

(1519)
Swanson

**FIRE HISTORY DATABASE OF THE WESTERN UNITED STATES:
PRELIMINARY REPORT COVERING OREGON AND WASHINGTON**

December 1993

INTERAGENCY AGREEMENT

Environmental Protection Agency: DW12934530
USDA Forest Service, Pacific Northwest Research Station: 93-0300
University of Washington, College of Forest Resources: 61-2239

Emily K. Heyerdahl,
Frederick J. Swanson
USDA Forest Service
PNW Research Station
4043 Roosevelt Way NE
Seattle, WA 98105

James K. Agee
College of Forest Resources
AR-10
University of Washington
Seattle, WA 98195

INTRODUCTION

Human activities are changing the chemical composition of the atmosphere at an unprecedented rate, that may lead to significant changes in climate (Bolin and others 1986; Houghton and others 1990, 1992). These climatic changes could directly alter fire frequency, extent and severity by changing the amount, distribution and seasonality of precipitation and other factors that influence fire (Clark 1990; Flannigan and Van Wagner 1991). Climate may also change the rate of forest production, mortality and decomposition that will change the amount and distribution of fuel, hence indirectly alter fire regimes (Clark 1990). In addition, changes in climate could alter the global distribution of forest life-zones (Emanuel and others 1985; Leverenz and Lev 1987; Smith and others 1992). The rate at which forest communities adjust to climate change will be controlled in part by disturbance processes, primarily fire and land use practices (Overpeck and others 1990). Fire is the dominant natural disturbance in many parts of the western United States (Pyne 1982; Agee 1993) where steep topographic and climatic gradients result in a great variety of fire regimes. A continental-scale fire frequency model is being developed by the U.S. Environmental Protection Agency (EPA) as an essential component of a broad-scale vegetation model used to predict the response of vegetation of global climate change. This workplan details a procedure to assemble existing tree-ring information on past forest fire regimes in the continental United States (west of 100°W, exclusive of Alaska) that can be used to calibrate and verify the EPA model.

Fire frequency in forested areas can be reconstructed by dating the annual ring in which a fire scar forms and/or estimating the year of origin of a tree that regenerates after fire (e.g. Barrett and Arno 1988, Sheppard and others 1988). The annual rings are either dated dendrochronologically using prepared samples (by crossdating patterns of wide and narrow rings (Stokes and Smiley 1968)) or by ring-counting, in the field or laboratory, using minimally prepared samples. Fire size is estimated from the number and spatial distribution of trees or sites recording fire in a given year (e.g. Agee and others 1990; Swetnam and Dieterich 1985; Baisan and Swetnam 1990). Numerous fire histories, reconstructed from tree-rings for small portions of the western United States, are available from both published and unpublished sources. These reconstructions cover a wide variety of vegetation types and topographic settings.

OBJECTIVES

The objective of this project is to create a database of existing published and unpublished tree-ring reconstructions of fire regimes in forested areas, before circa 1900, west of 100°W in the continental United States, exclusive of Alaska. The database includes only information that is provided in the studies or site information that can be gathered with minimal effort from other sources. Site locations and fire regimes are mapped but not interpolated. This preliminary report covers data from Oregon and Washington only.

The studies included in the database are restricted to tree-ring reconstructions of fire history and the information extracted includes citations to the data sources, site information, estimated fire regimes, and information on individual fire events (when readily available). Appendix A is a detailed description of the fields in each of the four database files and appendices B through E are listings of the database files.

Fire regimes vary greatly across short distances in the western United States, so that a reconstruction of fire history over a small area may not represent the history of a larger area. Therefore, we extracted information on the size of the study area and the amount of fire evidence (number of trees scarred and/or number of tree origin dates) used in computing the fire regimes to allow the user to gauge the applicability of each reconstruction to larger areas.

DATA SOURCES

Thirty tree-ring reconstructions of fire history (figure 1 and Appendix B) covering 104 sites in Oregon and Washington were identified by searching the extensive literature and data collections of the personnel involved in this work and by keyword searching of the International Bibliography of Wildland Fire (International Association of Wildland Fire 1993) and the bibliography of the International Tree-Ring Data Bank (ITRDB 1992). Sixteen of the thirty studies were published, nine were unpublished theses or dissertations and five were unpublished reports. The reconstruction of fire history was the primary purpose of fourteen of the studies. The remaining sixteen studies included fire history reconstruction as part of multipurpose studies, e.g. studies of forest development or the interaction of fire with insects and/or fungi.

THE FIRE HISTORY DATABASE: OREGON AND WASHINGTON

1) Amount of fire history information.

a) *Evidence of fire.* At 22% of the sites, fire history was reconstructed using both fire scars and origin dates; at 37% of the sites only origin dates were used; and at the remaining 41% of the sites only fire scars were used. The number of trees used to estimate the reported fire regimes ranged from 1 to 577 with an average of 33. The number of fires used to estimate these same fire regimes ranged from 0 to 29 with an average of 7.

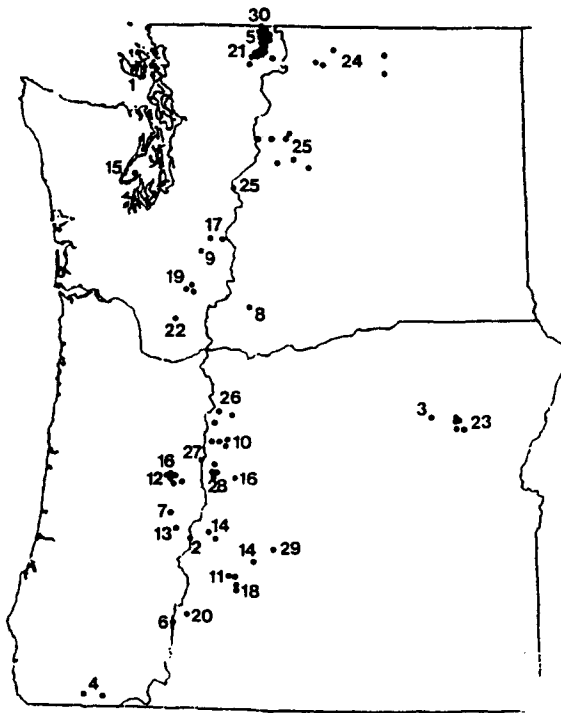


Figure 1. Location of sites, by reference number, in Oregon and Washington included in the Fire History Database. The studies to which the reference numbers refer are listed in Appendix B. The Cascade crest is indicated.

b) *Dating method.* Most studies dated fires by counting rings on minimally-prepared samples, some of these studies adjusted fire dates by matching patterns of fire years between samples. Relatively few studies crossdated the ring-widths of fire-scarred samples (only 11% of the sites).

c) *Period of record.* The oldest sites in the database date to the 1100's, however most sites date only to the early 1700's (figure 2). The oldest sites are found on the west side of the Cascades. Very few studies reported fire regimes by more than one time period (e.g. by century; 3% of sites).

d) *Size of study area.* The size of the study area was given or determined from maps for 74% of the sites. Size ranged from 0.5 to 492,500 ha.

e) *Information on individual fires.* Most studies gave some information about individual fires (73% of the sites gave information on a total of 574 individual fires). Few studies gave the size of individual fires (11% of individual fires). Many studies included the number of trees used to reconstruct the fire (80% of individual fires - average of 4 trees per fire with a range from 1 to 80).

2) Site characteristics.

a) *Geographic distribution.* Because it is based on tree-ring reconstructions, this database considers only forested areas, however large portions of both states are non-forested. Primarily located east of the Cascades, 41% of the combined land area in the two states is non-forested. The majority of the sites in the database are in or near the Cascades (figure 1). Beyond the Cascades, there are no tree-ring reconstructions of fire history to the west and only a few reconstructions to the east.

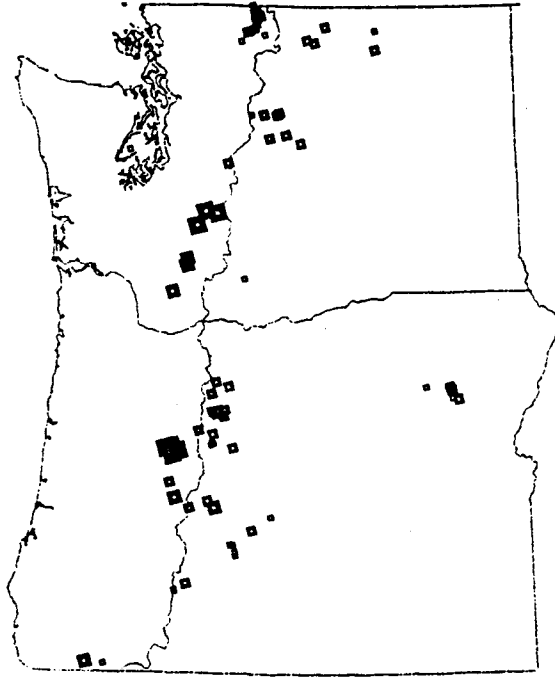


Figure 2. Sites in the Fire History Database in Oregon and Washington, indicating period of record. Size of symbols indicates century in which the record begins for that site - larger symbols indicate a longer record (from largest to smallest: 1100-1499, 1500-1599, 1600-1699, 1700-1799 and 1800-1899). The Cascade crest is indicated.

b) *Distribution by Küchler class.* Most of the studies did not provide the size of reconstruction sites nor the area over which the reconstructions could reasonably be expected to apply, therefore percentage of sites by number is used here as an indication of land area sampled. This is only a crude measure because sites varied considerably in size. In Oregon and Washington combined, over 25% of the sites in the database were sampled in Küchler's class 12 (Douglas-fir forest; 1964) while only about 5% of the land area falls into this class (figure 3). The database does not contain any information from Küchler's class 1 (Spruce-cedar-hemlock) which is located along the coast.

c) *Distribution by elevation.* The elevation range of the study sites included in the database is 15 to 2010 m but 69% of sites fall between 501 and 1500 meters (figure 4) higher and lower elevations are probably non-forested. The elevational distribution of the sites in the database approximates the elevational distribution of land area except at low elevations. (Defense Mapping Agency, 1981).

d) *Distribution by slope.* Approximately 95% of the sites are on slopes of less than 75% (figure 5).

e) *Distribution by aspect.* The aspects reported in most studies were assumed to be microsite features of the study areas so a comparison of this information with total land area in various aspect classes is probably not meaningful. At the microsite scale reported in the database, 69% of the sites were sampled on south aspects (SE to SW).

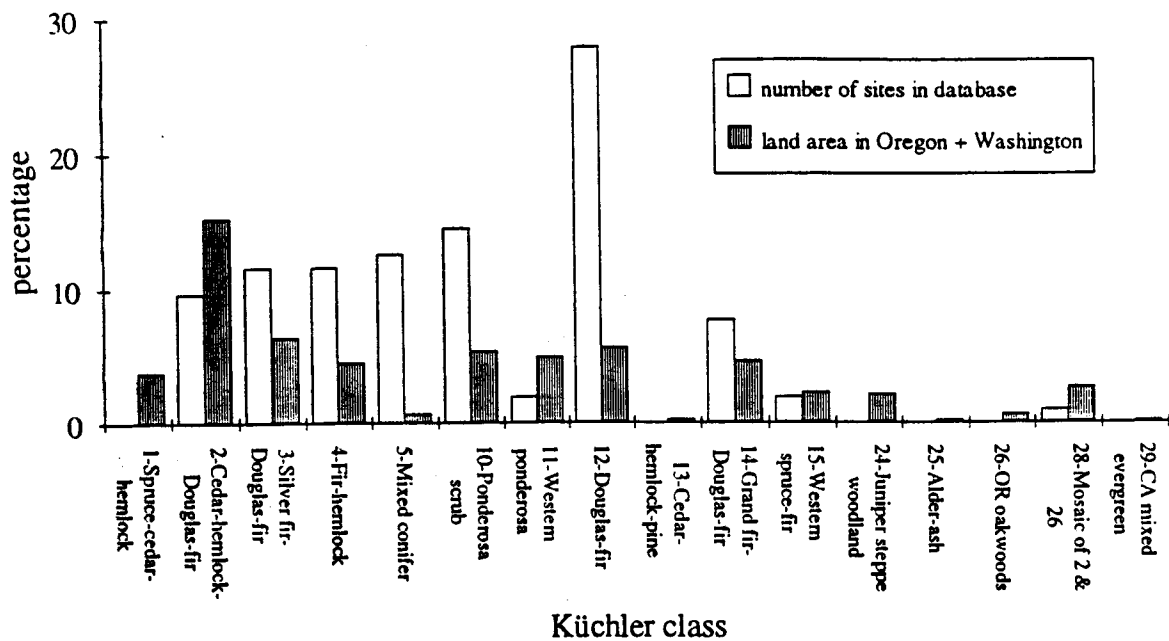


Figure 3. Percentage of a) sites in the database (104 sites total) and b) land area, by Küchler classes in Oregon plus Washington. 41% of the combined land area of the two states is not forested.

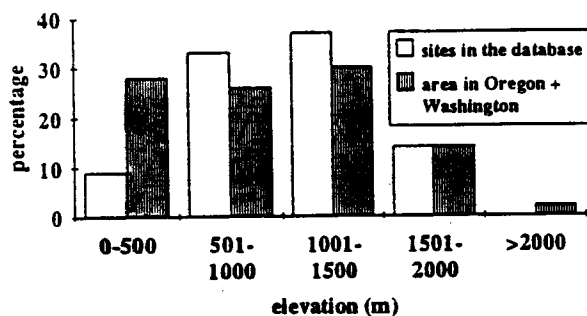


Figure 4. Percentage of a) sites in the database (104 sites total) and b) land area, by elevational classes.

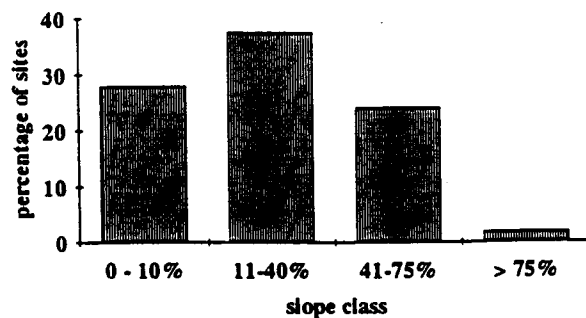


Figure 5. Percentage of sites in the database by slope class (104 sites total).

3) Fire history.

a) *Fire frequency.* Fire frequency can be computed at a single point, based on information from one or several trees, or it may be computed over an area, based on information from many trees (table A3; also Agee 1993). The frequency obtained is obviously highly dependent on the size of the area included in the computation and therefore fire frequency must be stratified by method of computation for inter-site comparisons to be meaningful. In the database, fire frequency is reported as it was reported by the author of each study. Most fire frequencies were computed as a composite fire interval (44% of sites). Fire frequency was computed as a mean fire return interval at 26% of the remaining sites, as a natural fire rotation at 12% of the sites and as a point frequencies at 6% of the sites. Stratifying the sites in the database by method of frequency computation would leave too few sites in each method-category, therefore, inter-site comparisons of fire history are made here on the basis of fire regime and severity classes.

b) *Fire regime and severity classes.* The sites are approximately equally distributed by severity classes (last row table 1). 86% of the sites are approximately equally distributed between Heinselman's regimes 2,3 and 4 (last column table 1; see table A4 for a description of the Heinselman classes). The Heinselman classification incorporates both frequency and severity - in general, severity increases with increasing Heinselman class number. It is therefore, not surprising that severity and Heinselman class are correlated in the database (table 1).

Table 1. Number of sites by fire regime and severity class (104 sites total).

Heinselman classes*	Severity			Percent
	LOW	MODERATE	HIGH	
0				
1	1			1%
2	28	2		29%
3		31		30%
4			27	26%
5		2	9	11%
6 ¹⁰³			4	4%
percent	28%	34%	38%	

* See table A4 for a description of the Heinselman classes.

Sites in all of Heinselman classes 2 through 6 are found both east and west of the Cascade crest and in both states (figure 6A). However, the majority of sites in class 2 are found east of the crest while the majority of sites in classes 5 and 6 are found west of the crest. Most sites with low severity regimes are found in or east of the crest (figure 6B). A single low severity site is found west of the Cascades (reference number fifteen in Puget Sound). The sites with high and moderate severity are located both east and west of the crest. Sites in all three severity classes are found in both states.

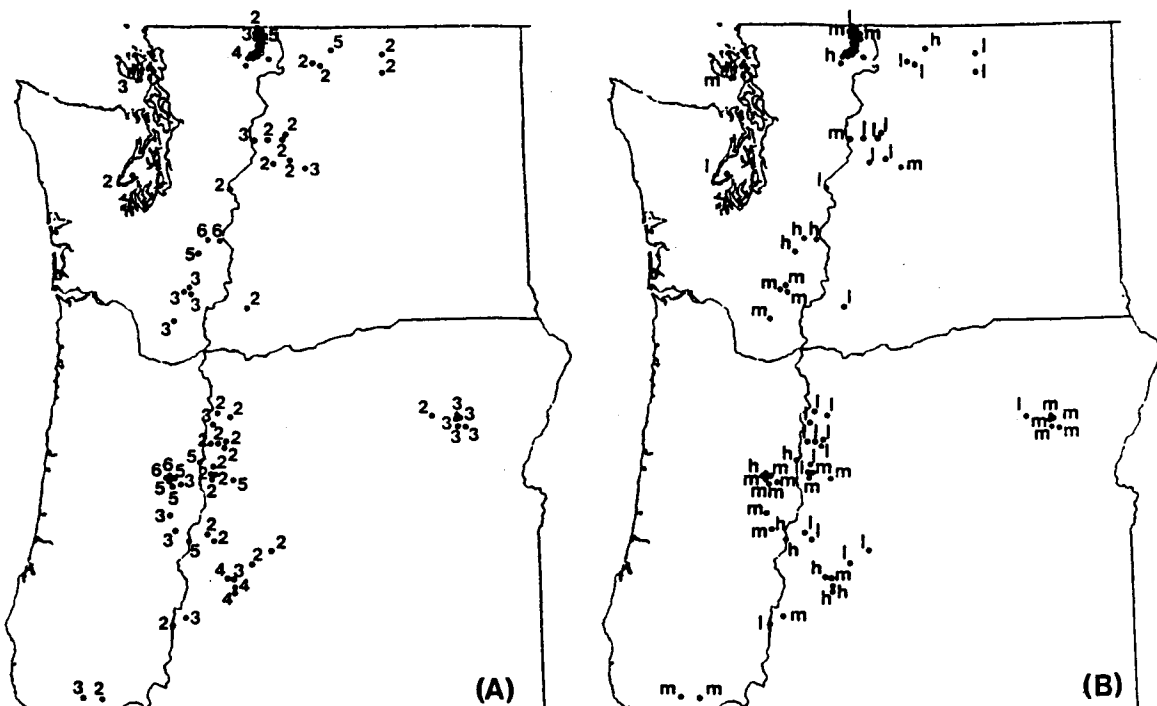


Figure 6. Fire regime and severity classes. Sites identified by (A) fire regime classification based on Heinselman (1973) and (B) fire severity (h = high, m = moderate, l = low). See table A3 for an explanation of the Heinselman classification. Although they are not individually labeled, the large cluster in central Washington, on the Canadian border, is dominated by sites with class 4, high severity fire regimes.

c) *Regional fire years.* Plots of fire dates and estimated fire dates by year and decade for Oregon and/or Washington did not reveal any single important years or decades.

DISCUSSION

The Fire History Database contains information from most of the available fire histories reconstructed from tree rings in Oregon and Washington. As such, it is the most complete record of pre-settlement forest fires over a several hundred year period in the two states. However, the symbols on the maps in figure 6 give a false impression of uniformity - in fact there is tremendous variation in the amount and kind of information represented by each symbol. Under the limited scope of this project, we did not re-analyze the fire history reconstructions to make detailed inter-site comparisons meaningful. Therefore, before drawing conclusions about regional patterns, the user should carefully review the information in the database, especially the number of trees and fires which were used to reconstruct each fire regime. Also, tree-ring reconstructions of fire history are limited to forested areas, are neither spatially nor temporally complete and are biased toward more severe fires. Finally, the accuracy of non-dendrochronologically dated (i.e. crossdated) samples decreases with age.

It is clear from the database that much additional information is needed to obtain a detailed regional history of pre-settlement fire in Oregon and Washington. There is very little existing information which is not from the Cascades. Also, very few studies crossdated ring-widths so identification of individual region-wide fire years is not possible.

REFERENCES CITED

- Agee, J.K. 1990. The historical role of fire in Pacific Northwest Forests. In: Natural and prescribed fire in Pacific Northwest forests. J.D. Walstad; S.R. Radosevich; D.V. Sandberg, eds. Corvallis, Oregon: Oregon State University Press. pp. 25-38.
- Agee, J.K. 1993. Fire Ecology of Pacific Northwest Forests. Washington, D.C.: Island Press. 493 pp.
- Arno, S.F.; Petersen, T.D. 1983. Variation in estimates of fire intervals: a closer look at fire history on the Bitterroot National Forest. Research Paper INT-301. Ogden, UT: US Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 8 pp.
- Baisan, C.H.; Swetnam, T.W. 1990. Fire history on a desert mountain range: Rincon Mountain Wilderness, Arizona, U.S.A. Canadian Journal of Forest Research. 20:1559-1569.
- Barrett, S.W. 1988. Fire regimes classification for the coniferous forests of the northwestern United States. Final report to Intermountain Research Station. Missoula, Montana. (cooperative agreement INT-87219).
- Barrett, S.W.; Arno, S.F. 1988. Increment-borer methods for determining fire history in coniferous forests. General Technical Report INT-244. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 15 p.
- Bibliography of Wildland Fire. 1992. Available from : International Association of Wildland Fire, Fairfield, WA 99012.
- Bolin, B.; Döös, B.R.; Jäger, J.; Warrick, R.A. 1986. The Greenhouse Effect, Climatic Change, and Ecosystems, SCOPE 29. New York: John Wiley & Sons. 541 p.
- Clark, J.S. 1990. Twentieth-century climate change, fire suppression, and forest production and decomposition in northwestern Minnesota. Canadian Journal of Forest Research. 20:219-232.
- Defense Mapping Agency. 1981. Product specifications for digital terrain elevation data. 2nd edition. D.M.A. Aerospace Center, Saint Louis Airforce Station, Saint Louis, Missouri. 23 pp. (The digital elevation model was based on a 15-arc-second grid developed by the USGS from 3 arc-second digital topographic elevation data from the Defense mapping agency. This was re-projected into an Albers equal area projection at 1 km using a bilinear interpolation algorithm).
- Emanuel, W.R.; Shugart, H.H.; Stevenson, M.L. 1985. Climate change and the broad-scale distribution of terrestrial ecosystem complexes. Climatic Change. 7:29-43.
- Flannigan, M.D.; Van Wagner, C.E. 1991. Climate change and wildfire in Canada. Canadian Journal of Forest Research. 21:66-72.

Heinselman, M.L. 1973. Fire in the virgin forests of the Boundary Waters Canoe Area, Minnesota. *Quaternary Research*. 3:329-382.

Houghton, J.T.; Jenkins, G.J.; Ephraums, J.J., editors. 1990. *Climate change. The IPCC scientific assessment*. Cambridge University Press. 365 pp.

Houghton, J.T.; Callander, B.A.; Varney, S.K., editors. 1992. *Climate change 1992. The supplementary report to the IPCC scientific assessment*. Cambridge University Press.

International Association of Wildland Fire. 1993. P.O. Box 328, Fairfield, WA 99012.

International Tree-Ring Data Bank (ITRDB). 1992. Available from: National Geophysical Data Center, NOAA, 325 Broadway, E/GC, Boulder, CO 80303.

Johnson, E.A.; Van Wagner, C.E. 1985. The theory and use of two fire history models. *Canadian Journal of Forest Research*. 15:214-220.

Küchler, A.W. 1964. Potential natural vegetation of the conterminous United States. *American Geographical Society Special Publication* 36.

Leverenz, J.W.; Lev, D.J. 1987. Effects of carbon dioxide-induced climate changes on the natural ranges of six major commercial tree species in the western United States. In: Shands, W.E.; Hoffman, J.S. eds. *The Greenhouse Effect, Climate Change and U.S. Forests*. Washington, DC: The Conservation Foundation. pp. 123-155.

Overpeck, J.T.; Rind, D.; Goldberg, R. 1990. Climate-induced changes in forest disturbance and vegetation. *Nature*. 343:51-53.

Pyne, S.J. 1982. *Fire in America: A cultural history of wildland and rural fire*. Princeton, NJ: Princeton University Press. 654 pp.

Sheppard, P.R.; Means, J.E.; Lassoie, J.P. 1988. Cross-dating cores as a nondestructive method for dating living, scarred trees. *Forest Science*. 34:781-789.

Smith, T.M.; Shugart, H.H.; Bonan, G.B.; Smith, J.B. 1992. Modeling the potential response of vegetation to global climate change. *Advanced Ecological Research*. 22: 93-116.

Stokes, M.A.; Smiley, T.L. 1968. *An introduction to tree-ring dating*. Chicago: University of Chicago Press. 73 p.

Swetnam, T.W.; Dieterich, J.H. 1985. Fire history of ponderosa pine forests in the Gila Wilderness, New Mexico. In: *General Technical Report INT-182*. Ogden, Utah: US Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. pp. 390-397.

APPENDIX A: DETAILED DESCRIPTIONS OF DATABASE FILES

Table A1. Listing of information contained in the database, by file.

Citation to sources, in file FHREF.DB

reference number - a number unique to each reference
authors
title
citation
year of publication
objectives of the study

Site information, in file FHSITE.DB

reference number
site number - a number unique to each site within each reference
state
location in Albers projection
latitude
longitude
aspect - nominal designation (e.g. N,NE)
slope - slope classes (flat, 10-40%, 40-75%, 75%+)
range in elevation at the site
range in years reconstructed at the site
total area reconstructed at the site
site name

Fire regime information, in file FHREGIME.DB

reference number
site number
range of years for the fire regime reported in this record - to distinguish fire regimes that change through time
fire frequency in years for the site
how the fire frequency was computed (table A3)
evidence used to reconstruct fire (scars, origin dates or both)
plant association (table A2)
community dominant (table A2)
Küchler classification (Küchler 1964)
crossdating of ring widths (yes or no)
amount of information used to compute the fire regime (i.e. the number of trees showing evidence of fire)
fire regime based on fire effects (high severity, moderate severity, or low severity)
fire regime based on fire characteristics (Heinselman 1973; table A4)
number of fires used to compute the regime

Individual fire information, in file FHFIRE.DB

reference number
site number
date of fire (or midpoint of range of dates)
range of dates for the fire
size of fire
number of trees used to reconstruct the fire

General

Fields that have the same name but are contained in different files, contain analogous information. Missing values are coded as -1. Fields which are starred in this appendix are limited to capital letters in the database.

FHREF.DB - citation to sources

Whenever possible, data was extracted from a full report, dissertation or thesis because they usually contain more information than the versions published in journals.

- 1) Reference number - a unique number is assigned to each of the references. If there were two versions of a reference (e.g. a thesis and a journal article), both versions were included in the database and have the same reference number.
- 2) Authors - the authors names as given in the reference
- 3) Title
- 4) Citation
- 5) Year of publication
- 6) Objectives of the study - in the authors words, if possible

FHSITE.DB -site information

- 1) Reference number
- 2) Site number - every reference has sites numbered 1,2,3,... so the combination of reference number and site number is unique for each site. A site is a unique location (where location includes longitude/latitude, slope, aspect, elevation) - so fire regimes reported from the same area but different aspects within that area are assigned a different site number for each aspect; while fire regimes from the same area but different vegetation types have the same site number.
- * 3) State - the two letter postal code
- 4) Site location based on the Albers equal-area conic projection. This information is provided for those users who cannot easily map latitude and longitude since site locations in the Albers projection can be mapped on simple scatter plots. Note that the Oregon-Washington border trends about 30° from the x-axis in such a plot.
- 5) Site location in latitude and longitude
- * 6) Aspect - nominal designation (e.g. N, NNW) includes F for flat sites and M for sites with multiple slope classes, maximum of three characters.

FHSITE.DB -site information (cont.)

7) Slope class

- | | |
|---|-----------------------------------|
| 1 | flat |
| 2 | 10-39% |
| 3 | 40-75% |
| 4 | >75% |
| 5 | sites with multiple slope classes |

8) Elevation range in meters - two separate fields.

9) Year range - total range of years for which fire history was reconstructed, two separate fields. This is not always the same as the year range in the regime file because the regime may be reported for different time periods at the same site. Also, whenever possible, regimes are reported before 1900. For example, if fire history at a site was reconstructed for the period 1400 to 1985, the range of years in the site file will be 1400-1985 but the range of years in the regime file will be 1400-1900.

10) Total area - total area of the site in hectares

11) Site name - either the name of the site as indicated by the author of the report; "entire area" if there is only one site or some other logical identifier

FHREGIME.DB -fire regimes information

1) Reference number

2) Site number

3) Year range - the years for which the regime is calculated - two separate fields. See the note under year range in FHSITE file.

4) Frequency - Fire frequency either as computed in the study or as can be easily computed from the data given. If fire frequency was provided as a composite fire interval over an area larger than approximately 40 ha, the fire frequency is not included in the database (Arno and Petersen 1983).

* 5) Evidence used to reconstruct fire - SCAR = fire scars only; ORIGIN = date of establishment of early seral trees only; BOTH = both fire scars and establishment dates

* 6) Plant association and Community dominant - the four letter code for species (first two letters of genus plus first two letters of species):

FHREGIME.DB -fire regimes information (cont.)

Table A2. Abbreviations used in plant association and community dominant fields.

Abbr.	Common name	Scientific name
ABAM	Pacific silver fir	<i>Abies amabilis</i>
ABCO	white fir	<i>Abies concolor</i>
ABGR	grand fir	<i>Abies grandis</i>
ABLA	subalpine fir	<i>Abies lasiocarpa</i>
ABMA	Shasta red fir	<i>Abies magnifica</i> var <i>shastensis</i>
ACCI	vine maple	<i>Acer circinatum</i>
AGIN	beardless bluebunch wheatgrass	
ARTR	big sagebrush	<i>Artemisia tridentata</i>
BEAQ	tall Oregongrape	<i>Berberis aquifolium</i>
BENE	Oregongrape	<i>Berberis nervosa</i>
CARU	pinegrass	<i>Calamagrostis rubescens</i>
CEVE	snowbrush ceanothus	<i>Ceanothus velutinus</i>
CHUM	western prince's pine	<i>Chimaphila umbellata</i>
GRASS		unidentified grass species
HODI	creambush oceanspray	<i>Holodiscus discolor</i>
LIDE	incense-cedar	<i>Libocedrus decurrens</i>
MULTIPLE		more than one species
PAMY	Oregon boxwood	<i>Pachistima myrsinites</i>
PIAL	whitebark pine	<i>Pinus albicaulis</i>
PICO	lodgepole pine	<i>Pinus contorta</i>
PIPO	ponderosa pine	<i>Pinus ponderosa</i>
PSME	Douglas-fir	<i>Pseudotsuga menziesii</i>
PUTR	bitterbrush	<i>Purshia tridentata</i>
QUGA	Oregon white oak	<i>Quercus garryana</i>
THPL	western redcedar	<i>Thuja plicata</i>
TSHE	western hemlock	<i>Tsuga heterophylla</i>
TSME	mountain hemlock	<i>Tsuga mertensiana</i>
VAME	big huckleberry	<i>Vaccinium membranaceum</i>
VASC	grouse huckleberry	<i>Vaccinium scoparium</i>
WHMO	whipple vine	<i>Whipplea modesta</i>

7) Kuchler class - vegetation classes from Kuchler (1964).

* 8) Cross-dated Y or N. Y applies only if ring-widths were crossdated.

9) Number of trees - the number of trees used in computing the fire regime

*10) The method used to compute the fire regime. Fire frequency can be computed at a single point, based on information from one or several trees, or it may be computed over an area, based on information from many trees (table A3; also Agee 1993). The frequency obtained is obviously highly dependent on the size of the area included in the computation and therefore fire frequency must be stratified by method of computation for inter-site comparisons to be meaningful. In the database, fire frequency is reported as it was computed by the author of each study.

FHREGIME.DB -fire regimes information(cont.)

Table A3. Methods used to compute fire frequency.

Method of estimation	Abbreviation	Description
natural fire rotation	NFR	time in years required to burn an area equal to the area of interest (Heinselman 1973)
point interval	P	average fire return interval in years from one or several adjacent trees
composite fire interval	CFI()	average fire return interval in years based on all trees from within the area indicated
mean fire return interval	MFRI	average of point intervals

*11) Regime (effects) - classification of the fire regime based on its effects on vegetation, i.e. fire severity (HIGH, MOD, LOW).

12) Regime (characteristics) - classification of the fire regime based on characteristics of its frequency and severity, after Heinselman (1973):

Table A4. Classification of fire regime based on characteristics (Heinselman 1973).

Fire regime number	Description of the regime
0	No natural fire (or very little)
1	Infrequent light surface fires (more than 25 year intervals)
2	Frequent light surface fires (1-25 year return intervals)
3	Infrequent, severe surface fires (more than 25 year return intervals)
4	Short return interval crown fires (25-100 year return intervals)
5	Long return interval crown fires + severe surface fires (100-300 yr return intervals)
6	Very long return interval crown fires+severe surface fires (> 300 yr return intervals)

13) Number of fires - the number of fires that were used to compute the regime.

FHFIRE.DB - individual fires information

- 1) Reference number
- 2) Site number
- 3) Year of fire - if the fire date is given as a range of dates, this is the mid-point.
- 4) Range of dates - could be from an actual range or computed from an uncertainty (e.g. 1745 ± 3 years becomes 1742 to 1748 in the database) - two separate fields
- 5) Size of the fire in hectares
- 6) Number of trees used to reconstruct the individual fire.

**APPENDIX B: CONTENTS OF THE REFERENCE FILE (FHREF.DB)
FOR OREGON AND WASHINGTON**

(Reference number is given following each reference.)

Agee, James K.; Dunwiddie, Peter W. 1984. Recent forest development on Yellow Island, San Juan County, WA. *Canadian Journal of Botany*. 62:2074-2080. (reference number 1)

Agee, James K.; Finney, Mark; de Govenain, Roland. 1986. The fire history of Desolation Peak - a portion of the Ross Lake National Recreation Area. Final report to National Park Service, cooperative agreement CA-9000-3-0004, subagreement 5. 76 pp. (also reported in: Agee, James K.; Mark Finney; and Roland de Govenain. 1990. Forest fire history of Desolation Peak, Washington. *Canadian Journal of Forest Research*. 20:350-356.) (reference number 5)

Agee, James K.; Potash, Laura; Gracz, Michael. 1990. Oregon Caves forest and fire history. National Park Service Report CPSU/UW 90-1. Cooperative Park Studies Unit. College of Forest Resources, University of Washington. (also reported in: Agee, James K. 1991. Fire history along an elevational gradient in the Siskiyou Mountains, Oregon. *Northwest Science*. 65:188-199) (reference number 4)

Bork, Joyce L. 1984. Fire history in three vegetation types on the eastern side of the Oregon Cascades. Ph.D. dissertation. Corvallis, OR: Oregon State University. 94 pp. (also reported in: Mazany, Terry and Marna Ares Thompson. 1983. Fire scar dates from the Pringle Falls area of central Oregon. Report prepared for the Silviculture Laboratory, Bend, OR by Modern Studies Section, Laboratory of Tree-Ring Research, University of Arizona, Tucson, AZ. 15 pp.) (reference number 14)

Bork, Joyce. 1984. Fire history in the Elkhorn Mountains. Unpublished data compiled for R.J. Mangan: Elkhorn Fire Management Action Plan. USDA Forest Service, Wallowa-Whitman National Forest. (reference number 23)

Chappell, Christopher B. 1991. Fire ecology and seedling establishment in Shasta red fir (*Abies magnifica* var *shastensis*) forests of Crater Lake National Park, Oregon. M.S. thesis. Seattle, WA: University of Washington. 133 pp. (reference number 20)

Dickman, Alan Wayne. 1984. Fire and *Phellinus weirii* in a mountain hemlock (*Tsuga mertensiana*) forest: postfire succession and the persistence, distribution, and spread of a root-rotting fungus. Ph.D. dissertation. Seattle, WA: University of Washington. 85 pp. (also reported in: Dickman, Alan and Stanton Cook. 1989. Fire and fungus in a mountain hemlock forest. *Canadian Journal of Botany*. 67:2005-2016.) (reference number 2)

Finch, R.B. 1984. Fire history of selected sites on the Okanogan National Forest. USDA Forest Service, Okanogan National Forest. Okanogan, WA. Unpublished manuscript. (reference number 24)

Geiszler, Daniel Reuben. 1981. Interactions of fire, fungi and mountain pine beetles in a lodgepole pine stand in south-central Oregon. Ph.D. dissertation. Seattle, WA: University of Washington. 101 pp. (also reported in: Gara, R.I., Litke, W.R., Agee, J.K., Geiszler, D.R., Stuart, J.D., and Driver, C.H. Influence of fires, fungi and mountain pine beetles on development of a lodgepole pine forest in south-central Oregon. In: Lodgepole Pine, The Species and its Management: symposium proceedings, May 8-10, 1984, Spokane, Washington and May 14-16, 1984, Vancouver, British Columbia, edited by Baumgartner, D.M., Pullman, Washington: Cooperative Extension, Washington State University, 1985, p. 153-162.) (reference number 11)

Gray, Andrew. 1990. Forest structure on the Siouxi burn, southern Washington Cascades: comparison of single and multiple burns. M.S. thesis. Seattle, WA: University of Washington. 85 pp. (reference number 22)

Hall, Frederick C. 1976. Fire and vegetation in the Blue Mountains - implications for land managers. Tall Timbers Fire Ecology Conference. 15:155-170. (also reported in: Hall, Frederick C. 1982. Fire history - Blue Mountains, Oregon. Presented at Fire History Workshop, University of Arizona, Tucson, Arizona, Oct. 20-24, 1980, USDA Forest Service, General Technical Report RM-81. pp. 75-81.) (reference number 3)

Hemstrom, Miles Arthur. 1979. A recent disturbance history of forest ecosystems at Mount Rainier National Park. Ph.D. dissertation. Corvallis, OR: Oregon State University. 67 pp. (also reported in: Hemstrom, Miles A. and Jerry F. Franklin. 1982. Fire and other disturbances of the forests in Mount Rainier National Park. Quaternary Research. 18:32-51.) (reference number 17)

Keen, F.P. 1937. Climatic cycles in eastern Oregon as indicated by tree rings. Monthly Weather Review. 65:175-188. (reference number 29)

Kertis, Jane. 1986. Vegetation dynamics and disturbance history of Oak Patch Natural Area Preserve, Mason County, Washington. M.S. thesis. Seattle, WA: University of Washington. 95 pp. (reference number 15)

Larson, James Wesley. 1972. Ecological role of lodgepole pine in the upper Skagit River Valley, Washington. M.S. thesis. Seattle, WA: University of Washington. 77 pp. (reference number 21)

McNeil, Robert Curlan. 1975. Vegetation and fire history of a ponderosa pine-white fir forest in Crater Lake National Park. M.S. thesis. Corvallis, OR: Oregon State University. 164 pp. (also reported in: McNeil, Robert C. and Donald B. Zobel. 1980. Vegetation and fire history of a ponderosa pine-white fir forest in Crater Lake National Park. Northwest Science. 54:30-46.) (reference number 6)

Means, Joseph Earl. 1980. Dry coniferous forests in the western Oregon Cascades. Ph.D. dissertation. Corvallis, OR: Oregon State University. 268 pp. (also reported in: Means, Joseph E. 1982. Developmental history of dry coniferous forests in the central western Cascade Range of Oregon. In: Means, J.E., ed. Forest succession and stand development research in the

Northwest. Proceedings of a symposium; 1981 March 26; Corvallis, OR. Forestry Research Laboratory, Oregon State University.) (reference number 7)

Morrison, Peter H.; Swanson, Frederick J. 1990. Fire history and pattern in a Cascade Range landscape. General Technical Report PNW-GTR-254. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. 77 pp. (reference number 12)

Sherman, Robert James. 1969. Spatial and developmental patterns of the vegetation of Black Butte, Oregon. Ph.D. dissertation. Corvallis, OR: Oregon State University. 80 pp. (reference number 28)

Simon, Steven A. 1991. Fire history in the Jefferson Wilderness Area east of the Cascade Crest. Final report to the Deschutes National Forest Fire Staff. 29 pp. (reference number 27)

Soeriaatmadja, Roehajat Emon. 1966. Fire history of the ponderosa pine forests of the Warm Springs Indian Reservation, Oregon. Ph.D. dissertation. Corvallis, OR: Oregon State University. 123 pp. (reference number 10)

Stewart, Glenn H. 1984. Forest structure and regeneration in the *Tsuga heterophylla* - *Abies amabilis* transition zone, central Western cascades, Oregon. Ph.D. dissertation. Corvallis, OR: Oregon State University. 148 pp. (also reported in Stewart, Glenn H. 1986. Forest development in canopy openings in old-growth *Pseudotsuga* forests of the western Cascade Range, Oregon. Canadian Journal of Forest Research. 16:558-568. and Stewart, Glenn H. 1986. Population dynamics of a montane conifer forest, western Cascade Range, Oregon, USA. Ecology. 67:534-544.) (reference number 16)

Stuart, John David. 1983. Stand structure and development of a climax lodgepole pine forest in south-central Oregon. Ph.D. dissertation. Seattle, WA: University of Washington. 212 pp. (also reported in: Stuart, John D.; James K. Agee; and Robert I. Gara. 1989. Lodgepole pine regeneration in an old, self-perpetuating forest in south central Oregon. Canadian Journal of Forest Research. 19:1096-1104.) (reference number 18)

Taylor, Dan. 1977. Some preliminary observations of the history of natural fires in Skagit District. North Cascades National Park, Skagit District. (reference number 30)

Teensma, Peter Dominic Adrian. 1987. Fire history and fire regimes of the Central Western Cascades of Oregon. Ph.D. dissertation. Eugene, OR: University of Oregon. 188 pp. (reference number 13)

Thornburgh, Dale Alden. 1969. Dynamics of the true fir-hemlock forests of the west slope of the Washington Cascade Range. Ph.D. dissertation. Seattle, WA: University of Washington. 210 pp. (reference number 9)

Weaver, Harold. 1961. Ecological changes in the ponderosa pine forest of Cedar Valley in southern Washington. Ecology. 42:416-420. (reference number 8)

Weaver, Harold. 1959. Ecological changes in the ponderosa pine forest of the Warm Springs Indian Reservation in Oregon. *Journal of Forestry*. 57:15-20. (reference number 26)

Wischnofsky, Merle G.; Anderson, David W. 1983. The natural role of fire in Wenatchee Valley. USDA Forest Service, Pacific Northwest Region, Wenatchee National Forest. Wenatchee, WA. Unpublished manuscript. (reference number 25)

Yamaguchi, David Kay. 1986. The development of old-growth Douglas-fir forests northeast of Mount St. Helens, WA, following an A.D. 1480 eruption. Ph.D. dissertation. Seattle, WA: University of Washington. 100 pp. (also reported as: Yamaguchi, David K. 1993. Forest history, Mount St. Helens. *National Geographic Research and Exploration*. 9:294-325.) (reference number 19)

**APPENDIX C: CONTENTS OF THE SITE FILE (FHSITE.DB)
FOR OREGON AND WASHINGTON**

(-1 indicates no data)

FHSITE.DB

Ref #	Site #	State	Albers - E	Albers - N	Latitude	Longitude	Aspect	Slope	---Elevation---		---Years-----		Total	
									Low	High	Start	End	Area	Site_name
1	1	WA	-1988407	3127974	1230153	483530	F	1	15	15	1730	1980	4.5	ENTIRE AREA
2	1	OR	-2057741	2586593	1215800	434334	M	1	1500	2200	1520	1984	18000	ENTIRE AREA
3	1	OR	-1755267	2654415	1183000	450000	-1	-1	-1	-1	1763	1967	-1	SINGLE STUMP
4	1	OR	-2220490	2443949	1232423	420544	M	3	1300	1800	1480	1988	197	OREGON CAVES
4	2	OR	-2199399	2437045	1230810	420523	N	3	1200	1200	1746	1985	2	KINNEY CREEK
5	2	WA	-1833592	3121106	1210008	485444	E	3	600	1280	1650	1985	800	E ASPECT
5	1	WA	-1833920	3124166	1210100	485618	N	3	880	1670	1573	1985	640	N ASPECT
5	3	WA	-1831607	3117917	1205753	485320	S	3	490	1220	1650	1985	840	S ASPECT
5	4	WA	-1835692	3119301	1210123	485329	SW	3	490	1220	1650	1985	530	SW ASPECT
5	6	WA	-1834889	3121139	1210108	485434	M	3	490	1670	1650	1985	3500	ENTIRE AREA
5	5	WA	-1835479	3122373	1210153	485508	W	3	490	1520	1650	1985	780	W ASPECT
6	1	OR	-2098997	2496901	1220930	425110	M	1	1770	1890	1748	1902	330	PANHANDLE
6	2	OR	-2099287	2498563	1221000	425159	M	1	1770	1890	1748	1902	230	NW PART
6	3	OR	-2098499	2498663	1220930	425209	M	1	1770	1890	1748	1902	190	NE PART
7	1	OR	-2071265	2622146	1221500	440000	SW	3	525	1250	1650	1980	-1	AVG. OF 23 PLOTS
7	3	OR	-2071265	2622146	1221500	440000	SW	2	495	977	1657	1980	-1	AVG. OF 9 PLOTS
7	2	OR	-2071265	2622146	1221500	440000	SW	3	488	975	1530	1980	-1	AVG. OF 11 PLOTS
7	4	OR	-2071265	2622146	1221500	440000	SW	3	777	1113	1566	1980	-1	AVG. OF 7 PLOTS
7	6	OR	-2071265	2622146	1221500	440000	M	3	-1	-1	1530	1980	-1	TSHE PLOTS
7	5	OR	-2071265	2622146	1221500	440000	S	3	740	884	1581	1980	-1	AVG. OF 5 PLOTS
8	1	WA	-1926938	2828402	1211100	460800	M	2	730	730	1785	1959	-1	ENTIRE AREA
9	1	WA	-1962325	2902025	1215245	464120	M	5	760	1525	1300	1969	20500	ENTIRE AREA
10	2	OR	-1990518	2679893	1212800	444138	M	4	610	1070	1509	1959	466600	SEEKSEEUQA
10	1	OR	-1987949	2685667	1212719	444500	M	2	860	980	1601	1960	440700	TENINO BENCH
10	4	OR	-2002079	2688244	1213808	444419	M	3	1280	1400	1614	1934	155500	LIONSHEAD
10	3	OR	-2008320	2662398	1213730	443000	M	3	980	1220	1540	1941	492500	BOULDER CREEK
11	1	OR	-2023222	2532448	1212226	432028	-1	1	1830	1830	1840	1975	-1	LOOKOUT POINT
11	2	OR	-2019861	2522078	1211800	431534	-1	1	1830	1830	1821	1976	-1	TIMOTHY SPRINGS
11	3	OR	-2021163	2517610	1211802	431304	-1	1	1800	1800	1821	1976	-1	JUNGLE SPRINGS
12	1	OR	-2052430	2654471	1220800	441930	M	2	915	1630	1160	1985	1940	DEER CREEK
12	2	OR	-2060829	2651666	1221330	441649	M	3	525	1295	1140	1985	1940	COOK-QUENTIN
13	1	OR	-2069937	2602451	1221000	435000	M	3	370	1600	1435	1982	11000	ENTIRE AREA
14	1	OR	-2029619	2578705	1213612	434332	SE	2	1080	1130	1400	1900	97	PRINGLE BUTTE
14	2	OR	-2034551	2588848	1214147	434805	-1	2	1190	1270	1600	1900	97	LOOKOUT MTN.
14	3	OR	-1994346	2541889	1210331	432926	F	1	1190	1190	1600	1900	97	CABIN LAKE
15	1	WA	-2014548	3007475	1225456	472834	F	1	100	100	1750	1900	7	ENTIRE AREA

FHSITE.DB (cont.)

Ref #	Site #	State	Albers - E	Albers - N	Latitude	Longitude	Aspect	Slope	---Elevation---		---Years-----		Total Area	Site_name
									Low	High	Start	End		
16	2	OR	-2061213	2660816	1221541	442130	N	2	1190	1190	1803	1982	48	GORDON LAKES
16	1	OR	-1989834	2640951	1211945	442130	SW	1	1140	1220	1527	1982	184	HYATT SOAPGRASS
16	3	OR	-2064638	2662431	1221829	442150	NW	1	1250	1280	1233	1982	58	GORDON MEADOWS
16	6	OR	-2057477	2661462	1221304	442223	M	1	1190	1260	1150	1982	110	SQUAW CREEK
16	5	OR	-2062099	2657109	1221532	441927	NE	1	1170	1200	1482	1982	116	BEAR PASS
16	4	OR	-2062708	2661079	1221649	442125	SE	2	1140	1140	1413	1982	51	SOAPGRASS MTN.
17	1	WA	-1948503	2914780	1214500	465000	M	5	730	1800	1205	1978	53000	ENTIRE PARK
17	2	WA	-1936664	2909588	1213500	464900	M	5	730	1800	1205	1978	14560	OHANAPECOSH R.
18	1	OR	-2020260	2530738	1212000	432000	F	1	1800	1800	1740	1900	25	WICKIUP SPRING
19	2	WA	-1983739	2868380	1220145	462040	S	2	1160	1290	1324	1985	7	BIG CREEK
19	3	WA	-1988355	2863375	1220408	461723	S	2	1110	1170	1504	1985	6	UPPER CLEARWATER
19	1	WA	-1985822	2860966	1220145	461630	NE	2	1070	1150	1306	1985	10	PARENT FOREST
20	1	OR	-2083731	2502276	1215942	425610	E	2	1830	1830	1620	1900	0.5	PROPHECY
21	4	WA	-1847883	3102098	1210714	484241	F	1	440	440	1891	1971	1	SITE 3
21	1	WA	-1859660	3095385	1211500	483728	F	1	160	160	1721	1971	1	SITE 1(A)
21	2	WA	-1859660	3095385	1211500	483728	F	1	160	160	1866	1971	1	SITE 1(B)
21	13	WA	-1849910	3105147	1210930	484400	W	2	460	460	1889	1971	1	SITE 14
21	5	WA	-1847013	3101040	1210622	484215	F	1	520	520	1861	1971	1	SITE 4(A)
21	6	WA	-1847013	3101040	1210622	484215	S	2	560	560	1861	1971	1	SITE 4(B)
21	10	WA	-1850054	3102338	1210900	484230	NNW	2	550	550	1858	1971	1	SITE 8
21	9	WA	-1850414	3102435	1210919	484230	N	2	440	440	1859	1971	1	SITE 6
21	11	WA	-1831954	3094549	1205315	484058	NNE	2	915	915	1896	1971	1	SITE 10
21	7	WA	-1847013	3101040	1210622	484215	NE	2	550	550	1861	1971	1	SITE 4(D)
21	12	WA	-1843949	3103534	1210430	484400	-I	-1	-1	-1	1857	1971	1	SITE 12
21	8	WA	-1847013	3101040	1210622	484215	S	2	560	560	1864	1971	1	SITE 4(E)
21	16	WA	-1842060	3106820	1210345	484600	S	1	620	620	1891	1971	1	SITE 18
21	22	WA	-1836708	3113821	1210100	485027	WNW	1	520	520	1601	1971	1	SITE 26
21	20	WA	-1834663	3116558	1210000	485211	W	2	1075	1075	1866	1971	1	SITE 23
21	15	WA	-1846511	3102328	1210615	484300	-I	-1	-1	-1	1860	1971	1	SITE 17
21	3	WA	-1849647	3103842	1210900	484321	S	2	305	305	1566	1971	1	SITE 2(B)
21	18	WA	-1841229	3103907	1210228	484435	SSW	1	510	510	1837	1971	1	SITE 20
21	19	WA	-1834950	3116635	1210015	485211	S	1	960	960	1836	1971	1	SITE 22
21	17	WA	-1840296	3105079	1210200	484520	SE	1	610	610	1881	1971	1	SITE 19
21	23	WA	-1836734	3107725	1205945	484714	SSW	2	1460	1460	1884	1971	1	SITE 27
21	14	WA	-1846990	3103407	1210652	484330	W	2	550	550	1889	1971	1	SITE 16
21	24	WA	-1839500	3106889	1210145	484624	SSE	1	530	530	1738	1971	1	SITE 29

FHSITE.DB (cont.)

Ref #	Site #	State	Albers - E	Albers - N	Latitude	Longitude	Aspect	Slope	---Elevation---		---Years---		Total Area	Site_name
									Low	High	Start	End		
21	25	WA	-1839214	3107950	1210145	484700	-1	-1	-1	-1	1847	1971	1	SITE 30
21	21	WA	-1836136	3115943	1210100	485139	SSE	2	530	530	1818	1971	1	SITE 24
22	1	WA	-2010575	2836249	1221500	460000	M	2	150	1270	1478	1932	15800	ENTIRE AREA
23	3	OR	-1726858	2642822	1180653	445729	SE	2	1525	1525	1554	1984	-1	DUTCH FLAT
23	2	OR	-1728258	2644774	1180815	445820	M	2	1680	1680	1504	1984	-1	ANTONE
23	4	OR	-1722305	2631929	1180138	445220	E	3	-1	-1	1502	1984	-1	HUNT MOUNTAIN
23	1	OR	-1727320	2648046	1180808	450010	S	4	1680	1770	1552	1984	-1	GORHAM BUTTE
23	5	OR	-1728617	2634375	1180645	445250	SE	1	1645	1645	1701	1984	-1	ROCK CREEK
24	2	WA	-1710090	3046542	1190840	483214	N	2	1100	1100	1700	1982	65	BAILEY MOUNTAIN
24	1	WA	-1704740	3068385	1190843	484430	S	2	1370	1370	1774	1982	30	CAYUSE
24	3	WA	-1777553	3071486	1200611	483622	S	3	1130	1220	1700	1982	75	FIRST BUTTE
24	5	WA	-1785296	3076656	1201315	483802	S	1	790	790	1700	1955	75	EIGHTMILE
24	4	WA	-1760845	3086165	1195605	484624	M	2	1890	2010	1700	1982	75	MEADOWS
25	4	WA	-1856335	3005629	1205341	475045	S	2	840	935	1580	1980	45	SITE L
25	1	WA	-1839171	3003555	1204003	475204	SE	2	880	990	1659	1983	18	SITE A
25	2	WA	-1838249	2976954	1203356	473813	N	3	875	950	1667	1980	18	SITE D
25	3	WA	-1856930	2978269	1204834	473618	SW	3	840	1190	1637	1977	27	SITE J
25	6	WA	-1870108	3009019	1210500	475035	-1	-1	-1	-1	1846	1983	-1	SITE R
25	7	WA	-1824275	2963411	1202030	473302	S	2	1120	1140	1504	1983	18	SITE B
25	8	WA	-1909230	2962153	1212510	472026	S	2	1000	1100	1565	1983	9	SITE M
25	5	WA	-1842330	3002238	1204213	475056	SE	2	770	780	1584	1983	-1	SITE P
26	1	OR	-1996857	2708905	1213830	445548	M	2	915	1220	1565	1957	-1	SF WARM SPRS RIV
26	2	OR	-1988507	2719907	1213438	450243	M	2	915	1220	1663	1957	-1	BUTTE CREEK
26	3	OR	-1975788	2711829	1212338	450020	M	1	790	1090	1641	1957	-1	SIMNASHO BUTTE
26	4	OR	-1996596	2686121	1213345	444400	M	2	1130	1220	1447	1957	-1	TWIN BUTTES
27	1	OR	-2022974	2671282	1215000	443230	M	2	970	2000	1518	1988	13490	ENTIRE AREA
28	1	OR	-2011158	2654513	1213800	442530	N	3	915	1220	1754	1903	-1	B.B. - PSME
28	2	OR	-2011653	2652724	1213800	442430	N	3	1160	1525	1820	1903	-1	B.B. - ABGR
28	3	OR	-2013653	2651157	1213908	442324	SW	3	1035	1525	1720	1903	-1	B.B. - PIPO
28	4	OR	-2010292	2651384	1213645	442400	E	3	1070	1280	1818	1903	-1	B.B. - CADE
29	1	OR	-1968932	2551245	1204701	433750	-1	-1	-1	-1	1800	1900	-1	WATKINS BUTTE
30	1	WA	-1835996	3131268	1210408	485945	F	1	490	490	1780	1947	1	ENTIRE AREA

**APPENDIX D: CONTENTS OF THE REGIME FILE (FHREGIME.DB)
FOR OREGON AND WASHINGTON**

(-1 indicates no data)

FIREGIME.DB

Ref #	Site #	-----Years-----		Fire Evidence	Cross-Dated?	Plant Association	Community Dominant	Kühler Class	# of Trees	# of Fires	Fire freq. (yrs)	Frequency Computed	Regime (severity)	Regime (char.)
		Start	End											
1	1	1730	1800	ORIGIN	N	PSME	PSME	2	9	2	113	NFR	MOD	3
2	1	1520	1900	ORIGIN	N	TSME	PICO	4	-1	9	1042	NFR	HIGH	5
3	1	1763	1904	SCAR	N	ABGR	PIPO	14	1	11	9	P	LOW	2
4	1	1650	1930	BOTH	N	ABCO	PSME	5	-1	-1	37	NFR	MOD	3
4	1	1650	1930	BOTH	N	ABCO	PSME	5	-1	-1	43	NFR	MOD	3
4	1	1650	1930	BOTH	N	ABCO	ABCO	5	-1	-1	61	NFR	MOD	3
4	1	1650	1930	BOTH	N	ABCO	ABCO	5	-1	-1	64	NFR	MOD	3
4	1	1400	1500	BOTH	N	MULTIPLE	MULTIPLE	5	-1	1	100	NFR	MOD	3
4	1	1500	1600	BOTH	N	MULTIPLE	MULTIPLE	5	-1	0	-1	NFR	MOD	3
4	1	1600	1700	BOTH	N	MULTIPLE	MULTIPLE	5	-1	2	81	NFR	MOD	3
4	1	1700	1800	BOTH	N	MULTIPLE	MULTIPLE	5	-1	3	93	NFR	MOD	3
4	1	1800	1900	BOTH	N	MULTIPLE	MULTIPLE	5	-1	7	34	NFR	MOD	3
4	1	1480	1900	BOTH	N	MULTIPLE	MULTIPLE	5	-1	13	67	NFR	MOD	3
4	2	1760	1900	BOTH	N	PSME/BENE	PSME	5	13	8	16	CFI(2)	MOD	2
5	1	1573	1985	BOTH	N	MULTIPLE	MULTIPLE	15	-1	5	182	NFR	MOD	3
5	2	1573	1985	BOTH	N	MULTIPLE	MULTIPLE	15	-1	9	107	NFR	MOD	3
5	3	1573	1985	BOTH	N	MULTIPLE	MULTIPLE	15	-1	4	97	NFR	MOD	3
5	4	1573	1985	BOTH	N	MULTIPLE	MULTIPLE	15	-1	14	65	NFR	MOD	3
5	5	1573	1985	BOTH	N	MULTIPLE	MULTIPLE	15	-1	5	120	NFR	MOD	3
5	6	1600	1699	BOTH	N	MULTIPLE	MULTIPLE	15	-1	1	100	NFR	MOD	3
5	6	1700	1799	BOTH	N	MULTIPLE	MULTIPLE	15	-1	3	208	NFR	MOD	3
5	6	1800	1899	BOTH	N	MULTIPLE	MULTIPLE	15	-1	16	60	NFR	MOD	3
5	6	1900	1985	BOTH	N	MULTIPLE	MULTIPLE	15	-1	8	103	NFR	MOD	3
5	6	1573	1985	BOTH	N	MULTIPLE	MULTIPLE	15	-1	29	100	NFR	MOD	3
5	6	1573	1985	BOTH	N	PSME/PIPO	PSME	12	-1	-1	52	MFRI	MOD	3
5	6	1573	1985	BOTH	N	PSME/PICO	PSME	12	-1	-1	76	MFRI	MOD	3
5	6	1573	1985	BOTH	N	PSME/THPL	PSME	12	-1	-1	93	MFRI	MOD	3
5	6	1573	1985	BOTH	N	PSME/TSHE	PSME	12	-1	-1	137	MFRI	MOD	3
5	6	1573	1985	BOTH	N	PSME/ABAM	PSME	12	-1	-1	108	MFRI	HIGH	5
5	6	1573	1985	BOTH	N	ABAM/ABLA	ABAM	15	-1	-1	137	MFRI	HIGH	5
5	6	1573	1985	BOTH	N	PICO/ABLA	ABLA	15	-1	-1	109	MFRI	HIGH	5
6	1	1748	1902	SCAR	N	ABCO	PIPO	5	18	25	6	MFRI	LOW	2
6	2	1748	1902	SCAR	N	ABCO	PIPO	5	20	19	9	MFRI	LOW	2
6	3	1748	1902	SCAR	N	ABCO	PIPO	5	10	16	9	MFRI	LOW	2
7	1	1650	1980	ORIGIN	N	PSME	PSME/HODI/GRASS	2	-1	18	96	MFRI	MOD	3

FHREGIME.DB (cont.)

Ref #	Site #	-----Years-----		Fire Evidence	Cross-Dated?	Plant Association	Community Dominant	Küchler Class	# of Trees	# of Fires	Fire freq. (yrs)	Frequency Computed	Regime (severity)	Regime (char.)
		Start	End											
7	2	1530	1980	ORIGIN	N	PSME	PSME/HODI-ACCI	2	-1	11	111	MFRI	MOD	3
7	3	1657	1980	ORIGIN	N	PSME	PSME/BEAQ	2	-1	9	118	MFRI	MOD	3
7	4	1566	1980	ORIGIN	N	PSME	LIDE/WHIMO	2	-1	7	94	MFRI	MOD	3
7	5	1581	1980	ORIGIN	N	PSME	LIDE/CHUM	2	-1	4	104	MFRI	MOD	3
7	6	1530	1980	ORIGIN	N	TSHE	-1	2	-1	5	144	MFRI	MOD	3
8	1	1790	1900	SCAR	N	PIPO	PIPO	11	1	11	9	P	LOW	2
9	1	1300	1969	ORIGIN	N	ABAM	MULTIPLE	3	-1	4	-1	-1	HIGH	5
10	1	1601	1960	SCAR	N	PSME	PIPO	10	75	-1	17	MFRI	LOW	2
10	2	1509	1959	SCAR	N	PIPO	PIPO	10	123	-1	14	MFRI	LOW	2
10	3	1540	1941	SCAR	N	PSME	PIPO	10	64	-1	25	MFRI	LOW	2
10	4	1614	1934	SCAR	N	ABGR	PIPO	10	43	-1	30	MFRI	LOW	2
11	1	1840	1900	SCAR	Y	PICO	PICO	4	-1	3	10	CFI0	HIGH	4
11	2	1821	1900	SCAR	Y	PICO	PICO	4	-1	2	-1	-1	HIGH	4
11	3	1821	1900	SCAR	Y	PICO	PICO	4	-1	1	-1	-1	HIGH	4
12	1	1200	1900	BOTH	N	ABAM	PSME	3	404	11	97	NFR	MOD	3
12	2	1150	1900	BOTH	N	TSHE	PSME	2	577	18	115	NFR	MOD	5
13	1	1435	1900	BOTH	N	TSHE	PSME	2	-1	25	81	MFRI	MOD	5
13	1	1435	1900	BOTH	N	ABAM	PSME	3	-1	26	63	MFRI	MOD	3
14	1	1560	1900	SCAR	Y	PIPO/PUTR	PIPO	10	35	25	14	MFRI	LOW	2
14	2	1600	1900	SCAR	Y	ABCO/CEVE	PIPO	14	48	12	26	MFRI	LOW	2
14	3	1780	1900	SCAR	Y	PIPO/PUTR	PIPO	10	31	11	12	MFRI	LOW	2
15	1	1750	1900	SCAR	Y	PSME	QUGA	28	-1	8	20	CFI(7)	LOW	2
16	1	1527	1900	BOTH	N	ABAM	PSME	3	40	6	-1	-1	MOD	5
16	2	1803	1900	BOTH	N	ABAM	PSME	3	5	3	-1	-1	MOD	5
16	3	1233	1900	BOTH	N	ABAM	PSME	3	13	5	-1	-1	MOD	5
16	4	1413	1900	BOTH	N	ABAM	PSME	3	-1	3	-1	-1	MOD	5
16	5	1482	1900	BOTH	N	ABAM	PSME	3	-1	1	-1	-1	HIGH	6
16	6	1150	1900	BOTH	N	ABAM	PSME	3	-1	1	-1	-1	HIGH	6
17	1	1205	1900	ORIGIN	N	ABAM	ABAM	3	556	14	383	NFR	HIGH	6
17	1	1200	1299	ORIGIN	N	ABAM	ABAM	3	-1	1	213	NFR	HIGH	6
17	1	1300	1399	ORIGIN	N	ABAM	ABAM	3	-1	1	882	NFR	HIGH	6
17	1	1400	1499	ORIGIN	N	ABAM	ABAM	3	-1	1	386	NFR	HIGH	6
17	1	1500	1599	ORIGIN	N	ABAM	ABAM	3	-1	1	388	NFR	HIGH	6
17	1	1600	1699	ORIGIN	N	ABAM	ABAM	3	-1	2	307	NFR	HIGH	6
17	1	1700	1799	ORIGIN	N	ABAM	ABAM	3	-1	1	1033	NFR	HIGH	6

FHREGIME.DB (cont.)

Ref #	Site #	-----Years-----		Fire Evidence	Cross-Dated?	Plant Association	Community Dominant	Küchler Class	# of Trees	# of Fires	Fire freq. (yrs)	Frequency Computed	Regime (severity)	Regime (char.)
		Start	End											
17	1	1800	1899	ORIGIN	N	ABAM	ABAM	3	-1	6	323	NFR	HIGH	6
17	2	1205	1978	ORIGIN	N	ABAM	ABAM	3	-1	-1	435	NFR	HIGH	6
18	1	1740	1900	BOTH	N	PICO	PICO	10	17	2	80	CFI(25)	MOD	3
19	1	1306	1900	SCAR	Y	ABAM	PSME	4	6	6	90	CFI(10)	MOD	3
19	2	1324	1900	SCAR	Y	ABAM	PSME	4	20	7	80	CFI(7)	MOD	3
19	3	1504	1900	SCAR	Y	ABAM	PSME	4	8	5	60	CFI(6)	MOD	3
20	1	1628	1902	SCAR	N	ABMA	ABMA	4	11	7	35	CFI(0.5)	MOD	3
21	1	1721	1900	ORIGIN	N	PSME	PICO	12	9	3	88	CFI(1)	HIGH	4
21	2	1866	1900	ORIGIN	N	PSME	PICO	12	3	1	-1	CFI(1)	HIGH	4
21	3	1566	1900	ORIGIN	N	PSME	PICO	12	1	1	-1	CFI(1)	HIGH	4
21	4	1891	1900	ORIGIN	N	PSME	PICO	12	4	1	-1	CFI(1)	HIGH	4
21	5	1861	1900	ORIGIN	N	PSME	PICO	12	5	1	-1	CFI(1)	HIGH	4
21	6	1860	1900	ORIGIN	N	PSME	PICO	12	2	2	30	CFI(1)	HIGH	4
21	7	1860	1900	ORIGIN	N	PSME	PICO	12	2	2	20	CFI(1)	HIGH	4
21	8	1864	1900	ORIGIN	N	PSME	PICO	12	7	3	17	CFI(1)	HIGH	4
21	9	1859	1900	ORIGIN	N	PSME	PICO	12	6	2	12	CFI(1)	HIGH	4
21	10	1858	1900	ORIGIN	N	PSME	PICO	12	2	1	-1	CFI(1)	HIGH	4
21	11	1896	1900	ORIGIN	N	PSME	PICO	12	7	1	-1	CFI(1)	HIGH	4
21	12	1857	1900	ORIGIN	N	PSME	PICO	12	4	1	-1	CFI(1)	HIGH	4
21	13	1889	1900	ORIGIN	N	PSME	PICO	12	3	1	-1	CFI(1)	HIGH	4
21	14	1889	1900	ORIGIN	N	PSME	PICO	12	4	1	-1	CFI(1)	HIGH	4
21	15	1860	1900	ORIGIN	N	PSME	PICO	12	1	1	-1	CFI(1)	HIGH	4
21	16	1891	1900	ORIGIN	N	PSME	PICO	12	2	1	-1	CFI(1)	HIGH	4
21	17	1881	1900	ORIGIN	N	PSME	PICO	12	1	1	-1	CFI(1)	HIGH	4
21	18	1837	1900	ORIGIN	N	PSME	PICO	12	4	2	22	CFI(1)	HIGH	4
21	19	1836	1900	ORIGIN	N	PSME	PICO	12	2	2	25	CFI(1)	HIGH	4
21	20	1866	1900	ORIGIN	N	PSME	PICO	12	1	1	-1	CFI(1)	HIGH	4
21	21	1818	1900	ORIGIN	N	PSME	PICO	12	2	2	20	CFI(1)	HIGH	4
21	22	1601	1900	ORIGIN	N	PSME	PICO	12	2	2	285	CFI(1)	HIGH	4
21	23	1884	1900	ORIGIN	N	PSME	PICO	12	2	1	-1	CFI(1)	HIGH	4
21	24	1738	1900	ORIGIN	N	PSME	PICO	12	6	2	144	CFI(1)	HIGH	4
21	25	1847	1900	ORIGIN	N	PSME	PICO	12	6	2	42	CFI(1)	HIGH	4
22	1	1800	1902	ORIGIN	N	TSHE	PSME	2	80	4	-1	-1	MOD	3
23	1	1552	1900	BOTH	N	ABGR/GRASS	PIPO	14	6	5	95	MFRI	MOD	3
23	2	1504	1900	BOTH	N	PICO/VASC	-1	14	2	3	150	MFRI	MOD	3

FHREGIME.DB (cont.)

Ref #	Site #	-----Years-----		Fire Evidence	Cross-Dated?	Plant Association	Community Dominant	Kuchler Class	# of Trees	# of Fires	Fire freq. (yrs)	Frequency Computed	Regime (severity)	Regime (char.)
		Start	End											
23	3	1554	1900	BOTH	N	PICO/VASC	PICO	14	1	6	66	MFRI	MOD	3
23	4	1502	1900	BOTH	N	ABGR/VAME	-1	14	6	5	125	MFRI	MOD	3
23	5	1701	1900	BOTH	N	ABLA/VAME	MULTIPLE	15	3	5	45	MFRI	MOD	3
24	1	1774	1900	SCAR	N	PSME/AGIN	PIPO	11	10	22	8	CFI(30)	LOW	2
24	2	1700	1900	SCAR	N	PSME	PSME	12	12	15	-1	-1	LOW	2
24	3	1700	1900	SCAR	N	PSME	PIPO	12	24	-1	-1	-1	LOW	2
24	4	1700	1900	SCAR	N	ABLA/VASC	PICO	15	27	0	-1	-1	HIGH	5
24	5	1700	1900	SCAR	N	PSME/CARU	PIPO	12	7	-1	-1	-1	LOW	2
25	1	1715	1915	SCAR	N	PSME/CARU	PIPO/PSME	4	10	25	8	CFI(18)	LOW	2
25	2	1715	1915	SCAR	N	PSME/CARU	PIPO/PSME	12	9	22	9	CFI(18)	LOW	2
25	3	1715	1915	SCAR	N	PSME/CARU	PIPO/PSME	3	10	18	11	CFI(27)	LOW	2
25	4	1715	1915	SCAR	N	PSME/CARU	PIPO/PSME	4	8	28	7	CFI(45)	LOW	2
25	4	1715	1915	SCAR	N	PSME/CARU	PIPO/PSME	4	2	6	33	CFI(45)	LOW	2
25	5	1715	1915	SCAR	N	ABGR/PAMY	PIPO/PSME	4	2	2	100	CFI(-)	MOD	3
25	6	1715	1915	SCAR	N	TSHE/PAMY	PIPO/PSME	4	2	2	100	CFI(-)	MOD	3
25	7	1715	1915	SCAR	N	PSME/ARTR	PIPO	12	10	12	17	CFI(18)	LOW	2
25	2	1715	1915	SCAR	N	PSME/PUTR	PIPO	12	1	3	67	CFI(18)	LOW	1
25	8	1715	1915	SCAR	N	PSME/PUTR	PIPO	12	10	26	8	CFI(9)	LOW	2
26	1	1565	1900	SCAR	N	ABCO	PIPO	14	1	6	48	P	MOD	3
26	2	1663	1900	SCAR	N	PIPO	PIPO	10	1	14	15	P	LOW	2
26	3	1641	1900	SCAR	N	PIPO	PIPO	10	1	18	12	P	LOW	2
26	4	1447	1900	SCAR	N	PIPO	PIPO	10	1	15	18	P	LOW	2
27	1	1518	1900	ORIGIN	N	ABGR	ABGR	14	-1	6	490	NFR	HIGH	5
27	1	1518	1900	ORIGIN	N	ABAM	ABAM	14	-1	7	2010	NFR	HIGH	5
27	1	1518	1900	ORIGIN	N	TSME	TSME	14	-1	10	450	NFR	HIGH	5
27	1	1518	1900	ORIGIN	N	ABLA	ABLA	14	-1	8	472	NFR	HIGH	5
27	1	1518	1900	ORIGIN	N	PIAL	PIAL/TSME	14	-1	4	764	NFR	HIGH	5
28	1	1754	1903	SCAR	N	PSME	PIPO	10	10	5	21	MFRI	LOW	2
28	2	1820	1903	SCAR	N	ABGR	ABGR	10	17	4	17	MFRI	MOD	2
28	3	1720	1903	SCAR	N	PIPO	PIPO	10	23	5	14	MFRI	LOW	2
28	4	1818	1903	SCAR	N	LIDE	PIPO	10	8	5	18	MFRI	MOD	2
29	1	1800	1900	SCAR	Y	PIPO	PIPO	10	90	6	13	CFI(-)	LOW	2
30	1	1800	1900	SCAR	N	PSME	PSME	12	7	14	6	CFI(1)	LOW	2

**APPENDIX E: CONTENTS OF THE FIRE EVENT FILE (FHFIRE.DB)
FOR OREGON AND WASHINGTON**

(-1 indicates no data)

FHFIRE.DB

Ref #	Site #	Year of Fire	Year		Size (ha)	Number of Trees
			start	end		
1	1	1935	-1	-1	3	-1
1	1	1910	-1	-1	3	-1
1	1	1830	-1	-1	3	-1
1	1	1730	-1	-1	3	-1
2	1	1925	-1	-1	6	-1
2	1	1870	-1	-1	58	-1
2	1	1865	-1	-1	460	-1
2	1	1845	-1	-1	260	-1
2	1	1840	-1	-1	78	-1
2	1	1835	-1	-1	2000	-1
2	1	1810	-1	-1	6	-1
2	1	1725	-1	-1	1	-1
2	1	1625	-1	-1	3200	-1
2	1	1525	-1	-1	380	-1
3	1	1941	-1	-1	-1	1
3	1	1905	-1	-1	-1	1
3	1	1867	-1	-1	-1	1
3	1	1858	-1	-1	-1	1
3	1	1843	-1	-1	-1	1
3	1	1837	-1	-1	-1	1
3	1	1828	-1	-1	-1	1
3	1	1823	-1	-1	-1	1
3	1	1813	-1	-1	-1	1
3	1	1803	-1	-1	-1	1
3	1	1795	-1	-1	-1	1
3	1	1782	-1	-1	-1	1
3	1	1772	-1	-1	-1	1
4	1	1921	1919	1923	-1	-1
4	1	1890	1888	1892	-1	-1
4	1	1875	1873	1878	-1	-1
4	1	1849	1847	1852	-1	-1
4	1	1835	1832	1838	-1	-1
4	1	1827	1824	1831	-1	-1
4	1	1822	1820	1824	-1	-1
4	1	1802	1797	1807	-1	-1
4	1	1775	1770	1780	-1	-1
4	1	1755	1750	1760	-1	-1
4	1	1735	1730	1740	-1	-1
4	1	1695	1685	1705	-1	-1
4	1	1650	1640	1660	197	4
4	1	1480	1470	1490	197	2
4	2	1915	1913	1917	-1	1
4	2	1856	1854	1858	-1	2
4	2	1839	1837	1841	-1	3
4	2	1825	1823	1827	-1	5
4	2	1807	1805	1809	-1	2
4	2	1795	1790	1800	-1	6
4	2	1778	1773	1783	-1	2
4	2	1763	1758	1768	-1	5
4	2	1746	1741	1751	-1	2
5	6	1926	-1	-1	-1	-1
5	6	1919	-1	-1	-1	-1

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	-----Year-----		Size (ha)	Number of Trees
			start	end		
5	6	1914	-1	-1	-1	-1
5	6	1908	-1	-1	-1	-1
5	6	1905	-1	-1	-1	-1
5	6	1899	-1	-1	-1	-1
5	6	1896	-1	-1	-1	-1
5	6	1894	-1	-1	-1	-1
5	6	1888	-1	-1	-1	-1
5	6	1884	-1	-1	-1	-1
5	6	1880	-1	-1	-1	-1
5	6	1872	-1	-1	-1	-1
5	6	1868	-1	-1	-1	-1
5	6	1865	-1	-1	-1	-1
5	6	1851	-1	-1	-1	-1
5	6	1832	-1	-1	-1	-1
5	6	1819	-1	-1	-1	-1
5	6	1815	-1	-1	-1	-1
5	6	1808	-1	-1	-1	-1
5	6	1806	-1	-1	-1	-1
5	6	1787	-1	-1	-1	-1
5	6	1782	-1	-1	-1	-1
5	6	1733	-1	-1	-1	-1
5	6	1648	-1	-1	-1	-1
5	6	1573	-1	-1	-1	-1
6	1	1902	1901	1903	-1	5
6	1	1897	1895	1899	-1	2
6	1	1892	1890	1894	-1	16
6	1	1883	1881	1885	-1	6
6	1	1879	1877	1881	-1	12
6	1	1870	1868	1872	-1	6
6	1	1864	1862	1866	-1	16
6	1	1855	1853	1857	-1	2
6	1	1849	1847	1852	-1	2
6	1	1846	1843	1849	-1	11
6	1	1841	1838	1844	-1	18
6	1	1829	1826	1832	-1	2
6	1	1826	1823	1829	-1	4
6	1	1818	1815	1821	-1	10
6	1	1812	1809	1815	-1	18
6	1	1804	1801	1807	-1	2
6	1	1800	1797	1803	-1	2
6	1	1797	1793	1801	-1	12
6	1	1791	1787	1795	-1	4
6	1	1783	1779	1787	-1	12
6	1	1776	1772	1780	-1	6
6	1	1769	1765	1773	-1	12
6	1	1759	1755	1763	-1	12
6	1	1755	1751	1759	-1	4
6	1	1748	1743	1753	-1	8
6	2	1902	1901	1903	-1	10
6	2	1897	1895	1899	-1	2
6	2	1883	1881	1885	-1	2
6	2	1879	1877	1881	-1	8

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	Year		Size (ha)	Number of Trees
			start	end		
6	2	1864	1862	1866	-1	14
6	2	1846	1843	1849	-1	18
6	2	1841	1838	1844	-1	2
6	2	1826	1823	1829	-1	4
6	2	1818	1815	1821	-1	20
6	2	1804	1801	1807	-1	6
6	2	1800	1797	1803	-1	2
6	2	1791	1787	1795	-1	10
6	2	1788	1784	1792	-1	2
6	2	1783	1779	1787	-1	12
6	2	1779	1775	1783	-1	2
6	2	1775	1771	1779	-1	4
6	2	1770	1766	1774	-1	6
6	2	1759	1755	1763	-1	8
6	2	1748	1743	1753	-1	8
6	3	1889	1887	1891	-1	8
6	3	1883	1881	1885	-1	2
6	3	1877	1875	1879	-1	10
6	3	1859	1857	1861	-1	6
6	3	1849	1847	1852	-1	2
6	3	1831	1828	1834	-1	8
6	3	1815	1812	1818	-1	4
6	3	1812	1809	1815	-1	2
6	3	1804	1801	1807	-1	2
6	3	1798	1785	1793	-1	8
6	3	1788	1784	1792	-1	6
6	3	1783	1779	1787	-1	2
6	3	1775	1771	1779	-1	4
6	3	1771	1767	1775	-1	2
6	3	1759	1755	1763	-1	8
6	3	1751	1747	1755	-1	8
8	1	1935	-1	-1	-1	1
8	1	1914	-1	-1	-1	1
8	1	1896	-1	-1	-1	1
8	1	1889	-1	-1	-1	1
8	1	1880	-1	-1	-1	1
8	1	1878	-1	-1	-1	1
8	1	1863	-1	-1	-1	1
8	1	1852	-1	-1	-1	1
8	1	1845	-1	-1	-1	1
8	1	1840	-1	-1	-1	1
8	1	1836	-1	-1	-1	1
8	1	1831	-1	-1	-1	1
8	1	1807	-1	-1	-1	1
9	1	1900	-1	-1	-1	-1
9	1	1820	-1	-1	-1	-1
9	1	1730	-1	-1	-1	-1
9	1	1600	-1	-1	-1	-1
11	1	1898	-1	-1	-1	-1
11	1	1893	-1	-1	-1	-1
11	1	1878	-1	-1	-1	-1
11	2	1879	-1	-1	-1	-1

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	Year		Size (ha)	Number of Trees
			start	end		
11	2	1880	-1	-1	-1	-1
11	3	1875	-1	-1	-1	-1
12	1	1897	1895	1897	154	-1
12	1	1850	1847	1854	277	-1
12	1	1838	1836	1841	277	-1
12	1	1829	1826	1833	251	-1
12	1	1800	1798	1801	287	-1
12	1	1764	1757	1768	234	-1
12	1	1575	1568	1591	971	-1
12	1	1552	1537	1557	743	-1
12	1	1515	1490	1530	1644	-1
12	1	1436	1415	1455	1457	-1
12	1	1200	1164	1222	1942	-1
12	2	1893	1891	1896	307	-1
12	2	1855	1852	1857	347	-1
12	2	1849	1847	1851	360	-1
12	2	1841	1839	1845	343	-1
12	2	1834	1831	1837	855	-1
12	2	1813	1812	1816	422	-1
12	2	1807	1805	1810	591	-1
12	2	1800	1798	1804	549	-1
12	2	1772	1770	1774	221	-1
12	2	1758	1752	1764	407	-1
12	2	1703	1699	1709	786	-1
12	2	1689	1683	1695	666	-1
12	2	1658	1648	1671	694	-1
12	2	1566	1549	1586	706	-1
12	2	1532	1511	1545	818	-1
12	2	1475	1475	1500	1457	-1
12	2	1400	1380	1410	1214	-1
12	2	1150	1150	1200	1942	-1
14	1	1887	-1	-1	-1	3
14	1	1865	-1	-1	-1	5
14	1	1855	-1	-1	-1	4
14	1	1842	-1	-1	-1	7
14	1	1836	-1	-1	-1	2
14	1	1830	-1	-1	-1	2
14	1	1823	-1	-1	-1	2
14	1	1813	-1	-1	-1	2
14	1	1800	-1	-1	-1	6
14	1	1788	-1	-1	-1	2
14	1	1787	-1	-1	-1	2
14	1	1768	-1	-1	-1	2
14	1	1763	-1	-1	-1	1
14	1	1762	-1	-1	-1	2
14	1	1758	-1	-1	-1	2
14	1	1749	-1	-1	-1	2
14	1	1740	-1	-1	-1	4
14	1	1707	-1	-1	-1	2
14	1	1706	-1	-1	-1	2
14	1	1693	-1	-1	-1	3
14	1	1692	-1	-1	-1	1

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	-----Year-----		Size (ha)	Number of Trees
			start	end		
14	1	1662	-1	-1	-1	3
14	1	1649	-1	-1	-1	2
14	1	1640	-1	-1	-1	3
14	1	1563	-1	-1	-1	2
14	2	1892	-1	-1	-1	2
14	2	1882	-1	-1	-1	10
14	2	1880	-1	-1	-1	20
14	2	1856	-1	-1	-1	8
14	2	1850	-1	-1	-1	6
14	2	1842	-1	-1	-1	8
14	2	1833	-1	-1	-1	5
14	2	1830	-1	-1	-1	2
14	2	1826	-1	-1	-1	4
14	2	1786	-1	-1	-1	4
14	2	1858	-1	-1	-1	6
14	2	1606	-1	-1	-1	2
14	3	1921	-1	-1	-1	3
14	3	1915	-1	-1	-1	2
14	3	1900	-1	-1	-1	2
14	3	1897	-1	-1	-1	3
14	3	1882	-1	-1	-1	4
14	3	1880	-1	-1	-1	3
14	3	1870	-1	-1	-1	2
14	3	1847	-1	-1	-1	2
14	3	1836	-1	-1	-1	2
14	3	1835	-1	-1	-1	5
14	3	1810	-1	-1	-1	2
14	3	1800	-1	-1	-1	2
14	3	1785	-1	-1	-1	2
15	1	1932	-1	-1	-1	-1
15	1	1902	-1	-1	-1	-1
15	1	1886	-1	-1	-1	-1
15	1	1868	-1	-1	-1	-1
15	1	1854	-1	-1	-1	-1
15	1	1843	-1	-1	-1	-1
15	1	1831	-1	-1	-1	-1
15	1	1802	-1	-1	-1	-1
15	1	1768	-1	-1	-1	-1
16	1	1893	-1	-1	-1	26
16	1	1862	-1	-1	-1	1
16	1	1770	-1	-1	-1	1
16	1	1732	-1	-1	-1	1
16	1	1662	-1	-1	-1	11
16	1	1527	-1	-1	-1	-1
16	2	1897	-1	-1	-1	5
16	2	1876	-1	-1	-1	-1
16	2	1803	-1	-1	-1	-1
16	3	1913	-1	-1	-1	4
16	3	1874	-1	-1	-1	3
16	3	1823	-1	-1	-1	4
16	3	1543	-1	-1	-1	1
16	3	1413	-1	-1	-1	1

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	Year		Size (ha)	Number of Trees
			start	end		
16	3	1233	-1	-1	-1	-1
16	4	1862	-1	-1	-1	-1
16	4	1838	-1	-1	-1	-1
16	4	1413	-1	-1	-1	-1
16	5	1482	-1	-1	-1	-1
16	6	1150	-1	-1	-1	-1
17	1	1934	-1	-1	770	9
17	1	1930	-1	-1	680	5
17	1	1894	-1	-1	270	23
17	1	1886	1885	1887	4280	59
17	1	1872	1870	1874	600	7
17	1	1858	1856	1860	3700	51
17	1	1856	1854	1858	2800	5
17	1	1825	1820	1830	2480	31
17	1	1803	1778	1828	2230	51
17	1	1703	1678	1728	5140	54
17	1	1688	1663	1713	4410	4
17	1	1628	1603	1653	12900	80
17	1	1503	1478	1528	13680	70
17	1	1403	1378	1428	13700	66
17	1	1303	1278	1328	6000	7
17	1	1230	1205	1255	25000	48
18	1	1899	-1	-1	-1	8
18	1	1837	1827	1846	-1	9
19	1	1806	-1	-1	-1	1
19	1	1751	-1	-1	-1	1
19	1	1662	-1	-1	-1	1
19	1	1415	-1	-1	-1	1
19	1	1384	-1	-1	-1	1
19	1	1359	-1	-1	-1	1
19	2	1868	-1	-1	-1	12
19	2	1810	-1	-1	-1	3
19	2	1625	-1	-1	-1	1
19	2	1595	-1	-1	-1	1
19	2	1578	-1	-1	-1	1
19	2	1562	-1	-1	-1	1
19	2	1387	-1	-1	-1	1
19	3	1766	-1	-1	-1	1
19	3	1738	-1	-1	-1	1
19	3	1622	-1	-1	-1	2
19	3	1545	-1	-1	-1	2
19	3	1528	-1	-1	-1	2
20	1	1837	1828	1841	-1	5
20	1	1815	-1	-1	-1	1
20	1	1779	-1	-1	-1	1
20	1	1758	-1	-1	-1	1
20	1	1736	-1	-1	-1	1
20	1	1668	-1	-1	-1	1
20	1	1629	-1	-1	-1	1
21	1	1896	1896	1899	-1	6
21	1	1864	1864	1866	-1	2
21	1	1721	-1	-1	-1	1

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	Year		Size (ha)	Number of Trees
			start	end		
21	2	1856	-1	-1	-1	3
21	3	1939	1939	1941	-1	2
21	3	1925	1925	1931	-1	7
21	3	1566	-1	-1	-1	1
21	4	1917	1917	1919	-1	4
21	4	1891	1891	1898	-1	4
21	5	1861	1861	1871	-1	5
21	6	1891	-1	-1	-1	1
21	6	1861	-1	-1	-1	1
21	7	1885	-1	-1	-1	1
21	7	1865	-1	-1	-1	1
21	8	1896	-1	-1	-1	1
21	8	1881	1881	1885	-1	2
21	8	1863	1863	1866	-1	4
21	9	1882	1882	1894	-1	3
21	9	1859	1859	1873	-1	3
21	10	1918	1918	1936	-1	9
21	10	1858	1858	1860	-1	2
21	11	1896	1896	1906	-1	7
21	12	1857	1857	1874	-1	4
21	13	1889	-1	-1	-1	3
21	14	1889	1889	1904	-1	4
21	15	1916	-1	-1	-1	1
21	15	1860	-1	-1	-1	1
21	16	1946	1946	1949	-1	2
21	16	1891	1891	1892	-1	2
21	17	1946	1946	1951	-1	3
21	17	1881	-1	-1	-1	1
21	18	1949	-1	-1	-1	3
21	18	1927	1927	1931	-1	2
21	18	1859	1859	1864	-1	2
21	18	1837	1837	1843	-1	2
21	19	1926	1926	1935	-1	4
21	19	1861	-1	-1	-1	1
21	19	1836	-1	-1	-1	1
21	20	1930	1930	1932	-1	2
21	20	1866	-1	-1	-1	1
21	21	1929	1929	1935	-1	4
21	21	1861	-1	-1	-1	1
21	21	1881	-1	-1	-1	1
21	22	1946	-1	-1	-1	1
21	22	1926	1926	1936	-1	6
21	22	1886	-1	-1	-1	1
21	22	1601	-1	-1	-1	1
21	23	1910	-1	-1	-1	1
21	23	1884	-1	-1	-1	1
21	24	1936	-1	-1	-1	1
21	24	1891	1891	1901	-1	4
21	24	1747	1747	1748	-1	2
21	25	1907	-1	-1	-1	1
21	25	1889	1889	1898	-1	4
21	25	1847	-1	-1	-1	1

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	-----Year-----		Size (ha)	Number of Trees
			start	end		
22	1	1932	-1	-1	-1	9
22	1	1923	-1	-1	-1	12
22	1	1902	-1	-1	-1	58
22	1	1848	-1	-1	-1	3
22	1	1824	-1	-1	-1	4
22	1	1803	-1	-1	-1	5
22	1	1478	-1	-1	-1	6
25	1	1930	-1	-1	-1	1
25	1	1910	-1	-1	-1	1
25	1	1905	-1	-1	-1	1
25	1	1900	-1	-1	-1	1
25	1	1889	-1	-1	-1	7
25	1	1885	-1	-1	-1	1
25	1	1881	-1	-1	-1	1
25	1	1873	-1	-1	-1	2
25	1	1869	-1	-1	-1	2
25	1	1856	-1	-1	-1	2
25	1	1850	-1	-1	-1	1
25	1	1846	-1	-1	-1	1
25	1	1840	-1	-1	-1	1
25	1	1828	-1	-1	-1	2
25	1	1824	-1	-1	-1	2
25	1	1801	-1	-1	-1	1
25	1	1799	-1	-1	-1	1
25	1	1794	-1	-1	-1	1
25	1	1761	-1	-1	-1	1
25	1	1753	-1	-1	-1	2
25	1	1739	-1	-1	-1	1
25	2	1937	-1	-1	-1	2
25	2	1923	-1	-1	-1	2
25	2	1914	-1	-1	-1	6
25	2	1899	-1	-1	-1	3
25	2	1895	-1	-1	-1	2
25	2	1890	-1	-1	-1	3
25	2	1885	-1	-1	-1	1
25	2	1877	-1	-1	-1	2
25	2	1875	-1	-1	-1	1
25	2	1872	-1	-1	-1	1
25	2	1867	-1	-1	-1	2
25	2	1853	-1	-1	-1	4
25	2	1843	-1	-1	-1	4
25	2	1831	-1	-1	-1	2
25	2	1824	-1	-1	-1	1
25	2	1818	-1	-1	-1	2
25	2	1809	-1	-1	-1	2
25	2	1803	-1	-1	-1	3
25	2	1798	-1	-1	-1	1
25	2	1790	-1	-1	-1	1
25	2	1769	-1	-1	-1	1
25	2	1745	-1	-1	-1	1
25	2	1738	-1	-1	-1	1
25	2	1730	-1	-1	-1	1

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	Year		Size (ha)	Number of Trees
			start	end		
25	3	1935	-1	-1	-1	2
25	3	1925	-1	-1	-1	1
25	3	1901	-1	-1	-1	1
25	3	1895	-1	-1	-1	1
25	3	1891	-1	-1	-1	4
25	3	1888	-1	-1	-1	3
25	3	1855	-1	-1	-1	1
25	3	1851	-1	-1	-1	2
25	3	1841	-1	-1	-1	2
25	3	1833	-1	-1	-1	2
25	3	1830	-1	-1	-1	1
25	3	1825	-1	-1	-1	2
25	3	1816	-1	-1	-1	1
25	3	1805	-1	-1	-1	1
25	3	1799	-1	-1	-1	1
25	3	1796	-1	-1	-1	1
25	3	1776	-1	-1	-1	1
25	3	1766	-1	-1	-1	1
25	3	1747	-1	-1	-1	1
25	3	1701	-1	-1	-1	1
25	4	1935	-1	-1	-1	1
25	4	1925	-1	-1	-1	2
25	4	1910	-1	-1	-1	1
25	4	1905	-1	-1	-1	4
25	4	1899	-1	-1	-1	1
25	4	1891	-1	-1	-1	4
25	4	1887	-1	-1	-1	1
25	4	1875	-1	-1	-1	1
25	4	1868	-1	-1	-1	3
25	4	1859	-1	-1	-1	5
25	4	1853	-1	-1	-1	1
25	4	1848	-1	-1	-1	7
25	4	1841	-1	-1	-1	4
25	4	1836	-1	-1	-1	1
25	4	1831	-1	-1	-1	3
25	4	1828	-1	-1	-1	1
25	4	1821	-1	-1	-1	3
25	4	1815	-1	-1	-1	1
25	4	1804	-1	-1	-1	2
25	4	1802	-1	-1	-1	2
25	4	1794	-1	-1	-1	1
25	4	1793	-1	-1	-1	1
25	4	1789	-1	-1	-1	1
25	4	1782	-1	-1	-1	1
25	4	1777	-1	-1	-1	2
25	4	1770	-1	-1	-1	3
25	4	1760	-1	-1	-1	2
25	4	1749	-1	-1	-1	2
25	4	1741	-1	-1	-1	1
25	4	1720	-1	-1	-1	1
25	4	1700	-1	-1	-1	1
25	5	1866	-1	-1	-1	1

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	Year		Size (ha)	Number of Trees
			start	end		
25	5	1718	-1	-1	-1	1
25	6	1900	-1	-1	-1	1
25	6	1846	-1	-1	-1	1
25	7	1911	-1	-1	-1	6
25	7	1890	-1	-1	-1	4
25	7	1870	-1	-1	-1	4
25	7	1845	-1	-1	-1	2
25	7	1835	-1	-1	-1	1
25	7	1824	-1	-1	-1	1
25	7	1804	-1	-1	-1	1
25	7	1776	-1	-1	-1	1
25	7	1763	-1	-1	-1	1
25	7	1762	-1	-1	-1	1
25	7	1758	-1	-1	-1	1
25	7	1732	-1	-1	-1	1
25	7	1679	-1	-1	-1	1
25	7	1634	-1	-1	-1	1
25	7	1611	-1	-1	-1	1
25	8	1932	-1	-1	-1	1
25	8	1914	-1	-1	-1	1
25	8	1898	-1	-1	-1	1
25	8	1890	-1	-1	-1	5
25	8	1876	-1	-1	-1	3
25	8	1870	-1	-1	-1	1
25	8	1852	-1	-1	-1	2
25	8	1841	-1	-1	-1	1
25	8	1838	-1	-1	-1	1
25	8	1835	-1	-1	-1	2
25	8	1830	-1	-1	-1	3
25	8	1826	-1	-1	-1	2
25	8	1824	-1	-1	-1	1
25	8	1820	-1	-1	-1	2
25	8	1816	-1	-1	-1	4
25	8	1804	-1	-1	-1	1
25	8	1801	-1	-1	-1	1
25	8	1795	-1	-1	-1	1
25	8	1790	-1	-1	-1	2
25	8	1775	-1	-1	-1	1
25	8	1769	-1	-1	-1	1
25	8	1763	-1	-1	-1	1
25	8	1756	-1	-1	-1	2
25	8	1753	-1	-1	-1	2
25	8	1739	-1	-1	-1	1
25	8	1616	-1	-1	-1	1
26	1	1864	-1	-1	-1	1
26	1	1824	-1	-1	-1	1
26	1	1771	-1	-1	-1	1
26	1	1762	-1	-1	-1	1
26	1	1603	-1	-1	-1	1
26	1	1583	-1	-1	-1	1
26	2	1921	-1	-1	-1	1
26	2	1864	-1	-1	-1	1

FHFIRE.DB (cont.)

Ref #	Site #	Year of Fire	-----Year-----		Size (ha)	Number of Trees
			start	end		
26	2	1857	-1	-1	-1	1
26	2	1834	-1	-1	-1	1
26	2	1829	-1	-1	-1	1
26	2	1812	-1	-1	-1	1
26	2	1788	-1	-1	-1	1
26	2	1786	-1	-1	-1	1
26	2	1784	-1	-1	-1	1
26	2	1767	-1	-1	-1	1
26	2	1754	-1	-1	-1	1
26	2	1737	-1	-1	-1	1
26	2	1720	-1	-1	-1	1
26	2	1687	-1	-1	-1	1
26	3	1873	-1	-1	-1	1
26	3	1865	-1	-1	-1	1
26	3	1852	-1	-1	-1	1
26	3	1843	-1	-1	-1	1
26	3	1834	-1	-1	-1	1
26	3	1829	-1	-1	-1	1
26	3	1826	-1	-1	-1	1
26	3	1820	-1	-1	-1	1
26	3	1812	-1	-1	-1	1
26	3	1800	-1	-1	-1	1
26	3	1784	-1	-1	-1	1
26	3	1774	-1	-1	-1	1
26	3	1766	-1	-1	-1	1
26	3	1762	-1	-1	-1	1
26	3	1752	-1	-1	-1	1
26	3	1735	-1	-1	-1	1
26	3	1686	-1	-1	-1	1
26	3	1669	-1	-1	-1	1
26	4	1906	-1	-1	-1	1
26	4	1891	-1	-1	-1	1
26	4	1874	-1	-1	-1	1
26	4	1857	-1	-1	-1	1
26	4	1842	-1	-1	-1	1
26	4	1837	-1	-1	-1	1
26	4	1824	-1	-1	-1	1
26	4	1806	-1	-1	-1	1
26	4	1800	-1	-1	-1	1
26	4	1773	-1	-1	-1	1
26	4	1740	-1	-1	-1	1
26	4	1732	-1	-1	-1	1
26	4	1720	-1	-1	-1	1
26	4	1691	-1	-1	-1	1
26	4	1667	-1	-1	-1	1
29	1	1888	-1	-1	-1	-1
29	1	1883	-1	-1	-1	-1
29	1	1863	-1	-1	-1	-1
29	1	1843	-1	-1	-1	-1
29	1	1838	-1	-1	-1	-1
29	1	1824	-1	-1	-1	-1