How Many Plant Species Are Native To Florida?

by Daniel B. Ward

The State of Florida contains what is generally agreed to be the largest number of plant species of any state east of the Mississippi River, and very probably a larger number of species than any state of the Union other than California and Texas. Yet Florida lacks a published state “Flora”, and no count has ever been made of the number of species that such a study would contain.

The plants that constitute a flora may be divided in various ways — into ferns, gymnosperms, and angiosperms, for example; or into woody versus herbaceous species. But one of the most useful divisions is the recognition of those plants that were present before the disturbances of modern man, in contrast to those species that have come into the area along with civilization. These two groups — the native species and the introduced species — are always present, and the proportion of one to the other and the rate of change of this proportion serves as a measure of the rate with which the original flora is being displaced by species of foreign origin. But, again, there has never been a count of the plant species that were in Florida before the first Spanish settlement, and thus no way to measure the rate of loss of this original flora.

Had anyone been willing to make the count, a body of information was available that would have permitted extraction of an estimate of the number of species that occur in Florida. In 1933, John Kunkel Small published his monumental Manual of the Southeastern Flora. Though this hefty volume covered the entire southeast, Small’s practice of citing the southernmost state in which each species occurred makes it possible to extract a count of the number of species that Small believed to form the Florida flora. Though his Manual did not include the ferns, by adding the Florida species in his 1938 Ferns of the Southeastern States, one can conclude that Small recognized 3,489 species of vascular plants (133 ferns and 3,356 seed plants) as occurring in Florida. But Small’s concept of species was often much narrower than is currently followed, and one could not gauge to what extent his many extra names are counterbalanced by the many species that have been found in Florida since his time.

In a delightful 1964 essay entitled, “How to study the Florida flora”, Lloyd H. Shinners of Southern Methodist University attempted to estimate the size of the Florida flora and the length of time that will be required before we have a satisfactory publication with keys, synonymy, and descriptions. His approach was to compare Florida with the British Isles. Because of our state’s inclusion of cool-temperate Appalachian species, tropical species, and one of the most notable concentrations of endemics in the continental United States, Dr. Shinners estimated that the total native flora of Florida would run close to three times the 1,511 native species recorded for the British Isles. His estimate thus suggests Florida may have approximately 4,500 native species. The many introduced species would, of course, have added appreciably to this number.

(Quoted: “How to study the Florida flora”, Lloyd H. Shinners of Southern Methodist University attempted to estimate the size of the Florida flora and the length of time that will be required before we have a satisfactory publication with keys, synonymy, and descriptions. His approach was to compare Florida with the British Isles. Because of our state’s inclusion of cool-temperate Appalachian species, tropical species, and one of the most notable concentrations of endemics in the continental United States, Dr. Shinners estimated that the total native flora of Florida would run close to three times the 1,511 native species recorded for the British Isles. His estimate thus suggests Florida may have approximately 4,500 native species. The many introduced species would, of course, have added appreciably to this number.

(Quoted: “How to study the Florida flora”, Lloyd H. Shinners of Southern Methodist University attempted to estimate the size of the Florida flora and the length of time that will be required before we have a satisfactory publication with keys, synonymy, and descriptions. His approach was to compare Florida with the British Isles. Because of our state’s inclusion of cool-temperate Appalachian species, tropical species, and one of the most notable concentrations of endemics in the continental United States, Dr. Shinners estimated that the total native flora of Florida would run close to three times the 1,511 native species recorded for the British Isles. His estimate thus suggests Florida may have approximately 4,500 native species. The many introduced species would, of course, have added appreciably to this number.

In 1977, I published the suggestion that “perhaps 3,500 species of vascular plants are native, adventive, or naturalized from cultivation in the state of Florida.” This estimate was based on comparison of the number of genera and species in families with which I was familiar, with the equivalent number in the floras of other areas both to the north and the south. Though clearly the Florida flora was richer than that of Indiana with 1,838 native and 302 introduced species (Deam, 1940), or Missouri with 1,881 native and 557 introduced species (Steyermark, 1963), or the Carolinas with 3,360 undifferentiated species (Radford et al., 1968), Florida had far fewer species than the reasonably well-studied floras of Cuba, Jamaica, or Costa Rica.

Now, at last, exact numbers of native and introduced species may be cited for Florida. This is possible because the checklist of the state’s species, begun in the early 1960s and partially published in 1968, has been revised and expanded, and is now in a computerized format that permits it to be queried as to the number of species of each status. This permits not only a quick and up-to-date count of the number of recognized species, genera, and families in the state, but also a tally of the number of additional plant names
that have been applied to Florida species but are not now in use (the synonyms), and the number of plant names that have been used in Florida but correctly should have been restricted to plants that do not grow in our state (the excluded names). And, most significantly, by separating those species that were here in pre-Columbian times from those that later became part of our flora, we can view for the first time the size of our native flora and begin to monitor any changes in its numbers and relative importance.

LIMITATIONS

But before evaluating the numbers that the computer now gives us, it is proper that we first recognize some of the limitations on any such analysis.

The names within the computer's databanks are the product of individual judgment. There is, we must acknowledge, a subjective component to the decision as to what defines the limits of a genus or species.

Small's Manual provides us with an example of a subjective judgment that has now wholly disappeared — the generic level of the maples. As he gained in experience with the southeastern species of the Aceraceae, John Small came to agree with some earlier authors that the maple species should be interpreted as representing five different genera. He, of course, acknowledged the classical genus, Acer, but limited it to the striped maple (Acer pensylvanicum) and mountain maple (A. spicatum) of the northeastern United States and Canada and related species of Europe. In Florida, he recognized four other genera: Saccharoendron, the sugar maples; Argentacer, the silver maple; Rufacer, the red maple; and Negundo, the box elder. No competent later botanist has disputed that these are indeed natural groups, and that Small's generic names are nomenclaturally legitimate. Yet none of us — myself included — is willing to argue that these natural groups are different enough to be called genera; we are in agreement in assigning all maples to the genus Acer.

Such judgments pervade any tabulation of the species native and introduced to Florida. No two persons will necessarily give the same weighting to the differences observed between two natural populations, and thus will not necessarily agree that two species, or one, is involved. Within the oaks, for example, we have several contestable species pairs. I am recognizing the sand live oak (Quercus virginiana), laurel oak (Quercus hemisphaerica) as distinct from swamp laurel oak (Q. laurifolia), and southern red oak (Q. falcata) distinct from cherrybark oak (Q. pagoda). Even though a recent author has done otherwise, I am retaining the mayberry (Vaccinium elliotii) distinct from our swamp highbush blueberry (V. fuscum) and rabbit-eye blueberry (V. formosum). I am even, cautiously, going along with the judgment by currently active Florida botanists that our endemic and endangered scrub balm (Dicerandra spp.) represent four distinct species.

At times the judgment tilts the other way. In my 1968 tabulation, I recognized 97 species of panic grasses (Panicum spp.) in Florida; now, following studies by David Hall and others, I have combined these names into 46 species. And I am quite unable to give specific rank to the aomicts of haws and blackberries that are recognized in the older books; I see only 10 species of Crataegus and 4 species of Rubus in Florida.

An area of even greater subjectivity is the judgment as to which plants found outside cultivation deserve admission to our flora, as "introduced" species. Not every African violet found on a trash pile is worthy of listing, no matter how excellently it has been prepared as a herbarium specimen. I've taken the position that a species must either reproduce, or reasonably be able to reproduce, in Florida if I am to acknowledge its presence as a component of our flora. Many names familiar in books from John Small's day to the recent past thus fall by the wayside.

And the status of names sometimes changes. At first I rejected the Washington palm (Washingtonia robusta) as a part of our flora, for I knew of no evidence that it would reproduce outside of a person's care; but then I learned of vigorous seedlings appearing in waste areas in both Dade and Broward counties, and I admitted it. The numerous species of fig (Ficus spp.) that turned up here and there in south Florida didn't meet my criteria, for I knew that the specific fig wasps required for their fertilization didn't occur in Florida; the wasps that pollinate the Cuban laurel (F. retusa) have now reached the state, and the familiar cultivated tree is reproducing in the wild.

Hybrids, when they are incapable of forming populations of reproducing plants, don't make the cut. It defeats the meaning of the term "flora" to treat these occasional individuals as equivalent to self-reproducing species when they exist only because of the sexual compatibility of two other species. One
Dr. Daniel B. Ward, one of the founding members of FNPS in 1980, is a professor of botany at the University of Florida, with three decades of experience in studying the flora of Florida. He is the author of numerous scientific papers describing our flora, and is the editor of Rare and Endangered Biota of Florida, Vol. 5: Plants, published in 1979. His latest publication is Checklist of the Woody Cultivated Plants of Florida, which lists a total of 1,979 species, written with Derek Burch and David W. Hall and available from your local Cooperative Extension Service.

Dr. Ward's research has shown that Florida, with a total of 3,448 species, does, indeed, have a richer vascular flora than the other eastern states for which we have counts. This evaluation remains true even when an adjustment is made for the many introduced species; our 2,523 native species clearly appear to be more numerous than those of any other eastern state. Even though Dr. Shinners overestimated our floristic riches, the number of Florida species tabulated by John Small was very close to the value we now recognize.

But a somber fact also emerges from these figures. While Indiana has 14% introduced species, and Missouri has 23%, the 925 species recognized as introduced into Florida represent a full 27% of our flora. Without question, our diverse, unique flora is in the process of being displaced in numbers by species foreign to our shores. The intuitive concern that those of us who love the Florida flora so often feel is, indeed, justified.

REFERENCES

INDEX TO THE PALMETTO
The Palmetto will begin its tenth year of publication with the next issue. The first issue was Spring 1981. FNPS has now published an index to the first 35 issues, a listing of all articles by title, author, and by one or more subjects. The Index is 12 pages long, 8½" by 11". It is for sale through the Subtropical Trader (see page 15) for $3.00 including postage.

Photocopies of individual articles are available from FNPS for $1.00 each including postage. Please allow three weeks for delivery.

Plant a Native Tree Today!
Support Your Local Retail Nurseries.
Ask for Native Trees, Native Palms, Native Shrubs and more

NATIVE TREE NURSERY
17250 SOUTHWEST 232 STREET, HOMESTEAD, FLORIDA 33170
(305) 247-4499

This message Sponsored by Native Tree Nursery, Inc.