

## Introduction Surface Model for *Phytophthora alni* ssp *alni*

**Data format:** Raster Dataset - ESRI GRID

**File or table name:** Introduction

**Coordinate system:** Albers Conical Equal Area

**Theme keywords:** Forest Pathogen, Forest Pest, Exotic, Invasive Species, *Phytophthora alni*, *Phytophthora alni* ssp *alni*, Alder pathogen, *P. alni*, Introduction Potential

**Abstract:** The Introduction Potential Surface for *Phytophthora alni* ssp *alni* was produced for the Conterminous United States (CUS) in 1 square kilometer (km<sup>2</sup>) units by the U.S. Forest Service, Forest Health Technology Enterprise Team's (FHTET) Invasive Species Steering Committee

### FGDC and ESRI Metadata:

- [Identification Information](#)
- [Data Quality Information](#)
- [Spatial Data Organization Information](#)
- [Spatial Reference Information](#)
- [Entity and Attribute Information](#)
- [Distribution Information](#)
- [Metadata Reference Information](#)

Metadata elements shown with blue text are defined in the Federal Geographic Data Committee's (FGDC) [Content Standard for Digital Geospatial Metadata \(CSDGM\)](#). Elements shown with green text are defined in the [ESRI Profile of the CSDGM](#). Elements shown with a green asterisk (\*) will be automatically updated by ArcCatalog. ArcCatalog adds hints indicating which FGDC elements are mandatory; these are shown with gray text.

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### Identification Information:

**Citation:**

**Citation information:**

**Originators:** Forest Health Technology Team (FHTET) USDA Forest Service

**Title:**

Introduction Potential Surface Model for *Phytophthora alni* ssp *alni*

\***File or table name:** intro2 (GRID)

**File or table name:** p\_alni\_intro.mdx

**Tool name:** p\_alni

**Model Name: suscept**

**Publication date:** 9/28/2007

**\*Geospatial data presentation form:** raster digital data

**Series information:**

**Series name:** Version 1.0

**Issue identification:** 9/28/2007

**Publication information:**

**Publication place:** Fort Collins, Colorado

**Publisher:** Marla C. Downing

**Online linkage:**

[http://www.fs.fed.us/foresthealth/technology/invasives\\_phytophthoraalni\\_riskmaps.shtml](http://www.fs.fed.us/foresthealth/technology/invasives_phytophthoraalni_riskmaps.shtml)

**Larger work citation:**

**Citation information:**

**Originators:** Forest Health Technology Enterprise Team (FHTET) USDA Forest Service

**Title:**

Introduction Potential for *Phytophthora alni* ssp *alni*

**Publication date:** 9/28/2007

**Edition:** 1.0

**Geospatial data presentation form:** map

**Online linkage:**

[http://www.fs.fed.us/foresthealth/technology/invasives\\_phytophthoraalni\\_riskmaps.shtml](http://www.fs.fed.us/foresthealth/technology/invasives_phytophthoraalni_riskmaps.shtml)

**Description:**

**Abstract:**

The Introduction Potential Surface for *Phytophthora alni* ssp *alni* (PAA) was produced for the Conterminous United States (CUS) in 1 square kilometer (km<sup>2</sup>) units by the USDA Forest Service, Forest Health Technology Enterprise Team's (FHTET) Invasive Species Steering Committee; a multidisciplinary team with participation from USFS and APHIS. Supporting information for this product was taken from Exotic Forest Pest (ExFor) website (<http://spfnic.fs.fed.us/exfor/>).

**Purpose:**

The Introduction Potential Surface for *Phytophthora alni* ssp *alni* (PAA) was produced for the Conterminous United States (CUS) in 1-

square-kilometer (km<sup>2</sup>) units by the U.S. Forest Service, Forest Health Technology Enterprise Team's (FHTET) Invasive Species Steering Committee (Table 1). The product's intended use, in conjunction with the Establishment Potential Surface, is to develop a Susceptibility Potential Surface for PAA. Supporting information was taken from the Exotic Forest Pest (ExFor) website (<http://www.spfnic.fs.fed.us/exfor/data/pestreports.cfm?pestidval=28&langdisplay=english>). Three primary datasets with standardized values from 0 to 10 were used as variables in the analysis. The data sets are: 1) wholesale nurseries, 2) production nurseries, and 3) metropolitan areas. Wholesale and production nurseries were buffered by 6 km and merged using a maximum overlay process into a single nurseries data set. The 6 km buffer was used to capture the retail nurseries. Metropolitan areas were buffered 3 km. Nurseries and metropolitan areas were multiplied by their arithmetic weights (Table 2), and the resultant values were combined in a weighted overlay. The output values are 0, 5, and 10, with 10 having the highest introduction potential. Each of the variables was used to depict potential locations where *P. alni* could be released into the CUS. The resulting groups are 0 = Little or No, 5 = Medium, and 10 = High potential for introduction.

**Supplemental information:**

Each of the variables was used to depict potential locations where PAA could be introduced into the Conterminous United States.

**Wholesale and Production Nurseries.** Source: ReferenceUSA database. ReferenceUSA is an online, proprietary database offered by the InfoUSA company. It contains detailed records on more than 13 million businesses. Documentation/metadata is not available. Using the business address information contained in ReferenceUSA database, these data were then geocoded. Geocoding was made possible with data provided by TeleAtlas (Appendix I).

**Metropolitan Areas.** Source: Environmental Research Institute (ESRI) in Redlands, California, World at Night (\*Imhoff et al. 1997) represents a nighttime view of the Earth produced by mosaicking Defense Meteorological Satellite Program (DMSP) Operational Linescan System (OLS) satellite images. This system was originally designed to view clouds by moonlight and to map the locations of permanent lights on the Earth's surface. These data are derived from nine months of observations superimposed on a darkened land surface. ESRI georeferenced these data to a real-world coordinate system.

**Table 1**

**Steering Committee**

Marla C. Downing, FHTET Lead  
Daniel M. Borchert, APHIS PPQ  
Kerry Britton USFS Research  
Frank H. Koch, USFS SRS  
Frank J. Krist Jr., USFS FHTET  
Frank J. Sapio, USFS FHTET

Bill D. Smith, USFS SRS  
Borys M. Tkacz, USFS FHP  
Robert C. Venette USFS NRS

**Contractor Support**

Michael F. Tuffly  
Information Technology Experts, INC (ITX)

**Table 2**

Introduction Variables and  
Arithmetic Weights

<b>Variables</b>	<b>Weight</b>
Nurseries	50%
Metropolitan areas	50%

**References**

\*Imhoff M. L., Lawrence, W. T., Stutzer, C.S., and  
Elvidge, C.D., 1997. Remote Sensing and Environ 61:361-  
379

\***Language of dataset:** en

**Time period of content:**  
**Time period information:**  
**Single date/time:**  
**Calendar date:** 9/28/2007

**Currentness reference:**  
publication date: 9/28/2007

**Status:**  
**Progress:** Planned  
**Maintenance and update frequency:** As needed

**Spatial domain:**  
**Bounding coordinates:**  
\***West bounding coordinate:** -131.718010  
\***East bounding coordinate:** -50.048796  
\***North bounding coordinate:** 54.232833  
\***South bounding coordinate:** 17.231111

**Local bounding coordinates:**  
\***Left bounding coordinate:** -2549760.64354  
\***Right bounding coordinate:** 2497239.35646

\***Top bounding coordinate:** 3267052.87047

\***Bottom bounding coordinate:** 187052.870471

**Keywords:**

**Theme:**

**Theme keywords:** Forest Pathogen, Forest Pest, Exotic, Invasive Species, *Phytophthora alni*, *Phytophthora alni* spp *alni*, Alder pathogen, , *P. alni*, Introduction Potential

**Place:**

**Place keywords:** Conterminous United States

**Place keyword thesaurus:** Lower 48 States

**Access constraints:** None

**Use constraints:**

None

**Point of contact:**

**Contact information:**

**Contact organization primary:**

**Contact person:** Marla C. Downing

**Contact organization:** Forest Health Technology Enterprise Team (FHTET)  
Forest Health Protection

**Contact position:** FHTET Lead, Biological Scientist

**Contact address:**

**Address type:** mailing and physical address

**Address:**

2150 Centre Avenue, Bldg A, Suite 331

**City:** Fort Collins

**State or province:** Colorado

**Postal code:** 80526-1891

**Country:** USA

**Contact voice telephone:** 970-295-5843

**Contact electronic mail address:** mdowning@fs.fed.us

**Hours of service:** 9:00 AM - 5:00 PM MT

**Browse graphic:**

**Browse graphic file name:**

[http://www.fs.fed.us/foresthealth/technology/invasives\\_phytophthoraalni\\_riskmaps.shtml](http://www.fs.fed.us/foresthealth/technology/invasives_phytophthoraalni_riskmaps.shtml)

**Browse graphic file description:**

webpage

**Browse graphic file type:** JPEG

**Security information:**

**Security classification:** Unclassified

\***Native dataset format:** Raster Dataset

\***Native data set environment:**

**Cross reference:**

**Citation information:**

**Originators:** Forest Health Technology Enterprise Team (FHTET) USDA  
Forest Service

**Title:**

Introduction Potential for *Phytophthora alni* spp alni

**Publication date:** 9/28/2007

**Edition:** 1.0

**Geospatial data presentation form:** map

**Online linkage:**

[http://www.fs.fed.us/foresthealth/technology/invasives\\_phytophthoraalni\\_riskmaps.shtml](http://www.fs.fed.us/foresthealth/technology/invasives_phytophthoraalni_riskmaps.shtml)

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## Data Quality Information:

**Attribute accuracy:**

**Attribute accuracy report:**

One kilometer

**Lineage:**

**Process step:**

**Process description:**

Summary of Introduction Potential for *Phytophthora alni* spp alni  
September 28, 2007

Website URL:

[http://www.fs.fed.us/foresthealth/technology/invasives\\_phytophtho\\_raalni\\_riskmaps.shtml](http://www.fs.fed.us/foresthealth/technology/invasives_phytophtho_raalni_riskmaps.shtml)

The Introduction Potential Surface for *Phytophthora alni* spp alni was produced for the Conterminous United States (CUS) in 1 square kilometer (km<sup>2</sup>) units by the USDA Forest Service, Forest Health Technology Enterprise Team's (FHTET) Invasive Species Steering Committee; a multidisciplinary team with participation from USFS and APHIS. Supporting information for this product was taken from Exotic Forest Pest (ExFor) website

(<http://www.spfnic.fs.fed.us/exfor/data/pestreports.cfm?pestidval=28&langdisplay=english>).

The Introduction Potential Surface for *Phytophthora alni* ssp *alni* (PAA) was produced for the Conterminous United States (CUS) in 1-square-kilometer (km<sup>2</sup>) units by the U.S. Forest Service, Forest Health Technology Enterprise Team's (FHTET) Invasive Species Steering Committee (Table 1). The product's intended use, in conjunction with the Establishment Potential Surface, is to develop a Susceptibility Potential Surface for *P. alni*. Supporting information was taken from the Exotic Forest Pest (ExFor) website (<http://spfnic.fs.fed.us/exfor/>). Three primary datasets with standardized values from 0 to 10 were used as variables in the analysis. The data sets are: 1) wholesale nurseries, 2) production nurseries, and 3) metropolitan areas. Wholesale and production nurseries were buffered by 6 km and merged using a maximum overlay process into a single nurseries data set. Metropolitan areas were buffered 3 km. Nurseries and metropolitan areas were multiplied by their arithmetic weights (Table 2), and the resultant values were combined in a weighted overlay. The output values are 0, 5, and 10, with 10 having the highest introduction potential. Each of the variables was used to depict potential locations where *P. alni* could be released into the CUS. The resulting groups are 0 = Little or No, 5 = Medium, and 10 = High potential for introduction.

#### References

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**Wholesale and Production Nurseries.** Source: ReferenceUSA database. ReferenceUSA is an online, proprietary database offered by the InfoUSA company. It contains detailed records on more than 13 million businesses. Documentation/metadata is not available. Using the business address information contained in ReferenceUSA database, these data were then geocoded. Geocoding was made possible with data provided by TeleAtlas.

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Susceptibility potential related to the product of:

1. Establishment Potential
2. Introduction Potential

**Process software and version:** ArcGIS ver 9.2  
**Process date:** 9/28/2007

**Process contact:**

**Contact information:**

**Contact organization primary:**

**Contact person:** Marla C. Downing

**Contact organization:** Forest Health Technology Enterprise Team (FHTET)  
USDA Forest Service

**Contact position:** FHTET Lead, Biological Scientist

**Contact address:**

**Address type:** mailing and physical address

**Address:**

2150 Centre Avenue, Bldg A, Suite 331

**City:** Fort Collins

**State or province:** Colorado

**Postal code:** 80526-1891

**Country:** USA

**Contact voice telephone:** 970-295-5843

**Contact electronic mail address:** mdowning@fs.fed.us

**Hours of service:** 9:00 AM - 5:00 PM MT

**Process step:**

**Process description:**

Metadata imported.

**Source used citation abbreviation:**

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## Spatial Data Organization Information:

**\*Direct spatial reference method:** Raster

**Raster object information:**

**\*Image format:** ESRI GRID

\***Number of bands:** 1

\***Row count:** 3080

\***Column count:** 5047

\***Vertical count:** 1

**Cell size X direction:** 1000

**Cell size Y direction:** 1000

\***Bits per pixel:** 8

\***Pyramid layers:** FALSE

\***Image colormap:** FALSE

\***Compression type:** Default

\***Raster object type:** Grid Cell

\***Raster display type:** matrix values

\***Raster origin:** Upper Left

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## Spatial Reference Information:

### Horizontal coordinate system definition:

#### Coordinate system name:

\***Projected coordinate system name:** NAD\_1983\_Albers

\***Geographic coordinate system name:** GCS\_North\_American\_1983

### Planar:

#### Map projection:

\***Map projection name:** Albers Conical Equal Area

#### Albers conical equal area:

\***Standard parallel:** 29.500000

\***Standard parallel:** 45.500000

\***Longitude of central meridian:** -96.000000

\***Latitude of projection origin:** 23.000000

\***False easting:** 0.000000

\***False northing:** 0.000000

### Planar coordinate information:

\***Planar coordinate encoding method:** row and column

#### Coordinate representation:

**Abscissa resolution:** 1000

**Ordinate resolution:** 1000

\***Planar distance units:** meters

### Geodetic model:

\***Horizontal datum name:** North American Datum of 1983

- \* **Ellipsoid name:** Geodetic Reference System 80
- \* **Semi-major axis:** 6378137.000000
- \* **Denominator of flattening ratio:** 298.257222

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## Entity and Attribute Information:

### Detailed description:

\* **Name:** introduction

### Entity type:

\* **Entity type label:** introduction

\* **Entity type type:** Table

\* **Entity type count:** 11

### Entity type definition:

Introduction Potential Surface for *Phytophthora alni* ssp *alni*

### Attribute:

\* **Attribute label:** ObjectID

\* **Attribute alias:** ObjectID

### Attribute definition:

Internal feature number.

\* **Attribute definition source:**

ESRI

\* **Attribute type:** OID

\* **Attribute width:** 4

\* **Attribute precision:** 0

\* **Attribute scale:** 0

### Attribute domain values:

\* **Unrepresentable domain:**

Sequential unique whole numbers that are automatically generated.

### Attribute measurement frequency:

Unknown

### Attribute:

\* **Attribute label:** Value

\* **Attribute alias:** Value

### Attribute definition:

Integer Value 0, 5, and 10 where 0 equals little or no potential, 5 equals medium potential, and 10 equals high potential for introduction.

\* **Attribute type:** Integer

\* **Attribute width:** 0

\*Attribute precision: 0

\*Attribute scale: 0

**Attribute value accuracy information:**

**Attribute value accuracy:** As Reported

**Attribute measurement frequency:**

As needed

**Attribute:**

\*Attribute label: Count

\*Attribute alias: Count

**Attribute definition:**

The frequency of 1000 by 1000 meter GRID cells

**Attribute definition source:**

ESRI

\*Attribute type: Double

\*Attribute width: 0

\*Attribute precision: 0

\*Attribute scale: 0

**Attribute measurement frequency:**

As needed

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**Distribution Information:**

**Resource description:** Downloadable Data

**Standard order process:**

**Digital form:**

**Digital transfer information:**

\*Transfer size: 14.82 MB

\*Dataset size: 14.82 MB

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**Metadata Reference Information:**

\*Metadata date: 20070928

Metadata review date: 20070928

\*Language of metadata: en

**Metadata contact:**

**Contact information:**

**Contact organization primary:**

**Contact person:** Marla C. Downing

**Contact organization:** Forest Health Technology Enterprise Team (FHTET)  
USDA Forest Service

**Contact position:** FHTET, Lead and Biological Scientist

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**Contact voice telephone:** 970-295-5843

**Contact electronic mail address:** mdowning@fs.fed.us

**Hours of service:** 9:00 AM - 5:00 PM MT

\***Metadata standard name:** FGDC Content Standards for Digital Geospatial Metadata

\***Metadata standard version:** FGDC-STD-001-1998

\***Metadata time convention:** local time

**Metadata security information:**

**Metadata security classification:** Unclassified

**Metadata extensions:**

\***Online linkage:** <http://www.esri.com/metadata/esriprof80.html>

\***Profile name:** ESRI Metadata Profile

## Appendix I

The wholesale and production nursery data were taken from the ReferenceUSA database. ReferenceUSA is an online, proprietary database offered by the InfoUSA company. It contains detailed records on more than 13 million businesses. Documentation/metadata is not available. But through a series of phone calls it was determined that the datum of the geographic coordinates listed with each record is NAD 83, and that the geocoding is possibly provided by TeleAtlas.

Field Descriptions and some qualifying information describing those fields.

NAME  
ADDRESS  
CITY  
ST  
ZIPCODE  
ZIP\_4  
COUNTY  
MSA = metropolitan statistical area  
PHONE  
FAX\_PH  
TOLL\_FREE = if they have a toll-free phone number  
EMP\_SIZE = # of employees, in classes (1 to 4, 5 to 9, etc.)  
CORP\_EMP = # of corporate employees  
SALES = in classes (less than \$500,000, \$500,000 to \$1 million, etc.)  
BUS\_STATUS = single location or branch location  
PARENT\_NO = if a branch location, then ID number associated with parent company, not sure what it is  
PARENT\_CO = if a branch location, name of parent company  
LASTNAME = last name of primary contact  
FIRSTNAME = first name of primary contact  
TITLECODE = title of primary contact (manager, owner, president, CEO, etc.)  
GENDER = gender of primary contact  
CREDIT\_RAT = credit rating (good, very good, unknown, etc.)  
IUSA = code number assigned to the business by InfoUSA  
HOLD\_STAT = hold status -- not sure about this one  
TICKER\_SYM = if publicly traded, ticker symbol  
STOCK\_CODE = if publicly traded, stock code  
FOREIGN\_PAR = if company has foreign parent  
RANKING = not sure  
URL = if have URL, would be listed here, but I've generally truncated  
NAICS = North American Industrial Classification System code (primary means of search/query)  
NAICS\_DESC = NAICS textual description  
CREDIT\_SC = credit grade (A, B+, etc.)  
CREDIT\_NUM = looks to be out of 100  
NO\_OF\_PCS = # of computers  
SQ\_FT = square footage of business  
OWN\_LEASE = own or lease  
LATITUDE  
LONGITUDE  
PSIC\_CODE = primary Standard Industrial Classification Code (another means of search/query)  
PSIC\_DESC = primary SIC textual description

The next set of fields has to do with Yellow Pages listings -- repeats several times -- a business may offer numerous services, so they may be listed in several Yellow Pages sections --

ADSIZE\_01  
YR01  
SIC\_02  
DESC\_02  
ADSIZE\_02  
YR02

...

The next set of fields has to do with executives/contacts -- repeats several times --

CONTACT\_LAST\_NAME\_01  
CONTACT\_FIRST\_NAME\_01  
EXECUTIVE\_TITLE\_01  
EXECUTIVE\_GENDER\_01

....

Similar to above, but director information -- repeats several times --

DIRECTOR\_LASTNAME\_01  
DIRECTOR\_FIRSTNAME\_01  
DIRECTOR\_TITLE\_01  
DIRECTOR\_GENDER\_01

...

As mention above, some business locations offer multiple services, under different NAICS categories -- if so, they're listed in the following set of fields --

NAICS\_CD1  
NAICS\_DES1  
NAICS\_CD2  
NAICS\_DES2  
NAICS\_CD3  
NAICS\_DES3  
NAICS\_CD4  
NAICS\_DES4

The wholesale nurseries layer was created by querying the ReferenceUSA database for all business locations who reported North American Industrial Classification System (NAICS) code 424930 (nursery stock wholesalers) as one of their activities

Note: This is not necessarily the business' primary activity.

The nursery and tree production businesses in the U.S. was compiled using a similar process, but using the using the NAICS code 111421.

The process required downloading comma-delimited files from ReferenceUSA (only 10 - 100 files may be downloaded each time). These files were concatenated using the Unix code. Then all files were converted to a DBF using SAS. The DBF was converted into shapefiles based on the lat/long coordinates included with every business location in the ReferenceUSA database.

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