



Arlinger John

27 April 2022

Minutes StanForD

2022-04-26

Place:	Uppsala/Teams, 2022-04-26, 10:00-15:00 CET
Participants:	John Arlinger, Secretary Johan J. Möller, Chairman Asko Leivonmäki, Logset Andreas Barth, CGI Antti Korkiakoski, JohnDeere Bengt Sörvik, Otmeka Bobby Szwajkowski, Tigercat Christophe Ginet, FCBA Étienne Pilon, FP Innovation Fredrik Tjernberg, Komatsu Henrik Persson, Logmax Ian Wilson, PHD Forest Jānis Magaznieks, LUUKV Jonas Gustafsson, Sveaskog Janne Pursiainen, Ponsse Juha Korhonen, Technion Jean Plamondon, FP Innovation Jeremy Gibson, PHD Forest Joel Gessner, SP Maskiner Jonas Thorsson, Dasa Josh Hildebrand, Tigercat Lars-Erik Andersson, Dasa Lars Henriksson, Biometria Tapio Räsänen, Metsäteho Timo Melkas, Metsäteho Pasi Palonen, Logset Ronan O'Keeffe, Coillté Thomas Engström, Otmeka

Decision summary

Decided to do the following schema updates:

- New DiameterAdjustmentMatrix added to the StemVolumeTableDefinitionType (vti and bpr schemas) for calculating DBH based on a reference diameter
- Add “modificationRestricted” to the FeatureCollection
- Description of BoomExtension updated:
Extension of boom when angle is registered. This is the distance from the ~~harvester~~ base machine to the ~~harvester head~~ attachment (e.g. harvester head). This value can be a “default” value indicating the “normal” extension.
- Change the element names:
~~MachineHeadManufacturer~~ → MachineAttachmentManufacturer
~~MachineHeadModel~~ → MachineAttachmentModel
- updating the UserIDType definition as follows:

```
<xsd:simpleType name="UserIDType">  
  <xsd:restriction base="RestrictedStringType" />  
</xsd:simpleType>
```
- Large number of constraints updated and added (appendix 1)
- New definition of CalibrationUseLog:
Manually measured control log accepted for calibration use, only registered in caliper. Operator should be able to set it manually to “false” for all logs independently of whether the stem is randomly or manually selected.

The following errors and defects were discovered after the meeting. The present pre-release schema has been corrected as described in appendix 2.

- An error in RestrictedStringType
- “Unique” restriction for element FeatureName (ogi and ogr) has been deleted.
- New restriction type has been added for GISCoordinateReferenceSystem that means that the value must have pre-fix “EPSG:”
- DensityAdjustment made non repeatable and attribute denistyCategory should be deleted.
- Sequence under element BarkFunction made mandatory and description of barkFunctionCategory update

Action list:

- It has been noted that DiameterMeasuredStartHeight is always 0 cm in several controllers. It is recommended that DiameterMeasuredStartHeight should be identical with:
 - ButtEndProfileExtrapolation.ReferenceHeight (e.g. 130 cm) if ButtEndExtrapolationFunction is used

- OR
 - ReferenceDiameterHeight (e.g. 93 or 111 cm) if ButtEndExtrapolationFunction is NOT used
- An increased interest in following-up whether the harvester or feller-buncher is using herbicides or fungicides means that it is recommended that element StumpTreatment is implemented.
- 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 is an urgent variable to be shown when creating new object in harvester and forwarder.
- 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).

§1 Opening of meeting and agenda

Chairman Johan J Möller opened the meeting.

A new issue “Russian contacts” was added to item “Other issues”.

The agenda was accepted.

§2 Presentation of participants

Presentation of meeting participants including a short report on the weather!

§3 Information about decisions and discussions at previous meetings

DECISIONS MAJOR VERSION 4.0

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

- StemKey (hpr and hqc), LoadKey (fpr) and IndividualMachineWorkTimeKey (mom) added to Tracking
- New bark function elements added: ConsolidatedFunction, BarkFuntionUserID, BarkFuntionName, BarkFunctionInfo, BarkFuntionVersion
- A number of bark function elements renamed.
- Element BarkFunction made optional and enumeration “None” excluded.
- New element ForwardingVolumeCategory added to the DeliverDefintion in order to define which single volume unit to report from forwarder.
- Elements Density (DeliverDefinition) and LoadVolume (PartialLoad) are to be non-repeatable and without any attributes.
- GeographicalDirective is to be replaced by FeatureCollection and TextToMachine should be renamed to TextFromMachine in ogr schema.
- New positioning of felled stems with element FelledStemCoordinates including new recieverPosition “Product position” and new element “FelledStemBearing”.
- New element “LogBearing” added to LogCoordinates.

Suggested with the minutes

- add “modificationRestricted” to the FeatureCollection

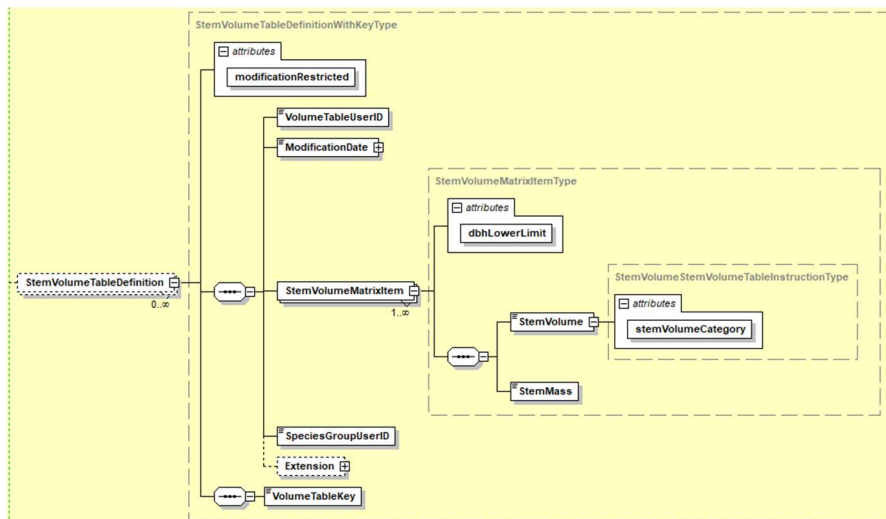
To be discussed at next meeting:

- New constraints will be presented.
- Possible adjustments to ogr and ogr.

§4 Proposals new major version 4.0

USING STEMVOLUMETABLE

A matrix for stem volume estimations in a feller buncher has been added to version 4.0 of the bpr and vti schemas as illustrated below.



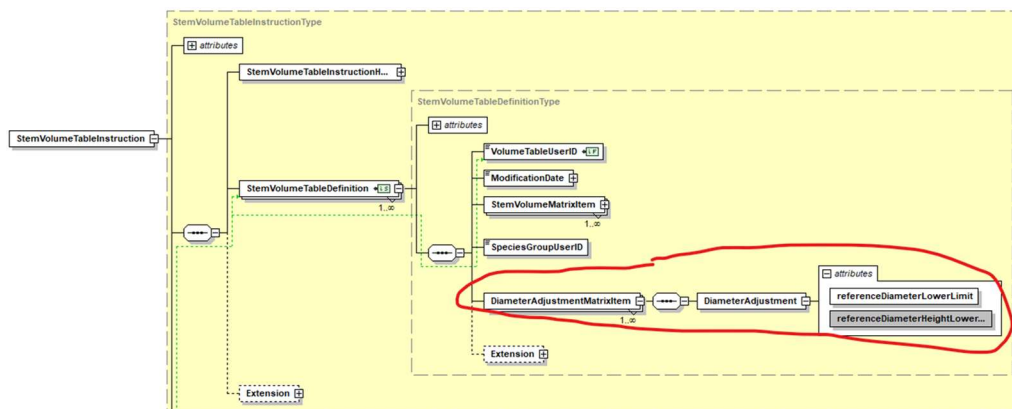
This table is based on having a dbh value for each felled stem. However, the feller buncher's reference diameter is most often not measured at the correct height from the stump. It is therefore necessary to specify how to calculate a DBH, based on the reference diameter.

In the case of a harvester felling a tree the estimation of DBH can be done using the DBH values measured on single tree felled stems.

The possibility of using the ButtEndExtrapolation function has been analysed. This is quite complex due to the fact that this function is based on having a measured diameter at a height above the reference diameter position.

A simple solution could be to add a new structure for DBH adjustments for estimating DBH based on the measured referenceDiameter in a feller bunchers.

It was decided to add a new structure to the StemVolumeTableDefinitionType included in the volume table instruction schema (vti) and the felled-bunched production schema (bpr) according to the illustration and table below.



New elements and attributes:

Name	Unit	Data type	Description
DiameterAdjustment-MatrixItem	-	-	Structure for estimating DBH based on

DiameterAdjustment	Mm	Integer	Adjustment value for estimating DBH based on measured referenceDiameter. Used in feller bunchers where only reference diameter is measured. DBH = referenceDiameter+DiameterAdjustment
referenceDiameter-LowerLimit	Mm	Integer	Lower limit for measured reference diameter
referenceDiameterHeight-LowerLimit	Cm	Integer	Lower limit for height from stump of measured reference diameter

This new structure is presently only to be implemented for feller-bunchers

Example using a DiameterAdjustmentMatrix

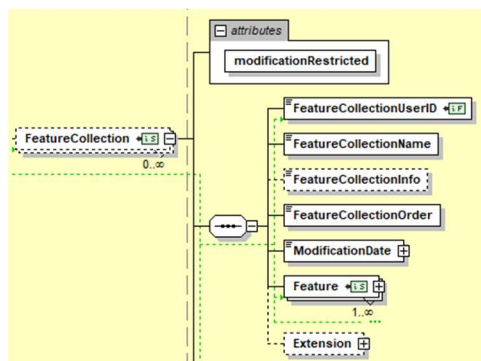
Below is an example matrix with diameter adjustments

	ReferenceDiameterHeight (cm)					
ReferenceDiameter (mm)	90	100	110	120	130	140
100	-4 mm	-2 mm	0 mm	+1 mm	+2 mm	+2 mm
150	-5 mm	-2 mm	0 mm	+1 mm	+2 mm	+3 mm
200	-5 mm	-3 mm	0 mm	+1 mm	+2 mm	+3 mm

The DBH of a felled stem with the reference diameter 151mm measured at position 134 cm will calculate using the adjustment value -2 mm. This means that the estimated DBH will be 153 mm (151+2).

FEATURECOLLECTION

The decision with the previous minutes to add modificationRestricted to the FeatureCollection element in ogi and ogr was confirmed.



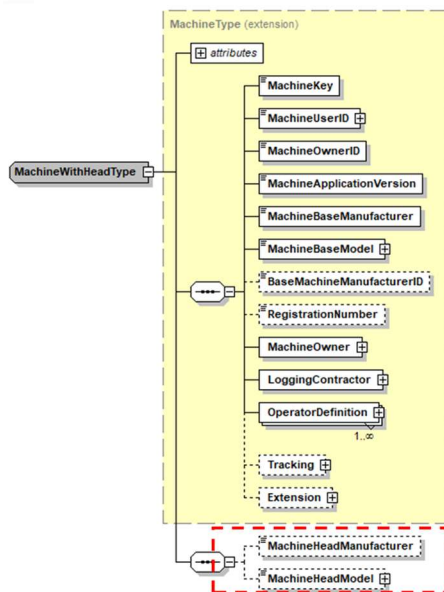
BOOMEXTENSION

As we have started to use the term Attachment rather than HarvesterHead it was decided to update the description of BoomExtension according to the following text:

Extension of boom when angle is registered. This is the distance from the ~~harvester~~ base machine to the ~~harvester head~~ attachment (e.g. harvester head). This value can be a “default” value indicating the “normal” extension.

It was also decided to change the following element names:

- MachineHeadManufacturer → MachineAttachmentManufacturer
- MachineHeadModel → MachineAttachmentModel



ERROR DATA TYPE FOR USERIDS

It was decided 2021-03-22 to implement a new restriction for UserIDs by adding a new type to the CommonDefinition schema:

```
<xsd:simpleType name="RestrictedStringType">
  <xsd:restriction base="xsd:string">
    <xsd:pattern value="([\S-[%?&lt;&gt;:&quot;&apos;/\|]*+]])+
      ([\S-[%?&lt;&gt;:&quot;&apos;/\|]*+]])*"/>
  </xsd:restriction>
</xsd:simpleType>
```

However, it has been noted by Janne Pursiainen, Ponsse, that this new type is not used for any UserIDs:

```
</xsd:simpleType>
<xsd:simpleType name="UserIDType">
  <xsd:restriction base="xsd:string"/>
</xsd:simpleType>
```

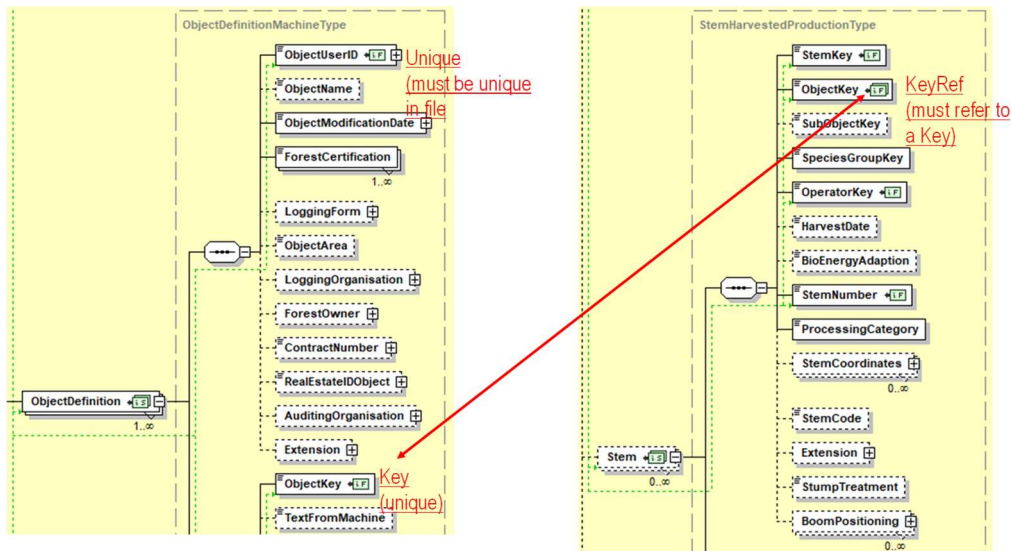
It was thus decided to correct this error by updating the UserIDType definition as follows:

```
<xsd:simpleType name="UserIDType">
  <xsd:restriction base="RestrictedStringType"/>
</xsd:simpleType>
```

CONSTRAINTS

Juha-Antti Sorsa has, as decided at the previous meeting, updated the constraints of the schemas. All updates are included in appendix 1. The meeting decided to accept these updates. All actors have the possibility to check these updates until mid-June when the release schemas are to be published.

The following figure illustrates the three commonly used types of constraints (Unique/Key/KeyRef) used in StanForD2010 schemas:

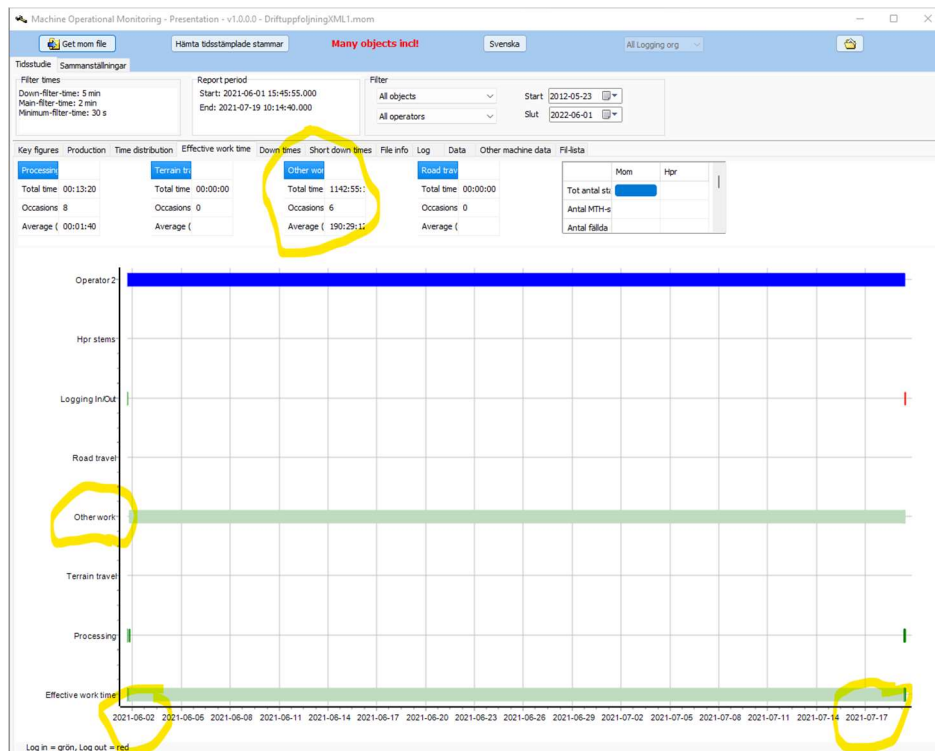


§5 Items for discussion

OTHER WORK IN MOM

Urban Nordmark, Sveaskog, 2022-02-10

It has been noted that it is possible to register an “Other work time” for the whole of a summer vacation in cases where this was the last time manually selected by the operator as illustrated below.



MonitoringStartTime	MonitoringTime...	M...	OtherMachineData	IndividualMachineRunTimeCategory
2021-06-01T15:45:55+02:00	272	1	OtherMachineData	Processing
2021-06-01T15:50:27+02:00	12014	1	OtherMachineData	Processing
2021-06-01T19:10:41+02:00	23	1	OtherMachineData	Processing
2021-06-01T19:11:04+02:00	4108626	1	OtherMachineData	IndividualMachineRunTimeCategory
			EngineTime 5767	otherWorkCategory=Unspecified
			DrivenDistance 310	Other work
			FuelConsumption 9	
2021-07-19T08:28:10+02:00	2907	1	OtherMachineData	IndividualMachineRunTimeCategory otherWorkCategory=U...
2021-07-19T09:16:37+02:00	40	1	OtherMachineData	Processing
2021-07-19T09:17:17+02:00	1	1	OtherMachineData	IndividualMachineRunTimeCategory otherWorkCategory=U...
2021-07-19T09:17:18+02:00	212	1	OtherMachineData	Processing

“Other work” is work done by machine, for example salvaging / towing other machine, laying out branches on strip roads etc. This type of work is registered manually by the operator.

It is strongly recommended that “Other machine work times” are always to be ended when the operator logs out of a control systems in order to avoid this type of error.

NEW SCHEMAS FOR SCARIFICATION AND PLANTING

Suggestion based on discussion between Ian Wilson, John Arlinger and Jeremy Gibson.

It was suggested that we start exploring the possibility of also including scarification and planting as described below:

1. Planting Machines - Mechanized planting is starting to gain a lot of traction in Australasia and it will probably not be long till there is a Plantma X machine operating in Australia given the level of interest in it. A number of forest companies have contacted ForestPHD as they would like to see planting machines come into the standard.



2. Scarification/Site preparation – ForestPHD have been contacted by both forest companies and contractors that undertake this work (in Australia, harvesting contractors are being used to do more of the site preparation work). Given that they (harvesting contractors) already familiar with StanForD data coming from their Feller Bunchers, Harvesters/Processors and Forwarders, they can see the merit in using the existing standard.

Below is an attached picture of what's called a “root rake” that gets used to pull/rake up the residue that is left after harvesting into a row, so that it is easier to plant the site. This site had eucalyptus trees on it which tends to have a higher amount of residue left on it than a Pine site



No objections were raised regarding the idea of starting to explore this issue.

BARK FUNCTION STUDY IN LATVIA

“Latvian timber measuring organization” (LKUUV, <https://www.lkuuv.lv>) has done a study on bark thickness in order to improve bark thickness calculations in harvesters. The study included pine, spruce, oak, birch, aspen and alder.

Below is an example of an equation for bark calculation of Scots pine

LimitationDefinitionType

```

<xs:element name="LimitationDefinitionType" type="LimitationDefinitionType"/>
<xs:complexType base="LimitationDefinitionType">
  <xs:sequence>
    <xs:element name="LimitationCategory" type="LimitationCategoryType"/>
    <xs:element name="LimitationResult" type="LimitationResultType"/>
    <xs:element name="ProductRelativeLimitationStart" type="ProductRelativeLimitationStartType"/>
    <xs:element name="RelativeLimitation" type="RelativeLimitationType"/>
  


```

LimitationCategory

```

<xs:element name="LimitationCategory" type="LimitationCategoryType"/>
<xs:complexType base="LimitationCategoryType">
  <xs:sequence>
    <xs:element name="LimitationCategoryType" type="LimitationCategoryType"/>
    <xs:element name="LimitationCategoryDescription" type="Text"/>
  


```

LimitationResult

```

<xs:element name="LimitationResult" type="LimitationResultType"/>
<xs:complexType base="LimitationResultType">
  <xs:sequence>
    <xs:element name="LimitationResultType" type="LimitationResultType"/>
    <xs:element name="LimitationResultDescription" type="Text"/>
  


```

ProductRelativeLimitationStart

```

<xs:element name="ProductRelativeLimitationStart" type="ProductRelativeLimitationStartType"/>
<xs:complexType base="ProductRelativeLimitationStartType">
  <xs:sequence>
    <xs:element name="ProductRelativeLimitationStartType" type="ProductRelativeLimitationStartType"/>
    <xs:element name="ProductRelativeLimitationStartDescription" type="Text"/>
  


```

RelativeLimitation

```

<xs:element name="RelativeLimitation" type="RelativeLimitationType"/>
<xs:complexType base="RelativeLimitationType">
  <xs:sequence>
    <xs:element name="RelativeLimitationType" type="RelativeLimitationType"/>
    <xs:element name="RelativeLimitationDescription" type="Text"/>
  


```

New optional elements

```

<xs:element name="ProductRelativeLimitationStart" type="xsd:nonNegativeInteger" minOccurs="0"/>
<xs:annotation>
  <xs:documentation>
    <doc:VersionCreated>4.1</doc:VersionCreated>
    <doc:UnitPcs/Volume/Doc:UnitPcs/Volume>
    <doc:Description>Total Number/volume of harvested logs of the product to start to use relative limitation for the product. Under this value, relative limitation is not in use. Production made before limit is reached, is taken in account in limitation calculation.</doc:Description>
  </xs:annotation>
</xs:element>

```

```

<xs:element name="RelativeLimitation" type="xsd:boolean" minOccurs="0"/>
<xs:annotation>
  <xs:documentation>
    <doc:VersionCreated>4.1</doc:VersionCreated>
    <doc:UnitPcs/Volume/Doc:UnitPcs/Volume>
    <doc:Description>If TRUE limitationCategory is relative (K) otherwise absolute volume or pieces.</doc:Description>
  </xs:annotation>
</xs:element>

```

Note these could be combined to new complex type containing this information

Relative limitation implementation proposal

```

<xs:simpleType name="LimitationCategoryType">
  <xs:restriction base="xsd:string">
    <xs:enumeration value="No limitation"/>
    <xs:enumeration value="Total number, quantity per product"/>
    <xs:enumeration value="Total volume, m3 per product"/>
    <xs:enumeration value="Number per diameter class per product"/>
    <xs:enumeration value="Volume per diameter class per product"/>
    <xs:enumeration value="Number per length class per product"/>
    <xs:enumeration value="Volume per length class per product"/>
    <xs:enumeration value="Number per cell (log size class) per product and tree species"/>
    <xs:enumeration value="Volume per cell (log size class) per product and tree species"/>
  
</xs:simpleType>

```

RelativeLimitation with value TRUE converts these to be used as relative values between products inside tree species.

Or these values can't be used as relative

New RelativeLimitation with value TRUE converts these to be used as relative values.

Action in the bucking system

- Intention with the new types is that the quantity of logs to be limited (number or volume of logs) increases as the total quantity of Product increases
- As the total quantity increases, the limited logs can be cut up to the set limitation percentage according to what has been set in LimitationResult
- Continuous calculation after cutting each log

Example

- Dimensions of log class
length = 310 cm
diameter = 150 mm
- Limitation = 5%

Number of cut logs in log class	Number of logs allowed to cut in log class according to RelativeLimitation and Limitation value
20	1
40	2
60	3



Comments in the Finnish StanForD meeting 2022-03-24

- Metsä Group 
 - Stora Enso 
 - UPM 
 - Metsähallitus 
 - John Deere, Komatsu & Technion
Proposal sounds reasonable, but hard to comment more until it is studied further.
- Heikki Komulainen / Ponsse will prepare the proposal for the next StanForD meeting together with Trimble Forestry



Heikki Komulainen will arrange a Teams meeting before the summer to discuss this further in a smaller setting. Ponsse will prepare some examples to clarify the proposed solution.

It is recommended by the secretary that an open Teams meeting is arranged for all StanForD members before the next StanForD meeting.

CALIBRATIONUSELOG

Pasi Palonen, Logset, has noted that the implementations of CalibrationUseLog varies between different calipers.

The present definition is:

Manually measured control log accepted for calibration use, only registered in caliper

E.g. randomly selected stems are handled differently from manually selected stems today.

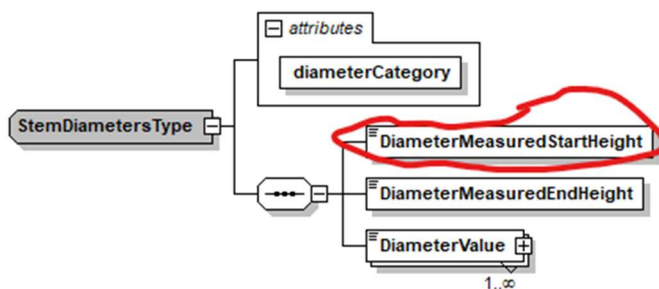
It was decided to update the definition according to the following text:

Manually measured control log accepted for calibration use, only registered in caliper.

Operator should be able to set it manually to “false” for all logs independently of whether the stem is randomly or manually selected.

DIAMETERMEASUREDSTARTHEIGHT

The present definition of DiameterMeasuredStartHeight is “Height from stump to first measured diameter in DiameterValue (stem diameter vector)”.



It has been noted by Juha-Antti Sorsa that DiameterMeasuredStartHeight is always 0 cm in most controllers. John Arlinger also verified this on hpr-files from Swedish forest companies.

It was pointed out by the secretary that DiameterMeasuredStartHeight must be identical with:

- ButtEndProfileExtrapolation.ReferenceHeight (e.g. 130 cm) if ButtEndExtrapolationFunction is used
- OR
- ReferenceDiameterHeight (e.g. 93 or 111 cm) if ButtEndExtrapolationFunction is NOT used

§6 Presentation of all previously decided 4.0 updates

John Arlinger briefly described all version 4.0 updates. No objections raised by the meeting participants.

§7 Experiences testing of pre-release schemas

All participants were given the chance to comment on the new 4.0 schemas. No significant comments or objections.

§8 Decision to publish “Release4.0”

It was decided to publish the new release version during the second half of June if no major objections have been raised.

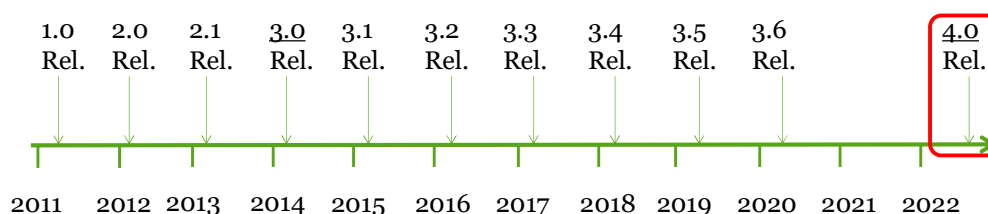
§9 StanForD2010 projects / implementations

No issues discussed.

§10 Other issues

UPDATING STANDARD ANNUALLY IN THE FUTURE

So far the StanForD2010 standard has been updated annually. The secretary raised the question of maybe in the future increase the updating interval to 18 or 24 months. The meeting concluded that a 4.1 will probably be necessary to implement in a year since we will probably find some errors and bugs in 4.0 as soon as this version is implemented. The issue of pro-longing the interval will be discussed again at future meetings.



RUSSIAN CONTACTS

The secretary raised the issue of future communication with Russian organizations due to the invasion of Ukraine.

There was a clear consensus among the members to not engage/communicate with Russian organizations as long as the war in Ukraine continues

§9 Next meetings

StanForD meeting 2022-11-15--16, Gävle/Teams (09:00-15:00 CET).

The first day will focus on presenting recent forest company applications using StanForD2010 as well as a possible field excursion. The meeting will be probably arranged at a hotel in central Gävle.

The final “release” schemas will be published in late June 2022.

The development of version 4.0 is considered “frozen” with exceptions for errors found in the pre-release schemas. A Teams meeting might be arranged by early June if any significant errors are found.

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

§10 End of meeting

The chairman Johan J Möller thanked everyone for attending the meeting.



Arlinger John

27 April 2022

Updated and new constraints

Below is a list of all updates included in the latest pre-release schemas.

New constraints:

Schema	Constraint for element	In structure	Type	Comment
Design-Instruction	StyleUserID	StyleDefinition	Unique	
	SymbolUserID	SymbolDefinition	Unique	
Felled-Bunched-Production	SubObjectUserID	SubObject	Unique	
	ObjectKey	UserDefinedData	Keyref	To ObjectKey in ObjectDefinition
	tableGroupID	UserDefinedData	Unique	
	tableID	UserDefinedData	Unique	
	rowID	UserDefinedData	Unique	
	columnID	UserDefinedData	Unique	
	OperatorKey	UserDefinedData	KeyRef	To OperatorKey in OperatorDefinition
	TrackingKey	TrackCoordinates	Key	
	ObjectKey	TrackCoordinates	Keyref	To ObjectKey in ObjectDefinition
	StemKey	TrackCoordinates	KeyRef	To StemKey in Stem
Felling-Bunching-QualityControl	ObjectUserID	ObjectDefinition	Unique	
	SubObjectUserID	SubObject	Unique	
	SpeciesGroupKey	ControlStemSettings	KeyRef	Take away SpeciesGroupUserID, add SpeciesGroupKey
	SpeciesGroupKey	DiameterCalibration	KeyRef	Take away SpeciesGroupUserID, add SpeciesGroupKey
	OperatorKey	DiameterCalibration	KeyRef	
Forwarded-Production	ObjectUserID	ObjectDefinition	Unique	
	ObjectKey	UserDefinedData	Keyref	To ObjectKey in ObjectDefinition
	LocationKey	UserDefinedData	Keyref	To LocationKey in LocationDefinition
	tableGroupID	UserDefinedData	Unique	

	tableID	UserDefinedData	Unique	
	rowID	UserDefinedData	Unique	
	columnID	UserDefinedData	Unique	
	OperatorKey	UserDefinedData	KeyRef	To OperatorKey in OperatorDefinition
	TrackingKey	TrackCoordinates	Key	
	ObjectKey	TrackCoordinates	Keyref	To ObjectKey in ObjectDefinition
	LoadKey	TrackCoordinates	KeyRef	To LoadKey in Load
Forwarding-Object-Instruction	ObjectUserID	ObjectDefinition	Key	Change this to Unique because there are no references to it
	DeliveryUserID	DeliveryUserIds	Key	
	LocationUserID	LocationUserIds	KeyRef	to LocationUserID in LocationDefinition
	DeliveryUserID	DensityAdjustments	KeyRef	to DeliveryUserID in DeliveryUserIds
Forwarding-QualityControl	ObjectUserID	ObjectDefinition	Unique	
	DeliveryKey	DeliveryDefinition	Key	
	DeliveryKey	ScaleControl	KeyRef	To DeliveryKey in DeliveryDefinition
	Productkey	DeliveryDefinition	Unique	
Harvested-Production	BarkFunctionKey	BarkFunction	Key	
	BarkFunctionKey	Stem	KeyRef	To BarkFunctionKey in BarkFunction
	SubObjectUserID	SubObject	Unique	
	ObjectKey	UserDefinedData	Keyref	To ObjectKey in ObjectDefinition
	tableGroupID	UserDefinedData	Unique	
	tableID	UserDefinedData	Unique	
	rowID	UserDefinedData	Unique	
	columnID	UserDefinedData	Unique	
	OperatorKey	UserDefinedData	KeyRef	To OperatorKey in OperatorDefinition
	TrackingKey	TrackCoordinates	Key	
	ObjectKey	TrackCoordinates	Keyref	To ObjectKey in ObjectDefinition
	StemKey	TrackCoordinates	KeyRef	To StemKey in Stem
Harvested-DeltaProduction	SubObjectUserID	SubObject	Unique	
	BarkFunctionKey	BarkFunction	Unique	
	ObjectKey	UserDefinedData	Keyref	To ObjectKey in ObjectDefinition
	tableGroupID	UserDefinedData	Unique	
	tableID	UserDefinedData	Unique	
	rowID	UserDefinedData	Unique	
	columnID	UserDefinedData	Unique	
	OperatorKey	UserDefinedData	KeyRef	To OperatorKey in OperatorDefinition
	TrackingKey	TrackCoordinates	Key	
	ObjectKey	TrackCoordinates	Keyref	To ObjectKey in ObjectDefinition
	StemKey	TrackCoordinates	KeyRef	To StemKey in Stem
Harvesting-QualityControl	BarkFunctionKey	BarkFunction	Key	
	BarkFunctionKey	Stem	KeyRef	To BarkFunctionKey in BarkFunction
	ObjectUserID	ObjectDefinition	Unique	

	SubObjectUserID	SubObject	Unique	
	SpeciesGroupKey	ControlStemSettings	KeyRef	Take away SpeciesGroupUserID, add SpeciesGroupKey
Object-Geographical-Instruction	FeatureCollectionUserID	FeatureCollection	Unique	
	FeatureName	Feature	Unique	
	MapName	BackGroundMap	Unique	
Object-Geographical-Report	FeatureCollectionUserID	FeatureCollection	Unique	
	FeatureName	Feature	Unique	
	OperatorKey	OperatorDefinition	Unique	
	OperatorUserID	OperatorDefinition	Unique	
	SubObjectKey	SubObject	Unique	
	SubObjectUserID	SubObject	Unique	
Object-Instruction	DiameterSectionUserID	DiameterSectionDefinition	Key	
	DiameterSectionUserID	ObjectDefinition	KeyRef	To DiameterSectionUselD in DiameterSectionDefinition
Operational-Monitoring	OperatorUserID	OperatorDefinition	Unique	
	CodeListKey	CodeListDefinition	Key	
	ObjectUserID	ObjectDefinition	Unique	
	SubObjectUserID	SubObject	Unique	
	CodeListKey	IndividualMachine-WorkTime	KeyRef	To CodeListKey in CodeListDefinition
	IndividualMachine-WorkTimeKey	IndividualMachine-WorkTime	Key	
	OperatorKey	OperatorLoginEvent	KeyRef	To OperatorKey in OperatorDefinition
	ShiftKey	OperatorShiftDefinition	Key	
	OperatorKey	OperatorShiftDefinition	KeyRef	To OperatorKey in OperatorDefinition
	ObjectKey	OperatorShiftDefinition	KeyRef	To ObjectKey in ObjectDefinition
	ShiftKey	OperatorWorkTime	KeyRef	To ShiftKey in OperatorShiftDefinition
	CodeListKey	OperatorIndividual-WorkTime	KeyRef	To CodeListKey in CodeListDefinition
	IndividualMachine-WorkTimeKey	OperatorWorkTime	KeyRef	To IndividualMachineWorkTimeKey in IndividualMachineWorkTime
	IndividualMachine-WorkTimeKey	IndividualShortDownTime	KeyRef	To IndividualMachineWorkTimeKey in IndividualMachineWorkTime
	ObjectKey	UserDefinedData	Keyref	To ObjectKey in ObjectDefinition
	ShiftKey	UserDefinedData	Keyref	To ShiftKey in OperatorShiftDefinition
	tableGroupID	UserDefinedData	Unique	
	tableID	UserDefinedData	Unique	
	rowID	UserDefinedData	Unique	
	columnID	UserDefinedData	Unique	
	OperatorKey	UserDefinedData	KeyRef	To OperatorKey in OperatorDefinition
	TrackingKey	TrackCoordinates	Key	

	ObjectKey	TrackCoordinates	Keyref	To ObjectKey in ObjectDefinition
	IndividualMachine-WorkTimeKey	TrackCoordinates	KeyRef	To IndividualMachineWorkTimeKey in IndividualMachineWorkTime
Skidded-Production	LocationUserID	LocationDefinition	Unique	
	ObjectKey	UserDefinedData	Keyref	To ObjectKey in ObjectDefinition
	LocationKey	UserDefinedData	Keyref	To LocationKey in LocationDefinition
	tableGroupID	UserDefinedData	Unique	
	tableID	UserDefinedData	Unique	
	rowID	UserDefinedData	Unique	
	columnID	UserDefinedData	Unique	
	OperatorKey	UserDefinedData	KeyRef	To OperatorKey in OperatorDefinition
	TrackingKey	TrackCoordinates	Key	
	ObjectKey	TrackCoordinates	Keyref	To ObjectKey in ObjectDefinition
	StemLoadKey	TrackCoordinates	KeyRef	To StemLoadKey in StemLoad
SkiddingObject-Instruction	ObjectUserID	ObjectDefinition	Unique	
	SpeciesGroupUserID	ObjectDefinition	Unique	
TotalHarvested-Production	BarkFunctionKey	BarkFunction	Key	
	ObjectUserID	ObjectDefinition	Unique	
	SubObjectUserID	SubObject	Unique	
	ObjectKey	UserDefinedData	Keyref	To ObjectKey in ObjectDefinition
	tableGroupID	UserDefinedData	Unique	
	tableID	UserDefinedData	Unique	
	rowID	UserDefinedData	Unique	
	columnID	UserDefinedData	Unique	
	OperatorKey	UserDefinedData	KeyRef	To OperatorKey in OperatorDefinition
UserDefined-DataInstruction	tableGroupID	DataTableGroupDefinition	Unique	
	tableID	DataTableDefinition	Unique	
	columnID	DataColumnDefinition	Unique	
	rowID	DataRowDefinition	Unique	
	enumListID	DataEnumDefinition	Unique	
	cellID	DataCellDefinition	Unique	
Yarded-Production	LocationUserID	LocationDefinition	Unique	
	ObjectKey	UserDefinedData	Keyref	To ObjectKey in ObjectDefinition
	LocationKey	UserDefinedData	Keyref	To LocationKey in LocationDefinition
	tableGroupID	UserDefinedData	Unique	
	tableID	UserDefinedData	Unique	
	rowID	UserDefinedData	Unique	
	columnID	UserDefinedData	Unique	
	OperatorKey	UserDefinedData	KeyRef	To OperatorKey in OperatorDefinition
	TrackingKey	TrackCoordinates	Key	
	ObjectKey	TrackCoordinates	Keyref	To ObjectKey in ObjectDefinition
	StemLoadKey	TrackCoordinates	KeyRef	To StemLoadKey in StemLoad

YardingObject-Instruction	ObjectUserID	ObjectDefinition	Unique	
	SpeciesGroupUserID	ObjectDefinition	Unique	

Corrected constraints:

Schema	Constraint name	Constraint type	Comment
ForwardingDeliveryInstruction	ProductUserIDRefProductDefinition	KeyRef	correct selector and field values
ObjectInstruction	UniqueProductUserID	Unique	correct selector and field values



Arlinger John

27 April 2022

Schema defects found after last meeting

This document includes all errors and defects found in the schemas as decided at the meeting 2022-04-26. All these errors have been fixed in the present pre-release schemas.

RestrictedStringType

An error in RestrictedStringType was found. This is the updated type:

```
<xsd:simpleType name="RestrictedStringType">
  <xsd:restriction base="xsd:string">
    <xsd:pattern value="([\S-
[%?&lt;&gt;:&quot;&apos;/\\|*+]])+( ([\S-
[%?&lt;&gt;:&quot;&apos;/\\|*+]])+)*"/>
  </xsd:restriction>
</xsd:simpleType>
```

FeatureName

Element FeatureName (ogi and ogr) has a “unique” restriction. There is no need for this element to be unique.

The following constraint has thus been deleted from ogi and ogr:

```
<xsd:unique name="UniqueFeatureName">
  <xsd:selector xpath="sfd:Feature"/>
  <xsd:field xpath="sfd:FeatureName"/>
</xsd:unique>
```

GISCoordinateReferenceSystem

Element GISCoordinateReferenceSystem has the following description:

Coordinate reference system used for multipolygon/line/point, codes according to the EPSG database (<http://www.epsg.org/>).

Not used for individual coordinates registered by machine, e.g. per harvested stem or forwarder location. EPSG-value must have pre-fix "EPSG:" and after that at least four digit integer. Example of valid EPSG-value is "EPSG:3006"

The element used to have data type string. A new restriction type has therefore been added for GISCoordinateReferenceSystem that means that the value must have pre-fix "EPSG:" followed by four integer values:

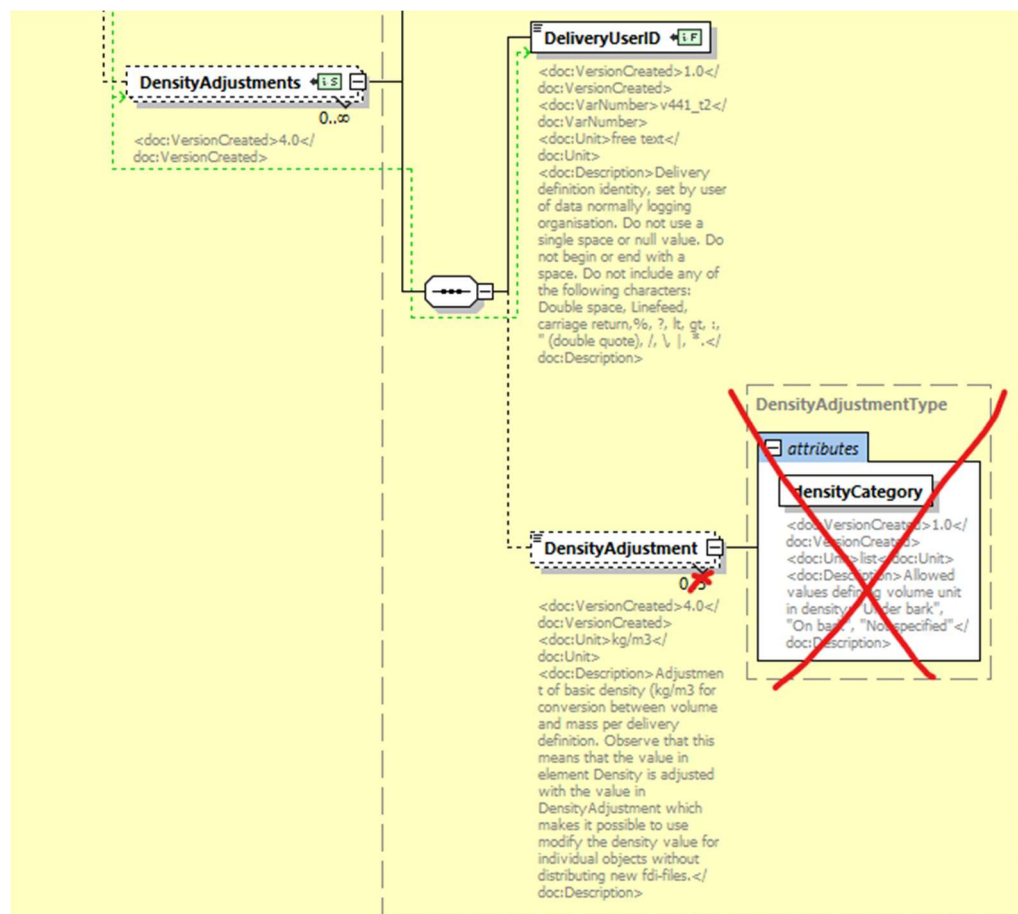
```
<xsd:simpleType name="GISCoordinateReferenceSystemType">
  <xsd:restriction base="xsd:string">
    <xsd:pattern value="EPSG:[1-9][0-9][0-9][0-9][0-9]*"/>
  </xsd:restriction>
</xsd:simpleType>
```

Density Adjustment in foi

2022-05-09

Density has been changed to non repeatable in fdi and without attribute DensityCategory.

DensityAdjustment has thus been made non repeatable and attribute denistyCategory has been deleted as the volume unit is defined once and for all in the fdi. DensityAdjustment is to remain optional.

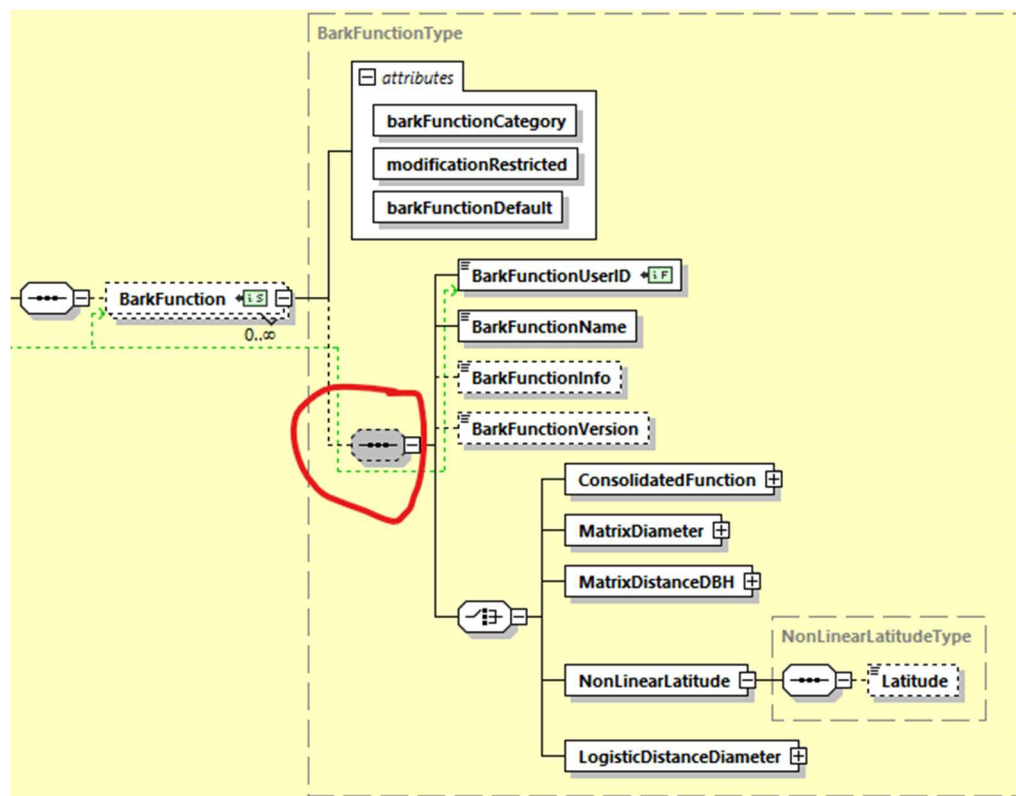


`DensityCategory` in `fpr` and `DensityCategoryType` in `CommonDefinition` have also been deleted.

BarkFunction structure

2022-05-10

Make sequence mandatory as illustrated below. It would otherwise be possible to e.g. specify that "Consolidated function" is to be used without included any parameters. In cases the NonLinearLatitude (old Skogforsk Scots pine) function is used it is possible to exclude element Latitude if this is to be set in the harvester.



Update description for BarkFunctionCategory:

Allowed values: **"None"**, "Consolidated", "MatrixDiameter", "MatrixDistanceDBH", "NonLinearLatitude" and "Logistic". **If this attribute is "None" the BarkFunction element is empty Observe that in case NonLinearLatitude function is used it is possible to exclude element Latitude when this parameter is to be set in harvester.**