

# CREATING A DATABASE OF DISTRIBUTION AND CONDITION OF WHITEBARK AND LIMBER PINES

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Marcus Johnson



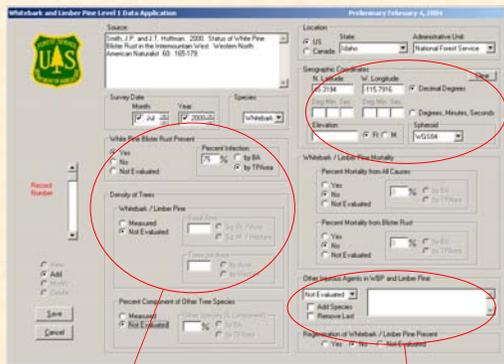
Marcus Johnson

## Introduction

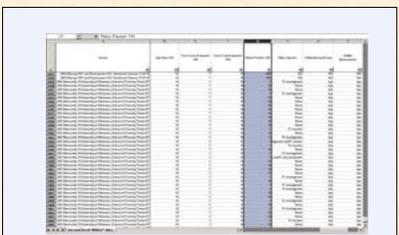
Whitebark pine and limber pine are well distributed throughout western North America. The impacts of white pine blister rust and other damaging agents are also found West-wide. These are forest types that have relatively little research compared to other white pine forest types, and thus the dynamics and impacts of detrimental changes are less understood. Although surveys have been done locally, information has not been compiled for a range-wide look at these two species. It is important to determine the condition of these forest types so restoration efforts can be developed and focused properly. A prototype database was developed by Eric Smith (USFS) and Holly Kearns (Colorado State University) for limber pine in Wyoming and Colorado. This initial effort has been expanded into a broader database with a GIS component.

## Database/Interface Development

The Whitebark and Limber Pine Level 1 database consists of a limited number of critical fields representing key plot data variables that can be queried and GIS-linked via a user-friendly interface. A workshop was held to develop this list of critical fields required to make a database application which can be easily queried. The application connects to the underlying MS Access Database using Microsoft Jet Database Engine technology. The application inserts, modifies and deletes values in the database using industry standard Structured Query Language (SQL) statements.



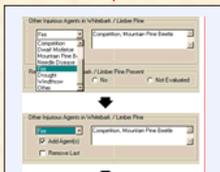
Specific data controls allow information to be entered using one of two common data units. For example, the Geographic Coordinates of the survey Plot can be entered using Decimal Degrees or Degrees, Minutes, and Seconds. Coordinates are automatically converted and saved as decimal degrees in the database.



A second level of the database includes the more detailed list of variables collected on each plot. The user can access available data for these variables, which will be queryable as yes/no statements. An example of such a variable is "Ribes evaluated, yes/no?"



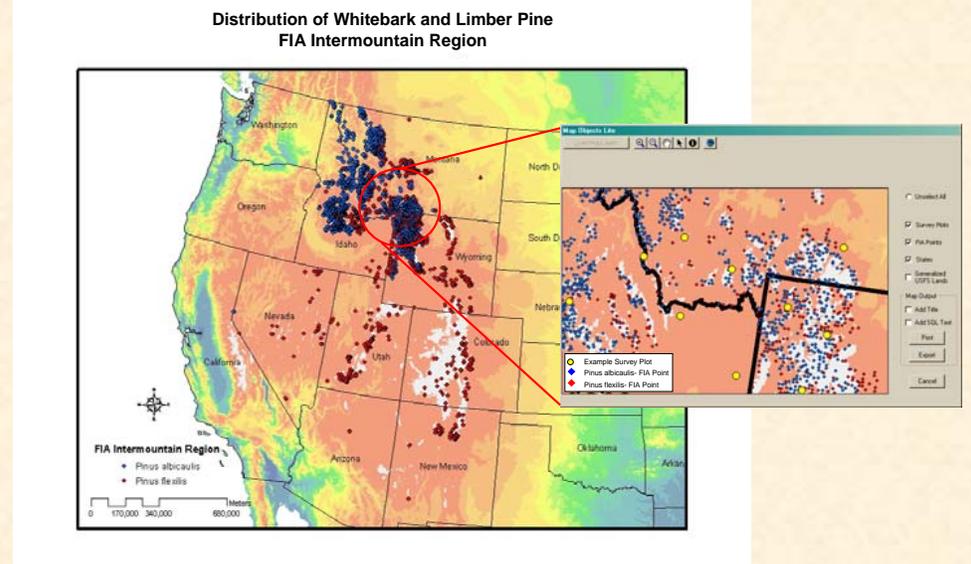
The database interface is a robust application designed using Microsoft Visual Basic 6.0. Individual data fields are self-validating, assuring out of range values are not entered into the underlying Access database.



Other Injurious Agents in Whitebark / Limber Pine are entered as list items in a comma delimited text field for ease of query.

## GIS/Mapping Component

USFS FIA plot data are being used to map the distribution of whitebark and limber pine. Data from FIA Interior West Region are displayed here, and data from FIA Pacific Northwest Region and possibly FIA North Central Region, will be incorporated soon. Plans are in place to incorporate FIA plot data on the condition of the species into the database as well.



A mapping function will be added to give the application limited GIS functionality allowing survey plots from the database to be represented geographically over top of FIA data points and reference features like State and/or County Boundaries. This Mapping function will be made possible by the addition of Map Objects Lite<sup>®</sup>, version 2.0 by Environmental Systems Research Institute (ESRI). These Active X program components allow the application to be distributed royalty free while providing many of the GIS functions found in ESRI products like ArcView<sup>®</sup>, ArcInfo<sup>®</sup> and ArcGIS<sup>®</sup>.

## Cooperators

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 Whitebark Pine Ecosystem Foundation: www.whitebarkfound.org  
 Diana Tomback, Dept. of Biology, University of Colorado at Denver, CO  
 Judy Adams and Eric Smith, USFS Forest Health Technology Enterprise Team, Fort Collins, CO  
 William Jacobi, Dept. of Biog. Sci. and Pest Mgmt., Colorado State University, Fort Collins, CO  
 Survey Contributions to Date= 39 Surveys, Totaling 1611 Plots. Contributing Organizations Include: USFS FHP, USFS Research, USFS FIA, NPS, University of Montana, Colorado State University, University of Colorado, Utah State University, University of New Mexico, University of Alaska Fairbanks, State University of New York, Montana State University, University of Wyoming, Northern Arizona University, University of California Davis, British Columbia Ministry of Forests.

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- Poster design and production: Bill Cramer, USDA Forest Service, Northern Region, Forest Health Protection, Missoula, MT

## Summary

This effort will result in an interactive database, plus maps of the species distribution, the known locations of blister rust, the overall condition of the species, and a map that depicts the obvious data gaps on the condition of these two species. This database application will fit on a CD that can be distributed to interested parties, who can then enter new records into the database clones on their own systems. Newly entered data can then be exported and sent to a "yet to be identified" data repository for evaluation and potential upload into the main tables. The goal is for this database to be web-accessed.