The Savannah Sparrow (Passerculus sandwichensis) is a widespread and common American songbird. It is a variable species, with “typical” Savannah Sparrows found throughout most of the range. However, very different “Savannah” Sparrows are found along the Pacific coast, breeding mainly in isolated salt marshes; most of these were originally named as distinct species. Among these are “Belding’s” and “Large-billed” sparrows—at present considered to be subspecies of the Savannah Sparrow. Should we consider all of these Savannah Sparrows to be the same species, or should we recognize the distinctive Pacific coast birds to be different species? In this article, I summarize information about the ecology, habitats, and identification of the many Savannah Sparrows, and I express my own opinions based on 40 years of study of these birds in the field.

The Savannah Sparrow breeds from Alaska west to the Aleutian Islands, eastward across northern Canada through central Nunavut to Labrador and Newfoundland, south to central Pennsylvania and northern Georgia, west through central Illinois, Indiana, and northern Nebraska to central Colorado and northern New Mexico, and continuing to Arizona, Nevada, and California, and then south through the highlands of Mexico and probably to the highlands of Guatemala.

The species has been the subject of a number of systematic reviews, most recently by Rising (2007), and many subspecies have been named. The fifth edition of the American Ornithologists’ Union (AOU) Check-list (1957)—the last Check-list to give subspecies—identified 16 subspecies found in what was then the AOU area of Baja California, the U.S., and Canada. At the time, the AOU treated
The bird currently known as the Savannah Sparrow is a complex of geographically variable populations; many are poorly defined and weakly differentiated, but others are geographically isolated and distinctive. Some, like the “Belding’s” Sparrow, shown here, may well deserve full-species rank. How many potentially valid species are included within the Savannah Sparrow complex? This article attempts to answer that question. Coastal Orange County, California; November 1994. Photo by © Larry Sansone.

the “Ipswich” Sparrow, breeding on Sable Island, Nova Scotia, as a distinct species, Passerculus princeps. More recently, this taxon generally has been treated as a subspecies (P. s. princeps) of the Savannah Sparrow. Thus, there are 17 subspecies recognized today in the old AOU area. Paynter (1970) lists 21 subspecies (including princeps as a subspecies) from the same range. Clearly, the Savannah Sparrow is variable.

I argue that most of the variation is “clinal,” meaning there are trends of variation from, say, dark to pale, or small to large, or relatively thin billed to relatively thick billed, but that it is difficult—and arbitrary—to draw lines between many of the subspecies that have been named. For example, Savannah Sparrows from Labrador and Newfoundland (labradorius) are relatively large and dark; to the west they grade into a population from northern Quebec, Ontario, and Manitoba (named oblitus), which was described from specimens from Churchill, Manitoba. Statistically, we can separate samples of these birds into the two groups, but many—if not most—of the individuals are intermediate.

Many contemporary American ornithologists would like individuals of different subspecies to be nearly 100% identifiable. However, there is no way to say with certainty that an individual found in Georgia in winter is labradorius or oblitus—or, for that matter, a representative of any other
“subspecies” that could be found there in winter. I have seen many dark Savannah Sparrows in winter on the Gulf coast of Texas. Are these from Labrador? Who knows? Inland in Texas, we see paler birds. Are these birds from the prairies (let’s say nevadensis)? Probably, but who knows, and who can know? There is no way one can prove an identification one way or the other, except maybe with a molecular method. Birders in the field really cannot know. I have argued that all of the subspecies of Savannah Sparrow found in Canada and the U.S., as well as those from the highlands of Mexico—except the “Ipswich” Sparrow and the Savannah Sparrows from the salt marshes of the Pacific coast—represent mere clines in body size, bill shape and size, and coloration that have been arbitrarily “chopped up” into delimited, named taxa—subspecies.

Throughout much of its range, the Savannah Sparrow is migratory, but there are resident populations in coastal California, in coastal Sonora and Sinaloa, and perhaps in the Mexican highlands. In coastal southern California and Baja California, several different subspecies have been described. Many of the populations of birds that are more-or-less resident in isolated salt marshes along the west coast of California and the Baja California peninsula were originally named as distinct species. As well, the Savannah Sparrows that occur along the east coast of the Gulf of California (Sonora south to central Sinaloa) have evolved as distinct taxa and are mostly resident. Some of the birds that breed on the coast of northern Sonora evidently move north into southern California, to the coast, or into the Salton Sink after breeding.

**Some Definitions**

Species are variously defined, but a common textbook definition is “a group of interbreeding natural populations reproductively isolated from other such groups.” In the real world, it is difficult to apply this definition. How can we know if isolated populations—populations that are allopatric to other populations of similar birds, and therefore do not have an opportunity to breed randomly—are reproductively isolated? Savannah Sparrows (or Savannah-like sparrows) breed on Sable Island, Nova Scotia, but are not found with typical Savannah Sparrows, which breed on the mainland. How can we know that they could, if given the chance, interbreed with typical Savannah Sparrows? And if they

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**Above:** This Savannah Sparrow can safely be assigned to the subspecies *oblitus*. That assignation is a bit circular, though, as it is based entirely on geography: Savannah Sparrows breeding in coastal Manitoba are *oblitus*; therefore, this individual must be *oblitus*. Churchill, Manitoba; June 2005. Photo by © Robert Royse.

**Below:** Based on geography, this Savannah Sparrow may belong to the subspecies *savanna*. However, it occurs in a region in which *savanna* Savannah Sparrows intergrade with other subspecies, including *oblitus*. (Can you discern any differences with the individual in the photo above?) Burke County, North Dakota; June 2004. Photo by © Robert Royse.
were to do so, would they produce normal, fertile offspring? Horses and donkeys interbreed, but their offspring—mules—are generally sterile. Therefore, horses and donkeys are reproductively isolated. Even when horses and donkeys interbreed, they are effectively reproductively isolated. There are no horse genes entering the gene pool for donkeys or vice versa.

By the way, the working definition of a species does not allow delimiting the many “species” of organisms that reproduce asexually. The essence of this definition—the reason that evolutionary biologists often embrace it—is that it describes the conditions under which two (or more) different populations of sexually reproducing organisms could evolve differences without the blending, confounding influence of gene flow (that is, the movement of characteristics from one population to the other). Thus, if natural selection favors dark individuals in one habitat and pale ones in another, those individuals’ tendency to evolve differences is offset by interbreeding with individuals adapted to a habitat that is different from their own. There are two different “forces” in action that are perhaps in conflict: (1) selection for adaptations to local conditions and (2) gene flow (interbreeding) from places where the local conditions select for different traits.

A subspecies, according to a dominant view, is an “aggregate of local populations of a species inhabiting a geographical subdivision in the range of a species.” Thus, a

Savannah Sparrows from Oregon, such as this individual of the subspecies *brooksi*, can be differentiated from Savannah Sparrows from, say, Pennsylvania. However, the transition from one subspecies to another is gradual, or clinal, across much of the continent. In other words, it is not usually clear where one subspecies ends and another begins. For this reason, it is proposed in this article that all the clinal subspecies be lumped into a single subspecies of the Savannah Sparrow. Deschutes National Forest, Oregon; September 1994. Photo by © Larry Sansone.

Imperial County, California; February 2006. Photo by © Larry Sansone.

This individual is probably of the subspecies *nevadensis*. Savannah Sparrows in this subspecies tend to average somewhat paler than other Savannah Sparrows, presumably as an adaptation to the hot, dry, sunny environment they inhabit. Such “local adaptations” by themselves are not usually considered to be sufficient for recognizing a population as a genetically distinct entity. Imperial County, California; February 2006. Photo by © Larry Sansone.
Proposed Revision of the Savannah Sparrow Complex (opposite page). Currently, the Savannah Sparrow is treated by the American Ornithologists' Union as a single species comprising more than a dozen subspecies. In the revision proposed in this article, the Savannah Sparrow would be split into the following four species and subspecies: (1) Savannah Sparrow (*Passerculus sandwichensis*), consisting of a widespread, variable continental subspecies (nominate *sandwichensis*) and a distinctive range-restricted subspecies (*princeps*) found during the breeding season only on Sable Island, Nova Scotia; (2) Belding's Sparrow (*P. beldingi*) of coastal salt marshes from southern California to Baja California, consisting of a northern subspecies ( nominate *beldingi*) and a southern subspecies (*guttatus*); monotypic (3) San Benito Sparrow (*P. sanctorum*) occurring only on three small islands off the Pacific coast of Baja California; and (4) Large-billed Sparrow (*P. rostratus*) from the coast of the Gulf of California, consisting of a northern subspecies (nominate *rostratus*) and a southern subspecies (*atratus*). Map by © Kei Sochi.

subspecies must have a distinct range (for example, Newfoundland and Labrador or Sable Island) and must be, in some way, recognizable distinct. The Savannah Sparrows from Sable Island are individually recognizable from those from anywhere else. But as I mentioned earlier, those from Newfoundland, although slightly larger and darker on average, are not individually separable from those from, say, Churchill, Manitoba. Thus, using this definition, the birds from Sable Island are a “good” subspecies (*princeps*); those from Newfoundland (*labradorius*) are not.

Biologists describing and cataloging the biota of North America first described and named many of our birds. In 1789 Johann Friedrich Gmelin gave a Latin name to the Savannah Sparrow, *Emberiza sandwichensis*, based on a bird John Latham had named the “Sandwich Bunting.” Unlike Gmelin, who followed the Linnean system of giving species Latinized binomial names, Latham, from England, gave the species an English name—and a rather misleading one, as “Sandwich” generally denotes the Hawaiian Islands. (The material upon which he based his description came from “Sandwich Bay” on Unalaska Island in the Aleutians.) Because Gmelin’s name is the oldest name available for the species, the name is today *Passerculus sandwichensis*, changed because we no longer believe that the Savannah Sparrow should be put in the genus *Emberiza*. (Many Old World buntings, such as the Rustic Bunting, *E. rustica*, are in that genus, but no species in the genus breeds in North America.)

Later, in 1811, Alexander Wilson, the “father of American Ornithology,” described a new bird (new to him) found from “Savannah [Georgia] north to Great Egg Harbor, New Jersey,” and called it *Fringilla savanna*—the Savannah Sparrow. Again, *Fringilla* is a name for some Old World species (for example, the Chaffinch, *F. coelebs*), not close relatives of the Savannah Sparrow. Today, the Savannah Sparrow is put in its own, monotypic genus—that is, a genus having only one species. The name of that monotypic genus is *Passerculus*. Many field workers have allied *Passerculus* to other American grassland sparrows and put it in the genus *Ammodramus* (which includes the Grasshopper Sparrow and Baird’s Sparrow). Recently published genetic information, however, confirms that the Savannah Sparrow is best placed in its own genus.

In due course, American ornithologists examined Latham’s, Gmelin’s, and Wilson’s descriptions, and decided that these were different descriptions of birds of the same species. Thus, they were “lumped” and became, by default, different subspecies of the same species. In this case, one could distinguish a bird from the Aleutians (Gmelin’s bird) from one from Savannah, Georgia (Wilson’s bird), as the Aleutian birds are larger, being about the same size as the birds from Sable Island. The problem is that as one moves from the Aleutians to the Alaskan Peninsula to mainland Alaska, one finds progressively smaller Savannah Sparrows. Birds from the Anchorage area are about the same size as those from the prairies and eastward.

Several other populations of “Savannah Sparrows” were described as distinct species, among these: the “Ipswich” Sparrow; the “Belding’s” Sparrow, now *P. s. beldingi*, from salt marshes on the Pacific coast from San Luis Obispo or Santa Barbara county, California, south to Magdalena Bay, Baja California Sur; the “San Benito” Sparrow, *P. s. sanctorum*, from the Islas San Benito, Baja California; and the “Large-billed” Sparrow, *P. s. rostratus*, from coastal Sonora and Sinaloa, Mexico. (Curiously, *rostratus* was described on the basis of specimens from San Diego, California, where the subspecies does not breed.) Should we continue to call these subspecies of the Savannah Sparrow, or should we recognize them as distinct species?

**“Ipswich” Sparrow**

The “Ipswich” Sparrow is a morphologically distinct population of Savannah Sparrow that breeds for all intents and purposes only on Sable Island, Nova Scotia—a small island off the southeast coast of Canada in the north Atlantic. Besides a few Common Ravens, it is the only songbird that breeds there. On Sable Island, the “Ipswich” Sparrow is common. “Ipswich” Sparrows are easily distinguished from typical Savannah Sparrows from the adjacent mainland—and indeed from all other Savannah Sparrows. They are no-
noticeably larger and very pale. A different species? Perhaps. You can certainly tell them from other Savannah Sparrows, even in the field. Do they interbreed with typical Savannah Sparrows? We don’t know. Occasionally a typical Savannah Sparrow breeds on Sable Island, and is mated to an “Ipswich” Sparrow; and occasionally an “Ipswich” Sparrow breeds along the coast of mainland Nova Scotia, and is paired with a typical Savannah Sparrow. Do they raise fertile offspring? I don’t think anybody knows, although my guess would be that they do.

So why not a separate “Ipswich” Sparrow species? Ipswich Sparrows may or may not be reproductively isolated, but in ways other than size and coloration they are just like typical Savannah Sparrows from the mainland, a finding recently supported by molecular analyses of their genes. “Ipswich” Sparrows differ from mainland birds only with regard to characters that have evolved (no doubt very recently) adapting them to their island environment. Gene flow between mainland and island populations—if, indeed, any occurs—has to be minimal. On the basis of current information, the question of species vs. subspecies for the “Ipswich” Sparrow is a guess.

“Belding’s” Sparrow

“Belding’s” Sparrows are morphologically distinct from typical Savannah Sparrows, differing both in dimensions and in coloration. The birds from the salt marshes of Morro Bay, San Luis Obispo County, California, are morphologically intermediate between those from coastal northern California and those from San Diego. The Morro Bay Savannah Sparrows are found in coastal salt marshes, as are those found to the south, but there are also Savannah Sparrows in the salt marshes of San Francisco Bay, which molecular evidence suggests are typical Savannah Sparrows,
and their morphology is likewise that of typical birds. The habitat similarities between Morro Bay birds and inland individuals do not constitute a strong argument for calling the Morro Bay birds “Belding’s” Sparrows. Information about Savannah Sparrows breeding between Morro Bay and Santa Barbara would be useful—if there are any breeding populations along that part of the coast.

South of Morro Bay, in southern California and Baja California, there are several isolated populations of Savannah Sparrows in salt marshes, and several subspecies have been named. These include the following: (1) P. s. beldingi, found from Santa Barbara County (or maybe San Luis Obispo County) south to Baja California to latitude 30º north; (2) P. s. amulus, found on the west coast of central Baja California in the vicinity of Bahía Vizcaino, Guerrero Negro; (3) P. s. guttatus, from Laguna San Ignacio, Baja California Sur; and (4) P. s. magdalenae, from Bahía Magdalena, Baja California Sur. Birds from these populations, especially guttatus and magdalenae, may move south to the Cape region of Baja California Sur after breeding; others are probably sedentary. There are many good records of nonbreeding Savan-

Above Left: Birds of coastal marshes in southern California and northwestern Mexico are distinctive in various ways. These “Belding’s” Sparrows are dark overall, slightly small bodied compared to most continental Savannah Sparrows, and proportionately longer billed than most continental Savannah Sparrows. Furthermore, they are geographically and presumably genetically isolated from other Savannah Sparrows. For these reasons, it is proposed that “Belding’s” Sparrow be elevated to full-species status. Coastal San Diego County, California; January 1995. Photo by © Larry Sansone.

Above Right: This Savannah Sparrow was photographed in a region in which “Belding’s” Sparrow is known to occur. Is it in fact a “Belding’s” Sparrow “out of habitat”? Or is it one of the several continental populations of Savannah Sparrows that winter in the area? The photo is from winter, at which time such determinations are difficult to make. Ventura County, California; March 1993. Photo by © Larry Sansone.

Below: “Belding’s” Sparrows are restricted to coastal marshes in southern California and northwestern Mexico. These marshes are themselves fragmented, with the result that the “Belding’s” Sparrow may consist of multiple subspecies. Bolsa Chica Ecological Reserve, Orange County, California; September 2005. Photo by © Larry Sansone.
S A V A N N A H  S P A R R O W S

Savannah Sparrows from the Cape region of Baja, but their population affinities are not clear. They are probably *guttatus* and/or *magdalenae*. They also have been called *rostratus* (see below), but *guttatus* and *magdalenae* also are large billed, and, on biogeographical grounds, movement from Sonora or Sinaloa seems unlikely. These coastal Savannah Sparrows are always found in salt marshes, except for some individuals of *beldingi* found on Isla Todos Santos, off the coast of Baja California. Although morphologically distinctive, not to mention quite variable, these birds all sing songs that are very like those of typical Savannah Sparrows. Molecular data, however, show that these salt marsh birds, along with “Large-billed” Savannah Sparrows of coastal Sonora and Sinaloa, are distinct from other Savannah Sparrows, including salt marsh birds from San Francisco Bay. Even if the songs of “Belding’s” Sparrows were considered to be like those of typical Savannah Sparrows, I doubt that song would tell us much about phylogenetic history. Songbirds, or “oscine passerines,” learn their songs. Thus, a songbird sings its father’s song—or that of some other nearby conspecific.

**“San Benito” Sparrow**

*P. s. sanctorum* is found only on three small islands off the west coast of Baja California, the Islas San Benito. There the “San Benito” Sparrow is common. Along with a few Common Ravens and Horned Larks, “San Benito” Sparrows are the only songbirds that breed on the islands. Unlike their relatives on the Baja mainland less than 100 kilometers away, which are found only in coastal salt marshes,
“San Benito” Sparrows are found in shrubs adapted to the arid conditions. Along the shore, “San Benito” Sparrows feed in beach wrack and in coastal desert thorn, *Lycium californicum*. To my knowledge, there are no salt marshes on the islands. “San Benito” Sparrows are morphologically quite different from mainland birds, being relatively large bodied and large billed—not unusual for island populations. Do they interbreed with mainland birds? We don’t know, but probably not.

I last visited the Islas San Benito and the adjacent mainland in late April of 1999. At Guerrero Negro on 23 April, on the Baja mainland, female Savannah Sparrows (*P. s. anulus*) were in the early stages of nesting, laying eggs, and/or incubating. On Islas San Benito, 25–27 April, most birds were not yet in breeding condition and did not appear to be territorial, although a few females seemed to be developing brood patches. In short, the San Benito birds and the mainland birds not only are found in radically different habitats and differ in appearance, but they also appear to have different breeding schedules. Thus, the Savannah Sparrows from Islas San Benito (1) are morphologically distinct, (2) breed in a different habitat from their mainland relatives, and (3) apparently don’t interbreed with mainland individuals. Not only are they allopatric, they are on different breeding cycles.

**“Large-billed” Sparrow**

The “Large-billed” Savannah Sparrows, *P. s. rostratus*, from the coast of Sonora and Sinaloa, are separated into two subspecies, *P. s. rostratus* from coastal Sonora and *P. s. atratus* from southern Sonora south to central Sinaloa. They are, for the most part, resident on the eastern coast of the Gulf of California, although many individuals—probably only from the northern part of their range—wander north into southern California after breeding. They are large Perhaps the most distinctive of all the populations currently classified as a Savannah Sparrow is the **“Large-billed” Sparrow**. **“Large-billed”** Sparrows are probably best known on their wintering grounds—especially around the southern end of the Salton Sea. *Salton Sea, Imperial County, California; February 2006. Photo by © Larry Sansone.*

The Salton Sea is a must-visit destination for ABA Area birders seeking Yellow-footed Gull for their lifelists. While you’re there, be sure to look for “Large-billed” Sparrows, too. Although currently classified as “just” a subspecies (albeit a distinctive one) of the Savannah Sparrow, the “Large-billed” Sparrow may one day be elevated to full-species status. *Salton Sea, Imperial County, California; June 1997. Photo by © Brian E. Small.*
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bodied, large billed, and distinctive in plumage. Also, their songs seem to differ from those of typical Savannah Sparrows, but this has not been rigorously analyzed. In no area does their range overlap that of typical Savannah Sparrows in the breeding season, so there is no indication as to whether or not they would interbreed, given the opportunity. *P. s. atratus* is darker in color than *P. s. rostratus*, although variation may be clinal; this is poorly understood, and the birds breed only in isolated pockets of suitable breeding habitat. Molecular evidence places *rostratus* birds in the *beldingi* group.

**Genetics**

Molecular evidence divides the Savannah Sparrow into two different “phylogenetic groups,” or clades. Let us call one group Clade A and the other group Clade B. Clade A consists of birds found from eastern Canada (including Sable Island) west to Alaska, and Clade B incorporates two sub-clades, which we will call Clades B1 and B2. Clade B1 contains birds from many places, from the northeast to Alaska; Clade B2 contains only salt marsh birds (*beldingi*, *sanctorum*, and *rostratus*.) Thus, a pair of birds nesting in a field in New York may include a female from Clade B1 and a male from Clade A. There is no geographical structure except that none of the salt marsh birds falls outside of its sub-clade, and none of the non-salt marsh birds are clustered with the salt marsh birds. The genetic data suggest that all of the salt marsh birds from southern California, Baja California, and coastal Sonora and Sinaloa appear to have a common origin, perhaps only recently diverged from other Savannah Sparrows. The birds from the salt marshes of San Francisco Bay are, on the basis of their genetics and their appearance, just typical Savannah Sparrows.

**Summary**

Summing it all up, is easy to separate “Large-billed” Savannah Sparrows from others, “San Benito” individuals from others, and “Beldings” Sparrows from others, although the population from Morro Bay in San Luis Obispo County, California, is intermediate—and we know nothing of its genetics. The “San Benito” Sparrows, in addition to being allopatric with mainland salt marsh Savannahs, apparently breed on a different cycle and are found in different habitat. Lastly, the “Ipswich” Sparrows (Sable Island, Nova Scotia) seldom overlap in range with mainland birds, but when they do, they apparently pair with them.

I recommend the following four species.

- **Savannah Sparrow** (*Passerculus sandwichensis*) with the “Ipswich” Sparrow
as a subspecies (*princeps*). The many other subspecies that have been named are all subject to clinal variation and are arbitrarily delimited. Thus, the Savannah Sparrow is most appropriately considered to be one species with only two (not 15—or whatever) subspecies.

- **Belding’s Sparrow** (*P. beldingi*) with perhaps two subspecies. Much of the variation, both in bill size and coloration, is clinal, but the populations are isolated. I would rather arbitrarily draw the line between the two subspecies at Bahía Vizcaíno. Thus, the two subspecies would be *beldingi*, found from San Luis Obispo County, California, south to Bahía Vizcaíno, Baja California; and *guttatus*, found from Laguna San Ignacio south to Bahía Magdalena, Baja California Sur. The latter probably winters south to southernmost Baja California Sur. (Note that the type specimen of *guttatus* is from San José del Cabo.)

- **San Benito Sparrow** (*P. sanctorum*). It is endemic to Islas San Benito, Baja California, Mexico. It is in a different habitat, and apparently it breeds on a cycle different from the birds on the adjacent mainland.

- **Large-billed Sparrow** (*P. rostratus*). It breeds in coastal Sonora and Sinaloa, Mexico, moving north into southern California after breeding. I would recognize two subspecies, *rostratus* of northern Sonora and *atratus* of southern Sonora south to central Sinaloa.

I hasten to add that these are my opinions, and they have not yet been embraced by the North American ornithological community. Right now, there is only one Savannah Sparrow. In my mind, the delineation of species and subspecies I recommend is a much better reflection of how these birds are related, how their evolution has occurred, and how they are variously adapted.