STATUS ASSESSMENT RESPONSE FORM

Species (Botanical name): <u>Santalum album</u>
(Common name): Sandalwood, white sandalwood
Where the voucher specimen is held: FTG, FLAS, USF
Assessment/ Reassessment completed by: Deah Lieurance
Date assessment started: <u>11/30/2016</u> Date assessment completed: <u>11/30/2016</u>

INSTRUCTIONS

Either check appropriate response or enter it in the designated space. Attach additional sheets with evidence as necessary using appropriate section numbers.

SUMMARY OF ASSESSMENT RES	SULTS	
BY STATE If species is NOT invasive in Florida, cl	heck one of the following three of	conclusions:
From Section A	Automatic Exemption	
Use Predictive Tool	Prohibited	
✓ Not considered a problem species	at this time	
BY ZONE North: Central: South Index	North: Central: South	
Score I = : :		M =
Category I = : :	P = : :	M = V =
Conclusions North		
Central		
South		

In case of incomplete assessment:

Where did assessment stop?

Who could provide the answer to this question?

<u>Autom</u>	ntic Exemption
Is this s	pecies listed on any federal or state noxious or prohibited plant lists?
🗌 Yes	Under "BY STATE" on page R-1 check Prohibited
🖌 No	Go to Section I-a below

Step-by-Step Assessment Responses

I-a Current Invasion in Florida

1. Is there a proposed or new use for a species that would result in higher propagule pressure* in Florida? For example, cultivation of ≥2 contiguous ac of a species for bioenergy (corresponding to DPI biofuel rule), or commercial cultivation of a species present in Florida for a new use, or increase in acreage cultivated from 1-10 ac to 10 times that acreage (10-100 ac), 10-100 ac to 5 times that acreage (50 to 500 ac), or >100 ac to 2.5 times that acreage.

Yes	Use the Predictive	Too
-----	--------------------	-----

- No Go to question I-a 2
- 2. Does this species occur in any natural areas of Florida?

Yes Attach distribution records and Go to question I-a 3

- No Go to Section A
- 3. Does it **ONLY** occur in natural areas of Florida because it has persisted from its previous cultivation?
 - Yes Attach evidence of previous cultivation for each site and Go to Section A

No Go to Section I-b

Section A is on page R-3 and Section I-b is on page R-4

Check box if distribution records are attached

Check box if evidence of previous cultivation is attached

A1	species, Sp	pecies hybridize with any Federal or Florida-listed Endangered or Threatened ecies of Special Concern, or economically important species (e.g., exhibit etic invasion)?
	Yes	Provide <i>information below</i> . Enter a conclusion on page R-17 of No unless limited use approved. Go to Section D for details on how to make a proposal for specified and limited use for the species.
	✓ No	Go to question A2
If yes	, then <i>provid</i>	e name of listed or economically important species & information sources:
A2	Has this sp 20 years if	ecies been introduced to Florida within the last 10 years if herbaceous, or last woody?
	Yes	Use Predictive Tool and so indicate on page R-1
	✓ No	Highlight attached distribution records that show presence in Florida before 10 or 20 years ago or attach other evidence and Go to question A3
A3		pecies have a record of causing problems in other regions with similar habitats e to Florida?
	Yes	Provide evidence below, Use Predictive Tool and so indicate on page R-1
	☑ No	<i>Enter a conclusion of</i> Not considered a problem species at this time and may be recommended by IFAS faculty <i>on page R-1</i> but reassess if invasion of natural areas is recorded or within 10 years, whichever is earlier.
	, then <i>give ev</i> risk (HPWRA	vidence of where and what problems this species has caused: A)

I-b Invasion Status in Three Zones of Florida

Check responses to the following questions for each zone (north, central, south) separately.

For "Yes" responses to questions 1-3, *distributional evidence of invasion* (forming self-sustaining and expanding populations within a plant community with which it has not previously been associated) *must be attached and distinguished for each zone*.

1.	Does species exist in areas outside its current, or former, cultivation in this zone? If <i>Yes</i> Go to question I-b 2 If <i>No</i> Go to question I-b 4	North Yes No	Central Yes No	South Yes No
2.	Is species invading in this zone ONLY when natural disturbance regime and scale have been altered? If <i>Yes</i> Go to question I-b 3 If <i>No (or unknown)</i> Go to Section II-a	North Yes No	Central Yes No	South Yes No
3.	Has this species ever been known to persist if the natural regime is resumed and the natural flora/communities recover? If <i>Yes (or unknown)</i> Go to Section II-a If <i>No</i> Go to question I-b 4	North Yes No	Central Yes No	South Yes No
4.	Are there other zones in which this species has invaded or persisted after restoration? If <i>Yes</i> indicate I = 0 for this zone on page R-1 then Go to Section III-b If <i>No</i> Go to Section A	North Yes No	Central Yes No	South Yes No
	Section II-a is on page R-5, Section III-b	is on page R	10, Section A i	is on page R-3

Check box if distribution records by zone are attached

II-a Known Impacts at WORST SITE(S) (without, or before, any control effort)

Add up points for ALL impact statements (i through vi) that are true at the <u>worst affected site(s) in</u> <u>that zone</u> then **Go to Section II-b**.

If scores are assigned, attach Ecological Impacts Worksheets that include citations and/or log of expert evidence.

Documentation of evidence of impacts for each zone (as defined in the Assessment Glossary) must be attached and include specific locations of observed impacts. If experts are providing evidence, their <u>written and signed observations</u> must be attached. Scientific names of impacted species (e.g., state-listed or native species with which hybridization occurs) must be included.

If there is no evidence of an impact then assign 0 points <u>unless</u> the impact is considered very likely (e.g., fixes N_2 in low nutrient soil which can change the flora) OR the impact (except vi) has been demonstrated in similar habitats in other zones or outside the state, OR if only one expert has documented the impact within the zone under consideration. In these cases assign 0.5 points.

		Points	North	Central	South
i)	Long-term alterations in ecosystem processes	15			
ii)	Negatively impacted T & E species:				
	Documented loss has occurred	12			
	Loss is considered very likely	4			
iii)	Displaces or precludes native vegetation (see criteria in assessment)	8			
iv)	Changes community structure	4			
v)	Hybridizes with native or economic plants	4			
vi)	Covers over 15% of invaded stratum (unless iii)	1			
		Total			
				Section	II-b is on page R-6

Check box if Impacts Worksheet is attached

II-b Range of Community Groups in Which Species is Invasive

Is this species known to be invasive in at least four community groups OR does it occur in at least one community group of each of the terrestrial and palustrine/aquatic lists?

If <i>Yes</i> list community groups below and multiply score from II-a by 1.5	North	Central	South
	Yes No	Yes No	Yes No
If No multiply score from II-a by 1.0	I =		0

Copy these Impact scores to page R-1. If $I \ge 12$, Go to Section II-c on page R-7; If I < 12, Go to Section III-a on page R-9.

If yes, then *list relevant community groups for each zone*: **North**:

Central:

South:

II-c Proportion of Invaded Natural Areas/Sites with Significant Impacts

Of the invaded sites, might any of the worst (statements i to v in Section II-a) impacts *only* occur under a few, identifiable, environmental conditions (i.e., conditions that occur in only 1 to 10% of the sites)?

To answer this question, for each statement in Section II-a, i - v that gets a score (> 0.5), determine the percentage from this table. Calculate the percentage separately for each zone.

	/	of Natural Area a <i>Yes</i> Answer*	s/Sites with	B) Tot	al Number of M Areas/Sites	Natural
	North	Central	South	North	Central	South
i)						
ii)						
iii)						
iv)						
V)						
TOTAL						
Total A/Total B x 100 = %						
	If the per	centage is betw	een 1-10% fro	om the table a	bove, check Y	<i>25</i> :
		North Yes No	Central Yes No		h No	
If Yes			tation of evide ets and Go to S		included in Eco	ological Impacts
If No	or No score	Go to Sec	ction III-a			
1		eive a score. If , seek a second		1	v 1 ,	e result of which

Section B is on page R-8 and Section III-a is on page R-9

Sectio	on B	***************************************			
B1	communities impacts occur	fic habitats and in which significant r be clearly defined as n invaded sites where uch impacts?	North Yes No	Central Yes No	South Yes No
	If Yes	Attach such a site definition in to Question B2	ncluding docum	entation of evid	ence and Go
	If No	Go to Section III-a			
B2		m distance of propagule/ sal be estimated?	North Yes No	Central Yes No	South Yes No
	If Yes	Attach a definition of that dist evidence, complete Sections I Potential for Expansion, Mana Enter a conclusion of No unle Section D for details on how to use for the species.	II, IV, and V to agement Difficues limited use a	derive informat ilty and Comme pproved on pag	tion on rcial Value. e R-17. Go to
	If No	Go to Section III-a			
		Section III-a i.	s on page R-9 a	nd Section D is	on page R-19

Check box if site definition is attached

Check box if definition of distance of dispersal is attached

ONLY For Zone	s Where Plant Has Inv	vaded (<i>Strike</i>	out un-invaded	zones)	
III-a Known Rate of Invasi	<u>on.</u>				
1. Was this species reported in more than two new discrete populations in any 12 month period within the last 10 years? North Yes No Yes No Yes No Yes No South Yes No					
If Yes	If <i>Yes</i> Indicate P = High , <i>highlight relevant reports on the distribution records and list these sites below</i> and Go to Section IV				
If No or Unknown	Indicate $\mathbf{P} = \mathbf{Low}$ and	d Go to Section	n IV		
		North	Central	South	
	P =				
Сору	these Potential values	to page R-14;	Section IV is on	page R-12	
If yes, then <i>list relevant new</i> North: Central: South:					

YTY 1		or Zones Where Plant Has NO	T Invaded. <i>(St</i>	rike out invaded	zones)
III-b	Potential fo	r Invading Non-invaded Zones			
1.		s species be able to survive, and disperse in the <u>climate</u> e?	North Yes No	Central Yes No	South Yes No
	If Yes If No	<i>Provide documented eviden</i> Indicate P = Low below and		1	і-b 2
2.		-types suitable for the growth cies occur in this zone?	North Yes No	Central Yes No	South Yes No
	If Yes	Provide documented evide invaded zone is equal to th Section III-a - if there is a Low, use High). If an <u>adjacent zone</u> i If the only <u>adjacent zone</u> i	e P assigned to n option betwee s invaded Go to	the <u>nearest inva</u> en two zones wi Section III-c	$\frac{\text{ded zone}}{\text{th } \mathbf{P}} = \text{High or}$
	If No	Indicate $\mathbf{P} = \mathbf{Low}$ below and	d Go to Section	IV	
			North	Central	South
		P =	Copy these P	otential categori	es to page R-14
		le evidence that suitable climate :	and habitat-type	es for survival an	nd impacts exist

Section III-c is on Page R-11 and Section IV is on page R-12

ONLY For Zones Where Plant Has NOT Invaded But Has The Potential To Invade.

III-c Potential for Causing Ecological Impacts in Non-invaded Zones

1. For zones invaded by this species, identify all communities in which any ecological impacts identified in Section II-a occur. Do these communities occur in the un-invaded zone under consideration (e.g., do the negatively impacted Federal- or Florida-listed Endangered or Threatened species or Species of Special Concern occur in this zone)? If no impacts were documented in any zones for this species, the response here is **NO**.

No	rth	Cen	tral	South		
Yes	No	Yes	No	Yes	No	

If Yes *Provide documented evidence below* and revise the **Ecological Impact Score** for this zone from zero to match the **Ecological Impact Score** for the <u>adjacent invaded zone</u> (use highest value if there is an option; mark this revised score with brackets{} to show this score was derived from Section III-c) then **Go to Section IV**

If No Go to Section IV

If yes, provide evidence that communities where ecological impacts occur exist in non-invaded *zone(s)*: Zone = _____:

Section IV is on page R-12

IV Factors That Increase the Difficulty of Management

If scores are assigned, attach Management Worksheets that include citations and/or log of expert evidence.

Add up all points from statements that are true for this species and documentation of evidence must be provided. Assign 0.5 point for each statement for which a true/false response is not known.

	Points	All Zones
i) No known permitted control techniques.	15	
 ii) Difficult to control without damage to native species in: ≥ 50% of discrete sites; 25% to 50% of discrete sites. 	10 7	
iii) Total costs of control per acre in first year are > \$1,500/acre	5	
iv) Further site restoration is necessary following plant death.	5	
v) Total area to be managed: \geq 500 acres; < 500 but $>$ 50 acres.	5 2	
 vi) Re-treatments following the first year of control expected: at least once a year for the next 5 years; 1 to 4 times over the next 5 years OR regrowth not known. 	5 2	
vii) Access to most areas is difficult.	3	
viii) Occurs in more than 20 discrete populations.	3	
ix) Many persistent or dispersed propagules per plant	3	
x) Early reproduction.	2	
Т	Fotal for M =	=
Copy these Management scores to page R-1 then Go to	Section Vo	n page R-13

Check box if Management Worksheet is attached

V	Economic Value					
1.	Does this species have any economic value in Florida?					
	Yes	Go to question V - 2				
	🗌 No	Indicate $V = No$ on page R-1, but treat as Low in the Conclusions table on page R-16. Go to Conversion of Index Scores to Index Categories.				
2.	Is this species sold in national or regional retail stores? (E.g., WalMart, Home Depot, Publix supermarkets.)					
	Yes	Go to Conversion of Index Scores to Index Categories on page R-14 and indicate V = High				
	🗌 No	Go to question V - 3.				
3.	State-wide are there more than 10 commercial growers of this species?					
	Yes	Go to Conversion of Index Scores to Index Categories on page R-14 and indicate V = High				
	🗌 No	Go to question V - 4.				
4.	Does this species have economic value for forage, biomass, or remediation purposes?					
	Yes	If net value \ge \$50,000 / yr, Go to Conversion of Index Scores to Index Categories (page R-14) and indicate V = High				
	🗌 No	If net value $<$ \$50,000 / yr, Go to Conversion of Index Scores to Index Categories (page R-14) and indicate V = Low				
		Conversion of Index Scores to Index Categories is on page R-14				

Conversion of Index Scores to Index Categories

Using the following table, determine the appropriate category (Low to High or Very High) for each index. (Categories for Potential for Expansion Index and Commercial Value were copied from Pages R-9, R-10, and R-13)

<u>Category</u>			Impacts	<u>s</u>	Ma	nagemen	t Difficulty	
Low	(L)		< 12			< 15		
Medium	(M)		12 - 26	.4				
High	(H)		26.5 - 4	41		≥15		
Very High	(VF	I)	>41					
	I	mpact			Potential		Management	Value
N		Central	South	North	Central	South	All zones	All zones
Category _								

Conclusion

For Zones where conclusions were NOT developed in Section D

Conclusions are derived separately for each zone from the combined index categories using the table on page R-14. Whenever new information becomes available about the invasive status of a species (e.g., new populations, new data on ecological impacts) that species should be reviewed and if necessary reassessed. The following text corresponds to the abbreviations in the table on page R-14 (text in bold is approved language for IFAS documents, text in parentheses provides additional instructions to IFAS faculty and for reassessment):

OK =

Not considered a problem species at this time (may be recommended by IFAS faculty and reassess in 10 years).

Caution =

Caution - manage to prevent escape (may be recommended by IFAS faculty and reassess in 2 years).

No - unless limited use approved =

Go to Section D for details on how to make a proposal for specified and limited use for the species.

If a proposal for specified and limited use has not been approved by the IFAS Invasive Plant Working Group (IPWG) the conclusion is:

Invasive and not recommended by IFAS faculty (reassess in 10 years - a proposal for specified and limited use may be submitted to the IPWG at any time). In IFAS publications, reference can be made to the Web site for the Center for Aquatic and Invasive Plants (<u>http://plants.ifas.ufl.edu/assessment</u>) to determine if any specified and limited uses have been approved since the time of publication.

If a proposal for specified and limited use has been approved by the IPWG the conclusion is:

Invasive and not recommended by IFAS faculty except for "the specified and limited" use that has been approved by the IFAS Invasive Plants Working Group (reassess in 2 years).

OR

Predicted to be invasive*: Recommended only under specific management practices agreed upon by the IFAS Invasive Plant Working Group (reassess in 2 years).

In IFAS publications the term "specified and limited" would be replaced by a summary of the specific use that has been approved (e.g., indoor foliage). Details of approved specified and limited uses are to be kept with other assessment documentation.

No =

Invasive and not recommended by IFAS faculty (reassess in 10 years).

*Reported invasiveness in environments similar to but outside of Florida is one basis for this conclusion

Determine Index Categories for ALL zones before starting this Section.

For each zone identify the combination of Index categories from page R-14 in the table below. The asterisk indicates the appropriate Conclusion. Footnotes and space for recording the Conclusions are provided on page R-17.

Index Categories

Conclusions

L/H = either Low or High

See page R-15 for full text for conclusions

Impact	Potential	Manage.	Value	No	No unless limited use approved	Caution	ОК
VH	L/H	L/H	L/H	*			
H H H H H H	H H H L L L	H H L H H L	L H L H L L	* * * *	* ¹ * ¹ *1		
H M M M M M M M M M	L H H L L L L L	L H L L H H L L	H L H L H L H L H	* *	*1 *1 *1 *1 *1 *1		
L L L L L	H H H L	H H L L L/H	L H L H L/H		No unless limited use approved *1 *1 *1 *1 *1 *1 *1 *1 *1 *1 *1 *1	* ² * ² * ² * ²	* 2, 3

Footnotes for table of Conclusions

¹ Enter a conclusion of **No unless limited use approved** in the spaces below. **Go to Section D** on page R-19 for details on how to make a proposal for specified and limited use for the species.

² If a zone is invaded and has Impact = Low or Medium but the <u>adjacent zone</u> has Impact = High or Very High or has received a **No** or **No unless limited use approved** conclusion via Section C, then for the invaded zone under consideration **Go To Section** C.

³ For zones where a species has <u>not</u> invaded, if Potential = Low but Impacts in an <u>adjacent</u> <u>invaded</u> zone are Medium, High, or Very High, then use **Caution** for the un-invaded zone. If Impact = Low in the adjacent zone or it is not yet invaded, then retain **OK**.

Because the Conclusion for one zone can be modified by the Index Categories or Conclusions for an adjacent zone, be sure to check Conclusions for each zone twice.

Conclusions North

Central

South _____

Copy these Conclusions to page R-1; Section C is on page R-18; Section D is on page R-19.

Secti	ion C	
C1		irst record of this species in natural areas of this zone less than 10 years ago if as or less than 20 years ago if woody?
	Yes	<i>Highlight distribution records that show first documentation in Florida is less than 10 or 20 years ago then</i> Go to question C2
	🗌 No	Conclusion for this zone remains as Caution - manage to prevent escape OR Not considered a problem species at this time .
C2	Can this s	species reproduce and disperse in this zone?
	[] Yes	The conclusion for this zone is Invasive and not recommended by IFAS faculty OR Invasive and not recommended by IFAS faculty except for the specified and limited use that has been approved by the IFAS Invasive Plants Working Group to match the adjacent, highly impacted zone. However, do not alter the Ecological Impact category for this zone from Low or Medium. (Thus, if there is an adjacent non-invaded zone, the Ecological Impact category for that zone will remain Low or Medium.) The assessment for this zone can be considered complete now, even if the "documentation of evidence" requirement for Ecological Impacts is not fulfilled (i.e., there are only one or two expert opinions on this species in this zone).
	🗌 No	Conclusion for this zone remains as Caution - manage to prevent escape OR Not considered a problem species at this time
		Select appropriate Conclusion and enter it on Page R-1 and R-16
If yes	s, then <i>provi</i>	de evidence of reproduction and dispersal in this zone: Zone =

Section D

If there are specific circumstances in which this species could be used that would not be expected to result in escape and invasion (e.g., foliage plants that are only used indoors and which can be reasonably prevented, by conspicuous labeling, from use or disposal in the landscape) **OR** if it is possible to define how to avoid dispersal of this species to habitats where its impacts are high (i.e., from Section B), then based on a proposal that is approved by the IPWG the conclusion becomes **Invasive and not recommended by IFAS faculty except for "the specified and limited" use that has been approved by the IFAS Invasive Plants Working Group**. The proposal for specified and limited use should document how invasion would be prevented, and should stipulate that disposal of any propagules must ensure their destruction. Reassess this species in 2 years (or in the case of referrals from Section B, immediately if the incidence of worst-case impacts increases above 10%.)

In IFAS publications the term "the specified and limited" would be replaced by a summary of the specific use that has been approved (e.g., indoor foliage).

Conditions of Acceptable Specified and Limited Use:

Further information needed:

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