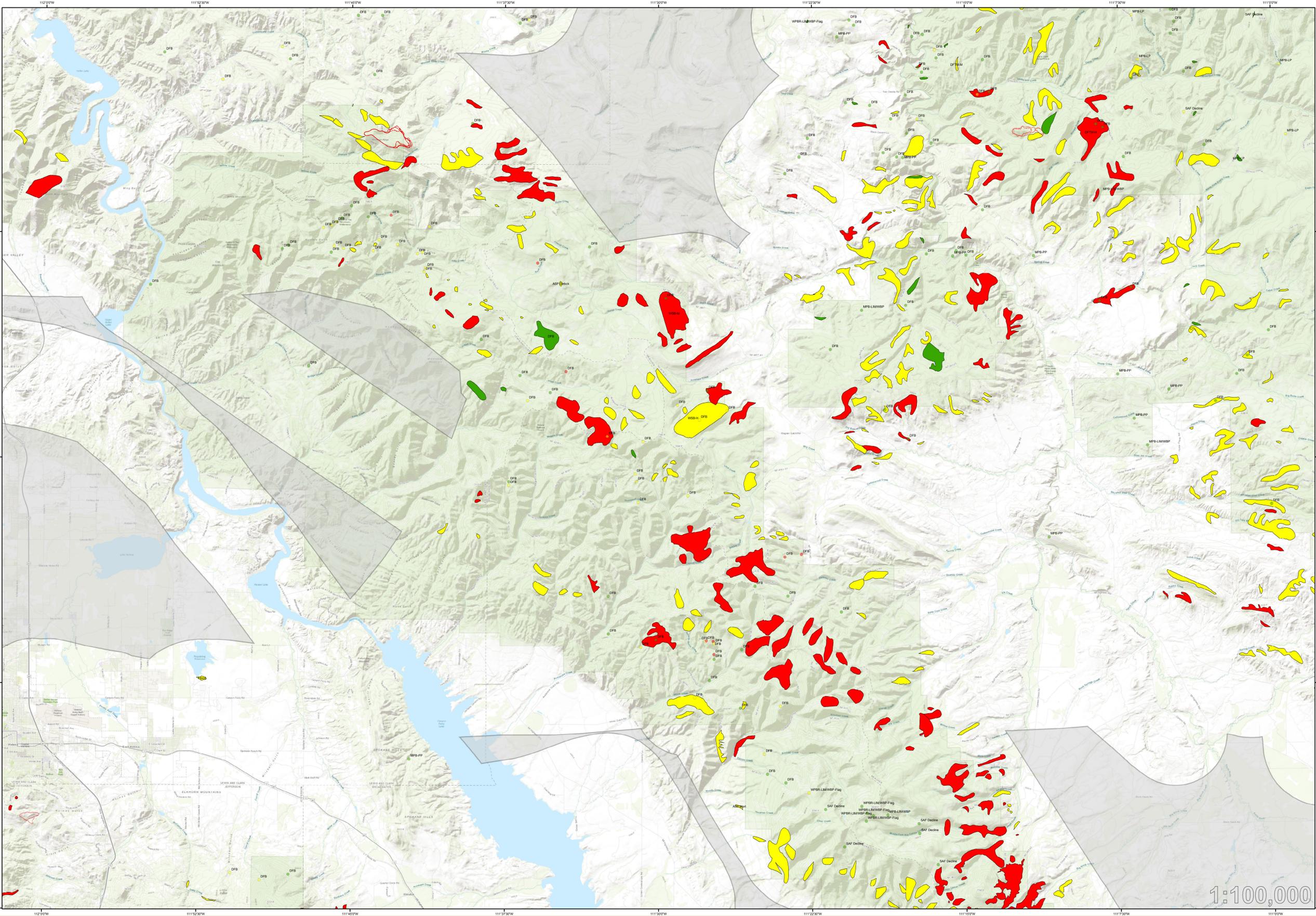


# 2019 Aerial Insect and Disease Survey Canyon Ferry Dam, Montana



### Legend

**Damage Points**  
Number of Trees

- 1 - 5
- 6 - 30
- > 30

**Damage Polygons**  
Percent Affected

- Light (1-10%)
- Moderate (11-50%)
- Severe (>50%)
- Not flown
- Fire Perimeters (2016 - 2018)

**CODING SYSTEM**  
Codes have two parts: the first represents the causal agent and the second represents the host. If needed, the two-part code is followed by an 'M' or 'H' to indicate severity of the activity. Data is color coded to represent the intensity of activity as seen in the legend.

Examples:  
MPB-LPP represents mountain pine beetle in Lodgepole pine.  
WSB-DF-SAF-H represents western spruce budworm infestation in subalpine fir/Douglas-fir mix with >75% of leaves defoliated.

Causal Agent Codes		Causal Agent Codes	
Abiotic		Disease	
ASP Defol	Aspen Defoliation	SAF Decline	Sub Alpine Fir Decline
ASP Diebck	Aspen Dieback	WL_Ndl Cst	Western larch needle cast
ASP Mort	Aspen Mortality	WPBR	White pine blister rust
Avalnch	Avalanche		
Flood	Flooding-high water		
Frost	Frost		
Wind	Wind		
Bark Beetles		Host Codes	
DFB	DFB	ASP	Aspen
ESB	Engelmann Spruce beetle	DF	Douglas-fir
FEB	Fir engraver beetle	GF	Grand fir
IPS	Pine engraver beetle	LIM/WBP	Limber pine / Whitebark pine
IPSEmag	IPS emarginatus	LP	Lodgepole pine
MPB	Mountain pine beetle	PP	Ponderosa pine
WPB	Mountain pine beetle	SAF	Subalpine fir
		WL	Western larch
		WWP	Western white pine
Defoliators		Miscellaneous	
BWA	Balsam woolly adelgid	Defol	Defoliation - Moderate ( 50-75% of leaves defoliated)
DFTM	Douglas-fir Tussock Moth	H	Defoliation - Heavy (>75% of leaves defoliated)
PButt	Pine Butterfly	Flag	Flagging
WHemLoop	Western Hemlock Looper	Tpk	Top kill
WSB	Western Spruce Budworm		

### Region 1 - Location Map USGS 100K Quad

USGS 100K TOPOI: 46111-E1  
Canyon Ferry Dam, Montana

**Legend**

- Counties
- Flow areas
- R1 Boundary

### HOW THE AERIAL SURVEYS ARE CONDUCTED

Data represented on this map are based on trees visibly affected by forest insects, diseases and abiotic factors that are detected and recorded by observers during aerial survey flights. These flights are conducted by a joint partnership between the USDA Forest Service and state cooperators.

Observers have just a few seconds to recognize characteristic signatures of healthy and damaged trees of different species, correctly diagnose damage causal agents, estimate the intensity or extent of damage, and precisely record information on a digital sketch mapping platform. Air turbulence, cloud shadow, haze, smoke, and observer experience can affect the quality of the survey. These sketchmaps and the resultant data summaries provide an estimate of conditions on the ground, and may differ from estimates derived by other methods.

Annual aerial surveys provide important information on the current status of detected causal agents and can be used to determine trends in damage levels over time by comparing previous and current survey data over large areas.

**Map Created: 2/4/2020**  
**Projection: UTM NAD83 Zone 12T**  
**Author: R1/R4 FHP GIS, USDA Forest Service**

### DIRECT ALL INQUIRIES TO:

**USDA FOREST SERVICE REGION 1**  
State and Private Forestry  
Forest Health Protection  
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Missoula, MT 59804

**USDA FOREST SERVICE REGION 4**  
State and Private Forestry  
Forest Health Protection  
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Boise, ID 83709

**DISCLAIMER**

The digital map layer upon which the insect and disease data are presented vary in both source and scale, therefore, accuracy is not guaranteed.

The insect and disease data should be used only as an indicator of insect and disease activity, and should be ground-truthed for actual location and causal agent. Polygons indicate locations of tree mortality, defoliation, and/or other damage. Intensity of damage is variable, and not all trees and areas indicated are dead or damaged. The joint cooperators reserve the right to correct, modify, update, or replace the data as necessary. Using this data for purposes other than those for which it was intended may yield inaccurate or misleading results.