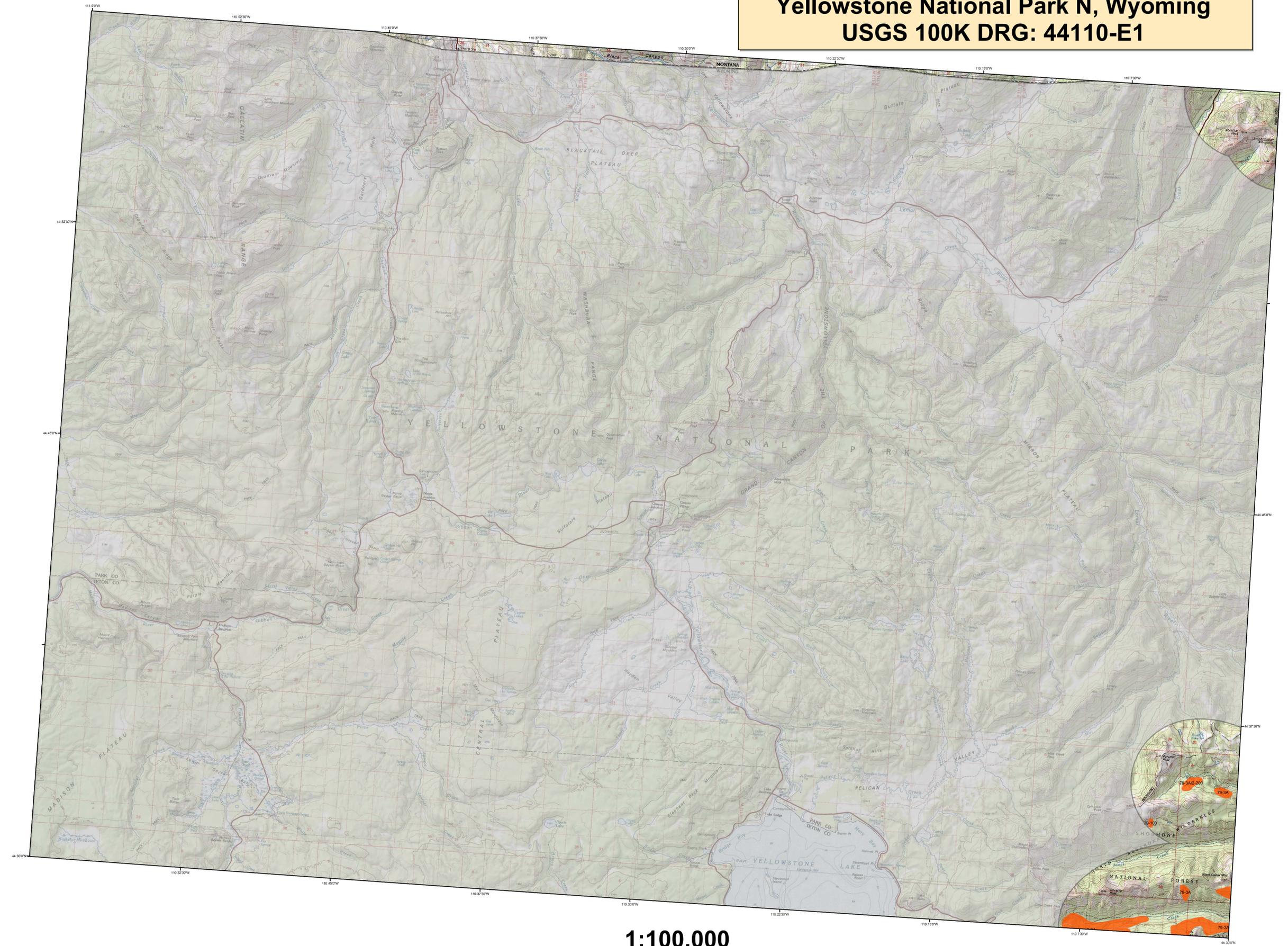


# 2006 Aerial Insect and Disease Survey Yellowstone National Park N, Wyoming USGS 100K DRG: 44110-E1

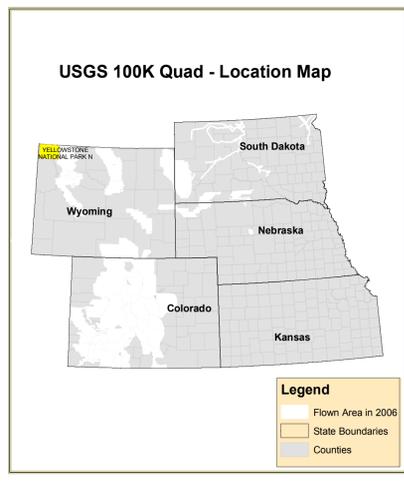


1:100,000

**Legend**

Use of the Number System  
 Example: 5-25 = The first number before the dash is the causal agent code. The number after the dash is the number of dead "fader" trees in the polygon or point. When recent dead trees are not counted, an intensity code of L-light, M-moderate, and H-high may be used after the causal agent code. Periodically, trees per acre estimates are used after the causal agent code instead of number of dead "fader" trees (or an intensity code). For example: 5-100A = The first number before the dash is the causal agent code. The number after the dash is an estimation of the number of dead "fader" trees in the polygon per acre. In this case it would be an estimation that, on the average, one tree per every two acres would be a dead "fader" tree. In another example: 5-3A = that on the average, an estimated three trees per acre are dead "fader" trees. A // is used as a separator when a point polygon has more than one causal agent code.

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Engelmann Spruce Beetle	Douglas-Fir	50	White pine blister rust	Lodgepole Pine	106	Ice nuclear bagging	Cottonwood/Poplar
2	Douglas-fir beetle	Douglas-Fir	51	Dwarf mistletoe	Softwoods	108	road salt	Softwoods
3	Mountain pine beetle	Ponderosa Pine	52	Elysiadema	Ponderosa Pine	109	pinewood nematode	Scots Pine
4	Mountain pine beetle	Lodgepole Pine	53	Inducida #55, 50 & 53	All Tree Species	110	oak wilt	Oak
5	Western pine beetle	Ponderosa Pine	54	Air pollutants	All Tree Species	111	Kilgus disease	All Tree Species
6	White Fir	White Fir	55	Chemical damage	All Tree Species	112	spine ice	White Spruce
7	White Fir	White Fir	56	Lophodermium pinastri	Softwoods	113	leeked chestnut borer	Oak
8	Douglas-fir engraver beetle	Douglas-Fir	57	Rhabdocline pseudotsugae	Softwoods	114	anthracnose like solar disease	Bur Oak
9	Western balsam bark beetle	Softwoods	58	Lothodermella aculeata	Softwoods	115	Dieback	All Tree Species
10	Unidentified bark beetle	Lodgepole Pine	59	Lecanosticta acicola	Softwoods	116	Mortality	All Tree Species
11	Pine engraver	Ponderosa Pine	60	Lothodermella concolor	Softwoods	117	Discoloration	All Tree Species
12	Pine engraver	Lodgepole Pine	61	Cotinis sp.	Softwoods	118	Herdicide	All Tree Species
13	Pine engraver	Ponderosa Pine	62	Needle cast (Hypodermataceae)	Softwoods	119	Flagging	All Tree Species
14	Pine engraver	Lodgepole Pine	63	Root Rot	All Tree Species	120	aspen tortrix	Quaking Aspen
15	Pondolia pine needle miner	Jack Pine	64	Unidentified disease	Softwoods	121	Mansonia blight	Quaking Aspen
16	Jack pine budworm	Douglas-Fir	65	Winter damage light	All Tree Species	200	Dieback (ash)	Ash
17	Jack pine budworm	Douglas-Fir	66	Winter damage medium	All Tree Species	201	Dieback (cottonwood)	Cottonwood/Poplar
18	Jack pine budworm	Douglas-Fir	67	Winter damage heavy	All Tree Species	202	Dieback (hardwood)	Hardwoods
19	Jack pine budworm	Douglas-Fir	68	Diploida	Softwoods	204	Dieback (oak)	Oak
20	Jack pine budworm	Douglas-Fir	69	Prion black stain	Common Pinon	210	Mortality (oak cottonwood)	Cottonwood/Poplar
21	Jack pine budworm	Douglas-Fir	70	Fire	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
22	Jack pine budworm	Douglas-Fir	71	Parasitic	Softwoods	212	Mortality (hardwood)	Hardwoods
23	Pine butterfly	Ponderosa Pine	72	Windthrow	All Tree Species	213	Mortality (oak)	Oak
24	Pine looper	Ponderosa Pine	73	High water damage	All Tree Species	214	Mortality (spruce)	Spruce
25	Pine looper	Ponderosa Pine	74	Aspen decline-multiple agents	Quaking Aspen	221	Discoloration (ash)	Ash
26	Pine looper	Ponderosa Pine	75	Prion pine mortality	Common Pinon	222	Discoloration (cottonwood)	Cottonwood/Poplar
27	Pine tortrix	Ponderosa Pine	76	Juniper mortality-unknown agent(s)	Juniper	223	Discoloration (eastern cedar)	Eastern Red Cedar
28	Leaf beetles	Hardwoods	77	Gambel oak decline-unknown agent(s)	Gambel Oak	224	Discoloration (hardwood)	Hardwoods
29	Leaf beetles	Hardwoods	78	Limber pine decline-multiple agent(s)	Limber Pine	225	Discoloration (oak)	Oak
30	Leaf beetles	Hardwoods	79	Hail damage	All Tree Species	228	Discoloration (spruce)	Spruce
31	Leaf beetles	Hardwoods	80	Unkown polygon	Unkown	230	Herbicide (cottonwood)	Cottonwood/Poplar
32	Leaf beetles	Hardwoods	100	old prison mortality	Common Pinon	231	Herbicide (eastern cedar)	Eastern Red Cedar
33	Leaf beetles	Hardwoods	101	leaf fall top	Lodgepole Pine	240	Flagging (hardwood)	Hardwoods
34	Leaf beetles	Hardwoods	102	slutb elm disease	Elm	250	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
35	Leaf beetles	Hardwoods	103	slutb elm disease	Ponderosa Pine	251	Unidentified defoliator (elm)	Elm
36	Leaf beetles	Hardwoods	104	ice burn(s)	Spruce, White Spruce	252	Unidentified defoliator (hardwood)	Hardwoods
37	Leaf beetles	Hardwoods	105	drought killed narrow leaf cottonwood	Narrowleaf Cottonwood	300	Mortality (pine)	Pine



**How Aerial Surveys Are Conducted**

Data represented on this map are based on aerial observations manually recorded onto a map. This procedure is considered both an art form and a form of scientific data collection, and is highly subjective. An observer only has a few seconds to recognize the color difference between healthy and damaged trees of different species; diagnose causal agents correctly; estimate intensity; delineate the extent of damage; and precisely record this information on a georeferenced map. Air turbulence, cloud shadows, distance from aircraft, haze, smoke, and observer experience can all affect the quality of the survey. These data summaries provide an estimate of conditions on the ground and may differ from estimates derived by other methods.

Aerial surveys provide information on the current status for many causal agents, and are important when examining insect activity trends by comparing historical and current survey data over large areas.

Overview surveys are a snap shot in time and therefore may not be timed to accurately capture the true extent or severity of a particular disturbance activity. Aerial surveys can be thought of as the first stage in a multi-stage sampling design. Other remote sensing approaches, including aerial photography, electro-optical sensors, and specially designed aerial surveys with modified flight patterns, can be used to more accurately delineate the extent and severity of a particular disturbance agent. The preceding methods are often more costly than overview surveys, and are generally reserved to address situations of sufficient environmental, economic, or political importance.

Area surveyed by AI Dymerski 08/01- 08/03 2006  
 Map Created: 01/12/2007  
 Projection: UTM NAD83 Zone 13  
 Author: J. Ross, USDA Forest Service

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Due to the nature of aerial surveys, the data on this map will only provide rough estimates of location, intensity and the resulting trend information for agents detectable from the air. Many of the most destructive diseases are not represented on this map because these agents are not detectable from aerial surveys. The data presented on this map should only be used as a partial indicator of insect and disease activity, and should be validated on the ground for actual location and causal agent. Shaded areas show locations where tree mortality or defoliation were apparent from the air. Intensity of damage is variable and not all trees in shaded areas are dead or defoliated.

The insect and disease data represented on this map are available digitally from the USDA Forest Service, Region Two Forest Health Management group. The cooperators reserve the right to correct, update, modify or replace GIS products. Using this map for purposes other than those for which it was intended may yield inaccurate or misleading results.

A data dictionary and digital copies of this map and the insect and disease data are available at: <http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>