

How do we handle a situation where we want to register a price volume for MultiTreeProcessed logs?

This way?

```
<MultiTreeProcessedStem>
  <Log>
    <LogVolume logVolumeCategory="m3 (price) Estimated"
logMeasurementCategory="Machine">0.0329</LogVolume>
    <LogVolume logVolumeCategory="m3sobEstimated"
logMeasurementCategory="Machine">0.0356</LogVolume>
    <LogVolume logVolumeCategory="m3subEstimated"
logMeasurementCategory="Machine">0.0329</LogVolume>
```

Or this way?

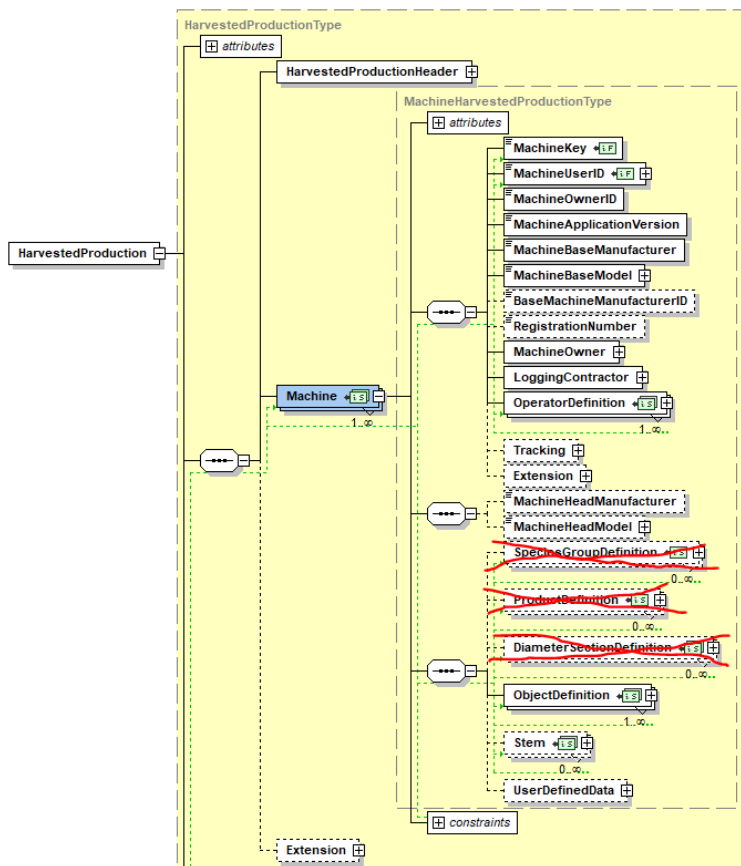
```
<MultiTreeProcessedStem>
  <Log>
    <LogVolume logVolumeCategory="m3 (price)"
logMeasurementCategory="Machine">0.0329</LogVolume>
    <LogVolume logVolumeCategory="m3sob"
logMeasurementCategory="Machine">0.0356</LogVolume>
    <LogVolume logVolumeCategory="m3sub"
logMeasurementCategory="Machine">0.0329</LogVolume>
```

It was decided to add new enumeration “m3 (price) Estimated” to attribute logVolumeCategory.

NEW SCHEMA FOR A DELTA-HPR

The possibility of implementing a new delta-hpr schema was discussed at the last meeting (2018-04-17—18). The objective is to make a new lighter schema that can be used in order to avoid re-sending some basic information every time a new hpr is sent from the machine, e.g. if sending a new hpr after each stem or every 5 minutes. This means that a very significant proportion of redundant information is not re-sent over and over again.

It is suggested that such a new schema (hpd) means that SpeciesGroupDef, ProductDef and DiameterSectionDef are excluded according to the following illustration. A beta-schema has been created (HarvestedProductionDelta_V3p5_Beta.xsd).



It is suggested that the main rule for reporting hpd is that:
No log to be reported if it's ProductDefinition, SpeciesGroupDefinition and DiameterSectionDefinition has not been reported previously.

A test was carried out where a “normal” hpr-file with two stems was converted into a delta-file by excluding SpeciesGroupDef, ProductDef and DiameterSectionDef. The consequences on file sizes are illustrated below:

☒	2 stems.hpr		2018-09-14 10:08	HPR File	1 180 KB
☒	2 stems.zip		2018-09-14 10:08	ZIP Archive	42 KB
☒	2 stems_Delta.hpd		2018-09-14 10:07	HPD File	8 KB
☒	2 stems_Delta.zip		2018-09-14 10:08	ZIP Archive	3 KB

There was a long discussion regarding whether to have an even lighter version or not as well as how to communicate e.g. the ProductDefinitions.

It was decided to let the secretary make a new proposal until next meeting which will only include the Stem structure as well as the MachineKey. The secretary will also make a use case illustrating how to send the ProductDefintions etc from the harvester.

FELLER BUNCHERS AND SKIDDERS

The idea of opening up StanForD2010 machines for tree-length machines was raised by Ian Wilson in November 2017. The idea has been discussed with a few manufacturers.

The background section below is based on an e-mail conversation between John Arlinger, Skogforsk and Ian Wilson, Interpine.

Background

There are probably some real opportunities to increase StanForD scope and utilisation into tree-length (TL) harvesting operations, especially the Feller Buncher machine which is probably the most important machine in a TL operation. Steep slope mechanised tree felling has dramatically increased in New Zealand and Australia with the use of “traction assist” winch systems and in both yarding and shovel/skidder operations. The feller buncher is critical to efficient extraction productivity of the stems to the landing (log making area). This is especially the case in grapple yarding operations where stem bunching and presentation is key to increased productivity i.e. making sure that the harvester productivity capability is fully realised

These machines are typically doing very large annual volumes (up to 280,000 m³) on a single shift system and will normally do all of the tree felling for multiple harvesting crews (teams) which are often 50 – 100 km apart as they are very efficient at tree felling. Some CTL contractors operate a feller buncher where the harvester is still performing CTL, but now not performing the tree felling task. Typically we see some very large productivity improvements (up to 20 – 30%)





Currently, the feller buncher could be considered a “dumb machine” as it doesn’t have any onboard controller for data capture, navigation/planning or operational monitoring capabilities. Due to the task, that this machine is performing, being much simpler than a harvester or forwarder Ian Wilson suggested that a “paired back” version of a harvesters SF2010 schema would work, as the harvester schema already has all of the necessary recording such as tracking, species, coordinates per stem and of course Operational Monitoring.

An overall vision could be to utilise the existing SF2010 file upload system such as the OIN, SPI, OGI and produce a “scaled back” HPR style of output file. It would also make good sense to utilise the Operational Monitoring capabilities of the MOM file for this type of machine and from my limited knowledge, it appears that the current MOM file structure will cover things really nicely.

Due to feller buncher being less complex than a harvester or forwarder (i.e. its primary role is to only fell trees), Ian suggested that we start with looking at what’s in the HPR file and then stripping out any items that it wouldn’t need, such as any Product related items such as diameter and length etc as all feller buncher heads on the market don’t have any length of diameter measurement capabilities and will likely never be a need for this.

Ian also pointed out that be an advantage for the operator to be able to use an OIN or an ENV file (but without any Product requirements) to create a harvesting Object. The OIN/ENV would contain SPI details so that individual Tree Species can be recorded within the production file (the same as what’s currently done by the harvester operator when they are harvesting different species).

A lot of feller bunchers are now also getting “tethered” via a separate winch machine or some have the winch physically attached to the Feller Buncher due to the steep slopes that the machines are working on. Knowing when its “On Tether” or “Off Tether” would be very valuable information to record. Speaking of tethering, a growing number of wheeled harvesters and forwarders are now utilising this technology so maybe this could be a good thing to have added to the Harvester and Forwarder functionality as well ?

Summary of background

- Feller bunchers (and skidders) are very important nodes in logging operations on many markets. In many case in combination with cut to length machines.
- Presently no data is available in standardized format from tree length machines. That makes it difficult to optimize the full supply chain and study productivity when just the cut to length machines support the system with standardized data.
- A critical amount of machines are probably needed in order to build efficient information systems. A significant proportion of "smart" machines are needed (maybe at least 80-90%).

Conclusions StanForD meeting 2018-02-18

The meeting decided to let the secretary further analyse the possibility of including feller bunchers and skidders. A proposal will be written for the meeting in November. The production data will be included in separate messages while the issue of creating separate instruction messages is open since Komatsu pointed out that harvester instructions will almost always be created when using feller buncher, it would thus make life simpler to be able to use the same instructions for feller bunchers as well as harvester.

Conclusions meeting with Ian Wilson and Jeremy Gibson 2018-10-31

It is clear, at least from the Australian market, that feller-bunchers are of significantly higher priority than skidders. It is thus suggested that we postpone the discussions regarding skidders.

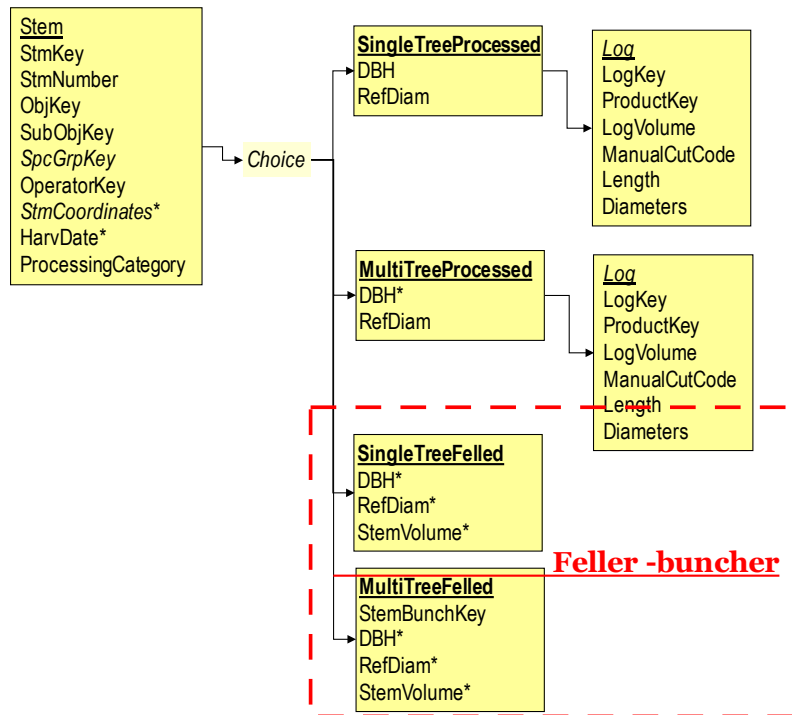
It is also suggested by Ian and Jeremy that we create a separate object instruction for feller bunchers in order to make the instructions more transparent and understandable.

It is thus suggested that we create two new messages (buncher production/bpr and buncher object instruction/boi) and that we update the mom-file.

Feller buncher

Buncher production

The present hpr-format includes Single/MultiTreeFelled stems that could be used for a feller buncher as illustrated below.



Only one new addition to the standard is needed in order to use the basic hpr-structure also for a feller buncher:

- Add “Feller buncher” enumeration to the machineCategory in order to utilize the hpr schema.

The measurement data included for felled stems are DBH, ReferenceDiameter and StemVolume. However, they are optional.

The only totally irrelevant mandatory elements are SpeciesGroupDefinition.Grades and SpeciesGroupDefinition.BarkFunction.

Below follows a few illustrations from an example hpr-file where the “crucial” items are inside “red boxes”:

The first screenshot shows a 'Machine' object with various attributes. The 'machineCategory' is highlighted with a red dashed box and contains the value 'FellerBuncher'.

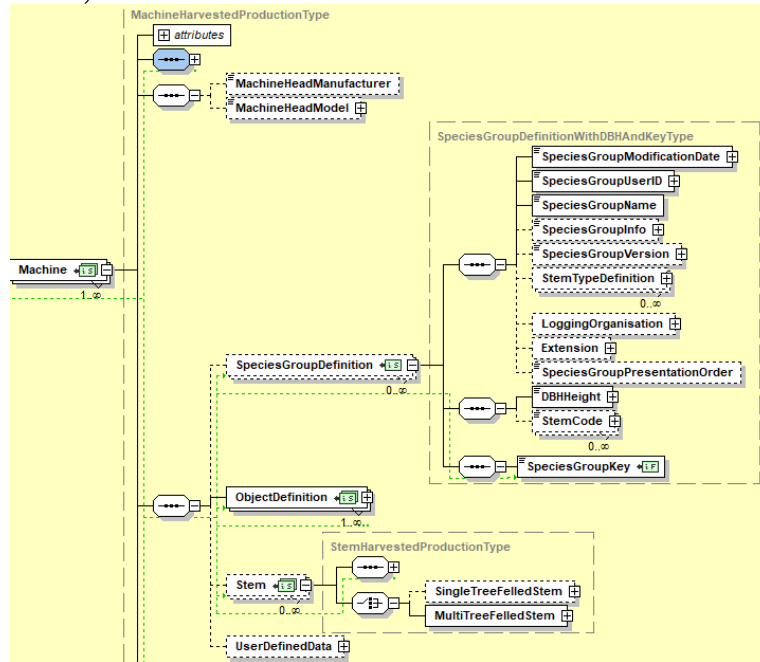
The second screenshot shows a 'Stem (10)' object with a table of attributes. The 'HarvestDate' and 'HarvestTime' fields are highlighted with a red dashed box and labeled 'Opt.'. The 'StemCoordina...' field is highlighted with a red dashed box and labeled 'Optional'.

The third screenshot shows two 'SingleTreeFelledStem' objects. The 'DBH' field of the first object is highlighted with a red dashed box and labeled 'Optional'. The 'ReferenceDiameter' field of the first object is highlighted with a red dashed box and labeled 'Optional'. The 'StemVolume (2)' field of the first object is highlighted with a red dashed box and labeled 'Optional'. The 'StemBunchKey' field of the second object is highlighted with a red dashed box and labeled 'Optional'.

The following modifications of the hpr-structure are suggested when implementing a new production message for feller bunchers:

- Adding new enumeration FellerBuncher to attribute machineCategory.
- Adding new enumeration bpr to attribute messageType
- Deleting irrelevant elements SingleTreeProcessedStem, MultiTreeProcessedStem, ProductDefinitions and DiameterSectionDefinition, Grades, BarkFunction, SoundKnotFunction, ButtEndProfileExtrapolation, EstonianVolumeParameters (illustrated

below).



It is a strong recommendation to include ReferenceDiameter for each felled stem.

Operational monitoring

The situation is probably comparable with production data in that a very minor schema update in the form of a new MachineCategory is needed.

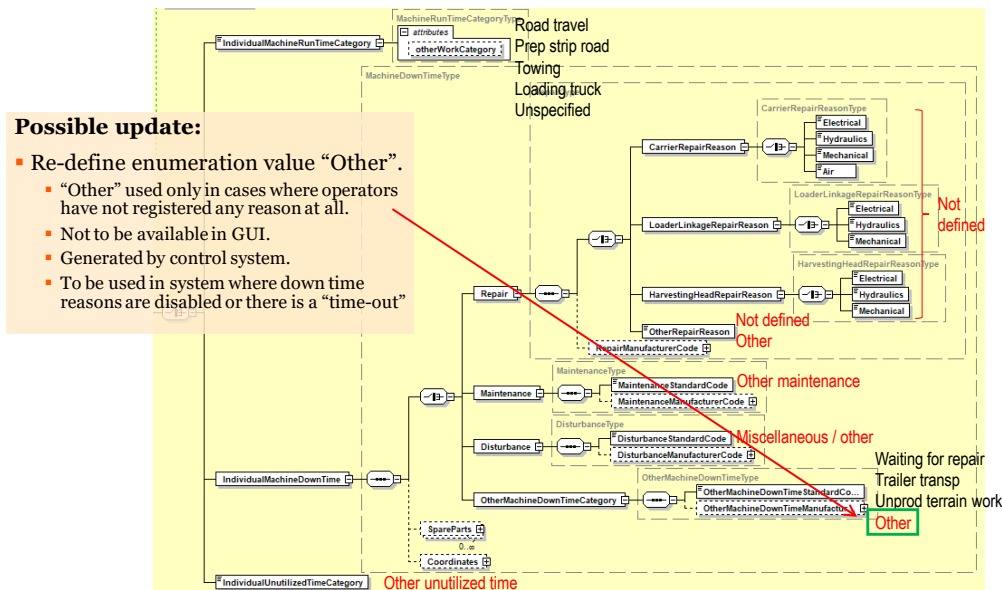
The only other significant modification is probably related to the definition of “Processing” time since a felling head is constructed in a different way than a harvesting head. The present definition for Processing in a harvester is:

- Time is registered as *Processing* for a harvester if feed rollers and swing are in motion (turning).

The definition of Processing in the case of a feller buncher is suggested to be something like :

- Time is registered as *Processing* for a feller buncher if “arms” and swing are in motion (turning).

Handling the registration of down time reasons might be problematic if only a very simple GUI is available. One possibility could be to register all down times as “OtherMachineDownTime - Other” as illustrated below (also included in separate proposal).



No new schema is suggested. The only suggested update to the mom-schema is to add a new enumeration FellerBuncher to attribute machineCategory.

It is also suggested that the definition of Processing in the case of a feller buncher is defined as:

- Time is registered as *Processing* for a feller buncher if “arms” and swing are in motion (turning).

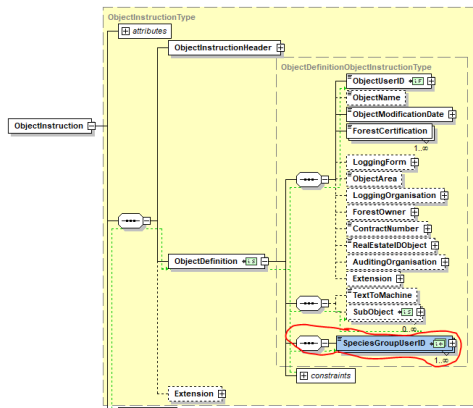
Instructions

Re-using the present harvester instructions also for feller bunchers is a bit more complex since products (pin) is not relevant in the case of a feller buncher.

A suggested solution is to introduce a new object instruction for feller bunchers (boi) that do not reference a product but only a SpeciesGroup. The SpeciesGroupDefinition could be included in the existing spi.

The following modifications of the present oin-structure are suggested when implementing a new instruction message for feller bunchers (FellingObjectInstruction_V3p5.xsd):

- Adding new enumeration FellerBuncher to attribute machineCategory.
- Adding new enumeration boi to attribute messageType
- Deleting irrelevant element ProductUserID, DiameterSectionUserID and DiameterSectionDefinition.
- Add repeatable SpeciesGroupUserID



Decisions

The meeting decided to implement the following updates:

- Add new boi-schema (feller buncher instruction)
 - Add new messageType (boi)
 - Delete ProductUserID, DiameterSection (comparing with oin).
 - Add repeatable SpeciesGroupUserID instead of ProductUserID
- Add new bpr-schema (feller buncher production)
 - Add new messageType (bpr)
 - Add new machineCategory (FellerBuncher)
 - Delete Grades, EstonianVolume, BarkFunction, ProductDef, ProcessedStems (comparing with hpr).
- Update of mom (operational monitoring)
 - New machineCategory (FellerBuncher)

It was also decided to let the secretary make a proposal for a new “lighter” mom structure that could be used in situations where the control system does not have access to any detailed sensor data in the base machine. Maybe adding information about fuel consumption and engine time to the tracking structure. Pasi Palonen also suggested to add felling date in the “lighter” mom structure.

NEW ELEMENT FOR TRACKINGASSIST (TETHERING)

Ian Wilson, 2017-12-18

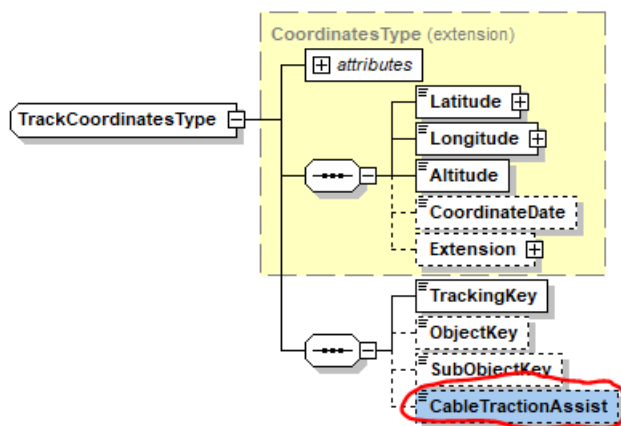
With the advent in use and popularity of the “Traction Assist (tethered)” machines (Feller Bunchers, Harvesters and Forwarders) in Australasia, North America and South America, along with the long standing use of this technology in Europe by existing StanForD machinery manufactures (Komatsu, Ponsse and John Deere (via HAAS), Ian proposed that we add the ability to record when the machine is or isn’t tethered. This functionality would provide the following benefits:

- Logging Organisations can better plan for subsequent operations (mechanical site preparation and planting) or next rotation harvesting where the machines needed traction assist technology
- Better Environmental outcomes, traction assist machines have been proven to reduce ground/soil disturbance and it could be an important component of Forest Certification
- The Logging contractor (or machine owner) can see if this technology is aiding in improved machine productivity and fuel consumption i.e. early evidence from Australasia is showing that machines on steep slopes that are tethered vs non tethered have better utilisation and lower fuel consumption





It was decided that we add “CableTractionAssist” to the Tracking structure as illustrated below (included in both hpr, fpr and the new bpr and mom schemas):



Observe that ObjectKey and SubObjectKey were added with version 3.4.

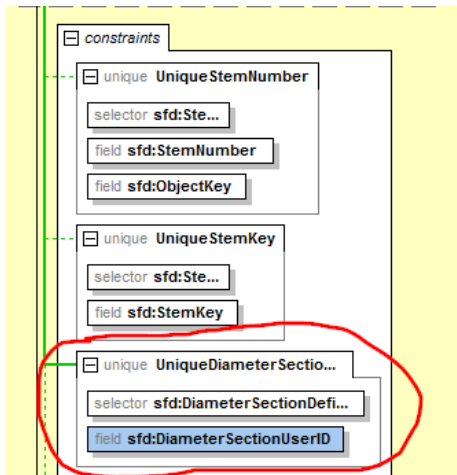
Name	Data type	Unit	Description
CableTractionAssist	Boolean	true/false	Flag that indicates if cable traction assist system (tethering) was in use. This means having a winch system on or attached to a forest machine in order to make it possible to drive the machine in very steep terrain.

UPDATING DIAMETERSECTIONDEFINITION

Constraints

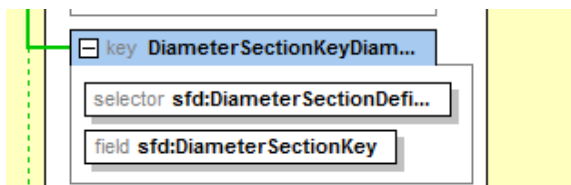
Teemu Paldanius, 2018-11-01.

There is a constraint in the hpr message that DiameterSectionUserID must be unique under Machine element. It means that it is not possible to “update” DiameterSections by giving new DiameterSectionKey. It will lead to invalid hpr message. Of course we could “replace” the old DiameterSectionDefinition and keep the Key, but we then lose the traceability if calculation parameters changes. And, because this constraint is under Machine level, we can’t update DiameterSections even between Objects.



It is thus suggested that we should remove the DiameterSectionUserId constraint from the hpr and keep the unique DiameterSectionKey constraint.

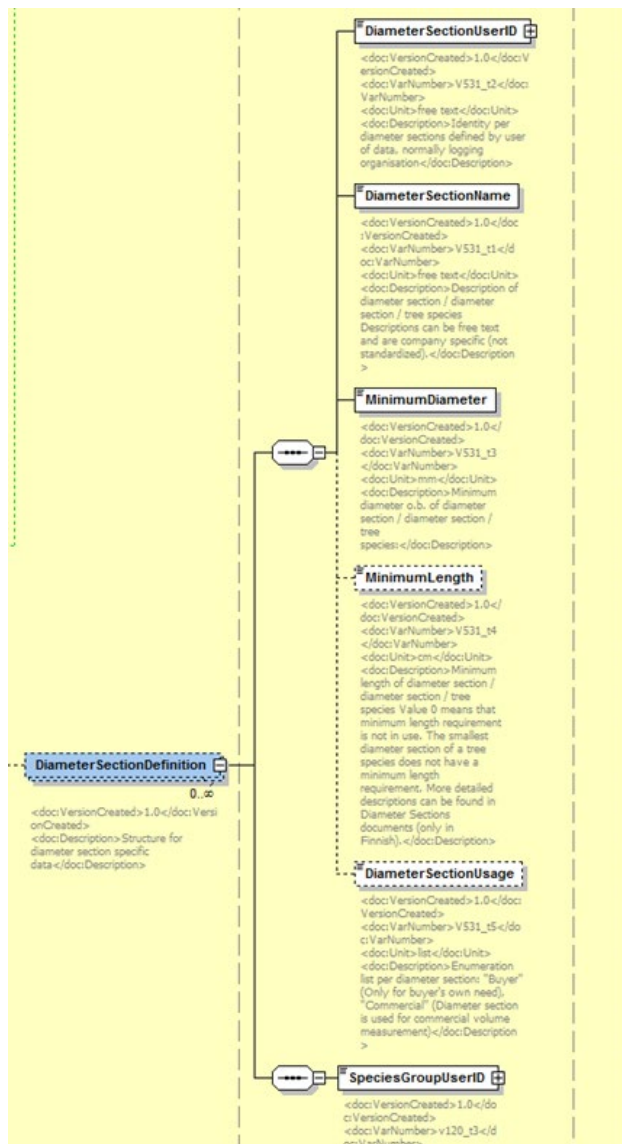
The issue was postponed.



ModificationDate

Teemu Paldanius, 2018-11-01.

Other issue worth to discuss is to define how DiameterSection “update” should be done in case if harvesting object is updated with OIN message. Now there is not ModificationDate/ModificationAuthor parameters that are usually needed for updates.



It was discussed to add DiameterSectionModificationDate and attribute modificationAuthor to DiameterSectionDefinition.

The issue was postponed.

Conclusions

It has been concluded by the Finnish StanForD meeting that:

- No version management of DiameterSections needed in the harvester system which means that no change of DiameterSectionKey needed within an object
- A basic rule should be that DiameterSections are not updated during the harvesting of the object
 - DiameterSection is given in oin for each object separately
 - If there are modifications of MinimumDiameter, MinimumLength, DiameterSectionName or

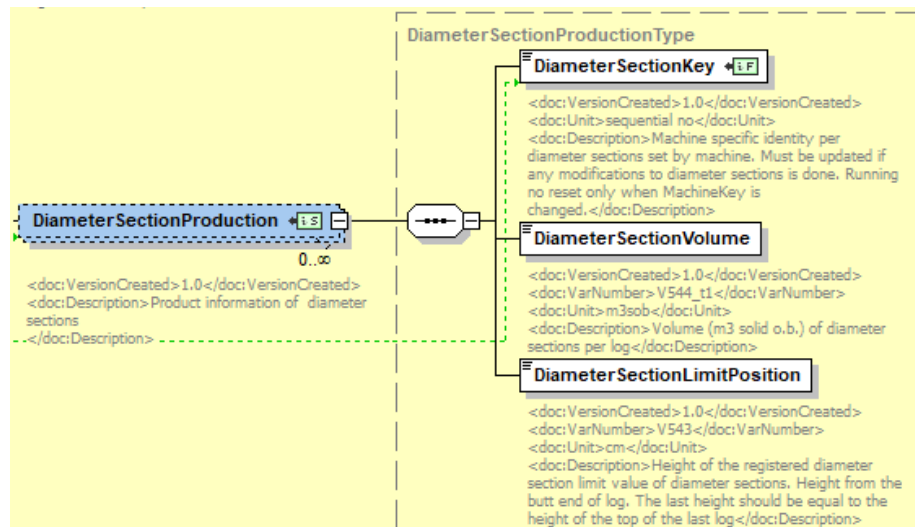
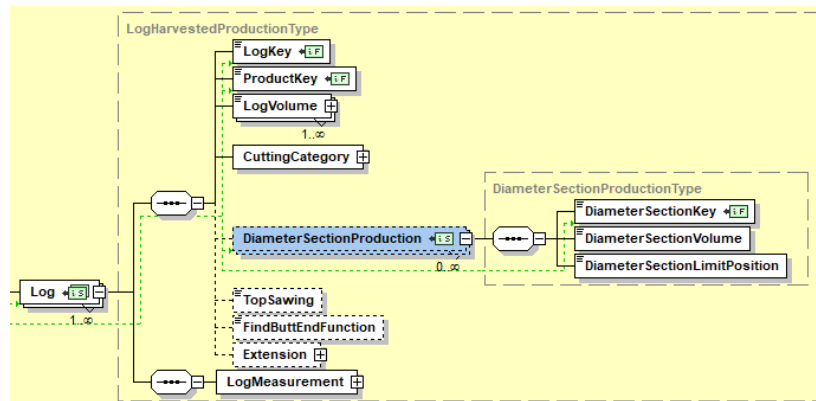
DiameterSectionUsage those are managed in company system and linked to the object using oin

Due to the fact that deleting constraints is possible only in a new major version and the fact that updating DiameterSectionDefinition is to be done only in exceptional cases it was decided to postpone this issue.

DIAMETERSECTIONPRODUCTION

Another DiameterSection issue was raised by Komatsu (2018-11-09).

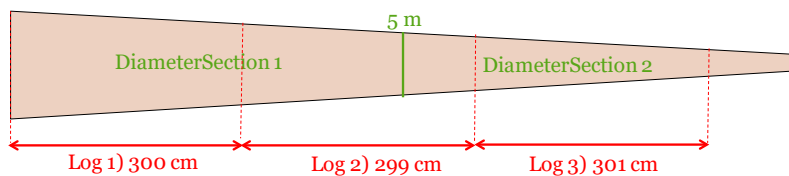
For each log it is possible to register the DiameterSectionVolume and DiameterSectionLimitPosition.



The question is how to handle DiameterSectionLimitPosition when the whole log belongs to one section without any limits within the log. The following definition exists today:

Height of the registered diameter section limit value of diameter sections. Height from the butt end of log. The last height should be equal to the height of the top of the last log.

The following example illustrates how to use DiameterSectionLimitPosition:



Log	LogLength	DiameterSection-Key	DiameterSection-Volume	DiameterSection-LimitPosition
1	3	1	0.21 m³sob	300 cm
2	3	1	0.12 m³sob	200 cm
2	3	2	0.03 m³sob	299 cm
3	3	2	0.04 m³sob	301 cm

It was decided to confirm the suggestion that the value of DiameterSectionLimitPosition should be equal to the length of the log if no limits exist within the log at the February meeting.

It was thus decided to update the definition of DiameterSectionLimitPosition according to the following text:

Height of the registered diameter section limit value of diameter sections. Height from the butt end of log. The last DiameterSectionLimitPosition for each log must be equal to the length of the log. DiameterSectionProduction never to include Unclassified logs.

§ 5. Implementation issues

COORDINATES IN SOUTHERN HEMISPHERE

Jeremy Gibson, September 2018

It has been noted by Jeremy Gibson that latitudeCategory with value North is sometimes generated in Australia (example below). In some situation (outside StanForD) “South” is handled by reporting negative latitudes. However, in StanForD the latitude must be between 0 and 180 degrees.

receiverPosition	Base machine position	
coordinateRefer...	WGS84	
Latitude	latitudeCategory	North
	Rbc Text	38.23684
Longitude	longitudeCateg...	East
	Rbc Text	147.1169
Altitude	64	

It is recommended that all manufacturers check that latitudeCategory “South” and LongitudeCategory “West” works correct for example when included in foi, fdi, fpr and hpr. It is also important to check that these coordinates are presented in correct way in GUI.

USING PRODUCTNAME

Based on discussion with several different persons in Sweden during the summer of 2018.

How to use ProductName? The basic idea of ProductName has never been discussed thoroughly. While testing pin-files from a new administrative system it was discovered that some conflicting ideas existed. E.g. one actor expected it to be possible to present both ProductName and ProductUserID in the GUI while another actor expected that ProductUserID should be unique, at least within a SpeciesGroup.

Recommendations from secretary are:

- ProductName main use in GUI and reports. Means that if the same ProductNames are used for different pins it may very well be difficult to distinguish between different pins.
- There should not be any requirement on ProductName that it must be unique in any way.

FRENCH NOMENCLATURE AND VOLUME CALCULATIONS

Morgan Vuillermoz and Christoph Ginet, FCBA 2018-04

National representatives of the French forest-based sector and forest machines users hereby request targeted adaptations in the harvesters' on-board systems. This is justified by a common willingness to facilitate an increased use of forest machines' potential in French conditions.

These expectations are shared between FNEDT, FNB, GCF, ONF as well as individual forest companies who own forest machines such as Alliance Forêt Bois (36 machines for logging operations and 259 tractors and tools for sylviculture)...

We suggest to overcome the following limitations:

- Key variables relating to product measurement and volume calculation are not named in the same way by the machine manufacturers and French-translation are sometimes confusing for the users. There is a need to adjust the French terminology to make sure that the different variables are used properly in the French context.
- Many volume formulas are already offered in the machine on-board systems but none correspond fully to the official calculation method used in France to determine the commercial volume of a round wood. there is a need to add the specific formula and respective settings that is really suitable for French use.

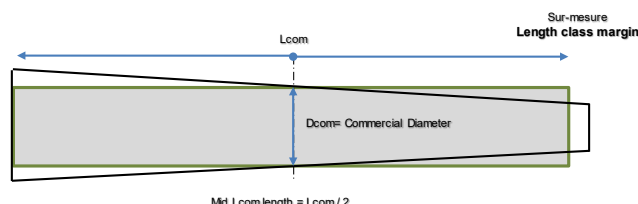
The secretary had a Skype meeting with Christoph and Morgan on the 12th of October. It then became clear that the settings included in the ProductDefinition is enough in order to handle the mid-measured volumes as defined in France.

Both requests are here-after described and the French community expects the changes to be made both for StanForD and StanForD2010 environments. Corresponding English terminology is presented for the sake of clarity.

This request has been prepared together with FCBA

Volumes

The following figure illustrates how to calculate a correct log volume in France:



Formula "Volume commercial NF B53.020" : $V_{com} = \Pi / 4 D_{com}^2 \times L_{com}$

V_{com} in meter with three (3) decimals, arithmetic rounding

L_{com} in meter with two (2) decimals, **rounded down to the nearest dm or cm as specified in the contract**

D_{com} = **Diameter at mid-length of L_{com}** ; D_{com} in meter with two (2) decimals, **rounded down to the nearest cm**

The given value of $\Pi/4$ is 0.7854

D_{com} is **measured over-bark** (unless it is specified otherwise in the contractual agreement)

New code to be created?

In which type?

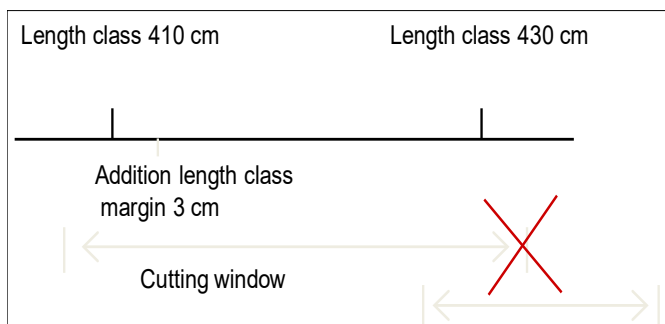
It's unclear how VolumeLengthCategory is handling the possibility to choose between cm rounding or dm one

The following table illustrates the pin-settings that will meet the French volume definition "NF B53.020 français" / "French NF B53.020"

Structure	Element	Values
Length-Definition	LengthClassAdjustment	"LengthClassAdjustment1" = Log belongs to first length class smaller or equal to log length (427 cm => class 400 cm)
	LengthMargin*	e.g. 0 cm (just an example)
Cutting-WindowDef	Lower/UpperLengthLimit*	e.g. 27-30 cm (just an example)
Diameter-Definition	DiamClassAdjustment	"DiameterClassAdjustment1" = Log belongs to first diameter class smaller or equal to log diameter (227 mm => class 220 mm)
	DiamClassCategory	Midpoint
	DiameterTopPosition	0 cm
	DiameterMINTop*	e.g. 180 mm
	DiameterUnderBark	false
PriceDef	VolumeDiamAdjustment	Measured diameter rounded downwards to cm
	VolumeDiameterCategory	Mid
	VolumeLengthCategory.	Length as defined in LengthClasses
	VolumeUnderBark	false

* This are just examples from a long log product, not included in pre-defined volume type "French NF B53.020"

It is important to be aware of the fact that the CuttingWindows should never overlap. It can not be above the next LengthClassLowerLimit nor above LowerLengthLimit for the "cutting window" of the next length class.



Nomenclature

A complete translation into French of the existing nomenclature list will hopefully be finalized by early 2019.

STANFORD2010 NOMENCLATURE

Presentation by Tapio Räsänen.

Recommendation for StanForD 2010 nomenclature was decided in the meeting 2017-11-22 for Finnish, English and Swedish.

Some of the Swedish translations were still missing, but were added to the documents 2018-09-17 which means that the latest updated version is “StanForD 2010 Nomenclature_2018-09-17.xlsx”

The meeting decided to let the secretary publish the present version via StanForD web pages.

There were also a wish to share translation for other languages for example Portuguese, Russian, Spanish etc

TIME SCHEDULE FOR IMPLEMENTATION

Harvesters

The following table for harvesters was compiled in September 2018 (specify latest minor version that has been or is planned to be implemented).

Manufacturer	Present software version released on the market	Last StanForD-version supported	Lower versions not supported
Opti (Ponsse)	4G 4.743 (4.745 week 39 2018)	3.1	2.0 or lower
Timbermatic (JohnDeere)	H 2.0.4	3.4	2.0
LogMate (LogMax)	1.8.11 (2.0.21)	3.0 (3.3)	< 2.0
MaxiXplorer (Komatsu)	3.16	3.3	Presently not 3.2
DasaForester	1.4.6	3.2	<2.0
Motomit (Parker)			
xLogger (Technion)	7.16	3.3	< 3.0
TOC 2 (LogSet)	3.127	3.1	3.0

Implemented functionality	Opti	Timber-matic	Log-Mate	Maxi-Xplorer	Dasa-Forester	Motomit	xLogger	TOC 2
Updating of product (pin) during harvesting? Restart not needed.	X	X	X	X	X		X	X
Updating of object (oin) during harvesting? Restart not needed.	X	X	X		X		X	
Can ObjectDef.TextToMachine easily be presented to operator? Important when updating oin (pop-up).	X	X	X	X*	X		X	
Can ProductDef.ProductDescription easily be presented to operator? Important when updating oin (pop-up).			X*	X*	X		X	

* Some adjustments remain

Implemented	Opti	Timber-matic	Log-Mate	Maxi-Xplorer	Dasa-Forester	Motomit	xLogger	TOC 2
ProductDef.ProductClass	X	X	X		X		X	X
Stem.StemCode			X	X				X
Machine.Tracking (gps-log)				X				
SingleTreeProc.Reversing			X					
Stem.BoomeAngle		X		X	X*			
ModificationRestricted			X	X	X		X	
UDI				X				

* Some adjustments remain

Implemented for multi tree processing	Opti	Timber-matic	Log-Mate	Maxi-Xplorer	Dasa-Forester	Motomit	xLogger	TOC 2
Calculated "true" length and top diameter per log. <u>NOT measured values based on total log bunch.</u>	X	X(-)	X		X			X
Calculated "true" DBH based on reference diameter. <u>NOT measured values based on total stem bunch.</u>	X	X	X	X(-)	X(-)		X	X

Forwarders

The following table for forwarders was compiled in September 2018 (specify latest minor version that has been or is planned to be implemented).

Manufacturer	Present software version released on the market	Last StanForD-version supported	Lower versions not supported
Opti (Ponsse)	4G 4.743 (4.745 week 39 2018)	3.1	2.0 or lower
Timbermatic (JohnDeere)	F 2.0.4	3.4	2.0
LogMate (LogMax)	No forwarder application		
MaxiXplorer (Komatsu)	3.16	3.3	Presently not 3.2
DasaForester	1.1.1	3.2	<2.0
Motomit (Parker)	No forwarder application		
xLogger (Technion)	No forwarder application		
TOC 2 (LogSet)	No forwarder application		

Implemented	Opti	Timber-matic	Maxi-Xplorer	Dasa-Forester	Motomit	xLogger	TOC 2
Forwarding instructions (foi and fdi)?	X Only Scale	X	X				

QUESTIONNAIRE FREEBUCK AND MANUALCUTS

The following table for harvesters was compiled in September 2018:

Manual cuts

	Opti	Timber-matic	Log-Mate	Maxi-Xplorer	Dasa-Forester	Motomit	xLogger	TOC2	Stan-ForD
Manual moving cut position	Other manual	Other manual	Other manual	Other manual	Other manual		Other manual	Other manual	Other manual
Re-optimization (shorter length with max value)	Autom.	Other manual	Other manual	Other manual	Other manual		Autom.	Autom.	Other manual
Manual cut at optimal length	Autom.	Autom.	Other manual	Other manual	Other manual		Autom.	Autom.	Autom.?
Outside cutting window when ManualFreeBuck is true	Pulpwood-grade, or Other Manual	Other manual	Other manual	Other manual	Other manual		Other manual	Autom.	Other manual
Outside cutting window when ManualFreeBuck is false	Other Manual Remain (forced Sawing)	Other manual	Other manual Re-classified (forced Sawing)	Other manual Most valuable product that fit criteria	Other manual Re-classified		Other manual According to the selected grade, length and diameter	Other manual Un-classified (Outspec)	Other manual
Last log cut outside cutting window when TopLogFreeBuck is true	Pulpwood-grade, or Other Manual?		Autom.	Autom.	Autom.		Autom.		Autom.
Changing stem grade (no pre-selected log length)									Autom.
Pre-selected log length.									Manual

TopLogFreeBuck

	Opti*	Timber-matic	Log-Mate	Maxi-Xplorer	Dasa Forester	Motomit	xLogger	TOC2
Minimum diameter search is priority before length-class on last log before minimum top diameter allowed.	Not ok	Ok		Ok	Ok			
Minimum diameter search is priority before price on last log before minimum top diameter allowed.	Not ok	Not tested		Ok	Ok			
Minimum diameter search is priority before distribution demand price on last log before minimum top diameter allowed.	Not ok	Ok		Ok	Ok			
" Forbidden to buck " is not allowed when "TopLog FreeBUck" is activated	Not ok	Ok		Ok	Ok			
" Only allowed to cut manually " is not allowed for automatic cut even when "TopLog FreeBUck" is activated, just manuel	Not ok	Ok		Ok	Ok			
Log is classified as pulpwood if the log is cut in between allowed minimum and maximum leght/ diameter also when it is cut outside the cutting window.	Ok	Ok		Ok	Ok			

* Some adjustments remain

VALIDATION ISSUES STANFORD2010

This document (written by secretary) is partly based on a mail conversation with Antti Korkiakoski and Antti Yli-Fossi, JD.

When StanForD2010 was developed my basic idea was probably that the party generating a file is to be responsible for generating a valid file. Today we often see that validation is carried out by the receiver, e.g. in the harvester while validation is not always carried out before sending the file to a machine.

The issue of validation and handling multiple schema versions have been discussed in several different forums lately.

Conclusions

Present rules:

- New minor schema versions must be backward compatible. This means that we can only add new optional elements and we cannot make any changes to how data is interpreted.
- Attribute schemaLocation must be included in StanForD files.

New recommendations:

- Validation of files must be mandatory when creating files.

- Validation of files when reading should be avoided. An application that validates files before reading must always be updated immediately after a new schema version has been published.
- When reading a higher minor version than is supported in machine all irrelevant (added since supported version) elements and attributes must be skipped, e.g. when reading 3.3 into system supporting only 3.1. If there is an error when reading a file it is recommended that an understandable error message is returned.
- Forest machine (harvester or forwarder) should by default generate files (typically hqc, hpr and mom) according to highest version that is supported by machine.

If we follow the recommendations above we only need the latest schema version per major version when validating files.

Examples

Timbermatic supports version 4.4, but the HPR recipient supports only 4.1. Yet, there's no need for Timbermatic to have anything but schema 4.4 support, as it can write 4.4, validate that, and then trust the recipient to be able to read it regardless of the minor version it has.

Office application for creating pin-instruction supports version 4.4, but the Timbermatic supports only 4.1. Yet, there's no need for Office application to have anything but schema 4.4, as it can write 4.4, validate that, and then trust the recipient to be able to read the relevant parts of from the pin-file regardless of the minor version it has.

The “recommendations” was used as a basis for a long discussion where some manufacturers prefer to keep validating all files before reading while others do not validate before reading. No common solution could be found. It was also pointed out that it is important to consider whether or not to be able to generate a file that is not valid in the machine. It is not acceptable to totally “shut down” a machine just due to a validation bug. It is often better to send something invalid rather than nothing at all.

The secretary and Henrik Persson will study the possibility to use some kind of online validation in order to make it possible to use e.g. a 3.5 pin-file in a machine only “supporting” 3.4. The idea is to look at the possibility of having the latest schema version available online for validation, e.g. 3.5 included in schemas with name also for 3.4, 3.3, 3.2, 3.1 and 3.0.

ERRORS FOUND IN OFFICIAL FINNISH SPI FILES

Presentation by Tapio Räsänen.

Errors were found in ”official” Finnish spi files

- table values of butt end profile extrapolation coefficients
 - ButtEndProfileExtrapolation.ButtEndProfileExtrapolationTable.ExtrapolationCoefficient

- values are per mille type and have been copied from the StanForD spp files, e.g. 1024
- values should be in decimal format (e.g. 1,024)
- spi files were originally created in spring 2013
- butt end profile extrapolation coefficients of pine were updated in November 2015
- Based on the query, none of the machine manufacturers or Masser actually use table values in the butt end profile calculation
- Instead, ButtEndProfileExtrapolationFunction is used
 - Komatsu function
 - Logset function
 - Masser function
 - John Deere function, hardcoded
 - Ponsse function
 - Technion primarily with function, possible risk if users create their own tables
 - Parker hardcoded tables, spi not implemented

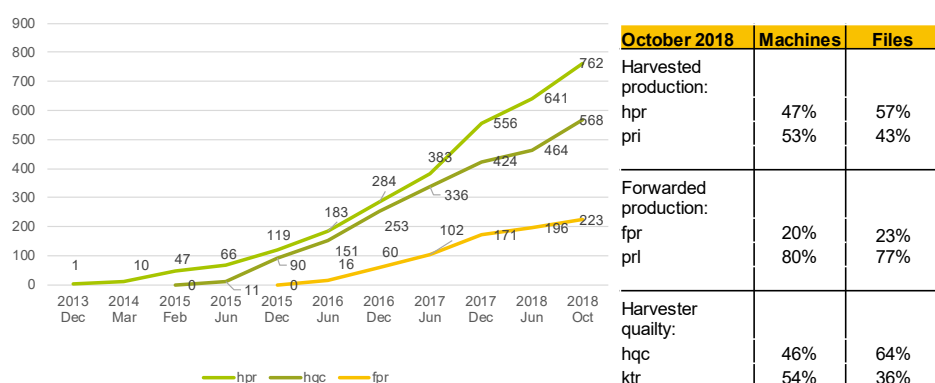
Decision of Finnish StanForD meeting 2018-10-11

- the error must be corrected and official Finnish spi files are to be updated
 - SpeciesGroupModificationDate is updated
 - SpeciesGroupVersion is not changed
 - Reason for the change is described in SpeciesGroupInfo: change to decimal values

§ 7. StanForD2010 projects

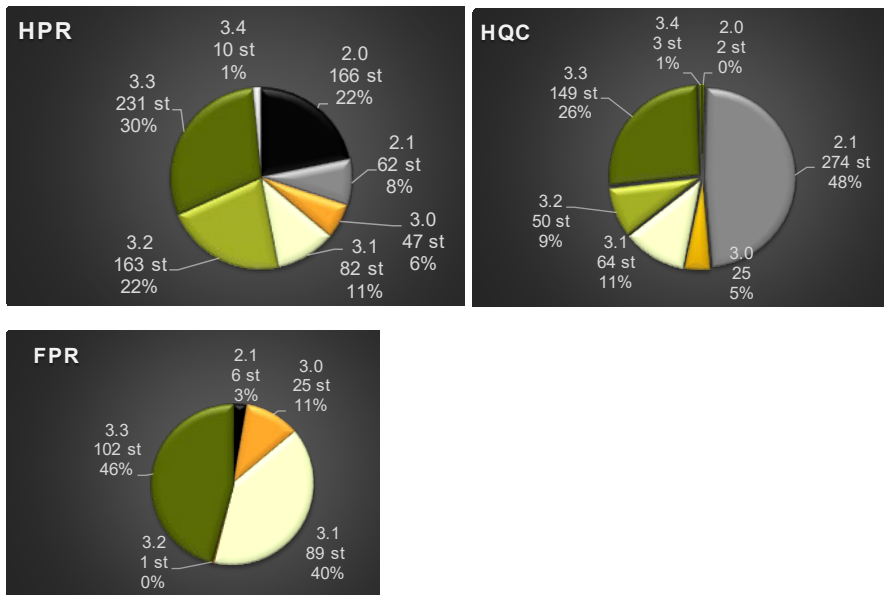
USE OF STANFORD2010

The number of forest machines reporting according to StanForD2010 is increasing:



October 2018	Machines	Files
Harvested production:		
hpr	47%	57%
pri	53%	43%
Forwarded production:		
fpr	20%	23%
pri	80%	77%
Harvester quality:		
hqc	46%	64%
ktr	54%	36%

Standard version reported October 2018:



Sveaskog today has approximately 170 harvesters that only use StanForD2010 instruction. 40-50 harvesters remain. They expect to start out implementing an administrative system for generating forwarder instructions during 2019. During

GDPR TRAINING MATERIAL FOR FINNISH CONTRACTORS

Training material about GDPR has been prepared for the forest machine contractors and for forest companies by Metsäteho and Trade Association of Finnish Forestry and Earthmoving Contractors. It was published at the end of April 2018 as an open material on web pages puuhuolto.fi

The training material includes:

1. Guide (extended document)
 - a. How does GDPR apply to a logging company (contractor)
 - background and general requirements of GDPR
 - what type of personal data is handled normally in forest machine work; what is necessary data
 - responsibilities of a controller and a processor of personal data
 - b. How a company should prepare for GDPR
 - actions to take
 - present state of data protection in the company
 - assessment of the possible risks related to the management of personal data and its protection
 - guidelines for the required documentation of the actions (check list)
 - Data Processing Agreement, DPA
 - c. How to act in case of a data breach
2. Leaflet describing practical actions to take

3. Model document for the contract between a contractor and a personal data processor

PILOTING OF UDI AND UDD IN FOBIA PROJECT

Presentation by Tapio Räsänen

Tietohippu Oy is a partner in FOBIA project. “The FOBIA project aims at enhancing business competitiveness of forestry service enterprises in the northern and peripheral regions of Finland, Sweden, Scotland and Ireland. The origin of the project lies in the need to improve the enterprises’ ability to meet increased service demands.” (www.luke.fi/fobia/en/)

The aim is to define the structure of an UDI message for the reporting needs of the harvesting contractors

- additional information needed in invoicing, e.g. extra work and consumed materials
- idea is to find the best solution how to show UDI tables in GUP’s of the machines
- examples of different types of UDI files have been created and tested by Komatsu

One question to be looked is how updated versions of the tables defined in UDI files should be managed in the machine system and its database

- there are now attributes tableGroupID, tableGroupName, tableName
- should we also have modificationDate and version elements?

Discussion in the meeting?

Räsänen encouraged the machine manufacturers to implement UDI and UDD. There might be also similar type of reporting needs in other markets to what now has been identified in Finland.

§ 8. Other issues

No other issues.

§ 9. Next meeting

StanForD web meeting 2019-02-07, 13:00 CET

Next ordinary StanForD meeting, 2018-04-03--04 in Vantaa.
Starting with lunch on the 3rd.

§ 10. End of meeting

Johan thanked everyone for their participation.