SFVI Data Model
Version 3.0

Forest Service, SE
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This SFVI data model is based on Saskatchewan Forest Vegetation Inventory manual (2004 Forest Service).

Objectives

To provide a data model and data dictionary for SFVI attributes

Rationale

Database design is flexible; data tables are small (less entities) and expandable.
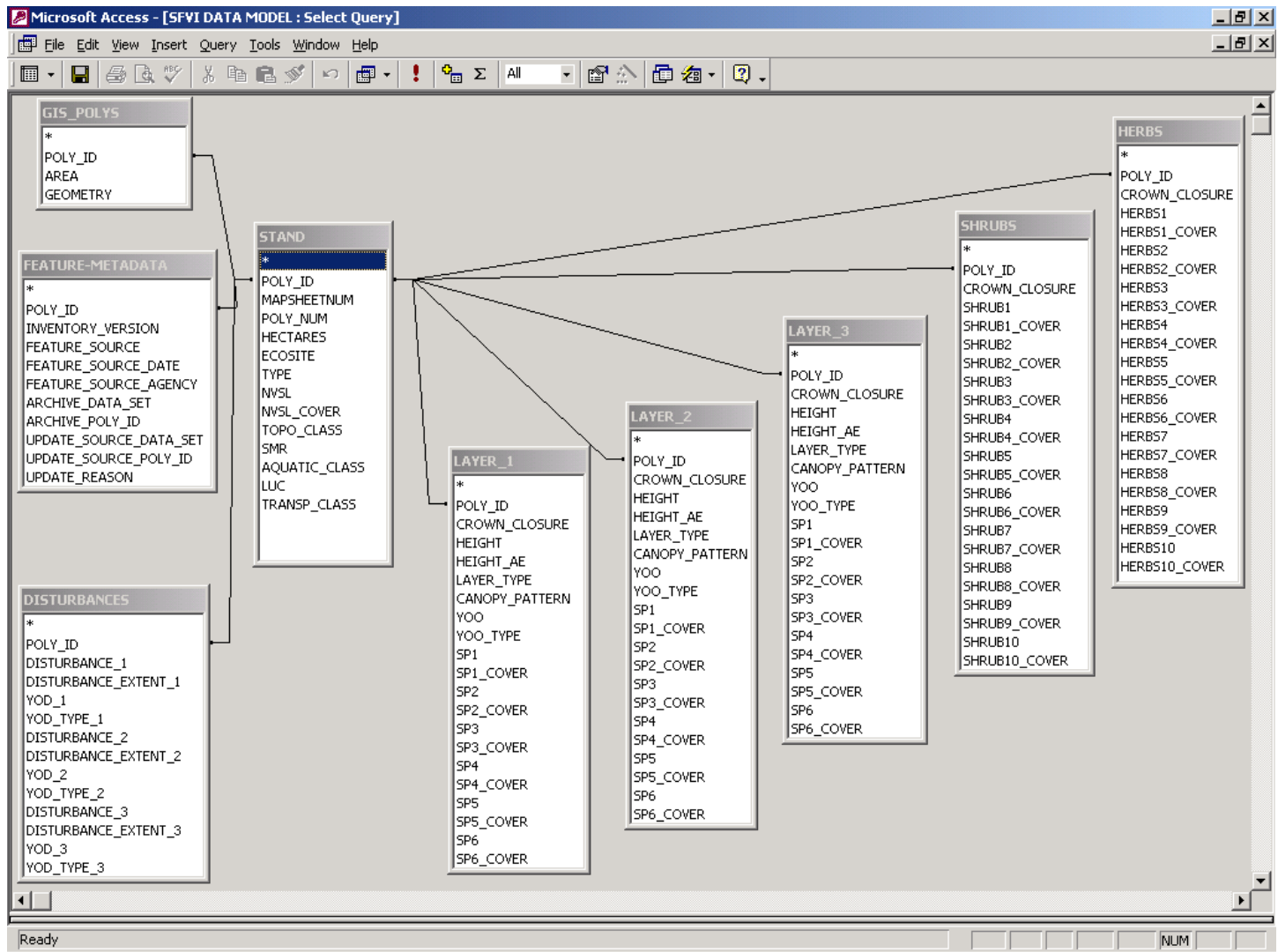
Data Model Diagram

Figure 1.   SFVI Data Model

Descriptions

There is only one spatial data table (GIS_polys) in the SFVI data model. The data entered into GIS_polys table must be in ESRI Arc GIS format.

There are eight attribute tables related to GIS_polys spatial data table. These include five vegetation layers, one stand characteristics table, one metadata file and one disturbance table.

Since all tables have a primary key "POLY_ID", they can be linked to each other according to request.

There are also 14 attribute list tables (lookup tables). No data entries are required for those tables. They are defined by SFVI manual and can be used for data entry prompting and error checking.

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   STAND   FEATURE_METADATA        LAYER_1  LAYER_2  LAYER_3    SHRUBS    HERBS   DISTURBANCES
    _|_____                     |_____|_____|        ___|____   __|__   _____|_____
   L_Aquatic                       L_Age_adj_Factor           L_Shrubs   L_Herbs  L_Disturbance
   L_Stand_Type                    L_CanopyPattern                                L_Ext_Disturbance
   L_LUC                           L_SP
   L_NVSL                          L_Layer_Type
   L_SMR
   L_Topo_Class
   L_Transp_Class
```

Figure 2.   Lookup Table Relationship

An MS Access database, SFVI_tables.mdb, was created for the above ASPATIAL and LOOKUP tables. Simple descriptions can be found in the Access database. Most information on SFVI manual will be included in the future (add description or comment field later). Data field validation rules are not built yet.

Table Structures

1.   GIS_POLYS

Field	Name	Type	Width	Decimal	Index	Not Null
1	POLY_ID	NUM	12		Y	Y
4	AREA	NUM	11	2	N	Y
	total		23			
7	GEOMETRY	SPATIAL (vector)			N	Y

If the spatial data are in ARC/INFO format, GEOMETRY will include GIS_POLYS.PAT, GIS_POLYS.BND, GIS_POLYS.TIC and GIS_POLYS.AAT.

2.   FEATURE_METADATA

Field	Name	Type	Width	Decimal	Index	Not Null
1	POLY_ID	NUM	12		Y	Y
2	INVENTORY_VERSION	CHAR	4		N	Y
3	FEATURE_SOURCE	CHAR	10		N	Y
4	FEATURE_SOURCE_DATE	DATE	10		N	Y
5	FEATURE_SOURCE_AGENCY	CHAR	10		N	Y
6	ARCHIVE_DATA_SET	CHAR	10		N	N
7	ARCHIVE_POLY_ID	NUM	12		N	N
8	UPDATE_SOURCE_ DATA_SET	CHAR	10		N	N
9	UPDATE_SOURCE _POLY_ID	NUM	12		N	N
10	UPDATE_REASON	CHAR	15		N	N
	total		105			

3.   STAND

Field	Name	Type	Width	Decimal	Index	Not Null
1	POLY_ID	NUM	12		Y	Y
2	MAPSHEET_NUM	NUM	7		N	Y
3	POLY_NUM	NUM	4		N	Y
4	HECTARES	NUM	9	4	N	Y
5	ECOSITE	CHAR	6		Y	Y
6	TYPE	CHAR	3		N	N
7	NVSL	CHAR	2		N	N
8	NVSL_COVER	NUM	3		Y	Y
9	TOPO_CLASS	CHAR	1		N	Y
10	SMR	CHAR	2		N	Y
11	AQUATIC_CLASS	CHAR	2		N	Y
12	LUC	CHAR	3		N	Y
13	TRANSP_CLASS	CHAR	3		N	Y
	total		57			

4   LAYER_1, LAYER_2 AND LAYER_3

Field	Name	Type	Width	Decimal	Index	Not Null
1	POLY_ID	NUM	12		Y	Y
2	CROWN_CLOSURE	NUM	3		N	Y
3	HEIGHT	NUM	2		N	Y
4	HEIGHT_AE	NUM	2		N	Y
5	LAYER_TYPE	CHAR	1		N	Y
6	CANOPY_PATTERN	CHAR	2		N	Y
7	YOO	NUM	4		N	Y
8	YOO_TYPE	CHAR	1		N	Y
9	SP1	CHAR	2		N	Y
10	SP1_COV	NUM	2		N	Y
11	SP2	CHAR	2		N	N
12	SP2_COV	NUM	1		N	N
13	SP3	CHAR	2		N	N
14	SP3_COV	NUM	1		N	N
15	SP4	CHAR	2		N	N
16	SP4_COV	NUM	1		N	N
17	SP5	CHAR	2		N	N
18	SP5_COV	NUM	1		N	N
19	SP6	CHAR	2		N	N
20	SP6_COV	NUM	1		N	N
	total		46			

5.   SHRUBS

Field	Name	Type	Width	Decimal	Index	Not Null
1	POLY_ID	NUM	12		Y	Y
2	CROWN_CLOSURE	NUM	3		N	Y
3	SHRUB1	CHAR	2		N	Y
4	SHRUB1_COVER	NUM	2		N	N
5	SHRUB2	CHAR	2		N	N
6	SHRUB2_COVER	NUM	1		N	N
7	SHRUB3	CHAR	2		N	N
8	SHRUB3_COVER	NUM	1		N	N
9	SHRUB4	CHAR	2		N	N
10	SHRUB4_COVER	NUM	1		N	N
11	SHRUB5	CHAR	2		N	N
12	SHRUB5_COVER	NUM	1		N	N
13	SHRUB6	CHAR	2		N	N
14	SHRUB6_COVER	NUM	1		N	N
15	SHRUB7	CHAR	2		N	N
16	SHRUB7_COVER	NUM	1		N	N
17	SHRUB8	CHAR	2		N	N
18	SHRUB8_COVER	NUM	1		N	N
19	SHRUB9	CHAR	2		N	N
20	SHRUB9_COVER	NUM	1		N	N
21	SHRUB10	CHAR	2		N	N

Field	Name	Type	Width	Decimal	Index	Not Null
22	SHRUB10_COVER	NUM	1		N	N
	total		46			

6.   HERBS

Field	Name	Type	Width	Decimal	Index	Not Null
1	POLY_ID	NUM	12		Y	Y
2	CROWN_CLOSURE	NUM	3		N	Y
3	HERB1	CHAR	2		N	Y
4	HERB1_COVER	NUM	2		N	Y
5	HERB2	CHAR	2		N	N
6	HERB2_COVER	NUM	1		N	N
7	HERB3	CHAR	2		N	N
8	HERB3_COVER	NUM	1		N	N
9	HERB4	CHAR	2		N	N
10	HERB4_COVER	NUM	1		N	N
11	HERB5	CHAR	2		N	N
12	HERB5_COVER	NUM	1		N	N
13	HERB6	CHAR	2		N	N
14	HERB6_COVER	NUM	1		N	N
15	HERB7	CHAR	2		N	N
16	HERB7_COVER	NUM	1		N	N
17	HERB8	CHAR	2		N	N
18	HERB8_COVER	NUM	1		N	N
19	HERB9	CHAR	2		N	N
20	HERB9_COVER	NUM	1		N	N
21	HERB10	CHAR	2		N	N
22	HERB10_COVER	NUM	1		N	N
	total		46			

7.   DISTURBANCES

Field	Name	Type	Width	Decimal	Index	Not Null
1	POLY_ID	NUM	12		Y	Y
3	DISTURBANCE_1	CHAR	2		N	Y
4	DISTURBANCE_EXTENT_1	NUM	1		N	Y
5	YOD_1	NUM	4		N	N
6	YOD_TYPE_1	CHAR	1		N	N
3	DISTURBANCE_2	CHAR	2		N	Y
4	DISTURBANCE_EXTENT_2	NUM	1		N	Y
5	YOD_2	NUM	4		N	N
6	YOD_TYPE_2	CHAR	1		N	N
3	DISTURBANCE_3	CHAR	2		N	Y
4	DISTURBANCE_EXTENT_3	NUM	1		N	Y
5	YOD_3	NUM	4		N	N
6	YOD_TYPE_3	CHAR	1		N	N
	total		36			

Data Dictionary

1.   GIS_POLYS

Attribute	Polygon identification number
Abbreviation	POLY_ID
Description	GIS unique polygon number
Measurement criteria	
Standard	Index field
Permit values/range	1 – 999999999999
Input Type	Numeric
Width	12
Decimals	
Default	Must have value

Attribute	Polygon area
Abbreviation	AREA
Description	GIS polygon area in square metres
Measurement criteria	
Standard	
Permit values/range	≥ 0.5
Input Type	Numeric
Width	11
Decimals	2
Default	Must have value

Attribute	Polygon geometry
Abbreviation	GEOMETRY
Description	Geometry of inventory, usually SDE or Shapefiles
Measurement criteria	
Standard	
Permit values/range	
Input Type	Spatial
Width	
Decimals	
Default	Must have spatial coverage

2.   FEATURE_METADATA

POLY_ID has been defined in the above.

Attribute		Inventory Version
Abbreviation		INVENTORY_VERSION
Description		Forest vegetation inventory method
Measurement criteria		
Standard		
Permit values/range		SFVI, WFVI, ETC
Input	Type	Character
	Width	4
	Decimals	
	Default	Must have

Attribute		Inventory Feature Source
Abbreviation		FEATURE_SOURCE
Description		Photo Type, Scale, Imagery Type, GPS, etc.
Measurement criteria		
Standard		
Permit values/range		
Input	Type	Character
	Width	10
	Decimals	
	Default	Must have

Attribute		Inventory Feature Source Date
Abbreviation		FEATURE_SOURCE_DATE
Description		Year of Feature Captured
Measurement criteria		
Standard		Month/Day/Year
Permit values/range		06/19/2003
Input	Type	Date
	Width	10
	Decimals	
	Default	Must have

Attribute		Feature Source Agency
Abbreviation		FEATURE_SOURCE_AGENCY
Description		Source creator
Measurement criteria		
Standard		
Permit values/range		FSB, Fire Mgt, WeyCo, Mistik, Etc.
Input	Type	Character
	Width	10
	Decimals	
	Default	Must have

Attribute		Archive data set
Abbreviation		ARCHIVE_DATA_SET
Description		History data archived
Measurement criteria		
Standard		
Permit values/range		
Input	Type	Character
	Width	10
	Decimals	
	Default	

Attribute		Archive polygon ID
Abbreviation		ARCHIVE_POLY_ID
Description		History polygon ID
Measurement criteria		
Standard		
Permit values/range		
Input	Type	Numeric
	Width	12
	Decimals	
	Default	

Attribute	Update Source data set
Abbreviation	UPDATE_SOURCE_DATA_SET
Description	Depletions Layer, Feature_update_layer, etc.
Measurement criteria	
Standard	
Permit values/range	
Input Type	Character
Width	10
Decimals	
Default	

Attribute	Update Source polygon ID
Abbreviation	UPDATE_SOURCE _POLY_ID
Description	
Measurement criteria	
Standard	
Permit values/range	
Input Type	Numeric
Width	12
Decimals	
Default	

Attribute	Update Reason
Abbreviation	UPDATE_REASON
Description	Burn, Harvest, BlowDown, I&D, etc
Measurement criteria	
Standard	
Permit values/range	
Input Type	Character
Width	15
Decimals	
Default	

3.   STAND

Attribute	MAP SHEET NUMBER	
Abbreviation	MAPSHEET_NUM	
Description	UTM map tile number	
Measurement criteria		
Standard	Index field	
Permit values/range	1256596 - 1432587	
Input Type	Numeric	
Width	7	
Decimals		
Default	Must have value	

Attribute	Polygon number	
Abbreviation	POLY_NUM	
Description	Numbered by map sheet from left/top to right/bottom *generated based on polygon positions*	*or*
Measurement criteria		
Standard	Index field	
Permit values/range	1 - 9999	
Input Type	Numeric	
Width	4	
Decimals		
Default	Must have value	

Attribute	Ecosite
Abbreviation	ECOSITE
Description	Stand ecosite classification, not interpreted from photo
Measurement criteria	
Standard	
Permit values/range	
Input Type	Character
Width	6
Decimals	
Default	

Attribute	Stand type
Abbreviation	TYPE
Description	Class Code
Measurement criteria	
Standard	
Permit values/range	SWD, HWD, MWD, SHB, HRB, WTR, LND
Input Type	Character
Width	3
Decimals	
Default	

Attribute	Non-Vegetated Surface Layer
Abbreviation	NVSL
Description	Class Code
Measurement criteria	
Standard	
Permit values/range	UK, CB, RK, SA, MS, GR, SB, WA
Input Type	Character
Width	2
Decimals	
Default	

Attribute	Non-Vegetated Surface Layer Coverage
Abbreviation	NVSL_COVER
Description	% of stand in NVSL code
Measurement criteria	to nearest 1%
Standard	
Permit values/range	1 - 100
Input Type	Numeric
Width	3
Decimals	
Default	

Attribute	Topographic class	
Abbreviation	TOPO_CLASS	
Description	Description of percentage of vertical rise relative to horizontal distance	
Measurement criteria	Location relief and percentage of slope	
Standard		
Permit values/range	D, F, U, H, S, G	
Input	Type	Character
	Width	1
	Decimals	
	Default	

Attribute	Soil moisture regime	
Abbreviation	SMR	
Description	A relative ranking of sites based on their available moisture supply	
Measurement criteria	Soil moisture and texture	
Standard		
Permit values/range	VD, D, MF, F, VF, MM, M, VM, MW, W, VW	
Input	Type	Character
	Width	2
	Decimals	
	Default	

Attribute	Aquatic Feature Class	
Abbreviation	AQUATIC_CLASS	
Description	Aquatic Classification - Code	
Measurement criteria		
Standard		
Permit values/range	LA, RI, ST, IS, FL, SF, FP, DI, RA, FA, RF, DM, SN, BL	
Input	Type	Character
	Width	2
	Decimals	
	Default	

Attribute		Land Use Category
Abbreviation		LUC
Description		Anthropogenic Land Use Classification - code
Measurement criteria		
Standard		
Permit values/range		ALA, POP, REC, PEX, GPI, BPI, MIS, ASA, NSA, OIS, OUS, AFS, CEM, WEH, TOW
Input	Type	Character
	Width	3
	Decimals	
	Default	

Attribute		Transportation Class
Abbreviation		TRANSP_CLASS
Description		Transportation Feature Classification - code
Measurement criteria		
Standard		
Permit values/range		RWC, RRC, TLC, PLC, MPC
Input	Type	Character
	Width	3
	Decimals	
	Default	

4.	LAYER_1, LAYER_2 and LAYER_3

POLY_ID has been defined in the above.

Attribute	Crown Closure of the tree layer
Abbreviation	CROWN_CLOSURE
Description	Percentage of crown closure of the tree layer
Measurement criteria	Percentage
Standard	
Permit values/range	5 – 100%
Input Type	Numeric
Width	3
Decimals	
Default	Must have value

Attribute	Average Height of the tree layer
Abbreviation	HEIGHT
Description	Interpreted average height of the tree layer
Measurement criteria	Meter
Standard	Must be 3 meters difference between layers
Permit values/range	1 – 50
Input Type	Numeric
Width	2
Decimals	
Default	Must have value

Attribute	Allowable Error of Average height of complex stand
Abbreviation	HEIGHT_AE
Description	Interpreted allowable error, ie. ±3
Measurement criteria	Meter
Standard	Must be 3 meters difference between layers
Permit values/range	> 1
Input Type	Numeric
Width	2
Decimals	
Default	

Attribute	Tree layer type	
Abbreviation	LAYER_TYPE	
Description	Distinguished by the height characteristics of the species in the stand	
Measurement criteria	Single, multiple and complex	
Standard		
Permit values/range	S, M and C	
Input Type	Character	
Width	1	
Decimals		
Default	Must have	

Attribute	Canopy pattern	
Abbreviation	CANOPY_PATTERN	
Description	The spatial arrangement of the trees by layer in a stand	
Measurement criteria	Distribution of trees	
Standard		
Permit values/range	P1, P2, P3, P4, P5 an P6	
Input Type	Character	
Width	2	
Decimals		
Default	Must have value	

Attribute	Year of origin of the stand	
Abbreviation	YOO	
Description	Year of stand germinating	
Measurement criteria	Year	
Standard		
Permit values/range	Four digits in year or decade	
Input Type	Numeric	
Width	4	
Decimals		
Default	Must have	

Attribute	Type of YOO recorded
Abbreviation	YOO_TYPE
Description	Use "a" for knowing exact year and use "d" for estimated year
Measurement criteria	Annual or decade
Standard	
Permit values/range	a or d
Input Type	Character
Width	1
Decimals	
Default	Must have

Attribute	Tree species
Abbreviation	SP1, SP2, SP3, SP4, SP5 and SP6
Description	Ordered by percentage of species
Measurement criteria	≥ 10%
Standard	
Permit values/range	wS, bS, jP, bF, tL, lP, tA, bP,wB, gA, mM, wE, bO, rP, sP, sL, pC
Input Type	Character
Width	2
Decimals	
Default	Must have SP1

Attribute	Species composition
Abbreviation	SP1_COVER, SP2_COVER, … SP6_COVER
Description	Contribution of tree species to the overall tree cover
Measurement criteria	Percentage in 10% classes
Standard	
Permit values/range	1, 2, … 10 for SP1_COVER, 1,2,…9 for the rest
Input Type	Numeric
Width	2 for SP1_COVER and 1 for the rest
Decimals	
Default	Must have SP1_COVER

5. SHRUBS

Attribute	Crown closure of shrubs
Abbreviation	CROWN_CLOSURE
Description	Percentage of vertical projection of shrubs crowns
Measurement criteria	Percentage
Standard	
Permit values/range	1 – 100%
Input Type	Numeric
Width	3
Decimals	
Default	Must have value

Attribute	Shrub species
Abbreviation	SHRUB
Description	Ordered by percentage of shrub species
Measurement criteria	≥ 10%
Standard	
Permit values/range	Ts,Al,Bh,Ma,Sa,Pc,Cr,Wi,Ls,Ro,Bi,Bu,Dw,Ra,Cu,Sn,Bb,Ci,Bl,La,Le,Be,Lc
Input Type	Character
Width	2
Decimals	
Default	Must have SHRUB1

Attribute	Shrub species composition
Abbreviation	SHRUB1_COVER, SHRUB2_COVER, … SHRUB10_COVER
Description	Contribution of shrub species to the overall shrub cover
Measurement criteria	Percentage in 10% classes
Standard	
Permit values/range	1, 2, … 10
Input Type	Numeric
Width	2 for SHRUB1_COVER and 1 for the rest
Decimals	
Default	Must have SHRUB1_COVER

6   HERBS

Attribute	Crown closure of herbaceous
Abbreviation	CROWN_CLOSURE
Description	Percentage of vertical projection of herbaceous crowns
Measurement criteria	Percentage
Standard	
Permit values/range	1 – 100%
Input Type	Numeric
Width	3
Decimals	
Default	Must have value

Attribute	Herbaceous species
Abbreviation	HERB
Description	Ordered by percentage of herbaceous species
Measurement criteria	≥ 10%
Standard	
Permit values/range	He,Fe,Gr,Mo,Li,Av
Input Type	Character
Width	2
Decimals	
Default	Must have HERB1

Attribute	Herbaceous species composition
Abbreviation	HERB1_COVER, HERB2_COVER, … HERB10_COVER
Description	Contribution of herb species to the overall herb cover
Measurement criteria	Percentage in 10% classes
Standard	
Permit values/range	1, 2, … 10
Input Type	Numeric
Width	2 for HERB1_COVER and 1 for the rest
Decimals	
Default	Must have HERB1_COVER

7. DISTURBANCES

Attribute	Disturbance polygon type
Abbreviation	DISTURBANCE_1, DISTURBANCE_2, DISTURBANCE_3
Description	Features should be evident on the 1:15,000 aerial photographs
Measurement criteria	Record past 30 years
Standard	
Permit values/range	CO, BO, WI, HA, IN, DI, AK, SF, SN, BL, SL and SI
Input Type	Character
Width	2
Decimals	
Default	

Attribute	Extent of disturbance
Abbreviation	DISTURBANCE_EXTENT_1, …, DISTURBANCE_EXTENT_3
Description	Proportion of the polygon that has been affected by the disturbance
Measurement criteria	Light, moderate, heavy, severe and entire
Standard	Percentage
Permit values/range	1, 2, 3, 4 and 5
Input Type	Numeric
Width	1
Decimals	
Default	Must have value

Attribute	Year of disturbance
Abbreviation	YOD_1, … YOD_3
Description	The year of the disturbance occurs
Measurement criteria	Year
Standard	
Permit values/range	Four digits in year or decade
Input Type	Numeric
Width	4
Decimals	
Default	

Attribute	Type of YOD recorded
Abbreviation	YOD_TYPE_1, …, YOD_TYPE_3
Description	Use "a" for knowing exact year and use "d" for estimated decade
Measurement criteria	Annual or decade
Standard	
Permit values/range	a or d
Input Type	Character
Width	1
Decimals	
Default	

8. Lookup Tables

Lookup tables are not defined here. They can be easily created from SFVI manual. The MS Access database, SFVI_tables.mdb, shows one of the defined lookuptables.