

# Index of Species Information

**SPECIES:** *Casuarina* spp.

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## Introductory

**SPECIES:** *Casuarina* spp.

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### **AUTHORSHIP AND CITATION :**

Snyder, S. A. 1992. *Casuarina* spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2007, September 24].

### **ABBREVIATION :**

CASSPP  
CASCUN  
CASEQU  
CASGLA

### **SYNONYMS :**

*Casuarina litoria* L.

### **NRCS PLANT CODE [[16](#)]:**

CASUA  
CACU8  
CAEQ  
CAGL11

### **COMMON NAMES :**

sheoak  
she-oak  
river sheoak  
river-oak  
Cunningham casuarina  
Australian-pine  
horestail casuarina  
grey sheoak  
ironwood

longleaf casuarina  
whistling pine

**TAXONOMY :**

The scientific name for the sheoak genus is *Casuarina* (Casuarinaceae) [[12](#),[19](#)]. Three species of sheoak are common in the United States. All will be treated in this report because of their similar status as invader species and across-the-board management plans to eradicate the genus from the continent. These species are [[6](#),[19](#)]:

*Casuarina cunninghamiana* Miq. river sheoak  
*Casuarina equisetifolia* L. Australian-pine  
*Casuarina glauca* Seiber gray sheoak

These species hybridize with each other [[14](#)].

**LIFE FORM :**

Tree

**FEDERAL LEGAL STATUS :**

NO\_ENTRY

**OTHER STATUS :**

All 3 species of sheoak are list as noxious weeds (prohibited aquatic plants, Class 1) in Florida [[16](#)].

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## DISTRIBUTION AND OCCURRENCE

### SPECIES: *Casuarina* spp.

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**GENERAL DISTRIBUTION :**

Sheoak was introduced to the United States near the turn of the century [[14](#)]. It is widely distributed in southern Florida and is also found in California, Arizona, and Hawaii [[12](#),[17](#)].

**ECOSYSTEMS :**

FRES12 Longleaf - slash pine  
FRES13 Loblolly - shortleaf pine  
FRES16 Oak - gum - cypress  
FRES30 Desert shrub  
FRES41 Wet grasslands  
FRES42 Annual grasslands

**STATES :**

AZ CA FL HI MEXICO

**BLM PHYSIOGRAPHIC REGIONS :**

3 Southern Pacific Border  
7 Lower Basin and Range

**KUCHLER PLANT ASSOCIATIONS :**

K080 Marl - Everglades  
 K091 Cypress savanna  
 K092 Everglades

**SAF COVER TYPES :**

70 Longleaf pine  
 75 Shortleaf pine  
 80 Loblolly pine - shortleaf pine  
 81 Loblolly pine  
 83 Longleaf pine - slash pine  
 84 Slash pine  
 111 South Florida slash pine

**SRM (RANGELAND) COVER TYPES :**

NO-ENTRY

**HABITAT TYPES AND PLANT COMMUNITIES :**

Sheoak is listed as a component in the following vegetation types:

| Area                      | Classification | Authority              |
|---------------------------|----------------|------------------------|
| Mariana Is,<br>S. Pacific | veg. type      | Falanruw & others 1989 |
| Palau,<br>S. Pacific      | veg. type      | Cole & others 1987     |

**MANAGEMENT CONSIDERATIONS****SPECIES: Casuarina spp.****WOOD PRODUCTS VALUE :**

Sheoak wood has many uses, including fuelwood, poles, posts, beams, oxcart tongues, shingles, paneling, fence rails, furniture, marine pilings, tool handles, and cabinets [[3](#),[12](#)]. The wood, however, is subject to cracking and splitting [[14](#)].

**IMPORTANCE TO LIVESTOCK AND WILDLIFE :**

Sheoak poses a serious threat to some wildlife species. Nest sites of three endangered species, the American crocodile (*Crocodylus acutus*), the loggerhead turtle (*Caretta caretta* ssp. *caretta*), and the gopher tortoise (*Gopherus polyphemus*), are all threatened by Australian pine invasion [[9](#),[10](#)]. Also, this invader creates sterile foraging and breeding environments for small mammals [[3](#),[14](#)]. It does, however, provide food for migrating goldfinches which feed on sheoak seeds [[3](#)].

**PALATABILITY :**

NO-ENTRY

**NUTRITIONAL VALUE :**

Tannins in the leaves of sheoak are carcinogenic and could be fatal to foraging cattle, which sometimes eat the leaves [3].

**COVER VALUE :**

NO-ENTRY

**VALUE FOR REHABILITATION OF DISTURBED SITES :**

Sheoak was once used in the United States for reclaiming eroded areas, but many land managers condemn its use because it threatens indigenous plants and animals [12]. Some African and Asian countries use it to combat desertification [17].

**OTHER USES AND VALUES :**

Sheoak has various medicinal uses and is also used for dyes, as an ornamental, and in windbreaks [12]. *C. cunninghamiana* (the most cold-hardy) can be planted in citrus groves to protect fruit trees from cold [14].

**OTHER MANAGEMENT CONSIDERATIONS :**

Sheoak is extremely fast growing, crowding out many native plants and creating sterile environments for both plants and animals [10]. It forms dense roots, which deplete soil moisture and break water and sewer lines. It is also susceptible to windthrow during hurricanes [3]. Cutting often induces sprouting, so it is not an effective control method. Chemicals, such as 2,4,5-T, 2,4-D, or Garlon 3A, can be used to eradicate sheoak [10,14].

## BOTANICAL AND ECOLOGICAL CHARACTERISTICS

### SPECIES: *Casuarina* spp.

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**GENERAL BOTANICAL CHARACTERISTICS :**

Sheoak is a medium to tall evergreen tree. It has a stout trunk with rough bark and erect or semispreading main branches and drooping twigs [12]. Its leaves are jointed and scalelike. Its fruits are round and warty with winged seeds. Trees can be dioecious or monoecious; male flowers are borne at the tips of twigs, while female flowers form on nonshedding branches [3,14]. Sheoak fixes nitrogen with the aid of *Frankia* spp. fungi.

Characteristics of individual species are as follows:

- C. cunninghamiana* - 80 feet (25 m) in height, 2 feet (6 m) d.b.h., dioecious, nonsprouter.
- C. equisetifolia* - 50 to 100 feet (15-30 m) in height, 1.0 to 1.5 feet (3-5 m) d.b.h., monoecious, nonsprouter.
- C. glauca* - 40 to 50 feet (10-15 m) in height, 1.5 feet (5 m) d.b.h., dioecious, aggressive sprouter, in Florida, usually does not

produce fruit [12].

**RAUNKIAER LIFE FORM :**

Phanerophyte

**REGENERATION PROCESSES :**

Sheoak regenerates by seed as well as vegetatively through sprouting [3,12,14]. It is fast growing (5 to 10 feet [1.5-3 m] per year) [14]. Seeds average 300,000 per pound. No pregermination treatment is necessary. Seeds can remain fertile for a few months to a year and will germinate in moist and porous soil, sometimes within 4 to 8 days of dispersal [14].

**SITE CHARACTERISTICS :**

Because of its nitrogen-fixing capability, sheoak can colonize nutrient-poor soils [12]. It can grow in sloughs, sawgrass (*Cladium jamaicensis*) glades, wet prairies, saltmarshes, pinelands, along rocky coasts, on sandbars, dunes, and islands, and in water-logged clay or brackish tidal areas [3,10,14,17,18]. *C. equisetifolia* is found only in south Florida because of its cold intolerance. It is resistant to salt spray but not to prolonged flooding. *C. cunninghamiana* grows along freshwater streambanks and is not salt tolerant [3]. It is more resistant to cold temperatures than *C. equisetifolia* [12]. *C. glauca* grows on steep slopes as well as in intermittently flooded or poorly drained sites. It is salt tolerant [3].

Some associates of sheoak include eucalyptus (*Eucalyptus* spp.), melaleuca (*Melaleuca quinquenervia*), lovegrass (*Eragrostis* spp.), muhly grasses (*Huhlenbergia* spp.), beard grasses (*Andropogon* spp.), plume grass (*Erianthus giganteus*), saltbush (*Baccharis halimifolia*), wax myrtle (*Myrica cerifera*), willow (*Salix* spp.), sweetbay (*Magnolia virginiana*), redbay (*Persia borbonia*), and coco plum (*Chrysobalanus icaco*) [18]. Native associates in the Northern Mariana Islands include *Neisosperma*, *Barringtonia*, *Terminalia*, *Heritiera*, *Cynometia*, and *Cordia* [5,6].

**SUCCESSIONAL STATUS :**

Sheoak is listed as a dominant species in some South Pacific island's vegetation types [2,5,6]. It is a warm weather species, not native to North America. It can be a primary or secondary colonizer in disturbed areas of Florida [3,10].

**SEASONAL DEVELOPMENT :**

Sheoak can flower and fruit year-round in warm climates [3]. Its peak flowering time is between April and June, and its peak fruiting time is between September and December. The minimum seed-bearing age is 4 to 5 years, and it produces a good seed crop annually. *C. equisetifolia* usually flowers and fruits two times a year: between February and April, and September and October. It produces fruit in June and December. The fastest growth occurs in the first 7 years with maximum growth reached in 20 years. The maximum lifespan of Australian pine is 40 to 50 years [3].

## FIRE ECOLOGY

**SPECIES: Casuarina spp.**

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### FIRE ECOLOGY OR ADAPTATIONS :

Sheoak less than 3 inches (8 cm) in diameter can sucker following fire [[3](#)].

### POSTFIRE REGENERATION STRATEGY :

survivor species; on-site surviving root crown or caudex  
off-site colonizer; seed carried by wind; postfire years 1 and 2  
off-site colonizer; seed carried by animals or water; postfire yr 1&2  
secondary colonizer; off-site seed carried to site after year 2

## FIRE EFFECTS

**SPECIES: Casuarina spp.**

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### IMMEDIATE FIRE EFFECT ON PLANT :

Trees greater than 3 inches (8 cm) in diameter are killed by fire [[3](#)].

### DISCUSSION AND QUALIFICATION OF FIRE EFFECT :

A May wildfire killed 60 to 70 percent of sheoak in Florida [[10](#)]. A smoldering controlled burn in Florida killed 90 percent of the sheoaks on the study plot [[14](#)]. A second attempt in the same area killed all the sheoaks; trunk diameters were between 5 and 8 inches (13-20 cm). Another tree, with a d.b.h. of 2 feet (0.66 m), was killed after charcoal was left to smolder at its base [[14](#)].

### PLANT RESPONSE TO FIRE :

Trees less than 3 inches (8 cm) in diameter may sprout following fire. Trees larger than this usually die [[3](#),[14](#)].

### DISCUSSION AND QUALIFICATION OF PLANT RESPONSE :

NO-ENTRY

### FIRE MANAGEMENT CONSIDERATIONS :

Periodic fires coupled with the use of herbicides may be an effective method of controlling sheoak. However, too frequent, intense fires that kill overstory native pines may actually encourage Casuarina species to establish [[18](#)]. Morton [[14](#)] warns that burning Australian

pine in peat soils may be hazardous. Elfer [3] suggests that fire may be an effective control method for trees greater than 3 inches (8 cm) in diameter and in dense stands. Burning could be potentially harmful if the soil pH is changed such that native species cannot establish [3].

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### SPECIES: *Casuarina* spp.

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