



Arlinger John

16 September 2021

Minutes StanForD

2021-09-15

Place:	Microsoft Teams (Uppsala), 2021-09-15, 10:00-16:00 CET
Participants:	John Arlinger, Secretary Johan J. Möller, Chairman Patrik Anderchen, Södra Asko Leivonmäki, Exertus Barth, Andreas, CGI Étienne Pilon, FP Innovation Jonas Gustafsson, Sveaskog Halvard Olderlund, Komatsu Hannrup Björn, Skogforsk Henrik Persson, Logmax Ian Wilson, PHD Forest Jean Plamondon FP Innovation Jeremy Gibson, PHD Forest Jonas Thorsson, Dasa Juha Korhonen, Technion Erik Kindlund, JohnDeere Antti Korkiakoski, JohnDeere Lars Henriksson, Biometria Lars-Erik Andersson, Dasa Mattias Nyström, Komatsu Melkas Timo, Metsäteho Mike O'Shea, Coillté Pasi Palonen, LogSet Mathias Paulsson, Rottne Janne Pursiainen, Ponsse Tapio Räsänen, Metsäteho

Decision summary

Decided to do the following schema updates:

- Old element LoadingCoordinates in fpr is deleted
- Mandatory attribute coordinateReferenceSystem moved to MessageAttributeGroup from CoordinatesType.
- New ObjectPolygon added to ObjectDefinitionType
- New element LogCoordinates added to LogType and new enumeration value “Crane tip log cut” added to attribute “recieverPosition”.

Decided to set up working group for discussing GNSS quality parameters including possible new attribute value “Crane base” in “recieverPosition”.

Decided to create a proposal for handling object specific bark parameters, density and volume/mass table.

Decided to continue discussing the following issues:

- Logging of de-activated mom-application
- New bark function
- Reporting of fuel consumption
- API communication between forwarder and harvester

Action list (not updated since last meeting):

- The following guidelines should be followed when implementing LongTimberDefinition:
 - Must be possible to view and edit LongTimberDefinition in administrative tools.
 - Default value equal to DiameterMAXButt in administrative tools
 - LongLogButtMAX is never to be included in pin-file if value is 0 (it is optional).
 - Value 0 (zero) is to be interpreted as null.
- It is recommended to implement stem codes for both individual trees and groups of trees (so called “sticky registration of stem codes”). Whether the “sticky registration” is trigger by double click or any other operator interaction does not matter.
- Do not mix products and deliveries in forwarder applications.
 - Focus on Deliveries in the UI.
 - Avoid using pin-files since it often creates operator confusion.
- Map interface when creating Locations would be good to avoid incorrect coordinates.
- TextToMachine an urgent variable to be shown when creating new object in harvester and forwarder.

- 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
- 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 Biometria).
- 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).
- An increased interest in following-up whether the harvester or feller-buncher is using herbicides or fungicides means that it is suggested that element StumpTreatment is implemented.

§1 Opening of meeting and agenda

Chairman Johan J Möller opened the meeting.

No “other issues” were raised.

§2 Presentation of participants

Presentation of meeting participants including a short report on Covid situation!

§3 Information about decisions and discussions at previous meetings

- It was decided to publish the new specification for StanForD REST API 1.0.
- It was decided to publishing new yarder and skidder schemas (soi/spr/yoi/ypr) within version 3.6.

DECISIONS MAJOR VERSION 4.0

The following decisions will affect the version 4.0 pre-release schemas:

- New simple type to be used for all UserIDs.
- New simple type for LogLengths to include a single fractional digit.
- The xml data type “xsd:unsignedLong” is to be used for all keys (from 0 up to 18446744073709551615).
- Reject the proposal for new Tracking structure and to keep the present layout. The secretary will analyse how to handle Tracking in order to do schema specific adjustments (e.g. fpr vs mom as illustrated in proposal.
- Update the diameter vector.
- Keep StemType structures in pin and spi as it is without any changes.

- Update the StemCode structures for both stem and species group. Also decided that the secretary will clarify rules for handling sticky stem codes.
- Modify the ogi schema including use of a GeoJson string inside element MultiPoint/MultiLine/MultiPolygonGeoJson and to add a new schema called DesignTemplate.
- Exclude combined times and frequency short down times from mom and to develop a new schema for distributing user defined codes for down times and other work.
 - exclude combined times and frequency short down times in mom.
 - develop a new schema for distributing user defined down time codes
 - exclude ShiftKey from the IndividualMachineWorkTime and to discuss how Shift, OperatorWorkTime, Login and MachineWorkTime are related to each other at the next meeting.
- New simple data types for common elements:
 - DiameterType = xsd:positiveInteger
 - VolumeType = nonNegativeDecimal
 - OrderType = xsd:positiveInteger
 - KeyType = xsd:unsignedLong
 - MassType = nonNegativeDecimal
 - LogLengthType = singleDigitNonNegativeDecimal
- Tracking modified so that a message specific Tracking-type is implemented for each type of message.
- StemCode adjusted for registration per stem (in hpr, hqc and bpr). No attribute is included for keeping sticky and non-sticky codes apart.
- Recommendation that a possible “sticky stem code” is not de-activated unless operator selects another sticky stem code or manually de-activates the present sticky stem code. This means that the sticky code is not affected if a “individual stem code” is selected or if a new species group is selected. However, it was decided that “changing Object” must de-activate sticky stem code!
- New elements added to ogi:
 - Extension elements to Feature, FeatureCollection, StyleDefinition, SymbolDefinition.
 - ModificationDate to FeatureCollection, StyleDefinition, SymbolDefinition.
 - FeatureCollectionInfo element to FeatureCollection
 - FeatureInfo element to Feature
 - SymbolUserID element to Warning
- Elements added to mom:
 - OperatorLoginTime is replaced by the OperatorLogInEvent

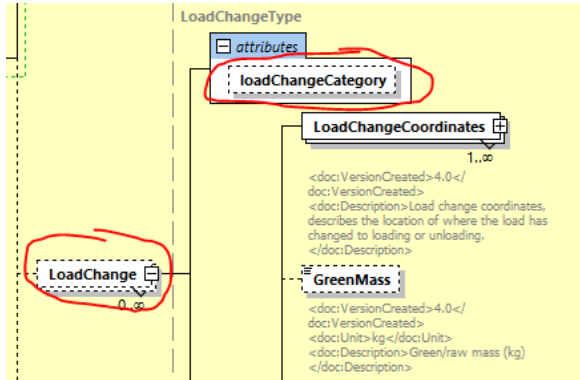
- IndividualMachineWorkTimeKey is added to IndividualMachineWorkTime.
- New structure for registering LoadChange added to fpr schema.
- Updates to mom-schema
 - Make all new down time code elements mandatory and add new “name” attributes.
 - Change element name HarvestingHead to Attachment.
 - Add new identity elements to code list (CodeListInfo, CodeListVersion, CodeListModificationDate). It was also decided to add these identities also to the mcl-schema.
 - Decided re-name UserDefinedCodeList schema to OperationalMonitoringCodeList in order not to mix it up with UserDefinedData, file type to be “mcl” and not “udl”
 - IndividualMachineWorkTimeKey is added to ShortDownTimes.
 - A choice structure is added to the OperatorWorkTimes in order clarify how MachineWorkTimes are to be referenced from OperatorWorkTimes.
- Updates to ogi-schema:
 - MultiPolygons, MultiLines and MultiPoints should have attribute GISReferenceSystem with unit string. Should be use for EPSG codes.
 - Re-modell types for MultiPolygons, MultiLines and MultiPoints so that a basic type does not include Symbol/StyleUserID. This makes it possible to use GeoJson string in situations where styles and symbols are not relevant.
 - Descriptions to be updated in ogi-schema and din-schema.
 - Alarm coordinates are added to the ogi-schema (decided with the minutes).

§4 Proposals new major version 4.0

UPDATE OF DESCRIPTIONS

LoadChangeCategory in fpr

No descriptions exist for element LoadChange and loadChangeCategory:



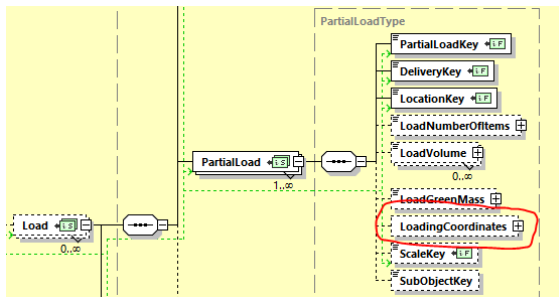
It was decided to add the following new descriptions:

Name	Unit	Description
LoadChange	-	Structure for loading and loading coordinates per load. This structure includes information about where logs have been moved by the forwarder.
loadChangeCategory	List	Describes the type of load change. Allowed values: "Loading", "Unloading"

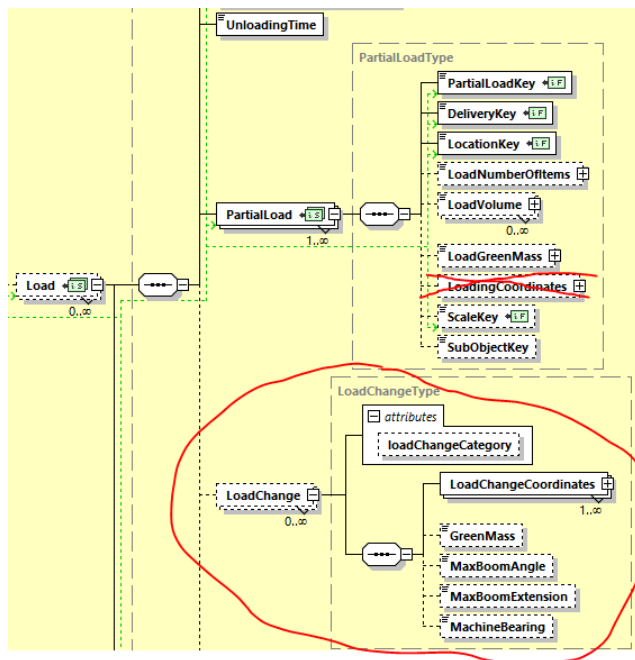
DELETE LOADINGCOORDINATES

Element LoadingCoordinate has existed since version 1.0. It has the following definition:

Coordinates for loading per PartialLoad. Must represent the last registered coordinates during loading.



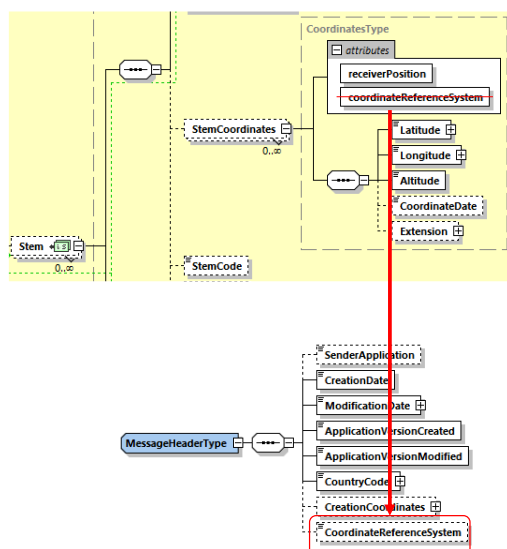
This element is now unnecessary when we have implemented the LoadChange structure. It was thus decided that to delete element LoadingCoordinates:



MOVING COORDINATEREFERENCESYSTEM TO HEADER

It was suggested, at last meeting, that we discuss moving attribute **coordinateReferenceSystem** from the **CoordinateType** to the **MachineType**. This attribute is repeated for each individual position even though it only has “WGS84” as its only enumeration value. This means it is a good example of redundant information.

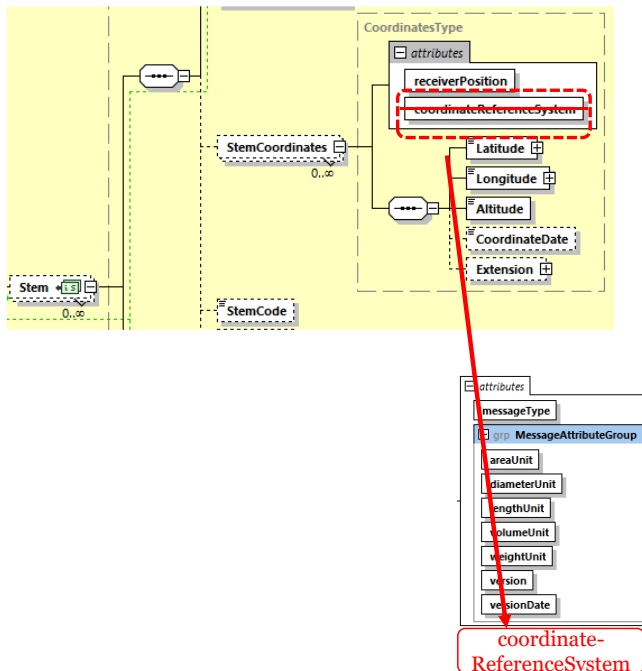
One solution could be to move to this attribute to **MessageHeaderType** as illustrated below.



This idea decreases the amount of redundant information, but it decreases the possibilities to use validation since the new element might be optional. It is thus

possible to send coordinates without registering which reference system is used. The secretary therefore prefers to keep the present solution.

A second solution could be to move the attribute to MessageAttributeGroup according to the following illustration:



It was decided to move mandatory attribute **coordinateReferenceSystem** to **MessageAttributeGroup**. Observe that the attribute will be mandatory and that the only allowed enumeration value today is **WGS84**.

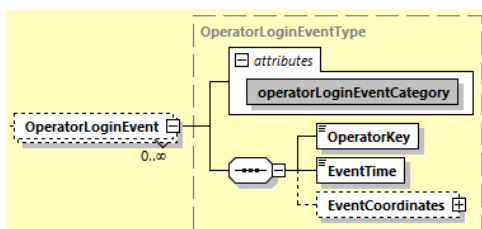
Name	Unit	Description
coordinateReferenceSystem	list	Coordinate system used in StanForD file: WGS84 Used for all coordinates based on CoordinatesType, e.g. StemCoordinates, Tracking

Henrik Persson, Logmax, commented that we should look at the possibility to open this code up also for other coordinate reference systems, e.g. using EPSG codes.

NEW ELEMENT APPLICATIONSTARTEVENT IN MOM

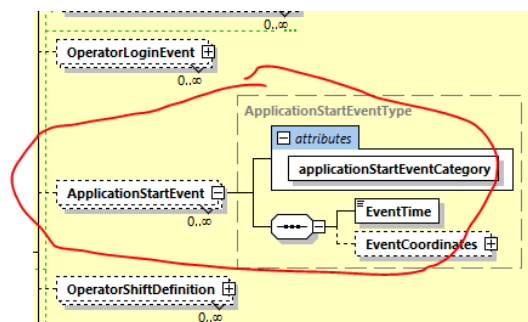
Suggestion by Henrik Persson, LogMax (2021-08-31).

It is today possible to register when an operator logs in to the mom-application.



Henrik has experienced situations when it would be suitable to also be able to track when the application was started up and closed since there are cases when the operator does not log in to the application immediately after starting it up or that the mom-applications is “de-activate” even if operator is logged in.

It was therefore suggested that the following new structure is added as an optional structure to the mom schema:



Name	Unit	Description
ApplicationStartEvent		Structure for register when mom application is started or closed.
applicationStartCategory	List	Type of log in event. Allowed values: "Start", "Close".
EventTime	yyyy-mm-ddThh:mm:ss[+ -]hh:mm	Time of starting or closing. Time stamp must have the following times registered: local time ±offset from UTC.
EventCoordinates		Coordinates of the machine at the time of starting or closing.

When discussing this proposal it was pointed out by Henrik Persson that the proposal should be re-defined since his need is mainly for registering whether “mom-recording” has been turned off or on during production while the operator is still logged in. A couple of meeting participants pointed out that they view this issue as a software design problem that could be handled by adjusting the software.

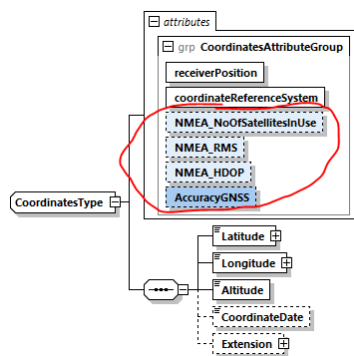
It was decided that the secretary will discuss this issue further with Henrik Persson in order to bring it up again at the next meeting.

GNSS PRECISION

Based on suggestions and comments from Patrik Anderchen, Södra (2021-03-18), Björn Hannrup (2021-06-09) and Per Knutsson (2021-09-07).

Quality of coordinates varies significantly depending on a number of different factors such as e.g. hardware, correction and tree canopy. How to analyse and use coordinates depends on the quality of the data, it is thus an advantage to register some quality parameters. Skogforsk is right now studying the possibilities of using available NMEA quality parameters.

As a starting point it was suggested that we discuss new attributes to CoordinateType (partly based on the NMEA protocol):



Attribute name	Data type	Description
NMEA_NoOfSatellitesInUse	Integer	Number of satellites in use (for estimating position) according to NMEA sentence GGA. Observe that this is not number of satellites in view.
NMEA_RMS	Float	RMS-value according to NMEA sentence GST. Standard deviation of the range inputs to the navigation process. Range inputs include pseudoranges & DGNSS corrections
NMEA_HDOP	Float	HDOP-value according to NMEA sentence GSA. Abbreviation for horizontal dilution of precision.
NMEA_QualityIndicator	Integer	Code indicating quality according to NMEA sentence GGA.
AccuracyGNSS	Float	Accuracy value generated by GNSS driver, should be in unit meter.

Comments from Mattias Nyström, Komatsu, prior to the meeting.

- HDOP and VDOP tells us how the satellites are dispersed in order to get a good horizontal/vertical precision and not the "real precision".
- An important factor is what "Base machine position" represents. Center of cab? Crane base? Cran swing? Hitch, oscillation joint (in Swedish "midja")?
- How is the machine bearing calculated?

Several participants questioned the idea of using the NMEA protocol within StanForD.

It was proposed to add enumeration value "Crane base" to attribute "recieverPosition".

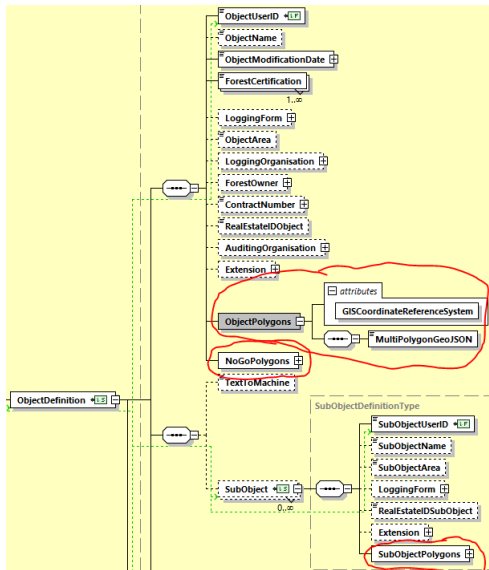
It was decided to form a working group with the following participants:

- Mattias Nyström, Per Knutsson, Hernik Persson, Pasi Palonen, Timo Melkas, Jonas Thorsson, Björn Hannrup and John Arlinger.
- The group shall create a proposal for including quality parameters for GNSS coordinates registered by the machine including a defining methods for estimating machine bearing as well as considering the possibility of a new attribute value "Cran base" in recieverPosition.

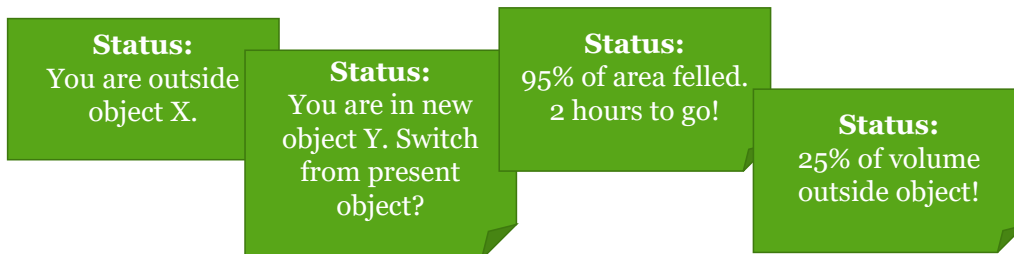
GEOGRAPHICAL DE-LIMITATIONS (BORDER POLYGON) PER OBJECT

John Arlinger, Skogforsk.

The idea of connecting polygons to Object and SubObject in order to open up possibility to automatically switch between different sub-objects in e.g. harvester or feller-buncher. Another possible application could be to continuously monitor how large proportion of an object that remains to be felled. A simple way could be to add a MultiPolygon element under Object and SubObject as well as for “no-go” polygons.

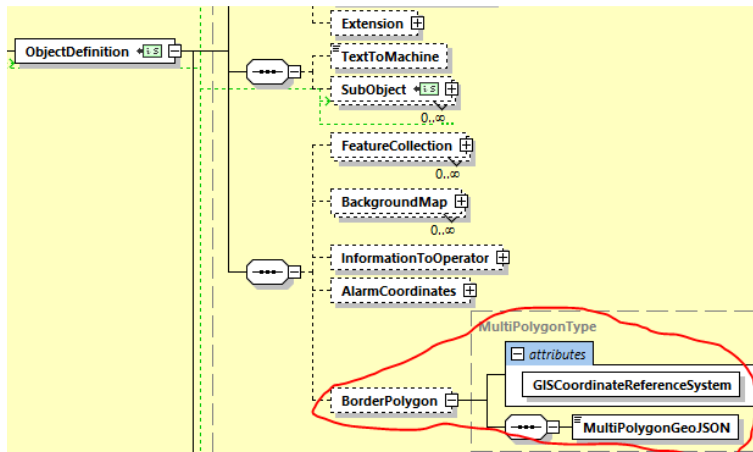


This would make it possible to display information as illustrated below:

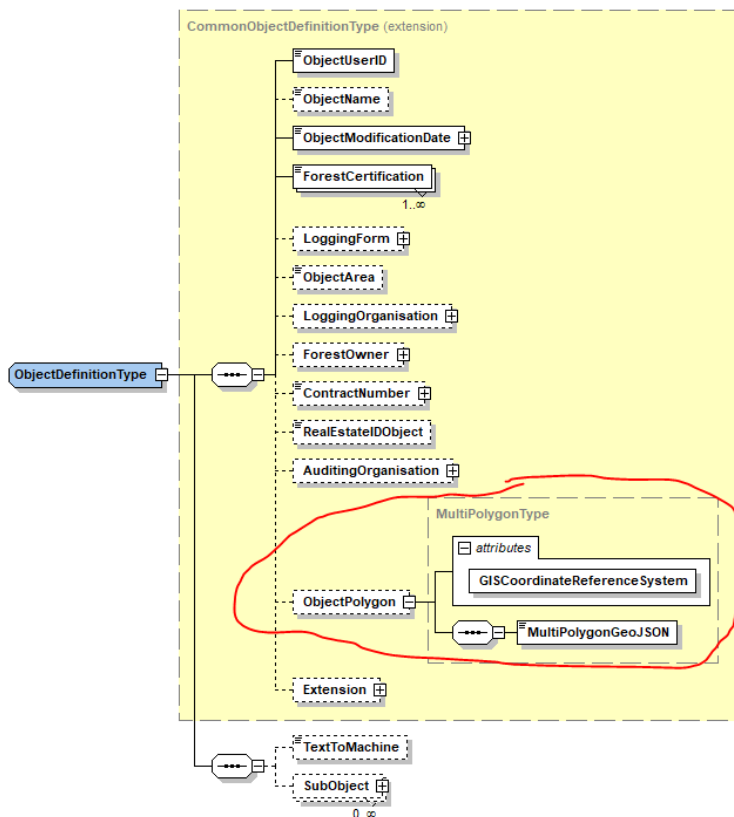


What should be controlled is if the tree position is inside a polygon rather than the harvester position. This will soon be possible with the introduction of better GNSS receivers and boom positioning.

It was decided at previous meeting to study proposal for “Border polygons” per object and sub-object in the ogi as illustrated below. An update of the SubObject type in ogi would be needed in order to include BorderPolygon also per SubObject.



It was decided at the present meeting to add the optional element ObjectPolygon to CommonObjectDefinitionType in order to extend the scope of this element, thus making it available in all ObjectDefinitions.



The description of the new ObjectPolygon is to be:

Name	Data type	Description
BorderPolygon	MultiPolygonType	Structure for including a multi-polygon that describes the boundaries of the harvesting object. The multi-polygon normally includes the area where the trees to be felled are located. Can be used to inform operator about whether the machine is inside or outside the object and other types of status information.

UPDATING BARK AND DENSITY PER OBJECT (NZ/AUSTRALIA)

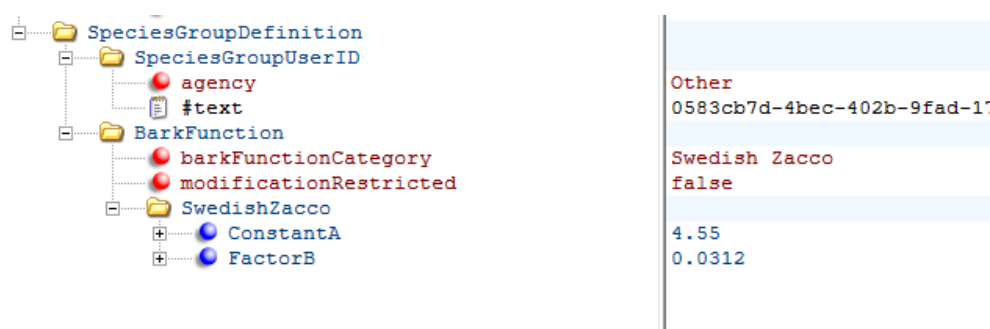
Harvesters/Processors:

In Australia in particular, a lot of thinnings are done – a typical regime on flat sites is 2 or 3 thinnings. *Pinus radiata* (the most common species) develops very thick bark on the butt as it ages – at clearfell age 2bt could be 10-15cm on a 55cm dbh tree. There are no sophisticated (GPS derived) bark biometry of Sweden and Finland so we use Zacco and different parameters at different ages. We are still running primarily apt as the instruction file and changing the bark parameters for each apt (when people remember to do it.....).

Where we want to be is that we a single species name and single assortment names across all sites/ages and vary the bark for each object as required similar to what the GPS derived function allows.

In theory StanForD 2010 would let us use userid and have multiple species groups with the same species name but then we would have to replicate all the assortments? Bark Parameters are defined at the Species Group? There might still be a way to use existing SpeciesGroup to manage it but it would be complex

A potential easier solution would be setting the default bark equation form and parameters in the spi but overriding with a function and parameters from the oin if they were there. Right now the oin only includes a reference to the pin (ProductUserID) but it would not be too disruptive to add an optional SpeciesGroupUserID or Species Group definition to the oin:



That way if there was a bark equation and parameters in the oin for a species group they could be used for the specific object

Forwarders:

We are running and recommending forwarders be run on StanForD 2010 only – fdi/foi instructions, fpr production file.

An issue for us is density kg/m³. As we see it we would like the ability to link this to the Object rather than the Delivery. We can see swings of 20% on a seasonal,

soil type or age basis and would like the ability to set and communicate the density on an object basis. Interestingly, the JD TimberMatic series requires that the density is set on each delivery when a new object is created or when a delivery is added to the object. If this is not done and scales are being used then the volume is left out of the fpr – I am not sure what happens when operator estimation is being used. We are seeing operators trip up on this a lot so it would be better if the files could be used to communicate this.

An idea that Ian and I have discussed is putting the density in the foi somehow. The logic would then be that when an object is created using fdi/foi that if there is no density in the foi then the density from the fdi would be used. If there was a density in the foi then the foi density would be used. If a delivery was manually added to the object in the machine then the fdi density would be presented but the operator could override it for the object.

If we were to replicate the Delivery Definition component of the fdi into the foi but make it all optional it would mean no process changes for Sweden/Finland and anyone who doesn't want to vary density by object and what I would call minor logic modification in the controllers:

If there is density defined in the foi for a delivery, use that instead of the density defined in fdi (library)

It might look like this – DeliveryUserID is still written into the foi as normal and the DeliveryDefinition element is added with the relevant density elements

- messageType - areaUnit - diameterUnit - lengthUnit - volumeUnit - weightUnit - version - versionDate - ForwardingObjectInstructionHeader - ObjectDefinition - ObjectUserID - ObjectName - ObjectModificationDate - ForestCertification - LoggingForm - LoggingOrganisation - ForestOwner - ContractNumber - RealEstateIDObject - AuditingOrganisation - TextToMachine - DeliveryUserID - LocationUserID - DeliveryDefinition - DeliveryUserID - Density - densityCategory #text - Density - densityCategory #text - LocationDefinition	<pre> foi ha mm cm m3 kg 3.1 2015-02-06 JGTest113 JGTest113 2021-06-22T14:50:03.4446328+10:00 FSC JGTest113 F Support 2021-06-22T14:50:03.4446328+10:00 E7576043-55F8-4D59-8D42-B2E96A5168F1 1 E7576043-55F8-4D59-8D42-B2E96A5168F1 Under bark 900 On bark 900 </pre>
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All this may depend on how the libraries are currently being handled. If for example I have put an fdi in the machine with density at 1000kg/m3 and

forwarded some wood and then I get an updated fdi with density at 900kg/m³ because I am about to start a new site, if I were to generate a fpr for the old site what density would be used? And on the flipside, if we then update the fdi what happens?

Has this problem/question come up before? How are others handling the scenario of different density per object?

Bunchers:

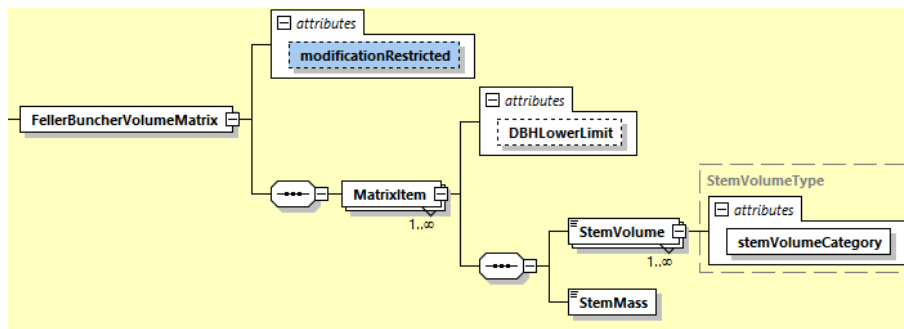
An area where we see great potential in the bunchers is in helping operators ‘build the bunch’ so that it is appropriate for the grapple capability of the yarder and the deflection (amount of lift) – Ian can explain this better than me....

We are thinking the way this might work is if there is a conversion table from the dbh or reference diameter to volume and/or weight. This would probably be per species and not too difficult for a forest manager to describe from inventory or operational data. The issue would be in communicating it in a standard way. The buncher requires an spi so this ‘table’ could go in there but the values are likely to be site specific so would be more appropriate in the boi. Again, there could be a default table in the spi but overridden by values in the boi. Also to go from volume to weight species would need a density which is currently defined on delivery but is usually species derived...

An issue in here is that the diameter sensor position on a felling head is only going to be at a reference height rather than actually passing over the dbh point and each brand and model of head is probably going to have a different position so does the butt extrapolation function (or something else) get used to convert refdiam to dbh and then a lookup table used or is the lookup table developed based on reference height? An easier thing to discuss I think but a ‘table’ might simply be like this:

Optional new volume matrix for feller-bunchers in spi and as an “overriding structure” in boi (new element FellerBuncherVolumeTable):

Species	DBHLowerLimit	StemVolumeOb	StemMassKg
P. Radiata	100	0.1	100
P. Radiata	150	0.15	150
P. Radiata	200	0.2	200
P. Radiata	250	0.25	250
P. Radiata	300	0.33	330
P. Radiata	350	0.35	350
P. Radiata	400	0.4	400

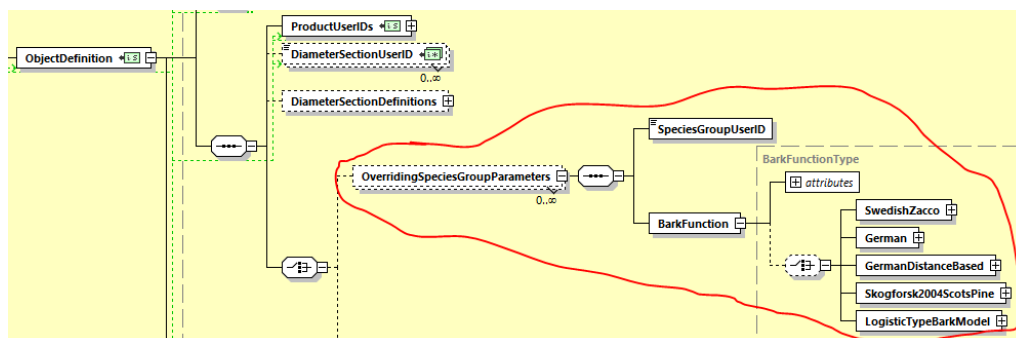


Possible solutions

This section was written by the secretary. The focus below is on the bark functions since a similar solution could probably be used for all three types of parameters (bark, density, volume/mass) as well as e.g. the sound knot function.

Alternative 1) BarkFunction in oin

One solution could be, as described above, that we add a new structure for object specific bark parameters. A disadvantage is that we then have the same parameters in two different locations. This solution will thus make the standard more indistinct. We may also have similar requests in the future that means that we have to add more spi-structures to the oin-file.



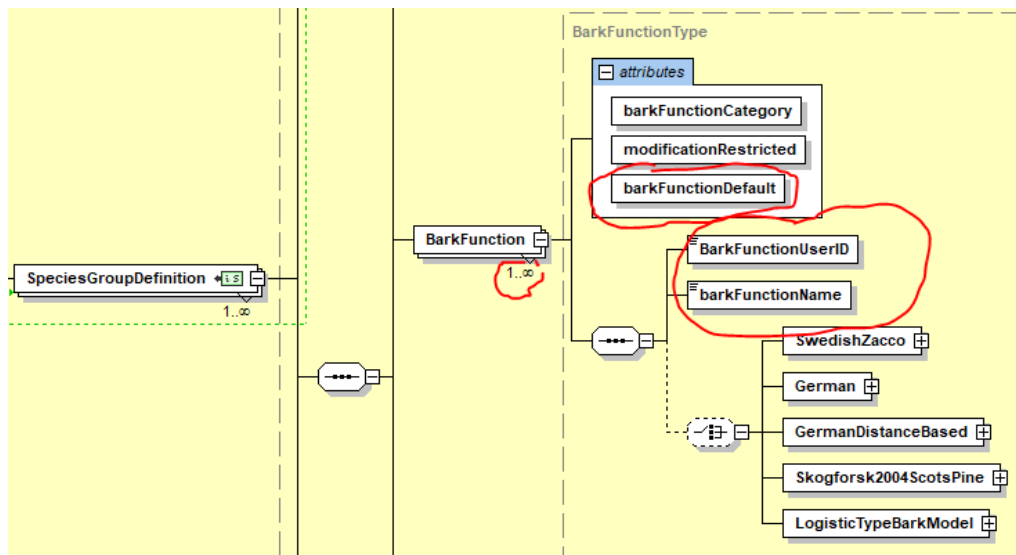
An advantage with this solution is that we do not need to make any changes to the instruction files in cases where we want to continue working as today (e.g. in Sweden).

Only a single simple implementation rule is needed: *“Elements in OverridingSpeciesGroupParameters should override spi for present object and only this object”*

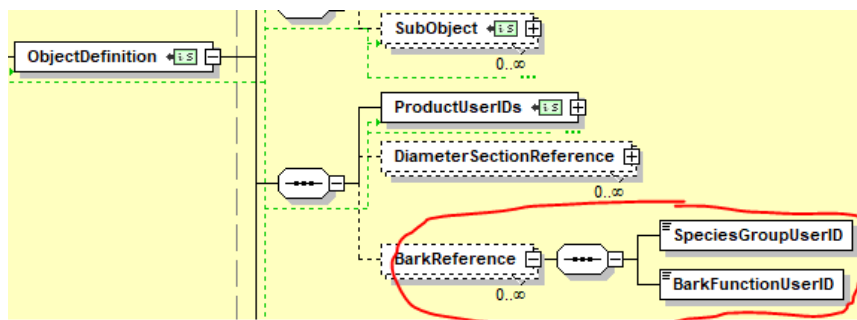
The only other “biological” spi parameters that may be relevant to handle in the same way are ButtEndExtrapolation, SoundKnotFunction and feller-buncher volume tables.

Alternative 2) BarkFunction in spi

Another alternative is to make BarkFunction repeatable in spi and to add a new identity attribute barkFunctionUserID.



This means that BarkFunctionUserID must be included in the oin-schema in order to specify which bark function to use for the specific object.

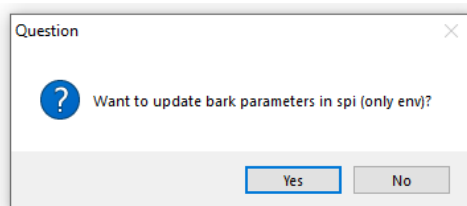
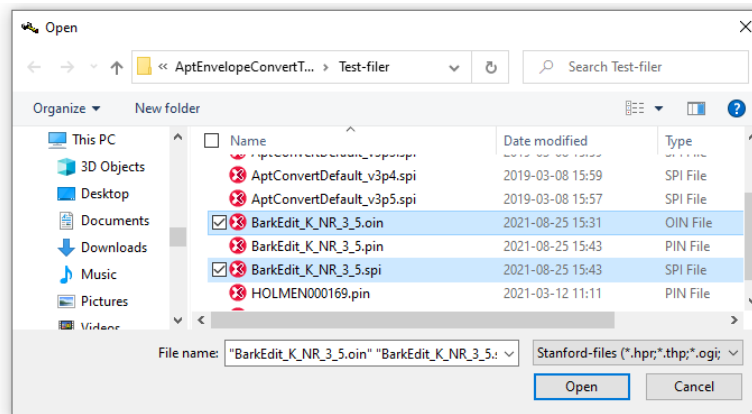


This alternative means that both file types need to be updated and that a new reference must be handled. It is probably necessary to also add an attribute indicating which bark parameters are to be default in case of starting an object without an oin.

Alternative 3

A third alternative could be to specify that the oin is to be distributed together with an spi inside an envelope in this type of case. It is then recommended that the operator can keep these bark settings for a specific object even if another spi is imported.

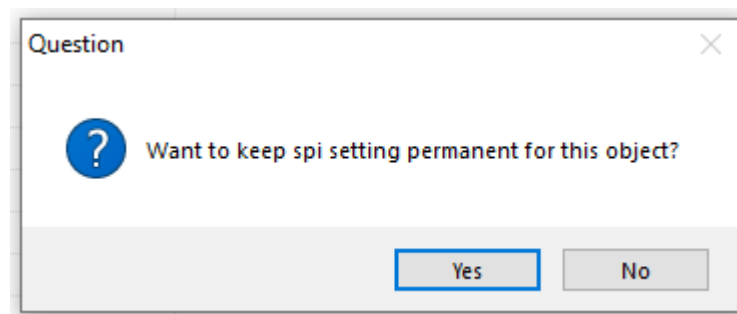
Illustration of how bark parameters in spi are modified for each oin and then distributed in an env in an administrative office system:



Spi: BarkEdit_KOMATSU_NR_3_5.spi							
OK							
SpeciesGroupUserId	SpeciesGroupName	SpeciesGroupInfo	SpeciesGroupVersion	Category	Bark Latitude	Bark parameter A	Bark factor B
X1_Broadleaves	Broadleaves	3	v1.1	Swedish Zacco		3.270000	0.036900
X1_Spruce	Spruce	2	v1.1	Skogforsk 2004, Norway spr			
X1_Pine	Pine	1	v1.1	Skogforsk 2004, Scots pine	59		

BarkEdit_K_NR_3_5.oin	2021-08-25 15:31	OIN File	4 KB
BarkEdit_K_NR_3_5.pin	2021-08-25 15:43	PIN File	622 KB
BarkEdit_K_NR_3_5.spi	2021-08-25 15:43	SPI File	170 KB
NewObject_SpecificBark.env	2021-08-30 15:35	ENV File	198 KB

When opening env in harvester the operator is asked the following question:



This alternative does not include any change to the standard but it means a quite complex software system to administrate this type of envelope with an object specific spi.

Final comment.

What ever solution we choose it must be possible to keep “local/object specific” spi-parameters if we are to be able to have different bark settings for several different active objects.

Meeting discussion

It was pointed out by Jeremy Gibson that a handful of parameter sets per company are normally in use. Different parameters are often used in the forest vs when processing at roadside since a significant amount of bark is removed when skidding or yarding stems.

It was pointed out that it must be possible to handle a start of object without oin if alternative 2 is implemented. There will be a need for defining a “default flag” in the spi. Maybe make speciesGroupReference mandatory?

All participants were given the chance to state their preferences:

- PHDForest, Dasa, Komatsu, JD, Ponsse, Technion are OK with both alternative 1 and 2
- Logset, and Coillte prefers alternative 1
- Logmax and CGI prefers alternative 2

It was decided to let Skogforsk write a final proposal for the next meeting, including also Density and Volume/MassTable. The possibility of moving DiameterSectionDefinitions will also be studied. It was also decided to have a short separate meeting on this issue on the 8th of November 2021, 9.00-11:00.

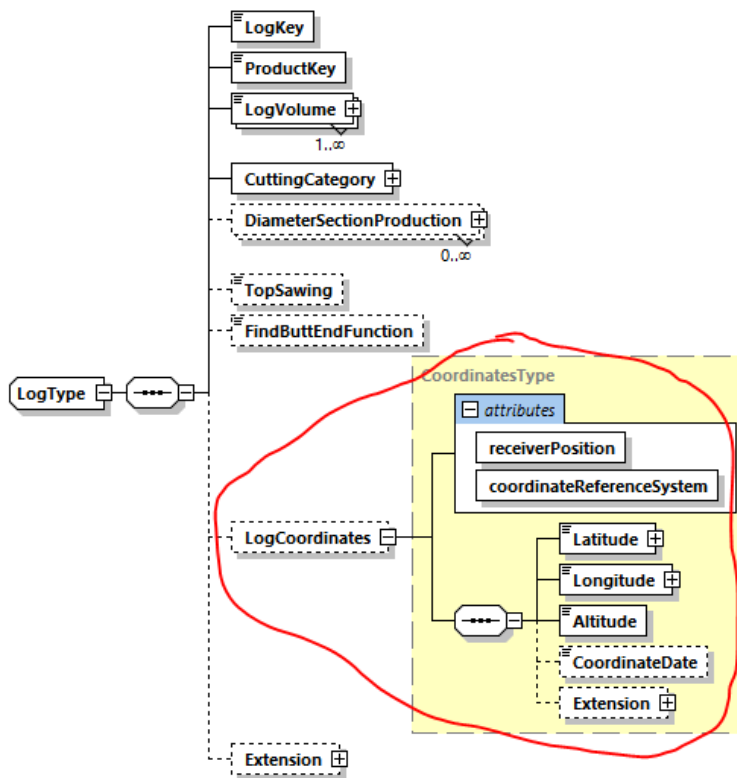
§5 Items for discussion

LOG PILE POSITIONS

Tapio Räsänen, 2021-09-10. Original proposal included in appendix 1.

In order to simplify communication of log pile positions from harvesters to forwarders it was suggested that we discuss adding coordinates to LogType in the hpr or to create a new separate message.

The secretary proposed that a new element LogCoordinates is added to the hpr in the LogType:



Observe that attribute coordinateReferenceSystem should be removed from LogType/LogCoordinates based on the previous decision to move this attribute to the header.

The meeting decided to add the new element LogCoordinates to LogType and to add a new enumeration value “Crane tip log cut” to attribute “recieverPosition”.

Name	Data type	Description
LogCoordinates	CoordinatesType	Log coordinates, describes the location of the crane tip when cutting the log. Value of recieverPosition must be “Crane tip log cut”
recieverPosition	list	Position of coordinate registration in file: "Base machine position", "Crane tip position when felling the tree", “Crane tip log cut” . Observe that only "Base machine position" is relevant for all types of coordinates. Other enumerations valid only in some specific situations."

The idea of adding a new file type specific for log pile positions was abandoned.

Tapio also initiated a discussion about how to communicate information from harvester to forwarder. “Real-time” probably means that data from harvester should be avaiable in forwarder within an hour or two. In the long term it is probably wise to build a the communication on the StanForD REST API.

In order to proceed in the issue, the group should try to find a good API solution for it. Sending hpr files from harvesters via machine manufacturer’s cloud services to the authorized forwarders might be the base solution.

The issue regarding communication between harvester and forwarder is to be discussed during the next meetings.

DISTRIBUTION BUCKING AND MULTI TREE PROCESSING

Anders Nylund, Komatsu, 2020-10-02

How to handle MTP-logs when working with distribution bucking? To be used in the algorithm or not?

A questionnaire was distributed to all manufacturers after the meeting in April. Below are the answers received so far (no answers from JohnDeere and LogSet yet):

Control system	Is length distribution bucking used on multi-tree-processed (MTP) stems at all?	Are multi-tree-processed (MTP) logs considered when running length distribution? Are they included in the log matrix used for calculating optimal length distribution?
Ponsse Opti	NO - Distribution is not taken in account when calculating optimization in MTH, (pre-defined target length used for MTP). Might affect to single tree processing calculation	YES - logs (from bunch) are registered in distribution follow up matrix. Multi tree processed logs affect STP length optimization.
Technion xLogger	YES – Distribution affects bucking result when multi-tree-processing scaling is active.	NO – MTP logs are not considered and not included in matrix as their number increases
Komatsu MaxiXT	YES – MTP-stems are fully bucked with products on a reference profile so product distribution and limits are in use. It's possible to use different product due to quality if single/multi should differ in distribution.	NO - MultiTree production is not included in distribution and limit data. Distribution and limit are based on single stem data. There is a programmer setting for testing it.
LogMax LogMate	YES – No consideration is paid to whether a stem is MTP or STP when using the distribution logic. Majority of operators use pre-defined target lengths when in MTP.	YES – Logs from MTP handled in the same way as STP.
Dasa Forester	YES, in the same way as STP.	NO, MTP stems are excluded from the log matrix.
JohnDeere Timbermatic	YES, With the multi-tree-processed stems the distribution is in use.	YES, In the distribution point of view the multi-tree-processed logs are handled in a same way as the single-tree-processed logs.
Logset TOC	NO, only manual cutting of stem bunches.	No (see previous)

This is not a "super urgent" issue from a Skogforsk perspective since length distribution bucking is of limited interest when doing multi-tree-processing. However, it might be a good idea to define a basic recommendation.

Based on the answers it was decided to recommend that:

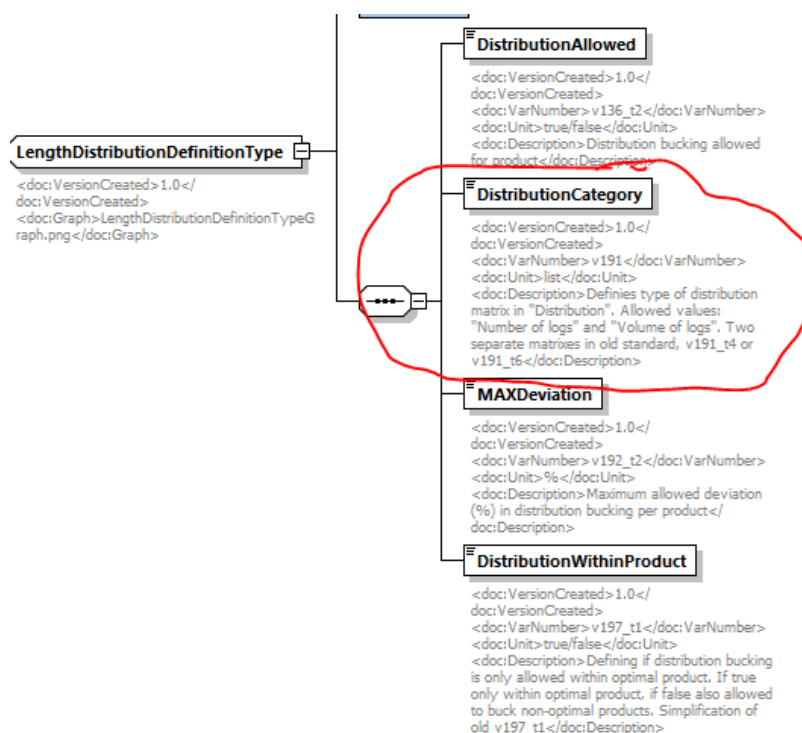
- Length distribution bucking should be used on multi-tree-processed (MTP) stems

No recommendation concerning the distribution follow-up matrix since it is not possible to state whether or not is an advantage to included MTP-logs in the log matrix used for calculating optimal length distribution.

DISTRIBUTIONCATEGORY PER PRODUCT

Jonas Gustafsson, 2021-05-27

How is LengthDistributionCategory per product implemented? In old standard one setting for the whole apt-file (var191).



A questionnaire was distributed to all members with the question whether a control system allow for using different DistributionCategories for different products:

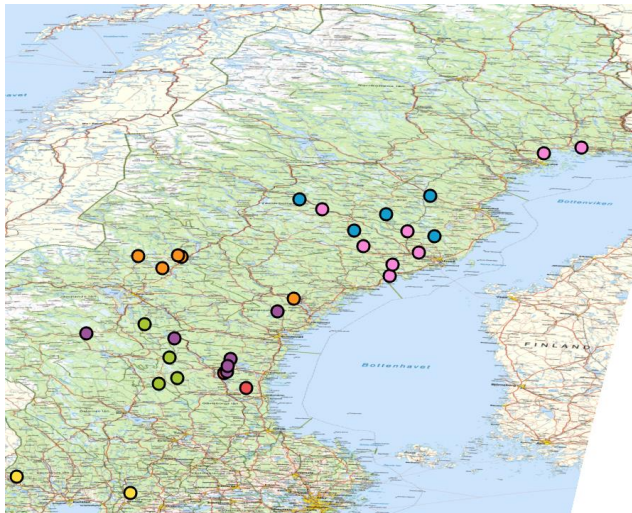
Control system	DistributionCategory per product
Ponsse	NO (same for all products) in 4G YES in 5G
Technion	YES
Komatsu	YES
LogMax	YES
Dasa	YES
JohnDeere	
Logset	NO (Not yet)

The issue will thereby not be discussed any further.

NEW BARK FUNCTION

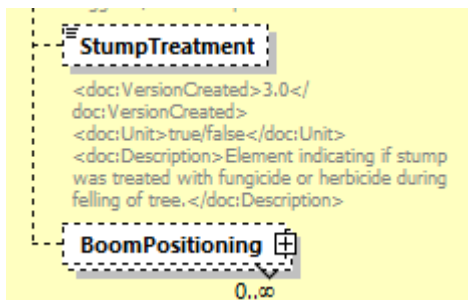
Skogforsk is, as previously discussed, evaluating the possibility of introducing a new logarithmic bark function since no existing function gives non-biased results on birch. The data collection for this evaluation is presently going on and will be completed in order to present a final proposal at the meeting in November.

At present we have extended the existing data set (221 stems in southern Sweden) with 158 stems from the northern half (illustrated below). The objective is to reach 200 stems also for the northern data set.



STUMPTREATMENT IN HPR

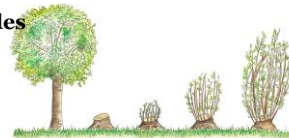
There is an element in hpr for registering whether the stump has been treated with fungicides or herbicides as illustrated below:



fungicides



herbicides



The market interest in element StumpTreatment seems to increase. The secretary has recently been asked about this element by Swedish forest companies. It is therefore recommended that this element is considered when deciding on future machine implementation updates.

There have also been questions regarding the possibility of updating the elements with new attributes such as:

- stumpTreatmentCategory, herbicide or fungicide
- agentName, free text describing the common name of the herbicide or fungicide in use
- perhaps some other quality parameters

This issue might be discussed in the future.

Presently StumpTreatment has been implemented by LogMax, Ponsse (5G) and Komatsu. It is not implemented by Dasa, John Deere, Logset and Technion.

NEW ENUMERATIONS TO LIMITATIONCATEGORYTYPE

Not discussed since there were no new input from Trimble.

FUEL AND CO₂ REPORTING IN HPR AND FPR.

Tapio Räsänen, Metsäteho, 2021-04-16.

There is a growing need in forest industry to report CO₂ emissions of wood supply operations as part of the environmental impacts of the end products

- improvement of environment efficiency
- reporting of emissions per m³ on harvesting object (site level) is required, no need to report on assortment level
- also other operations than harvesting, forwarding and transports must be considered in final analysis
- giving fuel consumption information from contractors to their customers is a sensitive question and does not happen (at least in Finland)

Any discussion around the subject in Swedish industry?

In practice the forest machines may be able to measure and report only the fuel consumption, not emissions (at least in the beginning)

- other emission components should be added as calculated based on emission class of the engine or model of the machine or some other information
- fuel type ?

Aim is that fuel consumption figures would be reported in hpr and fpr files per object and would be linked to other logistics information in forest company systems

Proposal is that the standardization of emission and fuel consumption data is prepared in a StanForD working group

- machine manufacturers, Skogforsk and Metsäteho
- first to look at the technical conditions and reporting possibilities of the machines
- to define common emission measurement and calculation principles and methods
- need for a wider project?

§6 StanForD2010 projects / implementations

POSSIBLE FORWARDER TEST IN SWEDEN (SVEASKOG AND SKOGFORSK)

Johan Möller presented the plan to do a forwarder test in Sweden during late autumn 2021. Presently Komatsu, JohnDeere, Rottne and Ponsse are planning to participate.

§7 Other issues

No other issues.

§8 Next meeting

StanForD meeting 2021-11-30—12-01, Vantaa or Teams (12:00-14:00 EET)

Final decision whether physical in early November?

Un-significant proposals after November 15th will be postponed to 4.1!

Possible REST API meeting 2021-08-25, Teams, (

8th of November 2021, 9.00-11:00 Teams meeting regarding bark parameters

Possible REST API meeting autumn, Teams. Experiences from work with version 1.0 and needs for a data-API CET). Experiences from work with version 1.0 and needs for a data-API.

By default, all financially contributing members will receive an Outlook invitation to all meetings in advance.

§9 End of meeting

The chairman thanked everyone for attending the meeting.

Appendix 1) Proposal log pile coordinates

Original proposal from Tapio Räsänen, Metsäteho, 2021-09-10

Proposal

1. To add log coordinates to logs ~~hpr~~ (new structure `LogCoordinates`)
2. To add enumeration value "Crane tip when cutting log" to attribute ~~ReceiverPosition~~
3. To seek and define a common method how to transfer the log pile position data to forwarder's system
 - Do we need a new file type for log pile data?
 1. Log by log data based on ~~hpr's~~ Stem and Log structures, but including only ~~LogProductKey~~ LogVolume and ~~LogCoordinatesProductDefinitions~~ required?
 2. Log pile based structure: average coordinates of a pile (how to calculate in the machine system?), ~~ProductKey~~ number and total volume of logs in the pile
 - Could some type of StanForDAPI solution be used?
 1. Forwarder's map application retrieve ~~hpr~~ files from the cloud service of the harvester manufacturer
 - GET/ File_v4.0/ HPR?StartDate =2021-09-15T00:00:00Z&EndDate=2021-09-15T11:59:59Z
 2. Forwarder's map application retrieves only log data from the cloud service of the harvester manufacturer
 - data-API solution needed
 3. Hpr files or log data are sent automatically from harvester's cloud service to named and authorized forwarders
 4. Some other way?
 - It is not reasonable to circulate the files or data via forest company or contractor's planning systems
 - The data communication should be ~~retain~~

