

# Data Standards Workplan

Presenter: **David Herries**

Meeting Date: 7 October 2022



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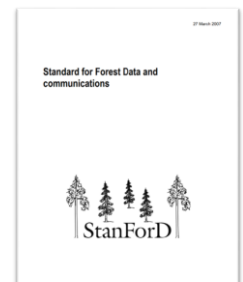
## BACKGROUND

- **What is the problem to solve?**
  - **Data fragmentation and translation**
    - A planting spade that records species name as “Species” and a drone that calls it “Crop” and a harvesting machine that calls it “SPP” ... is DBH in cm or mm ... is location in LatLong or NZTM ... is MTH the height of the 100 largest diameter trees per ha or the Avg HT of all trees...
  - **Ensure consistency in data so information can be shared through the life cycle of the forest supply chain and allowing innovation.**
  - **Realising data is the key element of making better decisions and implementing improvements in forest management; be it for chainsaw operator, machine operator, nursery packaging device, planter, or seedling lifter.**

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# StanForD

The old StanForD mainly comprises a data standard and a file-structure standard, but a Kermit-based communications protocol or standard for connecting a PC or data recorder to the machine computer on the harvester is also included. The usefulness of this part of the standard will diminish in pace with the growth in wireless data communications. Observe that no updates has been implemented since 2011-11-09.

[illegible]

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## Terms and concepts

- **Logging organisation** - The party responsible for logging - this may be the forest owner or an independent contractor
- **Delivery/location** - Delivery refers to how various products are to be managed in forwarding (e.g. separate product or combined with other products, e.g. as continuous payload) and location refers to a landing. In a graphical point where the harvested volumes are loaded onto the truck
- **Object** - Defined area where a measure (e.g. logging) is to be carried out. The same logging and forwarding instruction applies for the entire object. Normally, the entire object comprises a single contract in relation to the forest owner
- **Subobject** - Smaller, defined part of an object stand. Subobject can also be used for separate thinning from different logging classes (thinning, from the same object)
- **Product** - A price matrix according to the StanForD. Each product has its own definition
- **Species group** - One or more species that are managed according to the same instruction. Linked to the species group are, for example, bark function and calibration data for the measurement system on the bar (cut)
- **Key** - Usually a consecutive number that is not automatically by the machine computer to create measurability in the system. A key is never used, with the exception of SubObjectKey which is used when a new object is created, and LogKey which is used for each new run.



## Why is StanForD 2010 a stronger tool?

The new format and partly new structure in StanForD 2010 gives forestry an even more powerful tool for controlling and analysing the work of forest machines in fine detail. The following is a description of some advantages with StanForD 2010.

### XML-format

StanForD 2010 uses the XML format for storing information in a file structure. XML is an open, general format that is used in many applications where data is communicated. This can help avoid communication problems.

For software developers, XML is a standard in communication systems. It is that there are already many common solutions for reading and managing time and development resources. It is checked against the XML schema comply with the standard.

Even if XML files are large, they have zip compression, which saves transfer capacity. The compressed size is higher than the earlier StanForD 2000.

Advantages: The StanForD 2010 can store a large amount of data, which makes it possible to store a large amount of data in a single file. The data is stored in a structured way, which makes it easy to find and use. The data is also easy to transfer to other systems.

File	Content
Header.xml	Header information, such as file name, version, and date.
Object.xml	Object information, such as object name, location, and area.
Subobject.xml	Subobject information, such as subobject name, location, and area.
Product.xml	Product information, such as product name, location, and area.
Log.xml	Log information, such as log name, location, and area.
Measurement.xml	Measurement information, such as measurement name, location, and area.
Delivery.xml	Delivery information, such as delivery name, location, and area.
Stand.xml	Stand information, such as stand name, location, and area.
Species.xml	Species information, such as species name, location, and area.
Key.xml	Key information, such as key name, location, and area.

## StanForD2010

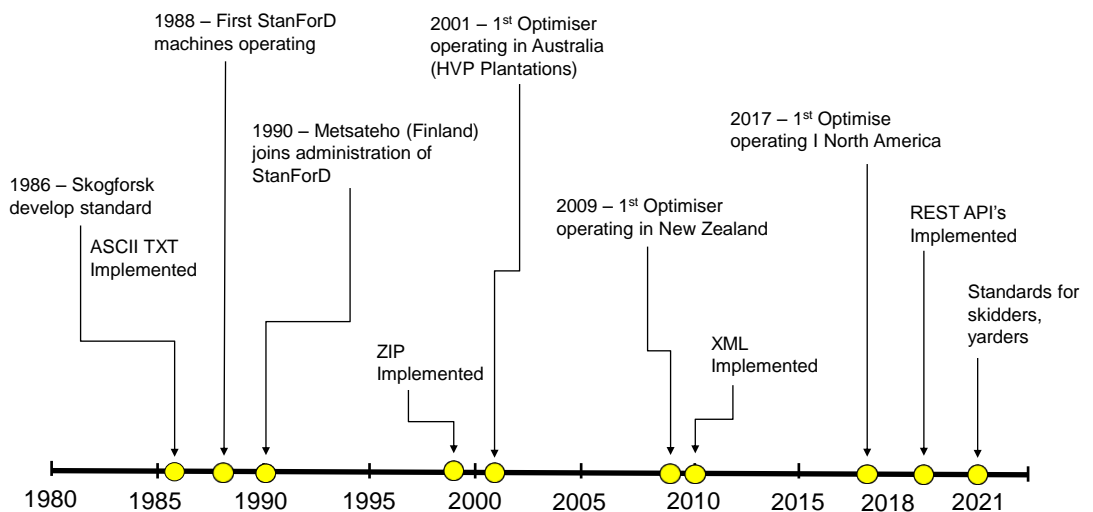
A project to develop a new standard version based on xml was started in 2006. The new StanForD2010 was decided during the spring of 2011. StanForD2010 is further described under StanForD2010.

## Management of StanForD

Skogforsk is responsible for the development and maintenance of the standard and receives financial support for this work from the manufacturers and Swedish forest enterprises. Most of the work is done by the StanForD secretary.

Representatives of the manufacturers and forest enterprises are welcome to attend the StanForD meetings, which are held twice a year—usually in Uppsala (Sweden) in April and October. Prior to these meetings, the individual countries usually hold their own meetings to discuss possible developments that could be put to the StanForD meeting. If new variables are needed, anyone may propose them by getting in touch with the secretary. New elements or attributes are considered at the meetings and, after approval, are added to the xml-schemas.

# History of StanForD



INTERPINE  
Bringing innovation to the forest industry



**skogforsk**

Forestry Research Institute of Sweden

[StanForD - Skogforsk - Forestry Research Institute of Sweden](#)



**John  
Arlinger**  
Researcher



**Johan  
Möller**  
Researcher

#### Partners

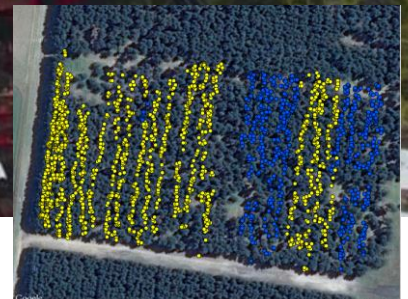
Tigercat  
Dasa  
LogMax  
Parker Hannifin Corp.  
Komatsu Forest AB  
Ponsse Oy  
Rotne AB  
John Deere Forestry  
Technion Oy  
LogSet Oy  
ForestPHD  
Biometria (previously SDC)  
CGI  
Skog-Data  
Coillté



**INTERPINE**  
INNOVATION

## STICKS Harvester Woodflow Management

managing wood-flow and customer demand the smart way



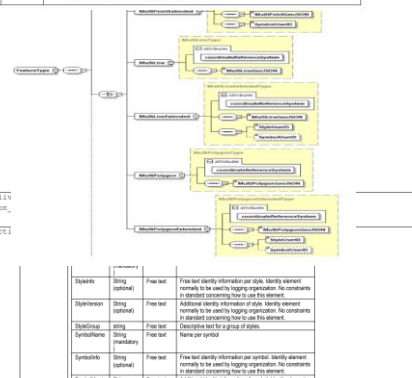
## StanForD Committee formally convene twice per year

### StanForD2010 naming and design rules

Date	Ver	Schemas	Schema documentation	Rules	Change history
2011-06-22	1.0	Released schemas 1.0		Rules 1.0	
2011-12-04	2.0	Released schemas 2.0	SchemaDoc 2.0	Rules 1.4	Change history 2.0
2013-02-05	2.1	Released schemas 2.1	SchemaDoc 2.1		Change history 2.1
2014-02-06	3.0	Released schemas 3.0	SchemaDoc 3.0		Change history
2015-02-06	3.1	Released schemas 3.1	SchemaDoc 3.1	Rules 1.5	Change history
2016-02-04	3.2	Released schemas 3.2	SchemaDoc 3.2		Change history
2017-02-06	3.3	Released schemas 3.3	SchemaDoc 3.3	Rules 1.6	Change history
2018-02-06	3.4	Released schemas 3.4	SchemaDoc 3.4		Change history
2019-02-07	3.5	Released schemas 3.5	SchemaDoc 3.5		Change history
2020-02-07	3.6*	Released schemas 3.6	SchemaDoc 3.6		Change history
2022-08-15	4.0	Released schemas 4.0	SchemaDoc 4.0		Change history

\*Observe that 3.6 was updated with new schemas for skidders and yarders 2021-02-07

21.6.2022	ObjectGeographicInstruction_V4p0.xsd	ROAR/JAS	<ul style="list-style-type: none"> <li>Added an <code>GISCoordinateReferenceSystem</code> attribute for every <code>GIS</code> type.</li> <li>Created <code>MultiPointExtended</code>, <code>MultiLineExtended</code> and <code>MultiPolygonExtended</code> types and put them in <code>GIS</code> data of original types and use them in <code>FeatureType</code> as can be seen in picture below</li> <li>Added an <code>AlarmCoordinates</code> and <code>BorderCoordinates</code> structures to <code>ObjectDefinitionObjectGeographicInstructionType</code></li> </ul>
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21.6.2022 ForwardingDeliveryInstruction\_V4p0.xsd  
21.6.2022 DesignInstruction\_V4p0.xsd

Object	Group	Free text	Free text
Skidders	(long optional)	Free text identify information per skid. Identify element normally to be used by logging organization. No constraints in standard concerning how to use this element.	
Skidderman	(long optional)	Free text	
Skidding	(long mandatory)	Free text	
Skiddername	(long mandatory)	Free text	
Skidderid	(long optional)	Free text	
Skidderinfo	(long optional)	Free text	

27.6.2022	StanForD2010CommonDefinitions_V4p0.xsd	ROAR/JAS	<ul style="list-style-type: none"> <li>Changed <code>SpeciesGroup</code> element to <code>SpeciesGroupID</code> element in <code>ControlSystemSettingsType</code> and <code>CommonCalibrationValuesType</code></li> </ul>
12.8.2022	All	ROAR/JAS	<ul style="list-style-type: none"> <li>Changed version attribute to "release_4.0" and versionDate attribute to "2022-08-15"</li> </ul>

## Why Consider StanForD?

- Why is StanForD: a data standard for forestry
  - (not just for harvesting/thinning/forwarding/loadout, but is there an opportunity to expand it to include NZ's needs for nurseries, seedling delivery, planting, surveillance, pruning etc).
- As we mechanize, automate or remotely assess things we should also not reinvent the wheel, as harvesting has been mechanizing, automating for many decades they have formulated a data standard.
- This data standard is reinforced by every manufacturer of harvesting equipment in the world. Also, every mechanized thinning machine in NZ today is already using it.

## **PLANNED WORK**

- **Ensure data structures that support data management requirements to interact across the workstreams**
- **Ad-here to existing data standards and uniformity in naming conventions and units.**
- **Ensure general open formats, making it simpler to implement in new innovations and products across the supply chain.**
- **Provide opportunity for new data standards creation and documentation.**

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## **PLANNED WORK**

- **It will be premature to develop a data model or conduct a large of work in this space without first arriving at the R&D step.**
- **But having this workstream alongside those creating and developing will be key.**

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# KEY MILESTONES AND TIMING

Milestone	Start	End	High Level Description
1. Workplan + Contract	1 Nov 22	30 Dec 22	Workplan completed and service agreement signed
2. Brainstorm and International Review	1 Dec 22	30 March 23	Initial meetings with FRG stakeholders, app platforms, science institutes, contractors, international data standards committees for forestry. Includes collating existing standards and feedback to a short form report. Review contribution to international standards as an option to fill gaps.
3. TST Attendance and Data Standards Review	Ongoing		Attendance at TST, focused on data standards in emerging research streams and the resulting technology and product innovations. Providing a short form report, to ensure alignment to international standards, or creation of commons standards across the work streams. This will aim to provide guidance on a project-by-project basis alongside Precision Silviculture workstreams in the 7yr R&D
4. Data Standards Workshop	1 May	31 May	Host workshop on data standards with key stakeholders (could be an annual workshop for the program every year)
5. Data Standards Development and Documentation	ad-hoc as required		Where emerging research, technologies and innovations require a formal development of a data standard to complement across workstream integration a project will be stood up.
11. Project Report	3 months prior to work program end		Final reporting, publishing of standards.

# KEY MILESTONES AND TIMING

Milestone	Costs
1. Workplan	\$1,498 one-off
2. Brainstorm and International Review	\$3,745 one-off
3. TST Attendance and Data Standards Review	\$1,873 per
4. Data Standards Workshop	\$6,741 per
5. Data Standards Development and Documentation	\$187.25/hr ad-hoc
7. Project Report	\$3,745 one-off

# INVOLVEMENT FROM INDUSTRY PARTNERS

Title / Function	Name
FRG Project Leader	TBA
FRG Technical Supervisor	TBA
Data Standards Reviewer	Interpine
Forest Company Representative (and Across Workstream's)	TST Representatives
Nursery Company Presentative (and Across Workstream's)	TST Representatives
Science Research Representative (and Across Workstream's)	Scion Research
Contractor/s (and Across Workstream's)	TBA or those within the TST Representatives
International Forestry Data Standards Committee	Skogforsk - StanForD

## Precision Silviculture Partnership

Your details here  
David Herries  
Interpine Group Ltd  
david@interpine.nz

www.fgr.nz

