

If we SCRUB our land too much, we may lose the LIZARDS

The Florida scrub lizard is a small, gray or gray-brown lizard that lives throughout upland sandy areas in the Central and Atlantic coast regions of Florida. The Florida Committee on Rare and Endangered Plants classified the scrub lizard as endangered. [You will find a fact sheet on the Florida Scrub Lizard starting on page 5.](#) The long-term survival of the Florida scrub lizard is dependent upon preservation of the proper spatial configuration and size of scrub habitat patches.



Picture by Grant Hokit

Task 1: Discuss factors that may contribute to the loss of appropriate habitat for scrub lizards in Florida. What recommendations would you make to the state of Florida to preserve these habitats and discuss obstacles to the implementation of your recommendations?

Task 2: Utilize the data provided in Table 1 to estimate the value for F_a (the average fecundity of adult lizards); S_j (the survivorship of juvenile lizards-between birth and the first reproductive season); and S_a (the average adult survivorship).

Table 1

Summary data for a cohort of scrub lizards captured and followed for 4 consecutive years. Hatchling lizards (age 0) do not produce eggs during the summer they are born. Average clutch size for all other females is proportional to body size according to the function $y = 0.21 \cdot (SVL) - 7.5$, where y is the clutch size and SVL is the snout-to-vent length in mm.

Year	Age	Total Number Living	Number of Living Females	Avg. Female Size (mm)
1	0	972	495	30.3
2	1	180	92	45.8
3	2	20	11	55.8
4	3	2	2	56.0

Task 3: It has been conjectured that the parameters F_a , S_j , and S_a , are related to the size and amount of open sandy area of a scrub patch. Utilize the data provided in Table 2 to develop functions that estimate F_a , S_j , and S_a for different patches. In addition, develop a function that estimates C , the carrying capacity of scrub lizards for a given patch.

Table 2

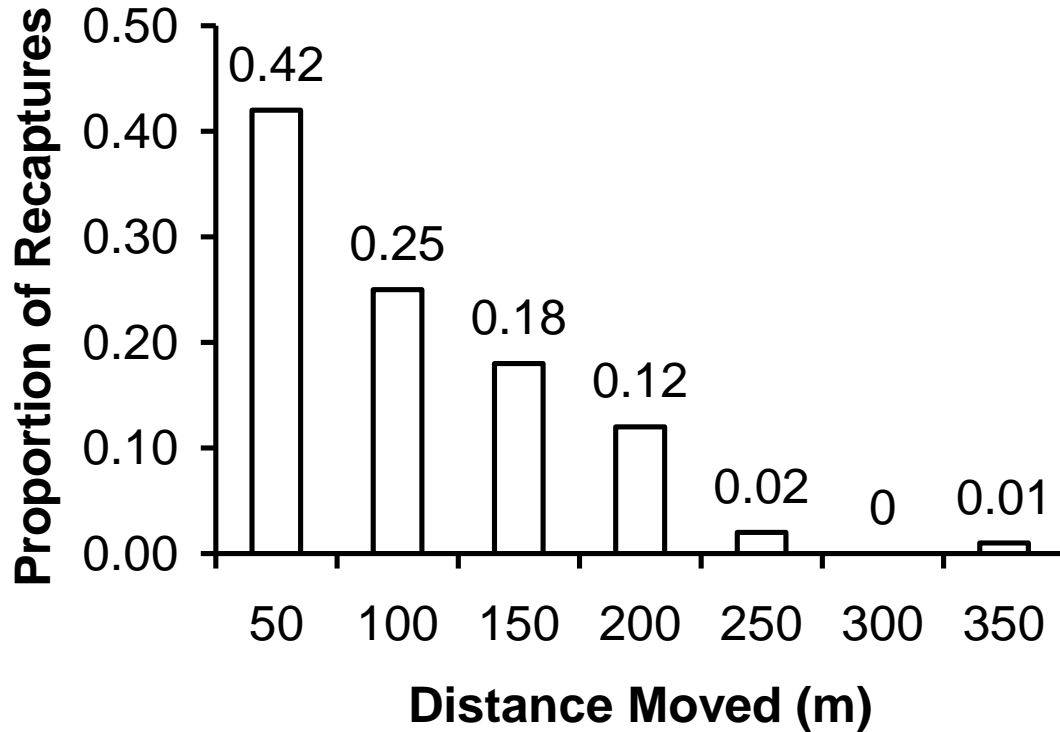
Summary data for 8 scrub patches including vital rate data for scrub lizards. Annual female fecundity (F_a), juvenile survivorship (S_j), and adult survivorship (S_a) are presented for each patch along with patch size and the amount of open sandy habitat.

Patch	Patch Size (ha)	Sandy Habitat (ha)	F_a	S_j	S_a	Density (lizards/ha)
a	11.31	4.80	5.6	0.12	0.06	58
b	35.54	11.31	6.6	0.16	0.10	60
c	141.76	51.55	9.5	0.17	0.13	75
d	14.65	7.55	4.8	0.15	0.09	55
e	63.24	20.12	9.7	0.17	0.11	80
f	132.35	54.14	9.9	0.18	0.14	82
g	8.46	1.67	5.5	0.11	0.05	40
h	278.26	84.32	11.0	0.19	0.15	115

Task 4: There are many animal studies that indicate that food, space, shelter, or even reproductive partners may be limited within a habitat patch causing individuals to migrate between patches. There is no conclusive evidence on why scrub lizards migrate. However, about 10 percent of juvenile lizards do migrate between patches and this immigration can influence the size of the population within a patch. Adult lizards apparently do not migrate. Utilizing the data provided in the histogram below estimate the probability of lizards surviving the migration between any two patches i and patch j .

Histogram

Migration data for juvenile lizards marked, released, and recaptured up to 6 months later. Surveys for recapture were conducted up to 750m from release sites.



Task 5: Develop a model to estimate the overall population size of scrub lizards for the landscape given in Table 3. Also, determine which patches are suitable for occupation by scrub lizards and which patches would not support a viable population.

Table 3

Patch size and amount of open sandy habitat for a landscape of 29 patches located on the Avon Park Air Force Range. See [map.jpg](#) for a map of the landscape.

Patch Identification	Patch Size (ha)	Sandy Habitat (ha)
1	13.66	5.38
2	32.74	11.91
3	1.39	0.23
4	2.28	0.76
5	7.03	3.62
6	14.47	4.38
7	2.52	1.99
8	5.87	2.49
9	22.27	8.44
10	19.25	7.58
11	11.31	4.80
12	74.35	19.15
13	21.57	7.52
14	15.50	2.82
15	35.54	11.31
16	2.93	1.15
17	47.21	10.73
18	1.67	0.13
19	9.80	2.23
20	39.31	7.15
21	2.23	0.78
22	3.73	1.02
23	8.46	1.67
24	3.89	1.89
25	1.33	1.11
26	0.85	0.79
27	8.75	5.30
28	9.77	6.22
29	13.45	4.69

TASK 6: It has been determined from aerial photographs that vegetation density increases by about 6% a year within the Florida scrub areas. Please make a recommendation on a policy for controlled burning.



Florida scrub lizard (*Sceloporus woodi*)¹

Lyn C. Branch and D. Grant Hokit²

Description

The Florida scrub lizard is a small, gray or gray-brown lizard with spiny scales (Figure 1). Adults are about 5 inches in total length. A prominent characteristic of scrub lizards is a thick brown stripe that runs down each side of the body from the neck to the base of the tail. Adult males have bright turquoise patches on the sides of the belly and a black throat with small turquoise patches at the base. Females generally lack the turquoise patches, but sometimes have faded patches on their bellies. The fence lizard (*Sceloporus undulatus*) overlaps geographically with the scrub lizard in northern Florida but is easily distinguished from this species because it lacks the dark stripe.

Distribution and Habitat

The range of the Florida scrub lizard is restricted entirely to Florida. These lizards occur in disjunct populations in central Florida and on the Atlantic Coast (Figure 2). Populations also once occurred along the Gulf Coast of Florida in Lee and Collier counties, but most or all of these populations may have been extirpated due to increasing development along the coast. Scrub lizards are habitat specialists that live in dry upland such as sand pine scrub, oak



Figure 1. The Florida scrub lizard Credits: Photograph by Grant Hokit

scrub and sandhill. They require sunny areas with large amounts of bare sand. Scrub lizards are most common in habitats that have been kept open by fire or other disturbances such as logging of sand pine, but also may persist for some time at the edges of more dense scrub.

1. This document is Fact Sheet WEC 139, one of a series of the Department of Wildlife Ecology and Conservation. Florida Cooperative Extension Service. Institute of Food and Agricultural Sciences. University of Florida. First published March 2000.

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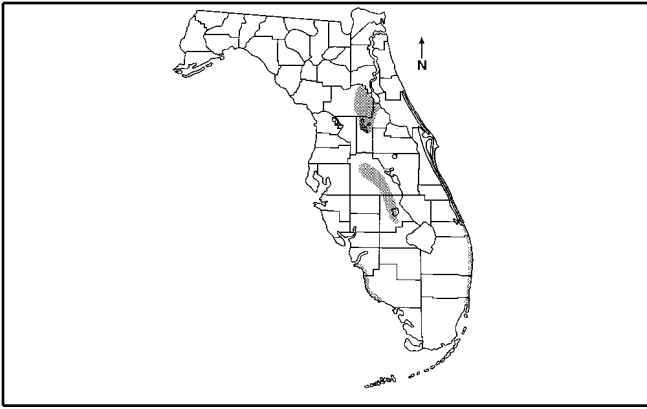


Figure 2. Distribution (shaded) of the Florida scrub lizard
Credits: Redrawn from Branch et al. 1999 and DeMarco 1992

Behavior and Diet

Scrub lizards forage on the ground, perch on the base of tree trunks, and sun themselves on logs or other debris. They are active during warm days throughout the year. Activity is lower on cool days or during very hot hours in the summer. Their diet consists of insects, spiders, and other small arthropods. This species has very limited dispersal capabilities. Scrub lizards generally do not move through dense vegetation, and are unlikely to disperse between scrub patches unless the patches are no more than a few hundred meters apart and connected by open areas.

Reproduction

Courtship and mating of scrub lizards occur from late March through June. Females deposit eggs (2-8 eggs per clutch) in the sand beginning in April. A single female may lay eggs 3-5 times in a season. Eggs deposited in April take about 75 days to hatch, but hatching time probably gets shorter as summer progresses and ground temperatures increase. Hatchlings appear from June until early November. Young lizards reach sexual maturity in 10-11 months.

Legal Status, Conservation Issues and Management

The scrub lizard is not listed legally as a threatened or endangered species at the state or federal level. The Florida Committee on Rare and Endangered Plants and Animals, a group of experts

on the flora and fauna of Florida, has classified this species as threatened. The primary conservation concern for scrub lizards is loss of habitat. During the last two decades, large areas of scrub have been converted to urban development and agriculture. Loss of habitat has caused a decline in scrub lizard populations and increased isolation of remaining populations. Small, fragmented populations are more vulnerable to extinction. Also, as small patches of habitat become more isolated, by housing projects and other development, lizards are not able to move between habitat patches to repopulate areas. Long-term survival of the Florida scrub lizard is dependent upon preservation of sufficient scrub habitat through growth management.

Suppression of fires, which are a natural component of the scrub ecosystem, also has resulted in habitat loss for scrub lizards. Scrub management should incorporate prescribed burns, or other practices, to reduce shrubs and ground cover and maintain open, sandy habitat for lizards. Habitat management for scrub lizards needs to be designed with consideration of the limited movement capabilities of this species. Current field studies indicate that maximum dispersal distance of scrub lizards is only a few hundred meters. If scrub patches become so overgrown with dense vegetation that lizards disappear from the patch, lizards may not be able to recolonize unless restored areas are adjacent to habitats that can supply lizards. It may be possible to link patches that are farther apart with open corridors for scrub lizards, but more scientific research is needed to develop effective designs for corridors.

Because scrub lizards are restricted to dry, upland habitats that naturally occur in patches, populations in different parts of the state have been isolated from genetic exchange for thousands of years. Over evolutionary time, this isolation has resulted in high genetic diversity in scrub lizards and large genetic differences between populations. Conservation strategies for wildlife frequently involve translocation of animals between populations by managers. For example to increase the size of a small population, females may be introduced from a larger population. Careful consideration should be given to any plans for translocation of scrub lizards

between populations because such movements may result in loss of the unique genetic diversity of different scrub lizard populations.

Selected References

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500 m

North Bombing Range Ridge
Avon Park Air Force Range