

THE STATUS AND DISTRIBUTION OF BARRED OWL AND RED-SHOULDERED HAWK IN SOUTHERN NEW JERSEY

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INTRODUCTION

The Barred Owl (*Strix varia*) and the Red-shouldered Hawk (*Buteo lineatus*) have long been known to be permanent breeding residents of the lowland swamp forests of southern New Jersey. Witmer Stone recorded both as present in 1908, but noted that each was less common in southern New Jersey than in the northern half of the state. In *Bird Studies at Old Cape May* (1937), Stone recorded them both as permanent residents of the Cape, but left some questions as to their status and distribution, and, in fact, he noted that no Red-shoulder nests had yet been found in Cape May County (although this is assuredly a lack of searching rather than a lack of birds). Both Fables (1955) and Leck (1984) note a decline in Barred Owl numbers in New Jersey, and Leck emphasizes that the Red-shoulder was once much more widespread and now confined primarily to northern New Jersey woodlands.

The decline of Barred Owl numbers in North Jersey was noted in *New Jersey Audubon* (Gutmore, 1977). A combination of a theorized general decline and a known lack of data led the New Jersey Department of Environmental Protection, Division of Fish, Game and Wildlife's Nongame and Endangered Species Program to list both the Barred Owl and Red-shouldered Hawk as official "threatened species" (those who may become endangered if conditions surrounding the species begin or continue to deteriorate) in January 1984. Leonard Soucy (1982) notes that the threatened status of the Barred Owl has clearly resulted from a loss of proper habitat and emphasizes the need for protecting this habitat type.

TECHNIQUES

The similar habitat preferences of Barred Owl and Red-shouldered Hawk have long been known (Bent, 1937). In New Jersey, this holds true for both the breeding birds of the northern woodlands and the southern swamps as well. In South Jersey, deciduous lowland forest is the habitat preferred by both species. In general, neither species is encountered in areas that do not hold standing water for at least the wetter months of the year (December-March). Both birds can be characterized as preferring freshwater wetlands hardwood forest habitat in inland southern New Jersey, what we generally consider to be the classic South Jersey "swamps."

Due to the well established propensity for association in similar habitat,

both species were censused together, albeit with different techniques. In late winter, spring, and early summers of 1984, 1985, and early 1986, an attempt was made to survey the populations of these birds in Salem, Cumberland, Cape May, and southern Atlantic Counties (essentially that area south of Route 322 running northwest to southeast across the state) in southern New Jersey.

A literature review was carried out in order to ascertain where these birds had been reported in the 1980's by the active network of birders, with particular attention paid to the areas known as Regions 4 and 5 of *Records of New Jersey Birds*, 1975-1985. Topographical maps and aerial photographs were studied in an attempt to find all "proper habitat" so it could be surveyed. Each area which had either published data or likely habitat was visited. Barred Owls were surveyed either by tape recorder (playback of recorded calls) or by voice imitation of their calls. Most censusing was done at either dawn or dusk.

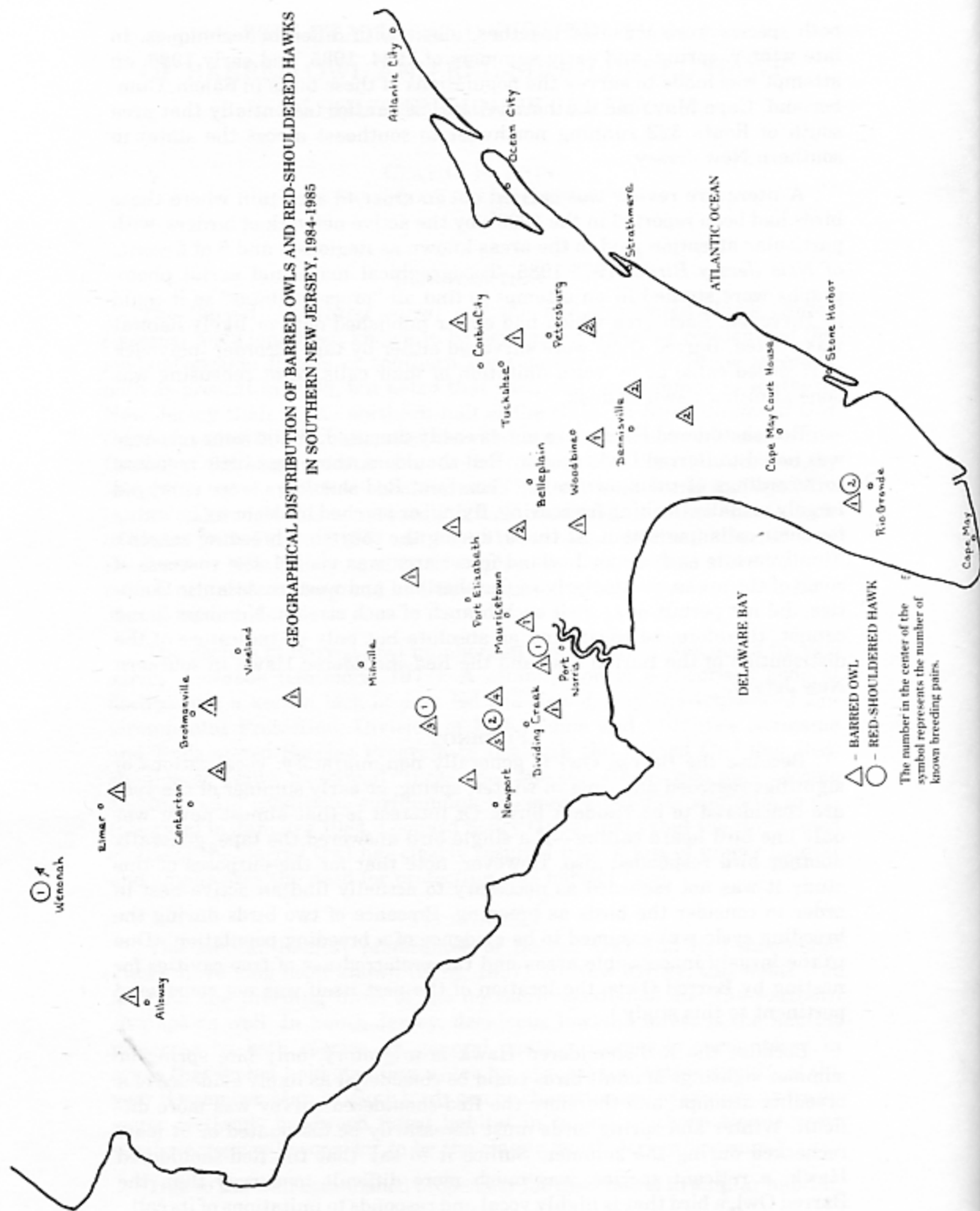
Red-shouldered Hawks are not as easily censused. While some response was noted to Barred Owl tapes by Red-shoulders, there was little response to recordings of their own calls. Therefore, Red-shoulders were surveyed largely visually (looking for soaring, flying, or perched birds) or by listening for their calls (persistent, at times, during the courtship/breeding season). Finally, while each major lowland forest area was visited, the vastness of some of the areas, particularly in Cumberland and western Atlantic Counties, did not permit us to visit each branch of each stream. Numbers found cannot, therefore, be considered as absolute but only as indicators of the distribution of the Barred Owl and the Red-shouldered Hawk in southern New Jersey.

FINDINGS

Because the Barred Owl is generally non-migratory, vocalizations or sightings recorded any time in winter, spring, or early summer of the year are considered to be resident birds. Of interest is that almost never was only one bird heard calling—if a single bird answered the tape, generally another bird responded also. However, note that for the purposes of this study it was not regarded as necessary to actually find an active nest in order to consider the birds as breeding. Presence of two birds during the breeding cycle was assumed to be evidence of a breeding population. (Due to the largely inaccessible areas and the preferred use of tree cavities for nesting by Barred Owls, the location of the nest itself was not considered pertinent to this study.)

Because the Red-shouldered Hawk is migratory, only late spring or summer sightings of adult birds could be considered as likely evidence of a breeding attempt, and therefore the Red-shouldered survey was more difficult. Winter and spring birds must necessarily be discounted or at least rechecked during the summer. Suffice it to say that the Red-shouldered Hawk, a reticent species, was much more difficult to survey than the Barred Owl, a bird that is highly vocal and responds to imitations of its call.

GEOGRAPHICAL DISTRIBUTION OF BARRED OWLS AND RED-SHOULDERED HAWKS
IN SOUTHERN NEW JERSEY, 1984-1985



△ - BARRED OWL
○ - RED-SHOULDERED HAWK
The number in the center of the symbol represents the number of known breeding pairs.

The number of pairs and general location of resident Barred Owls is shown in Table 1. Note that, in a few instances, recently published data for a few sites is included, but only when sightings/vocalizations have been noted a number of times by others during the dates of this survey. The status of the Red-shouldered Hawk, completely based on this survey, is shown in Table 2. The general distribution of these birds in the southern New Jersey counties is shown on Map 1, which includes both species and number of pairs present.

DISCUSSION

This survey should be regarded as preliminary because as previously noted, not *all* likely habitat was surveyed. The acreage of many of the swamps, particularly in southern Cumberland County and western Atlantic County, did not allow for a visit to each and every tributary of each lowland stream. However, as stated, each major swamp area was visited under ideal conditions at least once each year during the study, and the general presence or absence of Barred Owls or Red-shouldered Hawks could be determined. Nonetheless, numbers shown must be considered as conservative. The time allotment dictated that some sections remain unsurveyed, and there are no doubt more Barred Owls and Red-shouldered Hawks in southern New Jersey than shown on Tables 1 and 2. It is believed, however, that these numbers represent a fair base line by which to assess the general status and distribution of these two species in the South Jersey area in the mid-1980's. Stated numbers may undercount the total birds present (excluding the Bear Swamp); yet for the locations shown, the number of pairs probably represents a fairly close approximation of the breeding pairs present. Finally, please note that only southern Atlantic County was surveyed, from the Estell Manor area south.

BARRED OWL

The minimum of 37 pairs known to be present in the survey area in 1984 and 1985 is significantly higher than most authorities suspected, and considerably higher than published accounts intimate. Barred Owls were in fact present, in varying abundance, in almost all the areas surveyed. Centers of abundance were, however, clearly noted. Continued increased effort revealed more pairs in the southern Cumberland County area (and more pairs are yet to be discovered there . . .), and yet significant comparative effort in the Corbin City area, for instance, failed to reveal more than one pair of birds present.

The Barred Owl is present in Cumberland County, and parts of northern Cape May County, in seemingly healthy numbers. The center of abundance clearly seems to be the Bear Swamp areas of Downe and Commercial Townships in Cumberland County. The Buckshutum tributary to the Maurice River has a good population, as does Great Cedar Swamp in Cape May County. In western Cumberland County and Salem County there are many fewer pairs present, no doubt due to the comparative lack of large

tracts of lowland forest. Fewer birds are present to the north of Cape May County as well, but many areas near Estell Manor and Egg Harbor yet require further censusing.

Barred Owls were invariably found in the old growth sections of hardwood forest. Their association with the oldest growth and uncut stands of deciduous trees was continually noted in both Cape May and Cumberland Counties. In fact, the above noted concentrations of owls were all seemingly related to large tracts of old growth or near-climax forest. It is theorized that only these sections offer the cavities known to be favored nest sites. Soucy (1982) clearly outlines the link between available cavities and Barred Owl nesting in New Jersey, and this survey concurred. It is theorized that the comparative age of the trees may be one factor affecting the abundance of Barred Owls in the Corbin City area, where the trees are much younger than Great Cedar Swamp or Bear Swamp, with few available cavities present. No tree nests were found despite extensive searching and the discovery of numerous Red-tailed Hawk and Great Horned Owl nests within the Barred Owl habitats.

Barred Owls were also found in cedar swamps. At least three pairs at Buckshutum were found in an Atlantic White Cedar (*Chamaecyparis thyoides*) stream corridor, surrounded by upland pine-oak forest. Also the pair at Corbin City seemed to associate with a cedar tributary to the Egg Harbor River. In these cases, however, the cedar stands represented old growth as well, stands which appeared uncut in over one hundred years, with numerous blow-downs and some hardwoods within the cedar forest.

One interesting note comes from Donald Kunkle, who has birded Cumberland County for over 20 years. He indicates that Barred Owls seem far more common today than 10-20 years ago—perhaps because many swamp forests are recovering from the heavy cutting early in the 1900's, with trees now older and much larger.

Only one (probable) nest was located. A Barred Owl was flushed from a huge dead tree in the western section of the Bear Swamp on 4 May 1985. The cavity from which the bird flushed contained a large amount of what was presumably nesting material. "Courtship" was heard at this site on 18 May 1985. A young Barred Owl, fledged, yet still covered with some downy feathers, was observed near Corbin City on 23 June 1985. These dates give some idea of the seasonality of nesting in southern New Jersey. Calling is most prominent in December and again in March and April, yet the birds do call all months of the year. Dispersal is little understood, yet calling birds at Cape May Point are often heard in November, and Barred Owls continue to be found in woodlots on the Delaware bayshore wetland edges during December (Sutton and Sutton 1980-1985), hinting at the dispersal of juveniles, as both of these areas are not expected Barred Owl habitat.

Barred Owls, in all cases, seemed to be located as far from human habitation as possible. It can be said that they prefer the wildest remaining

TABLE 1

THE DISTRIBUTION OF THE BARRED OWL (*Strix varia*)
IN SOUTHERN NEW JERSEY, 1984-1985

# OF PAIRS	LOCATION	NEAREST TOWN	METHOD
1	Fishing Creek	Rio Grande	S
2	Timber & Beaver Swamp	Dennisville	S
2	Great Cedar Swamp	Dennisville	S
2	Great Cedar Swamp	Petersburg	S
1	MacNamara Wildlife Mgm. Area	Tuckahoe	S
1	Corbin City Wildlife Mgm. Area	Corbin City	S
1	Belleplain State Forest	Woodbine	S
1	Hand's Mill	Belleplain	S
2	Hoffman's Mill	Belleplain	S
1	Manumuskin River	Port Elizabeth	S
1	Muskee Creek	Port Elizabeth	S
1	Garren's Neck Swamp	Mauricetown	S
1	Bowker's Run	Port Norris	S
1	Hansey Creek	Dividing Creek	S
4	Bear Swamp (eastern section)	Dividing Creek	S
5	Bear Swamp (western section)	Dividing Creek	S
3	Buckshutum Creek	Millville	S
1	Shaw's Mill Pond	Newport	S
1	Union Lake	Vineland	S
1	Upper Maurice River	Brotmanville	S
2	Parvin State Park	Centerton	P/S
1	Alloway Lake	Alloway	P
1	Mudd Run	Elmer	P
37	pairs estimated present, 1984-1985		

Method: S = this survey

P = recently published records from New Jersey Audubon Society's
Records of New Jersey Birds

TABLE 2

THE DISTRIBUTION OF THE RED-SHOULDERED HAWK (*Buteo lineatus*)
IN SOUTHERN NEW JERSEY, 1984-1985

# OF PAIRS	LOCATION	NEAREST TOWN	METHOD
2	Fishing Creek	Rio Grande	S
1	Bowker's Run	Port Norris	S
2	Bear Swamp	Dividing Creek	S
1	Buckshutum Creek	Millville	S
1	Wenonah area	Wenonah, Gloucester Co.	P
7	pairs known present, 1984-1985		

Method: S = this survey

P = recently published records from New Jersey Audubon Society's
Records of New Jersey Birds

sizable forest tracts (unlike Great Horned Owls, which seem to be commonly found near houses and people in South Jersey). In fact, "road surveys" seemed almost completely ineffective in locating Barred Owls. The Barred Owls were invariably found only after a long walk deep into the woods. We received the impression that they are reticent, preferring the solitude of the deep swamps. Habitat encroachment is no doubt the major threat facing Barred Owls today, at least in Cape May and eastern Atlantic Counties.

A pair of Barred Owls near Goshen, at the headwaters of Bidwell's Creek, Cape May County, in the mid 1970's disappeared in 1983 and can no longer be located. The tract they inhabited was clear-cut for firewood in 1982 and 1983, and the drainage of the swamp for an adjacent campground development proposal has probably sealed the fate of this area as Barred Owl habitat. Also, the pair that was found near Oceanville, Atlantic County, until 1979 can no longer be located, probably a victim of the rapid suburbanization of Galloway Township.

Logging, particularly in the form of cedar cutting, must be considered a threat to Barred Owl habitats, and the cutting and drainage associated with housing developments are threats as well. Little is known regarding the requirements of Barred Owls in the region. In this study all were found in relatively remote large tracts of swamp forest. Five pairs are thought to inhabit the approximately 1500 acres of the eastern section of the Bear Swamp in Cumberland County, the largest tract of swamp forest left in southern New Jersey.

It can be assumed that the continued existence of Barred Owls is inexorably linked to the preservation of remaining freshwater wetland areas in southern New Jersey.

RED-SHOULDERED HAWK

The numbers of resident Red-shouldered Hawks found during this survey were alarmingly few. Only seven resident (either known or assumed to be breeding) pairs of Red-shouldered Hawks could be accounted for in 1984 and 1985. An attempt was made to visit most suitable habitats in March and April when the birds are most vocal during courtship and nesting, yet on few occasions were we rewarded with their calls resounding through the spring swamps.

Two pairs are known to be present in the Bear Swamp in Cumberland County, one each in the eastern and western sections. One pair is found along Buckshutum Creek near Millville, and there is one pair near Port Norris. Finally, two pairs are found in the Fishing Creek section of Cape May County. During the course of this study, one nesting was published: a nest found by Edward Manners near Wenonah, in Gloucester County, in the spring of 1984 (Meritt, 1984).

Because of the Red-shouldered Hawk's reticent nature, particularly during the raising of young, a few additional pairs are no doubt present.

Yet all the time spent afield during this survey failed to yield a single additional sighting, despite hundreds of hours spent in excellent Red-shouldered Hawk habitat. And, underscoring this, not a single breeding season sighting was reported to *Records of New Jersey Birds* for the South Jersey study area from 1976 to 1984, by any observer.

Little is known regarding the former status of the Red-shouldered Hawk on the coastal plain, but seemingly far more birds were seen in the 1970's and even as late as 1980. In 1974 there was clear indication of three breeding pairs present in the western section of Bear Swamp alone (Sutton and Sutton, n.d.). In 1980 a Red-shouldered Hawk nest with one almost full-grown young bird (and an adult in attendance) was found by Dave Ward on the 1980 Cumberland County June Bird Count. This nest was in the eastern section of Bear Swamp. Also in 1980 a pair of adults with a recently fledged young was found in the western section of the Bear Swamp by the authors. In June of 1983 we repeatedly saw a pair of adults on the extreme eastern boundary of the swamp, no doubt a different pair than the above. This pair could not be found in 1984 or 1985.

In Cape May County a pair resided near Goshen, Bidwell's Creek, in the late 1970's. This pair is no longer present, perhaps due to the same factors of cutting and drainage discussed above concerning the Barred Owls once found there also. The Fishing Creek birds have shown an interesting history. They were first located in 1983 when they fledged one young. They successfully fledged one young in 1984 as well. In the spring of 1985 the birds were actively nesting on March 10, and on this date a second pair was located approximately one-half mile away. These birds were present throughout the summer, yet nesting success was not ascertained (although we believe the young birds probably fledged before the second nest visit).

While Barred Owls seem to prefer the deepest woods, oddly, the Red-shouldered Hawks have often been found on the edge of civilization. Dave Ward's Bear Swamp nest was within 50 feet of an active highway. One of the two active Bear Swamp nests is very close to a number of homes, literally on the edge of the swamp. The two Fishing Creek pairs are within 300 yards and one-half mile of a housing development. Others, such as the Buckshutum site, are indeed miles from the nearest roads or houses. With so few pairs present, it is difficult to speculate as to the Red-shoulder's habitat needs. All Cumberland County nests are near old growth, wet hardwood swamp forest, but the Cape May County nesting pairs are in fairly recent aged wet woods. What perhaps is significant is that they are on private property, which is posted and patrolled, and probably rarely entered, in part due to the high water table within.

CONCLUSIONS

This preliminary survey found the Barred Owl to be significantly more numerous than published accounts had intimated. We found Red-shouldered Hawks to be very scarcely represented as a breeding bird, with a

virtual absence of any current published reports on their status. An extensive search has revealed a Barred Owl population in the study area of 37+ pairs, and yet only seven pairs of Red-shouldered Hawks were located at the same time. Since Barred Owls, as discussed, are more easily surveyed because they will respond to taped calls, it is fervently hoped that more Red-shouldered Hawks will be located in the coming years, but the almost total absence of any current nesting records in the recent literature makes it unlikely that many additional pairs will be located.

This study had originally been planned to cover all of Atlantic County and hopefully parts of Burlington County as well. Recent published reports of Barred Owls at Vincentown, Whitesbog, Browns Mills, New Lisbon, and Manahawkin indicate a breeding population in the Pine Barrens, and we hopefully plan to census this area for Barred Owl and Red-shouldered Hawk as well. In addition, we plan to fill in the gaps in the South Jersey areas we have currently censused. No doubt additional pairs of birds are present. We hope to keep the survey current over the coming years for its hopeful inclusion in state threatened species planning efforts.

The Barred Owl currently aptly deserves the official threatened status assigned by New Jersey Department of Environmental Protection, Non-game Program. While an apparently healthy population is present in proper habitat, this habitat is often itself threatened in modern New Jersey. Drainage for housing developments is occurring in Cape May County and drainage for sand mining (glass industry) interests remains a threat in Cumberland County. Cutting of swamp forests, including cedars, remains a threat in all areas.

The Red-shouldered Hawk may be more than threatened and should be considered for endangered species status in New Jersey. Second only to the Bald Eagle, it is the rarest breeding raptor in southern New Jersey (if we assume the Short-eared Owl is currently extirpated). It is far rarer than the breeding populations of Peregrine Falcon or Northern Harrier, both listed as endangered species in New Jersey.

Other possible Red-shoulder nesting areas should be urgently identified if possible. Known nesting sites should be vigorously protected. Only in this way will the Red-shouldered Hawk remain the Barred Owl's compatriot as a component of our southern New Jersey swamps, their urgent calls echoing through the hollow, haunting trees in the hazy late afternoon spring woods.

Barred Owl and Red-shouldered Hawk habitat remains as some of the wildest and most inaccessible swamp forest in New Jersey. If the birds are to remain, the land must remain as it is—inaccessible, unaltered, and wild.

ACKNOWLEDGMENTS

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