



IDENTIFICATION OF FEMALE CASSIN'S AND PURPLE FINCHES

by Alvaro Jaramillo and David Beadle

The genus *Carpodacus* which includes the Purple, Cassin's and House finches of North America and many Asian species, consists of sexually dimorphic birds with males showing obvious red on the plumage while the females are duller, brown and streaked. This article deals largely with the separation of Purple Finch *C.purpureus* and Cassin's Finch *C.cassinii* in this duller streaked plumage. House Finch *C.mexicanus* will be dealt with at a lesser level of detail as it is not nearly as difficult an identification problem. Purple and Cassin's finches are closely related "sister species" while House Finch is genetically quite distant from them (Marten and Johnson 1986). Only rarely are Cassin's Finches and Purple Finches both common at one site, usually one species is the predominant one. This means that there tends to be a default species which can facilitate putting a name to a bird, but not because the bird was properly identified! Traveling birders may encounter the opposite situation, defaulting to the species common in their home birding region in cases when they are in an area unfamiliar to them where both species occur. East of the Rocky Mountains, Cassin's Finch is entirely absent other than as a vagrant. Potential vagrant Cassin's Finches need to be separated from atypical Purple Finches. This article hopes to provide a framework for identifying these difficult species in their drab, streaked plumage with the aim of avoiding these identification pitfalls.

Geographic Variation and Distribution

Cassin's Finch has no widely accepted subspecies, it is regarded as monotypic. However, males from the western portion of the range are said to be darker and more purplish and have been given the name *vinifer* in the past (Duvall 1945). Cassin's Finches are widely distributed in the Rocky Mountains, the Great Basin but not on the Pacific Coast. They breed from south-central British Columbia and southeasternmost Alberta (Waterton Lakes National Park), south largely east of the crests of the Cascades and Sierras to the mountains of southern California and northern Baja California, Mexico, east to the foothills of the Rocky Mountains south to at least north-central New Mexico and northern Arizona. In winter they vacate the northernmost part of their range, and are found south of their breeding range at times to the central highlands of Mexico. Their winter distribution varies from year to year, as is typical of many fringillid finches.

The Purple Finch has three named subspecies: *C.p.purpureus* of the east and north, *nesophilus* of Newfoundland and *californicus* of the Pacific Coast (AOU 1957). However, Godfrey (1986)

does not recognize *nesophilus* (darker and larger) and instead recognizes *taverneri* for paler birds from the far northwest of the distribution. Arguments over which subspecies are valid and which are not are beyond the scope of this paper. For the sake of simplicity we will use the name Eastern Purple Finch to include *purpureus*, *nesophilus* and *taverneri* and the name California Purple Finch to refer to *californicus*; it is this division that is the fundamental one. The various forms of the Eastern Purple Finch are dubious at best and are certainly not identifiable in the field.

The Eastern Purple Finch is the most widespread and well known form, ranging east to Newfoundland and breeding south to the northern Appalachians. It ranges as far west as southeast Yukon Territory and southwestern Mackenzie, Northwest Territories, and northern and central British Columbia to the coast, while absent from the Okanagan Valley and the south-central part of the province. It is not clear how far south along the British Columbia coast this form is found and where it intergrades with the California Purple Finch, if at all. In winter the Eastern Purple Finch vacates the western portion of its range, wintering to the south and east, as far south as central Texas and northern Florida, roughly keeping east of the 100th Parallel. Eastern Purple Finch distributions in winter are quite variable, with birds being sometimes largely absent from some areas, then invading in other years.

The California Purple Finch breeds in the lowlands west of the Cascades and Sierras to southern California and northern Baja California, Mexico. It breeds north to the Lower Mainland and Vancouver Island in British Columbia. Note that the northern populations in British Columbia south to Oregon average darker than birds in California and were given the name *rubidus* in the past (Duvall 1945). These birds winter largely within the breeding range, but their abundance is greatly lowered in the winter in certain areas, for example central California. It is unclear where most birds go, but presumably they move south. However, they have reached Arizona in winter in invasion years (Rosenberg 1990) suggesting some eastern movements at times.

The House Finch has several named subspecies in North America but only one, *C.m.frontalis*, is found in Canada (AOU 1957). We will not deal with other forms of the House Finch here, as this would add little to the facilitation of the identification of Purple and Cassin's finches. The introduction of the House Finch from its native southwest to the east of North America was extremely successful, with birds having colonized almost all of the eastern United States and southern Canada at this point. This species can now be expected almost anywhere in the United States and throughout southern Canada, though it is still rare in Alberta and Atlantic Canada.

Moult

In Cassin's and Purple finches, the juvenal plumage is lost through a partial first prebasic moult which occurs in the vicinity of the breeding grounds from August to October in Purple Finch and July to September in Cassin's Finch (Pyle 1997). This partial moult is much more extensive on House Finches and may be complete (Pyle 1997). First basic male Cassin's and Purple finches remain in a female-like plumage for their first winter, spring and summer. Most House Finch immature males obtain an adult-like plumage during the first prebasic moult, but this varies geographically, with some populations retaining a female plumage (Hill 1996). There is a limited prealternate moult in early spring for Cassin's and Purple finches involving body feathers only (Pyle 1997). It is not clear if this moult also applies to immature birds and both sexes. It is assumed that it does not greatly change the birds' appearance.

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Eastern Purple Finch *Carpodacus purpureus purpureus*, Ontario, (Barry Cheriére).

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California Purple Finch *Carpodacus purpureus californicus*,
San Mateo, California, May 1998 (Alvaro Jaramillo).

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Purple Finch *Carpodacus purpureus californicus* and Cassin's Finch *Carpodacus cassinii*, South East Farallon Island, California, November 1989 (David Beadle). Note the longer primary extension on the Cassin's Finch (right) and, especially, the longer gap between P6 and P7. Note also the "colder" plumage of the Cassin's with sharp blackish streaking on the mantle and the head.

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Cassin's Finch *Carpodacus cassinii* and Purple Finch *Carpodacus purpureus californicus*, South East Farallon Island, California, November 1989 (David Beadle). Compare the bill shapes: the Cassin's (left) shows an almost straight culmen whereas on the Purple Finch the culmen is noticeably curved. Note the difference in head pattern: the pale areas on the Cassin's are invaded by dense and sharply defined blackish streaks which are (more diffused) on the Purple Finch. Also, the whitish eye crescents are very characteristic on the Cassin's.

Structure

The three species of North American *Carpodacus* finches differ substantially in their structure, and this is perhaps one of the best visual clues to the identity of a specific individual. Let's begin with the familiar House Finch: this is the smallest, slimmest, and longest-tailed of the group. The tail is not only longer, it lacks the obvious deep notch seen on the tails of Cassin's and Purple finches. House Finches have bills with an obvious curve to the culmen, giving them a small-billed appearance. They possess a moderate primary extension (primaries extending past the folded tertials), which is marginally shorter than that of the Purple Finch.

Both groups of Purple Finch have a deeper bill than House Finch, with a straighter culmen, although the culmen is ever so slightly curved on this species as well. The tail is relatively short and deeply notched. The primary extension is moderate, with a noticeable gap between primary 6 and 7. Note that in most cases, P8 is the longest primary visible on the folded wing, as P9 and P10 are shorter and hidden. California and Eastern Purple Finches are similar in structure, but Easterns have slightly longer wings and shorter bills on average than California Purple Finches (Duvall 1945).

Cassin's Finch is more extreme in its structure. It shows a deep, long bill with a very straight culmen, making the bill appear more sharply pointed than in the other two species. The tail is relatively short and deeply notched, as on Purple Finch. Finally, the primary extension is very long in this species, significantly longer than on Purple Finch. This is perhaps the single most reliable mark that can be used to separate these two species! Also, due to the longer wings the gap between P6 and P7 is quite noticeable. This wider space between these primaries is present, but not as wide, on Purple Finches. Note also that Cassin's Finches have a tendency to raise a short crest, which peaks just above or behind the eye. Purple and House finches show more rounded heads.



Cassin's Finch *Carpodacus cassinii*, South East Farallon Island, California, November 1989 (David Beadle). Notice the very clean-cut appearance of this bird. The blackish streaking is crisp and well defined, especially on the head and underparts. The whitish wing-bars and tertial edges are sharply defined

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Cassin's Finch *Carpodacus cassinii*, South East Farallon Island, California, November 1989 (*David Beadle*). The whitish underparts are densely and crisply streaked with blackish. Note the dark centres to the undertail coverts.



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House Finch *Carpodacus mexicanus*, South East Farallon Island, California, November 1989 (*David Beadle*). Compared to both Cassin's and Purple finches this species is stubbier billed with shorter primary extension and longer tail. Note the more uniform appearance of the head and upperparts and the diffuse, wider streaking on the buff-tinged underparts.

Plumage

Again, let's begin with the House Finch which is the most different of the three species. This is the least boldly streaked of the three species, showing a very dull face pattern. The head appears pale brown and unicoloured from a distance, perhaps with a slightly paler supercilium and not much more. House Finches lack the pale jaw stripe (submoustachial stripe) of the other forms. The upperparts are streaked, but not obviously so. House Finches have streaked undertail coverts. The combination of dull face pattern and structural differences is enough to adequately identify this species.

Dealing with plumage is where the separation between Eastern and California Purple Finches becomes important. Females of these forms are significantly different and can be separated in the field. As well, understanding the variation within the Purple Finch can aid in separating this species from Cassin's Finch. Eastern Purple Finches have the boldest face pattern of any North American *Carpodacus*, with an obvious white supercilium and white jaw stripe which contrasts with a dark cheek patch. Streaking within the white supercilium and jaw stripe is limited. Note that the dark face patch surrounds the eye and there is no obvious eye-ring. California Purple Finches are similar in structure and overall pattern to Eastern Purple Finches but differ in being muddier looking, not so crisp and contrasting. This is due to an underlying olive-buff wash to the body plumage which dulls down white areas of the body. The pale supercilium and jaw stripe are present, but tend to be streaked, and the background colour is buffy white rather than pure white. The dark malar stripe is present but since it does not contrast as much with the pale jaw stripe and the buffier throat on this form, it is not as distinct as on an Eastern Purple Finch. The underparts are washed with buff on the throat, breast and flanks, becoming more whitish on the belly and vent. The underpart streaking is wide and lacks crispness, it appears to bleed together, in some ways recalling a House Finch. Both Purple Finches have white undertail coverts, but note that on some individuals there may be a few streaks visible, particularly on the longest undertail coverts. Streaked undertail coverts appear to be most regular in California Purple Finches, and in particular in young males (pers. obs.). Both forms tend to show a green wash to the rump which female Cassin's Finches lack; note however that young male Cassin's Finches may show this character.

Cassin's Finch is the grayest and palest appearing of the three species. The back is obviously streaked and can appear "frosty" due to the whitish background colour on which the dark streaks contrast (Kaufman 1991). The face pattern is bolder than on a California Purple Finch, but duller than on an Eastern Purple Finch, always showing streaking both on the supercilium and jaw stripe. However, the background colour is white, not buffy as on the California Purple Finch. The dark auriculars contrast with a white lower eye crescent; similarly the streaks on the supercilium set apart a pale upper eye crescent, both of which are lacking or not obvious on Purple Finches. Kaufman (1991) notes that Cassin's Finches may show a pale yellowish suffusion on the ear coverts. The underparts are white with crisp dark streaking, which reaches clearly down to the undertail coverts. We do not know of any convincing records of Cassin's Finches lacking streaking on the undertail coverts. The underpart streaking is crisp, partially due to the longer, thinner shape of the streaks as well as their crisply outlined edges.

There is also an appreciable behavioural difference. Purple Finches are extremely arboreal, perching and foraging while in trees and seldom coming to the ground. Cassin's and House finches, on the other hand, commonly forage on the ground. If you see a Purple Finch on the ground, give it a second look, it just may be a Cassin's.

Purple Finch
Carpodacus purpureus purpureus



House Finch
Carpodacus mexicanus



Purple Finch
Carpodacus purpureus californicus



Purple Finch
Carpodacus purpureus purpureus

Cassin's Finch
Carpodacus cassinii



Cassin's Finch
Carpodacus cassinii



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Vocalizations

The most reliable way to identify a Cassin's or Purple finch is by call, which is usually given while in flight, but sometimes also while perched. Cassin's Finch utters a three syllable "giddy-up" or "chil-eee-up" (Kaufman 1986, Rosenberg 1990). Purple Finches give a single "tuuk"; "pit" or "pik" (Rosenberg 1990). There appear to be slight differences in the call notes of Purple Finches, with the Eastern ones sounding more musical and California Purple Finches sounding harder and sharper (David Sibley pers. comm., Jaramillo pers. obs.). Beware that Purple Finches, particularly young males, can give a sweet double note quite unlike their typical flight call. Songs of male Eastern Purple Finches are longer than those of California Purple Finches. The secondary song of the California Purple Finch usually includes mimicry, a behaviour that may be missing from Eastern Purple Finches (Jaramillo unpublished data). Cassin's Finches are adept mimics (R. Cannings pers. comm.).

Notes on males

Many first basic males of both Cassin's and Purple finches will not be separable from females. However, young males usually have an extensive greenish wash to the rump, more so than in females. This green wash tends to be most extensive on young California Purple Finches and least extensive on Cassin's Finches. If a female-plumaged bird sings, it is surely an immature male. Female-like birds showing a pinkish wash may not necessarily be immature males: a proportion of older female Eastern Purple Finches show a pinkish wash on the head (Kennard 1959) and this may also occur in the other taxa. Male Eastern Purple Finches experience seasonal changes in the colour of the gape, which appears brownish in the winter, yellowish in the spring and becomes orange or reddish in the summer. Female-like birds showing orange or reddish gapes are immature males (Magee 1943); this may also apply to the other taxa. Adult males of California and Eastern Purple Finches may not be readily identifiable in the field. However, we have noted that male California Purple Finches invariably show greenish lores given a good look. The lores are reddish in most if not all Eastern Purple Finches, or sometimes grayish. California Purple Finches regularly have olive fringes to the primaries and secondaries, unlike Eastern Purple Finches which have reddish fringes.

Summary

The three species of North American *Carpodacus* finches differ substantially in structure, which is the key to their identification. Structure alone may be enough to identify a bird! Equally reliable are the flight calls, which do not overlap. Finally, subtle plumage differences help, but keep in mind that in terms of plumage the two forms of Purple Finch are as different from each other as each is from Cassin's Finch. Also note that streaking on the undertail coverts is not a reliable way to identify a Cassin's Finch. Almost all *Carpodacus* finches should be identifiable given a good view, but be conservative and realize that some of the features mentioned here rely on personal experience and familiarity with one or more of the forms involved.

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