Non-native Plant Data

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for:
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Weed Databases

The Alaska Exotic Plants Information Clearinghouse (AKEPIC)

The Alaska Exotic Plants Information Clearinghouse (AKEPIC) is a database and mapping application that provide geospatial information for non-native plant species in Alaska and the Yukon Territory. These products are the result of an ongoing cooperation between the United States Forest Service, National Park Service, Bureau of Land Management, Fish and Wildlife Service, Department of Natural Resources Plant Material Center and Alaska Natural Heritage Program in support of the Alaska Committee for Noxious and Invasive Plants Management (CNIPM) and the Strategic Plan for Noxious and Invasive Plants Management in Alaska. The Alaska Natural Heritage Program administers the mapping application, database and website associated with the project.

The AKEPIC database was initiated in 2002 as a shared idea among AKNHP, U.S. Forest Service, National Park Service, Bureau of Land Management, and U.S. Geological Survey. As of 2019, approximately 30 different organizations have contributed well over 100,000 non-native plant species records. This makes AKEPIC one of the largest and most comprehensive non-native plant species databases in the United States. All non-native plant tabular data on NFS lands were entered into this database from 2002 through 2007. At that time, there was no spatial application to AKEPIC data as a specific map product. As such, any spatial representation of the data could only be displayed in a geographical information system as a **point,** which at best could only represent the centroid of the infestation location.

During this five year period, the US Forest Service was also developing a corporate data system for specific applications for the entry and storage of both rare and invasive plant survey and locations data specific to Forest Service business needs. This database is called the Natural Resource Manager (NRM). The application for invasive plants is called NRM-INVP (Invasive plants). Per national direction, all Tongass data from the original AKEPIC database were migrated into the NRM-INVP in 2007.

US Forest Service Natural Resource Manager - Invasive Plants (NRM-INVP)

Since 2007 the Tongass N.F. enters all weed data located on NFS lands into NRM-INVP. This database contains tools for managing Agency data across the Forest Service using a consistent and standardized format designed to meet most of the agency's natural resource business needs, in particular for project planning and analysis. The NRM-INVP database supports national data collection standards for both TESP (threatened, endangered and sensitive plants) and invasive plants (INVP) surveys, TESP element-occurrences (rare plant sightings), and Invasive Plant Inventories.

Survey data for invasive species is entered into a tabular database which is used to create a geodatabase of polygons and delineates the survey area. Polygon delineations are derived from the GPS coordinates of the area that was surveyed. For linear surveys, a line is buffered to create a polygon at a width which represents the total area of the survey. Surveys can have negative occurrences; meaning that no invasive plants were located within the survey polygon.

Weed occurrences (locations) derived from inventory data are also entered into a tabular database which is used to create a second spatial geodatabase of **polygons.** These polygons represent a

population of an individual plant. One limitation to the spatial data is that given an area infested by multiple weed species, the infestation acreage may seem to be overestimated by the sum of all polygon areas for each species. For example, one infestation of 10 acres may include weed-1 and weed-2. Numbers generated by summing the polygon areas for both species would report total infestation area to be 20 acres, when in fact the infestation which contains two weed species is actually 10 acres. This discrepancy is a result of how the data is stored in the national database. However, since treatment efforts are often focused on single species, it cannot be assumed that both weed-1 and weed-2 would be treated within the same infestation area. As such, summing the polygon areas for both species represents a truer measure of the total area treated by species. If both weed-1 and weed-2 were actually treated at the same time within the same area, the accomplishment reporting would represent the treatment area of 20 acres. These database and reporting mechanisms are in constant flux and with time, evolution of databases and reporting systems may change. Until that time and for the purposes of this document, total acres reported represent infestation area by species and therefore illustrate the worst case scenario for total area of infestations.

Polygon delineations of weed species occurrences (or infestations), are in some cases derived from the GPS coordinates of the actual infestation (see discussion below). The minimal polygon size to represent a point is .001 acres, which is equivalent to a 2 meter (3.7 ft.) radius around the plant. This minimum polygon size usually represents a trace level infestation. With most infestations larger than 0.1 acre, the polygon should represent the actual boundary of the infestation. However, due to the original method of data collection and input into the AKEPIC database, the resultant infestation boundaries in NRM-INVP are relatively inaccurate (see section below).

Relationship and differences between AKEPIC and NRM-INVP databases

The Forest Service continues participation in updating the State-wide invasive plant database (AKEPIC). As such, our data is forwarded to the Clearinghouse every year via the Alaska Region's Natural Resource Management staff in Juneau.

The primary difference between AKEPIC and NRM-INVP revolves around the spatial data. While the AKEPIC invasive plant infestations did not have a spatial application, the tabular data could be represented by points. On the other hand, the NRM-INVP database contains a spatial layer for infestations which are represented by polygons. This is a significant difference since the original data now contained in the Forest Service NRM-INVP database was derived from data contained in AKEPIC (point data). Since there were no protocols which mandated actual mapping of survey areas and infestation boundaries during the early years of data entry, the data which was migrated from AKEPIC into NRM did not contain more than one GPS coordinate per site. As such, each GPS coordinate associated with both surveys and invasive plant locations was entered into NRM-INVP as a point and subsequently buffered to a width that best represented the infestation area which was a noted data element on the original AKEPIC data sheet. The result of this process is the creation of relatively inaccurate delineations of invasive plant infestations and survey areas.

One note about the inaccuracies of the infestations: while the polygons in NRM-INVP spatial layer may not truly represent the actual boundaries of the infestation on the ground, they do represent the location of the center of the infestation and also represent an approximate total area extent of the infestation (acreage). However, since AKEPIC data was gathered on a sample point basis, these samples do not necessarily represent the entire infestation area, since the same weeds

are likely to occur in between the sample points. As such, total acres displayed in this document for many of the weeds will be underrepresented. Until the Forest Service can afford additional survey efforts to re-delineate the infestation areas more accurately, this data represents the best available information. Figure 1 illustrates an example of the sampling method using the AKEPIC protocols and how this affects the mapped acreage of the actual infestations.

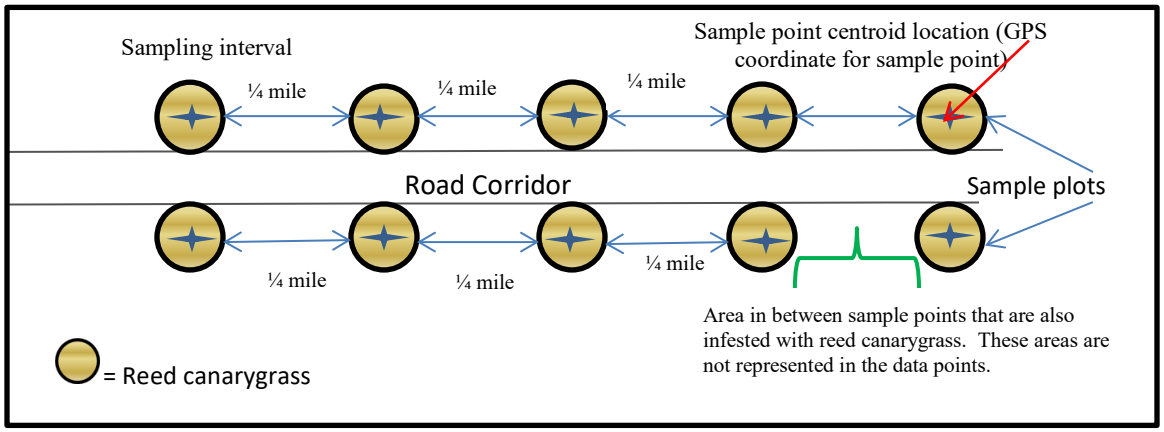

Figure 1. AKEPIC sampling protocols along a road corridor translating into mapped infestation polygons into NRM-INVP spatial database