

# White Sturgeon (*Acipenser transmontanus*)

## Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, April 2014

Revised, January 2018

Web Version, 6/13/2018



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## 1 Native Range, and Status in the United States

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### Native Range

From Froese and Pauly (2017):

“Eastern Pacific: Alaska Bay to Monterey, California, USA. Landlocked in Columbia River drainage, Montana, and perhaps Lake Shasta in California, USA. [...] Reported from northern

Baja California, Mexico [Eschmeyer et al. 1983; Lamb and Edgell 1986]. Considered vulnerable in Canada [Birstein 1993].”

## **Status in the United States**

From Fuller (2018):

“White sturgeon may have been released in the Coosa River in Georgia (J. D. Williams, personal communication) and stocked in Lake Havasu on the Colorado River (Arizona and California) in 1967 and 1968 (Minckley 1973; Lee et al. 1980 et seq.; Swift et al. 1993; Rinne 1994). Several collections of single fish were taken downstream at Imperial Dam [Arizona] in 1967 and 1969 (Swift et al. 1993). Another was taken at the mouth of the Bill Williams River, Arizona in 1976 (Swift et al. 1993). More than 200 white sturgeon were stocked in Irvine Lake and the Santa Ana River lakes of California in 1987; several were later captured (Swift et al. 1993). The species was stocked in the Snake River above the Shoshone Falls, Idaho (Idaho Fish and Game 1990), where it is native below the falls, but not above (Idaho Fish and Game 1990). It also was introduced to upper Klamath Lake, Oregon (Bond 1994; H. Li, personal communication).”

“Status of Lake Havasu population is not known; there is no evidence of reproduction (Minckley 1973; Lee et al. 1980 et seq.; Swift et al. 1993; Rinne 1994). The last specimen from the Colorado River was caught in 1976 (Swift et al. 1993). Reported from California, Idaho, and Oregon. No sturgeon have been reported since release in Georgia, so presumably they failed.”

## **Means of Introductions in the United States**

From Fuller (2018):

“Intentionally stocked in the Colorado River, on the Arizona-California border, in Oregon, and presumably in Idaho. The possibility of introduction for the Coosa River collection is not clear. We have some reports that several hundred white sturgeon were intentionally released from a fish farm on Cohulla Creek in the Conasauga system, in the Coosa River drainage in Georgia (J. D. Williams, personal communication; B. Freeman, personal communication in Walters 1997). However, G. Beisser (personal communication) says they were confiscated and does not believe any were intentionally released. Game and Fish biologists searched the area and no sturgeon were found downstream of the fish farm that had them. Walters (1997) reported a second fish that was captured from the Coosa but does not say if it was in Alabama or Georgia.”

## **Remarks**

From Fuller (2018):

“A single subadult individual taken in 1992 in the Coosa River, Talladega County, Alabama, (Anonymous 1992b, c; D. Catchins, personal communication) was previously identified as this species. It was later identified as a lake sturgeon *A. fulvescens*, a species native to the Coosa River. The specimen is deposited at the Florida Museum of Natural History (UF 93520).”

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

“Kingdom Animalia  
Subkingdom Bilateria  
Infrakingdom Deuterostomia  
Phylum Chordata  
Subphylum Vertebrata  
Infraphylum Gnathostomata  
Superclass Osteichthyes  
Class Actinopterygii  
Subclass Chondrostei  
Order Acipenseriformes  
Suborder Acipenseroidei  
Family Acipenseridae  
Subfamily Acipenserinae  
Genus *Acipenser*  
Species *Acipenser transmontanus*”

“Taxonomic Status: valid”

### Size, Weight, and Age Range

From Froese and Pauly (2017):

“Maturity: Lm 160.0 range ? - ? cm  
Max length : 610 cm TL male/unsexed; [Scott and Crossman 1973]; common length : 21.0 cm TL male/unsexed; [Hugg 1996]; max. published weight: 816.0 kg [Lamb and Edgell 1986]; max. reported age: 104 years [Rien and Beamesderfer 1994]”

### Environment

From Froese and Pauly (2017):

“Marine; freshwater; brackish; demersal; anadromous [Riede 2004]; depth range 1 - 122 m [Morrow 1980].”

“[...] 0°C - 23°C [Scott and Crossman 1973; assumed to represent natural water temperatures]”

### Climate/Range

From Froese and Pauly (2017):

“Subtropical; [...] 58°N - 24°N, 163°W - 107°W [Matallanas 2005]”

## **Distribution Outside the United States**

### **Native**

From Froese and Pauly (2017):

“Eastern Pacific: Alaska Bay to Monterey, California, USA. Landlocked in Columbia River drainage, Montana, and perhaps Lake Shasta in California, USA. [...] Reported from northern Baja California, Mexico [Eschmeyer et al. 1983; Lamb and Edgell 1986]. Considered vulnerable in Canada [Birstein 1993].”

### **Introduced**

According to Froese and Pauly (2017), *A. transmontanus* is reported as introduced in Chile, Germany, Italy and Israel. Little information is available regarding the Chile and Germany introductions. The Italy introduction is reported between 1975 and 1999; source of the introduction is unknown but the species is believed to be established. The Israel introduction is also reported between 1975 and 1999; the source is from the United States and the species is not believed to be established.

## **Means of Introduction Outside the United States**

According to Froese and Pauly (2017), introductions are reported to be associated with aquaculture practices.

## **Short Description**

From Froese and Pauly (2017):

“Dorsal spines (total): 0; Dorsal soft rays (total): 44-48; Anal soft rays: 28 - 31. Distinguished by the 2 rows of 4 to 8 bony plates on a midventral line between the anus and anal fin, and about 45 rays in the dorsal fin [Morrow 1980]. Gray or brownish above, paler below; fins gray [Morrow 1980]. Barbels situated closer to snout tip than to mouth; no obvious scutes behind dorsal and anal fins [Page and Burr 2011].”

## **Biology**

From Froese and Pauly (2017):

“Spends most of its time in the sea, usually close to shore [Morrow 1980]. Enters estuaries of large rivers and moves far inland to spawn. Individuals larger than 48.3 cm feed mainly on fishes; smaller ones feed mainly on chironomids, but also takes small crustaceans, other insects and mollusks [Scott and Crossman 1973]. Feeding ceases just before spawning [Scott and Crossman 1973]. Excellent food fish that is sold fresh, smoked or frozen [Frimodt 1995]. Eggs marketed as caviar [Scott and Crossman 1973]. In the past, the airbladder was made into isinglass [Morrow 1980].”

## Human Uses

From Froese and Pauly (2017):

“Fisheries: commercial; aquaculture: commercial; gamefish: yes”

## Diseases

According to Froese and Pauly (2017), *A. transmontanus* is a host of epitheliocystis, a bacterial disease.

According to LaPatra et al. (1995), *A. transmontanus* should be considered as a potential source of Infectious Haematopoietic Necrosis Virus because of results with the fish in experimental setting. “It is suggested that HNV can replicate in larval white sturgeons but not in juveniles or adults.”

**Infectious haematopoietic necrosis is an OIE-reportable disease.**

## Threat to Humans

From Froese and Pauly:

“Harmless”

## 3 Impacts of Introductions

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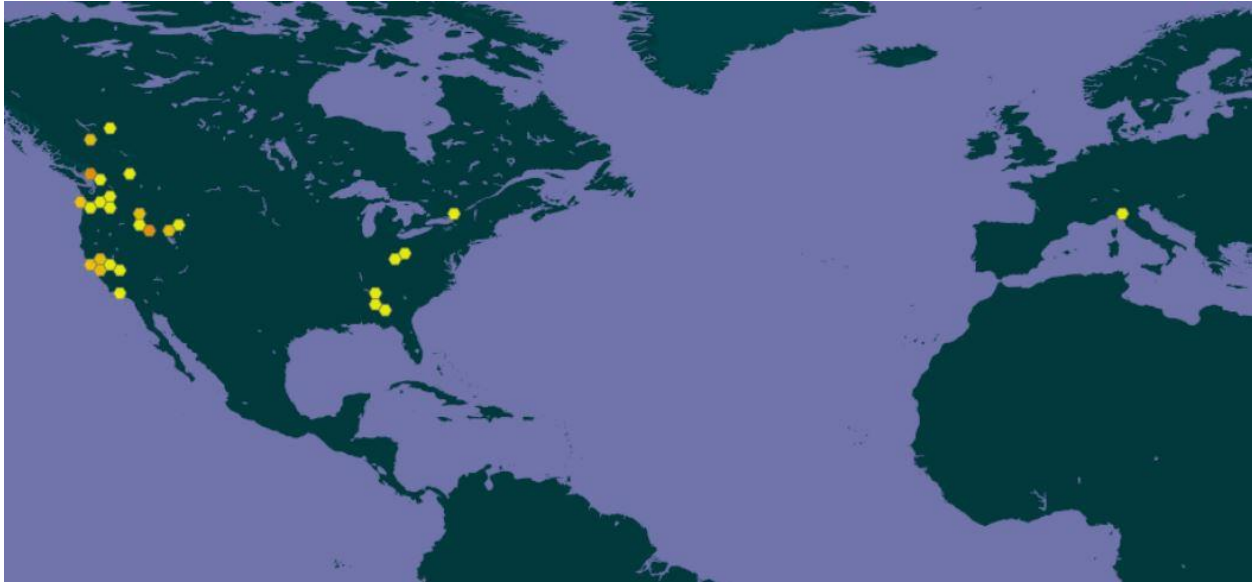
Iriarte et al. (2005), citing Brito (2002), classifies *A. transmontanus* as invasive in Chile because of its assumed effects of “predation on, [and] competition with native fishes”.

From Fuller (2018):

“Impact of Introduction: Unknown.”

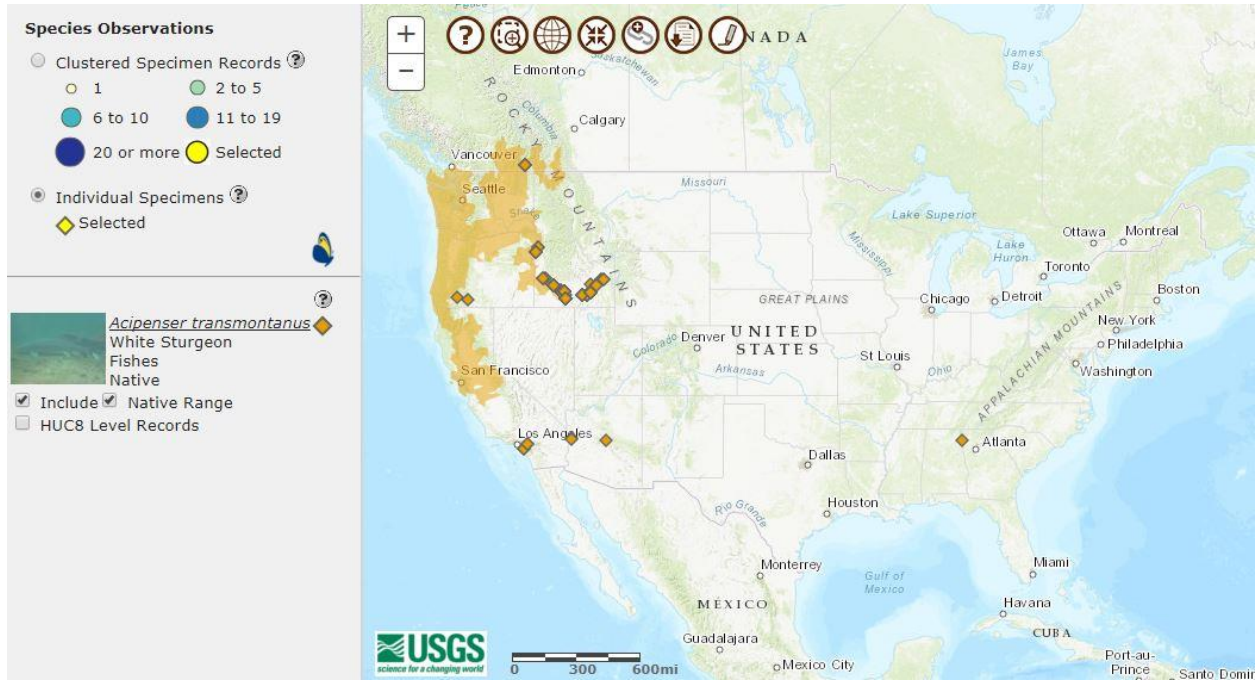
## 4 Global Distribution

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**Figure 1.** Map of known global distribution in North America and Italy of *Acipenser transmontanus*. Map from GBIF Secretariat (2017). Locations in Ohio and Georgia in the United States, and on the St. Lawrence River in eastern Canada are not known to represent established populations and therefore were omitted from the climate matching analysis.

## 5 Distribution Within the United States



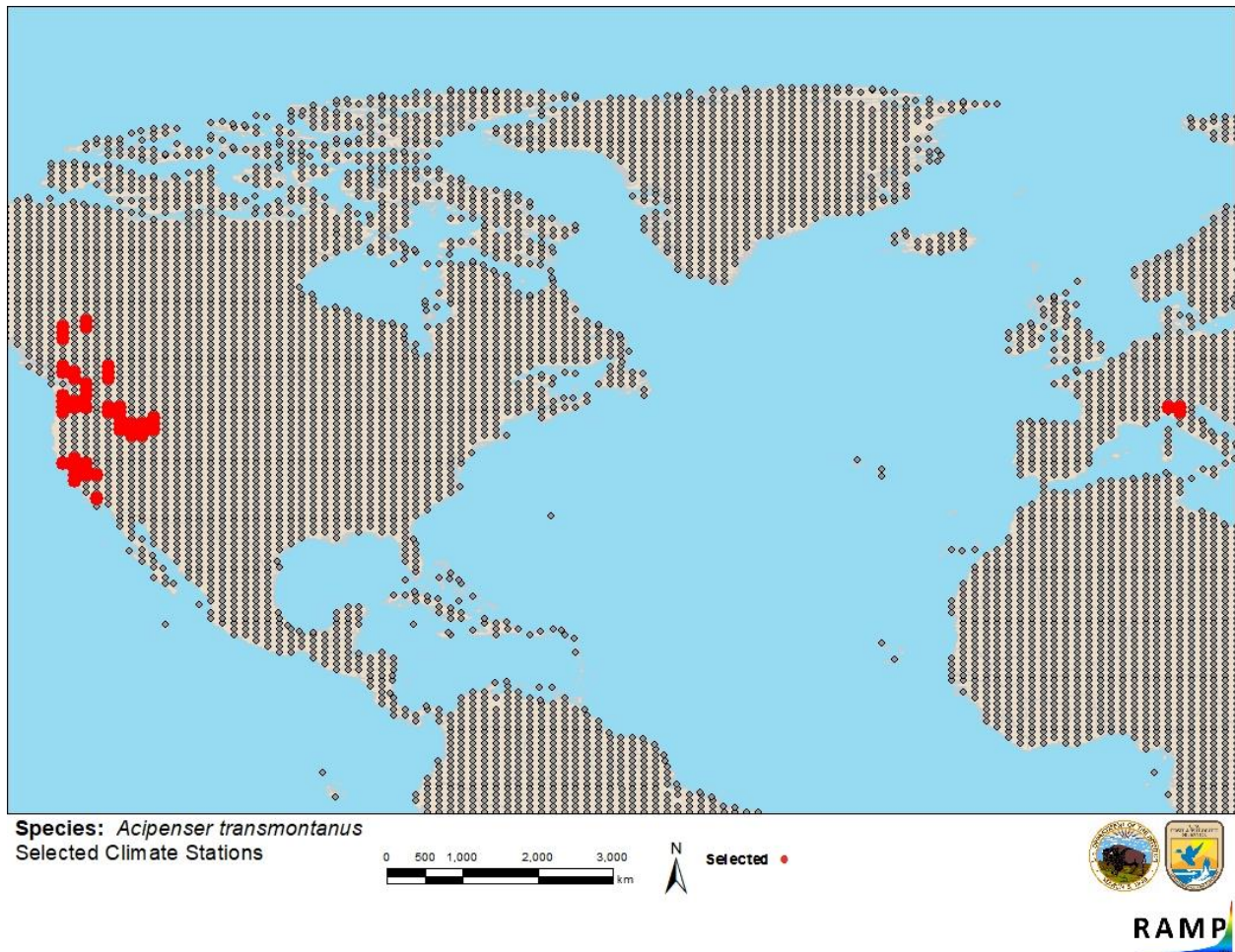
**Figure 2.** Map of reported United States distribution of *Acipenser transmontanus*. Map from Fuller (2018). Locations in Georgia and Arizona were omitted from the climate matching analysis because they do not represent established populations.

## 6 Climate Matching

### Summary of Climate Matching Analysis

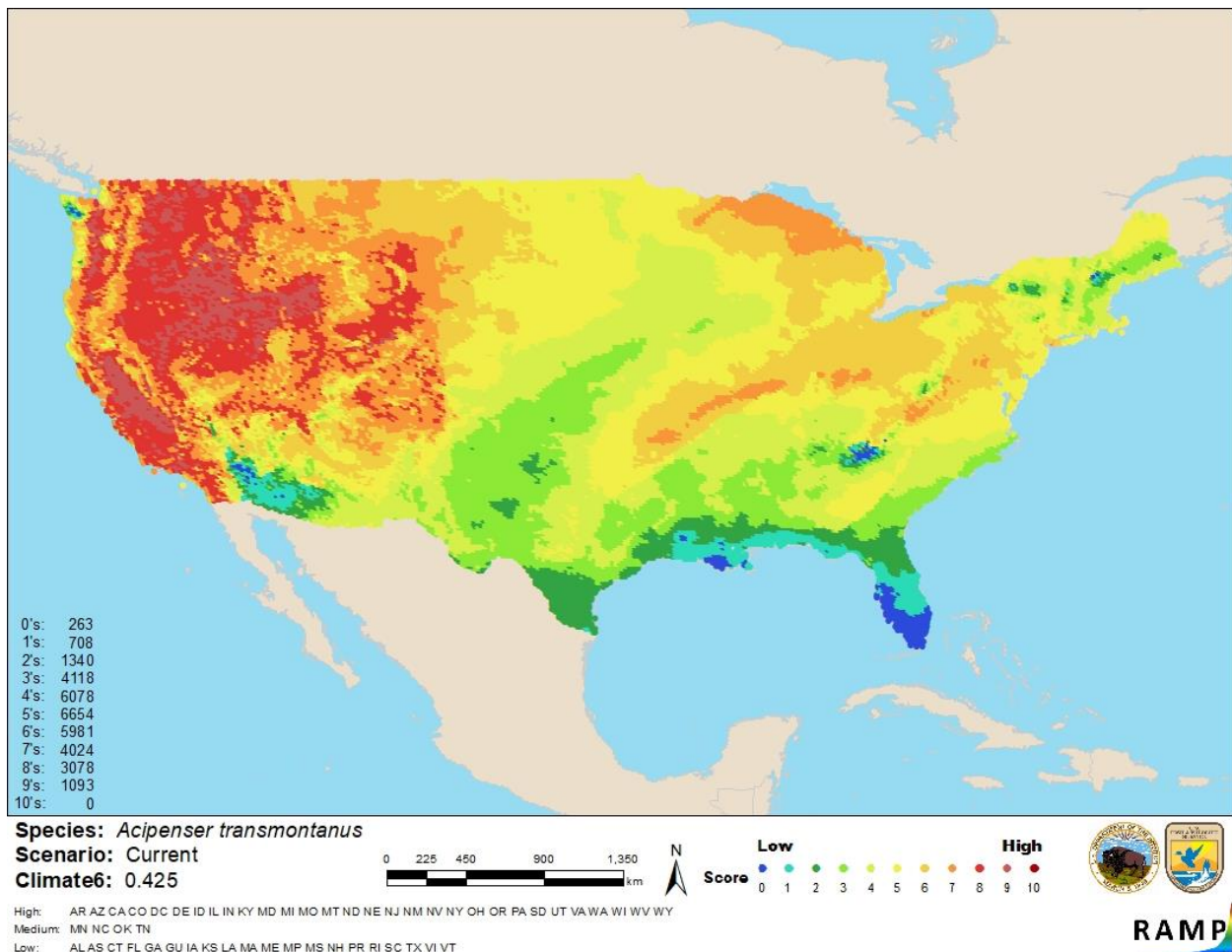
The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was high in the western United States except the Southwest, around Lake Superior, and in scattered locations in the southern Midwest and Mid-Atlantic regions. Medium matches occurred across much of the remainder of the contiguous United States, except for low matches in southern Arizona, much of the Southern Great Plains, the Gulf Coast, and Florida. Climate 6 match indicated that the contiguous United States has a high climate match overall. The range for a high climate match is 0.103 and greater; Climate 6 match of *Acipenser transmontanus* is 0.425.





**Figure 3.** RAMP (Sanders et al. 2018) source map showing weather stations selected as source locations (red; Italy, western U.S. and Canada) and non-source locations (gray) for *Acipenser transmontanus* climate matching. Source locations from GBIF Secretariat (2017) and Fuller 2018.





**Figure 4.** Map of RAMP (Sanders et al. 2018) climate matches for *Acipenser transmontanus* in the contiguous United States based on source locations reported by GBIF Secretariat (2017) and Fuller 2018. 0=Lowest match, 10=Highest match.

The “High”, “Medium”, and “Low” climate match categories are based on the following table:

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
$\geq 0.103$	High

## 7 Certainty of Assessment

Information on the biology and distribution of *A. transmontanus* is available. Introductions in the United States have been reported in Arizona, California, Georgia, Idaho and Oregon. International introductions have been reported in Chile, Germany, Italy, and Israel. Scientific data on the impacts of these introductions are lacking. More studies are needed to understand the

impact this species has on the biological communities of introduced areas. Certainty of this assessment is low.

## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

White Sturgeon (*Acipenser transmontanus*) is an anadromous fish species native to the eastern Pacific. It is used in commercial fisheries, game fishing, and aquaculture. This species is landlocked in the Columbia River drainage, Montana, and perhaps Lake Shasta in California. Introductions have been reported in Arizona, California, Georgia, Idaho, Oregon, Chile, Germany, Italy, and Israel. Introductions have failed in Arizona, Georgia, and Israel. Status is unknown in Germany and Chile. *A. transmontanus* is assumed to harm native fish in Chile through predation and competition, but there is not sufficient documentation to be certain. There is no well-documented evidence that *A. transmontanus* has negatively impacted native fish populations in any of the areas where it has been introduced. More research is needed to fully understand the impacts from introductions of this species; absence of this research makes the certainty of this assessment low. Climate match with the contiguous United States is high. Overall risk posed by this species is uncertain.

### Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec.6): High**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information** Potential source of Infectious Haematopoietic Necrosis Virus, the causative agent for an OIE-reportable disease
- **Overall Risk Assessment Category: Uncertain**

## 9 References

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**Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 10.**

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**Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.**

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