

120°W

100°W

80°W

Survey Sample Areas for the United States

Sirex woodwasp - Sirex noctilio

50°N

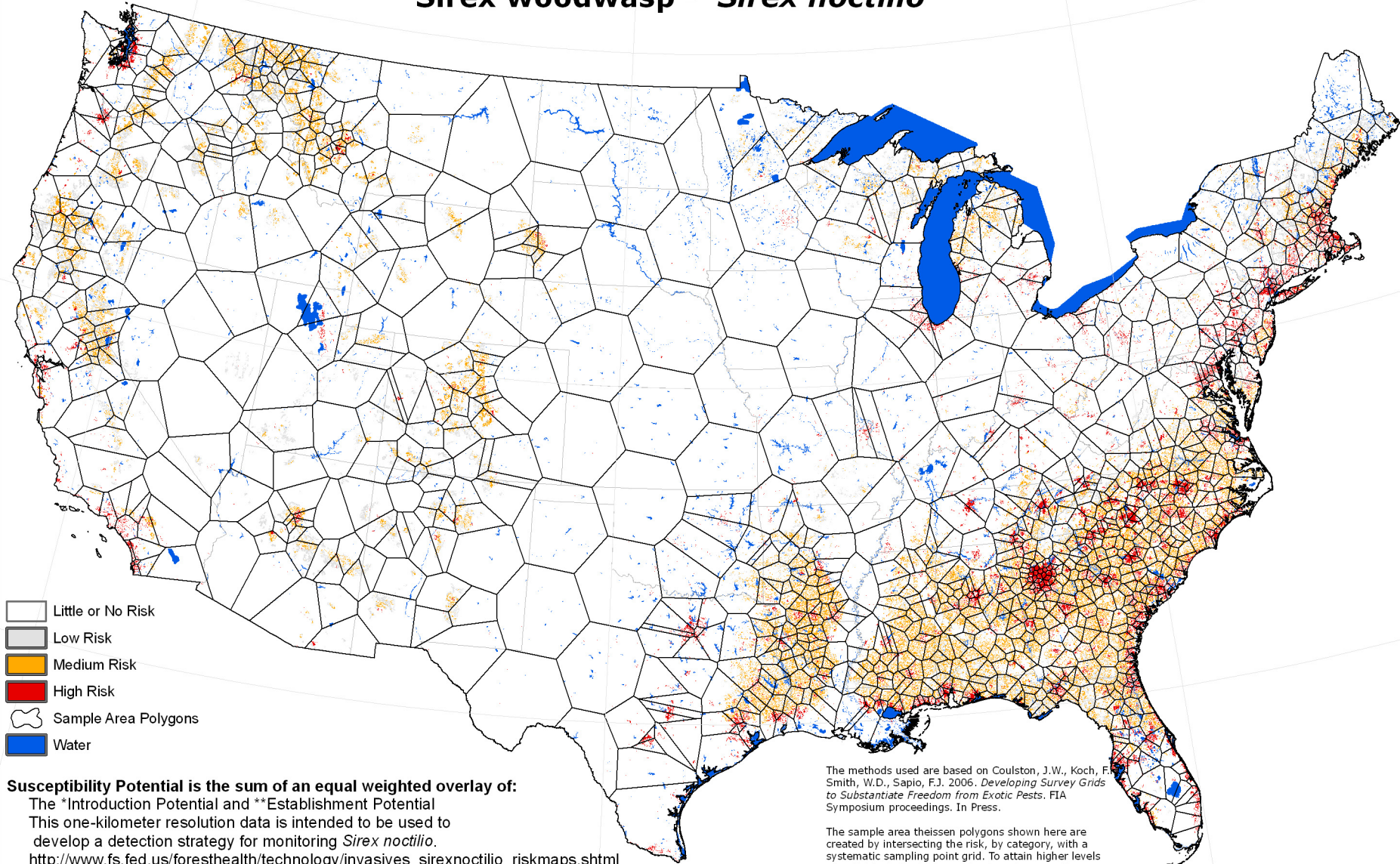
40°N







40°N

30°N

30°N

20°N



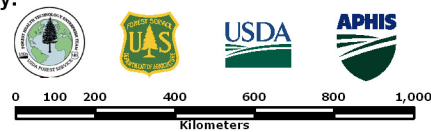
-  Little or No Risk
-  Low Risk
-  Medium Risk
-  High Risk
-  Sample Area Polygons
-  Water

Susceptibility Potential is the sum of an equal weighted overlay of:
 The *Introduction Potential and **Establishment Potential
 This one-kilometer resolution data is intended to be used to
 develop a detection strategy for monitoring *Sirex noctilio*.
http://www.fs.fed.us/foresthealth/technology/invasives_sirexnoctilio_riskmaps.shtml

The methods used are based on Coulston, J.W., Koch, F. Smith, W.D., Sapio, F.J. 2006. *Developing Survey Grids to Substantiate Freedom from Exotic Pests*. FIA Symposium proceedings. In Press.

The sample area theissen polygons shown here are created by intersecting the risk, by category, with a systematic sampling point grid. To attain higher levels of certainty in the higher risk categories, sample areas are intensified where risk of susceptibility is highest.

- *Introduction Potential is determined by the locations of the:**
- Ports that handle commodities with solid wood packing materials shipped from countries where *Sirex noctilio* exists.
 - Distribution centers
 - Markets
- **Establishment Potential is determined by:**
- Pine basal area
 - Presence of susceptible host
 - Soils Wetness Dryness Index
 - Plant Hardiness



Albers Equal Area Conic Projection

file: national_tessalton.mxd
 Map Produced by FHTET
 Fort Collins, CO on 4-30-2007. MFT

100°W

80°W

***Sirex noctillio* National Scale Survey Sample Areas for the Conterminous US Summary**

This project incorporates methods developed by Coulston, et. al. (2006) to develop national scale sampling areas based on the Forest Health Technology Enterprise Team (FHTET) *Sirex noctillio* Susceptibility Surface. The process involved:

- 1) reclassification of the susceptibility risk potential surface into four classes (0 - Little/No, 1 – Low, 2 – Medium, 3 – High);
- 2) estimating the intensification factor based on the required number of samples and the relative certainty for each risk category;
- 3) intensifying EMAP’s North American hexagon to develop a systematic point grid for each risk stratum;
- 4) spatially intersecting the intensified point grids with the corresponding risk stratum;
- 5) merging each set of selected points from the stratum intersection;
- 6) creating the sample areas that are semi-regular tessellations of theissen polygons created from the merged grid intensification points.

For this project, the FHTET *Sirex noctillio* susceptibility risk potential surface was used and reclassified into the required four classes. A total of 1,200 sample areas were used for the intensification model. Relative certainties were assigned in order to create increasing plot intensifications for increasing risk stratum. A custom EXCEL application calculates the intensification factor and sequence number based on the number of points and desired relative certainty. The sequence for the point intensification is determined from a table supplied by the authors. Table 1 shows the risk class, area by class, and number of sample areas used for this project. The point grid intensification is based on the Environmental Monitoring and Assessment (EMAP) hexagon for the conterminous United States and is iteratively intensified using a custom ArcView 3.3 application. A new point file is created for each iterative intensification. The final intensification iterations for each class is intersected with a vector version of the susceptibility surface and merged to create a single point shape file. A sample area tessellation is then performed from the merged intensification points using a custom function in the ArcView 3.3 application that creates theissen polygons. These polygons become the sample areas, where the sample areas are based on the risk class. It is intended that each sample area is given the same number of sample plots.

Citation

Coulston, John W., Koch, F.H., Smith, W.D., Sapio, F.J. 2006. *Developing Survey Grids to Substantiate Freedom from Exotic Pests*. FIA Symposium Proceedings. In Press.

Table 1. Summary Statistics

Risk Class	Relative Certainty	Area (km)	Sample Areas
Little/No (0)	0.25	7,199,762	95
Low (1)	0.4	173,784	170
Mod (2)	0.7	291,350	400
High (3)	0.8	119,769	535

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