Inspection Files

1. A new inspection file can contain one or more inspections.

New Inspection

1. An inspection must contain a set of Points.
2. An inspection must contain one or more Disorder records pertaining to the inspection.
3. An inspection may contain one or more Identification records pertaining to the inspection (i.e. identifications are optional).

Note - For historical reasons there are some duplicate serial numbers in the Forest Health database, and a new business rule has been implemented to stop this from re-occurring. During the interface update the serial number will be checked to make sure it only belongs to only one inspection; where this is not the case the inspection will be invalid and the update will not be done; an error log message will be written.

Validation Errors

1. XML data files will be validated against an XSD schema.
2. Attributes for Inspections, Disorders and Identifications will be validated according the validation rules specified below.
3. Updates will not proceed if there are any schema or attribute validation errors, or if the Inspection Serial Number is not unique.
4. An error log record will be written for each validation error, there may be more than one validation error for an inspection.
5. For XML elements that validate against reference tables, the lookup value must be valid or blank (if the value is not required). If a value is supplied it must be valid in the lookup table otherwise a validation error will occur.
6. An element is deemed as required if the target column in the Forest Health database is required (not null).
7. XML string elements are invalid if they are longer than the maximum length of the target database column.
8. XML element Boolean values must be represented as either the string value ‘True’ or ‘False’.
9. See also the ‘New Site’ section below.

Adding New Identifications to an Existing Inspection

1. Inserts new identifications for an existing inspection.
2. The parent inspection is identified by its serial number,
3. This serial number must be assigned to one and only one inspection record – a validation error occurs if this is not the case.

Adding New Site

1. A new site is will be added if the stand name does not exist in the site table for the current location (parent of site).
2. A valid location must be supplied for a site to be added.

XML Schema for Inspection

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema attributeFormDefault="unqualified" elementFormDefault="qualified" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="inspections">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="inspection" maxOccurs="unbounded" >
          <xs:complexType>
            <xs:sequence>
              <xs:element name="serialNumber" type="xs:string" />
              <xs:element name="forestManager" type="xs:string" />
              <xs:element name="location" type="xs:string" />
              <xs:element name="stand" type="xs:string" minOccurs="0"/>
              <xs:element name="siteId" type="xs:string" minOccurs="0" />
              <xs:element name="subSite" type="xs:string" minOccurs="0" />
              <xs:element name="bioRegion" type="xs:string" />
              <xs:element name="siteType" type="xs:string" minOccurs="0" />
              <xs:element name="date" type="xs:string" />
              <xs:element name="inspector" type="xs:string" minOccurs="0"/>
              <xs:element name="hostSpec" type="xs:string" minOccurs="0"/>
              <xs:element name="estabYear" type="xs:string" minOccurs="0"/>
              <xs:element name="treatment" type="xs:string" minOccurs="0"/>
              <xs:element name="stemsPerHa" type="xs:string" minOccurs="0"/>
              <xs:element name="diam" type="xs:string" minOccurs="0"/>
              <xs:element name="height" type="xs:string" minOccurs="0"/>
              <xs:element name="inspType" type="xs:string" minOccurs="0"/>
              <xs:element name="sampleType" type="xs:string" minOccurs="0"/>
              <xs:element name="comments" type="xs:string" minOccurs="0"/>
              <xs:element name="points">
                <xs:complexType>
                  <xs:sequence>
                    <xs:element name="datum" type="xs:string" />
                    <xs:element name="projection" type="xs:string" />
                    <xs:element name="comments" type="xs:string" minOccurs="0"/>
                    <xs:element maxOccurs="unbounded" name="point">
                      <xs:complexType>
                        <xs:sequence>
                          <xs:element name="east" type="xs:string" />
```

```
            <xs:element name="north" type="xs:string" />
            <xs:element name="err" type="xs:string" minOccurs="0"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="disorders">
  <xs:complexType>
    <xs:sequence>
      <xs:element maxOccurs="unbounded" name="disorder">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="name" type="xs:string" />
            <xs:element name="comments" type="xs:string" minOccurs="0"/>
            <xs:element name="agent" type="xs:string" minOccurs="0"/>
            <xs:element name="aspect" type="xs:string" minOccurs="0"/>
            <xs:element name="terrain" type="xs:string" minOccurs="0"/>
            <xs:element name="position" type="xs:string" minOccurs="0"/>
            <xs:element name="type" type="xs:string" minOccurs="0"/>
            <xs:element name="severity" type="xs:string" minOccurs="0" />
            <xs:element name="severityPercent" type="xs:string" minOccurs="0" />
            <xs:element name="extent" type="xs:string" minOccurs="0" />
            <xs:element name="incidencePercent" type="xs:string" minOccurs="0" />
            <xs:element name="isSampleTaken" type="xs:string" minOccurs="0" />
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
<xs:element name="identifications" minOccurs="0">
  <xs:complexType>
    <xs:sequence>
            <xs:element maxOccurs="unbounded" name="identification">
              <xs:complexType>
                <xs:sequence>
                  <xs:element name="name" type="xs:string" />
                  <xs:element name="agent" type="xs:string" minOccurs="0" />
```

```
                                <xs:element name="family" type="xs:string" minOccurs="0" />
                                <xs:element name="type" type="xs:string" minOccurs="0"/>
                                <xs:element name="labDate" type="xs:string" minOccurs="0"/>
                                <xs:element name="dateIdentified" type="xs:string" minOccurs="0"/>
                                <xs:element name="person" type="xs:string" minOccurs="0"/>
                                <xs:element name="cultureNo" type="xs:string" minOccurs="0"/>
                                <xs:element name="retained" type="xs:string" />
                                <xs:element name="herbariumNo" type="xs:string" minOccurs="0"/>
                                <xs:element name="confidence" type="xs:string" minOccurs="0"/>
                                <xs:element name="effect" type="xs:string" minOccurs="0"/>
                                <xs:element name="comments" type="xs:string" minOccurs="0"/>
                            </xs:sequence>
                        </xs:complexType>
                    </xs:element>
                </xs:sequence>
            </xs:complexType>
        </xs:element>
    </xs:sequence>
</xs:complexType>
</xs:element>
</xs:schema>
```

Xml Schema for Adding Additional Identifications

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema attributeFormDefault="unqualified" elementFormDefault="qualified"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="identifications">
    <xs:complexType>
      <xs:sequence>
        <xs:element maxOccurs="unbounded" name="identification">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="serialNumber" type="xs:string" />
              <xs:element name="name" type="xs:string" />
              <xs:element name="agent" type="xs:string" />
              <xs:element name="family" type="xs:string" />
              <xs:element name="type" type="xs:string" />
              <xs:element name="labDate" type="xs:string" />
              <xs:element name="dateIdentified" type="xs:string" />
              <xs:element name="person" type="xs:string" />
              <xs:element name="cultureNo" type="xs:string" />
              <xs:element name="retained" type="xs:string" />
              <xs:element name="herbariumNo" type="xs:string" />
              <xs:element name="confidence" type="xs:string" />
              <xs:element name="effect" type="xs:string" />
              <xs:element name="comments" type="xs:string" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

Note, the same validation rules for identifications apply to this schema, with the addition that serialNumber references valid and unique existing inspection to which these identifications will be added.

Inspection

The table below defines the XML elements for the Inspection related fields in the Inspections XML interface file and the type and validations applied to these elements.

	Validations					
XML Element Name	Type	Size	Required	XML Format	Range/Reference Table Lookup	Target column (of Inspection)
serialNumber	char	1-20	Yes		Required, error if not unique in Inspection table	serial_number
forestManager	char	1-100	Yes		Lookup on Organisation_name of Organisation	
location	char	1-50	Yes		Lookup on location_name on Location.	
stand	char	1-50	No		Lookup on stand in site table, or create new site if not found for the location.	
siteId	int		No		Where the site_id is known for an existing site, it should be included here. If it is provided, it will be used as a cross-check on the stand lookup. Leave blank for a new site	site_id
subSite	char	1-50	No	BB-HHH nnnnn If inspType = HRS, otherwise unconstrained	Lookup on sub-site in sub-site table, or create new sub-site if not found. For high-risk sites (HRS) sub-sites are transect numbers, in which BB-HHH is the Risk Site Area code (the BB is usually but not always the bioregion Crosby code); nnnnn is number within the RSA. Transect numbers are unique within the database (except for discretionary transects beginning with NZ-DSC), and are therefore sufficient to identify both the subsite and the site. If a transect already exists it is not essential to include stand and siteId as well as subSite. To create a new transect, the stand must be identified by stand and optionally by siteId.	
bioregion	char	1-4	Yes		Lookup on Bioregion_code on bioregion (Crosby region)	
siteType	char	1-4	No		Lookup on site_type_code of site_type (used for site record)	
sampleType	char	1-4	No		Lookup on sample_type_code of sample_type	sample_type_id
date	date		Yes	YYYY-MM-DD	Range (current year – 1) to current year,	date_inspected
inspector	char	1-50	No		Lookup on Inspector_name of inspector	inspector_id
hostSpec	char	1-80	No		Lookup on botanical_name from species	species_id
estabYear	int		No	YYYY	4 digit year - range 1900 to current year	species_estab_year
treatment	char	1-4	No		Lookup on treatment_code of treatment	treatment_id
stemsPerHa	int		No		Range 0 to maximum specified in configuration settings	stems_per_hectare
diam	float		No	5.3	Range 0.0 to maximum specified in configuration settings	species_diam

height	float		No	5.3	Range 0 to maximum specified in configuration settings	species_height
inspType	char	1-5	No		Lookup on inspection_type_code	inspection_type_id
comments	char	0-255	No		Error if > 255 chars	disorder_comments

Additional Validation Rules:

1. An error occurs for the entire inspection if any of the lookups fail to validate – the inspection will be placed in the error bin if this happens and will not be loaded into the Forest Health database.
2. Location validation is restricted to the subset of locations managed by the specified Forest Manger and visible to the user initiating the upload. Note that administrators can view all locations.

Feature (of Inspection)

The table below defines the XML elements for the Points related fields in the Inspections XML interface file and the type and validations applied to these elements.

	Validations					
XML Element Name	Type	Size	Required	XML Format	Range/Reference Table Lookup	Target column (of feature)
datum	char	8	Yes		Lookup on datum code in datum table (e.g. NZGD2000)	datum_id
projection	char	8	Yes		Lookup on projection code in projection table (e.g. NZTM2000)	projection_id
comments	char	500	No		Omit if not required	comments

Point

The table below defines the XML elements for the Points related fields in the Inspections XML interface file and the type and validations applied to these elements.

	Validations				
XML Element Name	Type	Size	Required	XML Format	Range/Reference Table Lookup
east	float		Yes	5.3	Easting within range supported by projection
north	float		Yes	5.3	Northing within range supported by projection
err	float		No	5.3	HDOP accuracy, omit if not known

Additional Validation Rules:

1. The Inspections XML interface file must contain one or more point elements. An inspection without points will be rejected.

Disorders

The table below defines the XML elements for the disorder related fields in the Inspections XML interface file and the type and validations applied to these elements.

	Validations					
XML Element Name	Type	Size	Required	XML Format	Range/Reference Table Lookup	Target column (of Disorders)
name	char	1-50	yes		Error if blank or > 50	disorder_name
comments	char	0-2000	No		Error if > 2000	disorder_comments
agent	char	1-100	No		Lookup on agent_name of agent	agent-id
aspect	char	1-4	No		Lookup on aspect_code of aspect	aspect_id
terrain	char	1-4	No		Lookup on terrain_code of terrain	terrain_id
position	char	1-4	No		Lookup on disorder_position_code of disorder_position	disorder_position_id
type	char	1-2	No		Lookup on disorder_type_code of disorder_type	disorder_type_id
severity	char	1-2	No		Lookup on disorder_severity_code of disorder_severity	disorder_severity_id
severityPercent	Float		No		0.0 to 100.00 %	disorder_severity_pc
extent	char	1-2	No		Lookup on disorder_extent_code of disorder_extent	disorder_extent_id
incidencePercent	float		No		0.0 to 100.00 %	disorder_incident_pc
isSampleTaken	bool		No		Must be entered as ‘True’ or ‘False’ or ‘Y’ or ‘N’ or ‘1’ or ‘0’	

Additional Validation Rules:

1. The Inspections XML interface file must contain at least one disorder complex XML types (i.e. disorder record). If no disorder records are present a validation error will occur and the entire inspection will be discarded.
2. An error occurs for the entire inspection if any of the lookups fail to validate – the inspection will be placed in the error bin if this happens and will not be loaded into the Forest Health database.

Identifications

The table below defines the XML elements for the identification related fields in the Inspections XML interface file and the type and validations applied to these elements.

	Validations					
XML Element Name	Type	Size	Required	XML Format	Range/Reference Table Lookup	Target column (of Identifications)
name	char	1-76	Yes		Error if > 76 chars	identification_name
agent	char	1-100	No		Lookup on agent_name of agent	agent_id
family	char	1-25	No		Lookup on family_name of family	family_id
type	char	1-2	no		Lookup on identification_type_code of identification_type	identification_type_id
labDate	date		No	YYYY-MM-DD	(Current year minus 1 to current date)	date_received_in_lab
dateIdentified	date		No	YYYY-MM-DD	(Current year minus 1 to current date)	date_identified
person	char	1-50	No		Error if > 50 chars	person of identification
cultureNo	char	1-20	No		Error if > 20 chars	culture_number
retained	bool		Yes		Must be entered as 'True' or 'False' or 'Y' or 'N' or '1' or '0'	retained of identification
herbariumNo	char	1-20	No		Error if > 20 chars	herbarium_number
confidence	char	1	No		Lookup on confidence_code of confidence	confidence_id
effect	char	1	No		Lookup on effect_code of effect	effect_id
comments	char	0-2000	No		Error if > 2000 chars	identification_comments

Additional Validation Rules:

1. The Inspections XML interface file may contain zero or more identification complex XML types (i.e. identification record) – that is, identification records are optional. Note, identifications for an inspection can also be added via a separate XML interface file at a later date if required.
2. An error occurs for the entire inspection if any of the lookups fail to validate – the inspection will be placed in the error bin if this happens and will not be loaded into the Forest Health database.

Implementation notes on recording spatial points

Each incoming feature specifies a datum and projection, which affect the interpretation of the point or points within that feature. As far as possible, the objective is to store the point in the database with both old and new coordinate systems where, in general terms, old indicates NZMG and new indicates NZTM. The datum and projection values stored for each feature in the database denote the basis for the "new" coordinates.

The action taken for a point depends on the projection specified for the parent feature.

Incoming projection	Permitted incoming datum	Area	Attributes of point in database				
			easting, northing	latitude, longitude	Latitude_old, longitude_old	nzmg_e, nzmg_n	is_ converted
NZMG1949	NZGD1949, WGS84	NZ	Conversion of NZGD2000 lat/long to NZTM2000 e,n	Transformation of NZGD1949 lat/long to NZGD2000 lat/long	Conversion of NZMG to lat/long (NZGD1949)	As supplied	true
NZTM2000	NZGD2000	NZ	As supplied	Conversion of NZTM to lat/long (NZGD2000)	Transformation of NZGD2000 lat/long to NZGD1949 lat/long	Conversion of NZGD1949 lat/long to NZMG e,n	false
CITM2000	NZGD2000	Chatham Islands	As supplied	Not converted	Not converted	Not converted	false
AKTM2000	NZGD2000	Snares and Auckland Islands	As supplied	Not converted	Not converted	Not converted	false
CATM2000	NZGD2000	Campbell Island	As supplied	Not converted	Not converted	Not converted	false
AITM2000	NZGD2000	Antipodes and Bounty Islands	As supplied	Not converted	Not converted	Not converted	false
RITM2000	NZGD2000	Raoul Island, Kermadec Islands	As supplied	Not converted	Not converted	Not converted	false