Notes based on Joe Morlan's Ornithology class lecture November 11th, 2009 and review-lecture on December 2nd, 2009.
Joe Morlan is not responsible for these notes, any errors or omissions in them are mine.

Kinglets have two wing bars, but the body feathers, particularly the scapular feathers, often fluff up over the shoulder or the bend of the wing and conceal all or parts of the upper wing bar.
The ruby crown of the Ruby-crowned Kinglet is found only on the males and is usually concealed unless the bird is alarmed or excited in some way.
There are Golden-crowned Kinglets in the Bay Area, but their habits are a little bit different. They breed in the Bay Area, while the Ruby-crowned Kinglet does not. Ruby-crowned Kinglets are here from September to late May. (The very similar but unrelated Hutton's Vireo is a permanent resident and breeds here.) Golden-crowned Kinglets breed in mature fir forests and Redwood forests in the tops of those trees. They are fairly common, but because of their canopy habitat they are hard to observe. They don't tend to come down to the ground. During migration and in the winter season the Golden-crowned Kinglet is eruptive and occurs in really large numbers in some years. That is probably a consequence of very good productivity somewhere followed by a collapse of food, which will bring Golden-crowned Kinglets that are food stressed into places where you would not normally see them. They have a very thin high pitched call note.
The Ruby-crowned Kinglet is found on edges, in parks. It tends to forage at eye level or somewhat higher, it does not get that high up into the trees. It also has a very loud vocalization which is seems to give quite constantly.

In **Louisiana** they are producing an **atlas**. Not just a breeding bird atlas, but a complete atlas of birds, wintering and breeding, and not just whether present or not present but with numbers and densities.

Any hummingbird can get pollen on its bill or on its head. There is no hummingbird in NA whose head is yellow.

There are ten tail feathers on a hummingbird, five on each side. They are counted from the inside and out, R2 is the central tail feather on each side, R5 is the outermost on each side.

Hummingbird wings

The wings of a hummingbird are dark and very narrow. On the inner front cover of Nat Geo there is a drawing showing the topography of a hummingbird, including the folded wing.
One of the features of hummingbird wings is that they have a very long hand, the joint of the wing is very close to the body. This makes the wing appear very stiff.
The long narrow feathers you see on the folded wings are the primaries. Usually the tips of all ten primaries are visible. The innermost primary is named P1, the outermost (the longest) P10.
P1-P6 are the inner primaries.
At the base of the primaries there is a short row of small feathers that cut straight across, they are all the same length, those are the secondaries.
In most birds on the folded wing the primaries are either invisible or a few of them are visible, forming the primary projection. Hummingbirds are quite exceptional in that all the primaries are visible beyond the folded secondaries, they have an extremely long primary projection. The folded secondaries are unusually short.

Our eight most widespread species

There are 320 species of hummingbirds in the world. They are all found only in the New World. Only 24 species are recorded in NA north of Mexico. Of these only 17 occur regularly, the other seven are wanderers from Mexico and the Bahamas. The most widespread of these 17 species are the most similar, eight species of small gorgeted hummingbirds, where adult males are mostly distinctive but females and immatures are difficult to identify.

These 8 species can be divided into two groups based on female plumage:

- 4 green and gray species (will be discussed tonight):
  Ruby-throated and Black-chinned (genus *Archilochus*)
  Anna's and Costa's (genus *Calypte*)
- 4 green and rufous species (will be discussed next week):
  Calliope (genus *Stellula*)
  Broad-tailed, Rufous and Allen's (genus *Selasphorus*)

All four of tonight's green and gray species occur in CA, three of them regularly, the Ruby-throated Hummingbird as an accidental.

Archilochus

Green upper parts, including the crown.
White collar that seems to extend all the way around the neck but is really only on the sides and front. (In Anna's the dark extends down and connects with the shoulder area.)
Females typically have a clear white throat.
Along the flanks you may see a little bit of buffy coloration.
The inner primaries (P1 - P6) are narrower than the outer primaries (P7 - P10). There is an abrupt difference in width between P6 and P7.
Forked tail (but also other hummingbirds in tail molt!).
Smaller than Anna's Hummingbird.
Hummingbird nests are usually heavily decorated on the outside with bits of lichen so they look like a knob of wood. That is less so in the genus *Archilochus*. They tend to have a plainer looking nest with fewer or no lichen.

Ruby-throated Hummingbird

OCCURRENCE

The only hummingbird which occurs regularly in the eastern US in the breeding season.
Occurs fairly far north, into Canada. Even records from Alaska.
Highly migratory. Migrates largely across the Gulf of Mexico.
Winters in Central America and South America.
Early ornithologists could not fathom how it was possible that such a small bird which uses energy at such a high rate could physically fly across the Gulf of Mexico. They concocted wild hypotheses about them riding on the backs of Broad-winged Hawks.
Interesting history of records in CA:
Some birds have been banded on the Farallon Islands that were thought to be Ruby-throated Hummingbirds, but the photos did not show the critical features that you would want to see.
Eventually there were some records of females or immature males coming to feeders in coastal CA.

A female looks a lot like a female Black-chinned or like a juvenile Anna's, so you would have thought that the first record for CA would have been an adult male.
In a way that is true. An adult male flew into a mist net that had been set up at the Sagehen Creek Field Station in Nevada County to trap bats. It was correctly identified by the bat biologist. It was accessioned to the museum at UC Davis where the identification was "corrected" to Broad-tailed Hummingbird. Eventually Andrew Engilis and Kimball Garrett re-identified it.
Since then there has been at least one other record of a male, coming to a feeding station in Nevada City in August last year.

FIELD MARKS
Fairly long bill, very slightly curved. (But slightly shorter than in Black-chinned.)
There is a difference in the shape of the outermost primaries between Ruby-throated and Black-chinned hummingbirds.
Outermost primaries quite pointed in Ruby-throated. (Sibley also says straighter, but Joe had a slide where it looked quite curved.)
They hold their tails still while they are hovering around the flowers, the tail wiggles around a lot on Black-chinned Hummingbirds.

Adult Male
A black mask extends underneath the bill and below and behind the eye, forming a border between the face and the throat area. This is in the same place where the Black-chinned Hummingbird has its black chin.
(The chin is directly under the bill, the throat is between the chin and the breast.)
Iridescent red throat.
Young males white throat, may have one or some tiny red spots.
Tail feathers pointed, no white spots on the tips of the tail feathers.

Female
The green of the crown has a glistening or sparkling quality to it.
A stronger black area between the eye and the bill compared to Black-chinned.
Underparts largely white, especially on the throat area.
White spots on the tips of the outer three tail feathers which are broader than on males.

Black-chinned Hummingbird

OCCURRENCE
Replaces the Ruby-throated Hummingbird in the west.
Nesting range barely overlaps that of Ruby-throated Hummingbird in central Texas.
The range maps tend not to do the bird justice. Looking at them you would think that we should see Black-chinned Hummingbirds all over the place, and we do not.
It is a significant rarity along the immediate coast. Joe has never seen one in SF, never in San Mateo County or in Marin County.
In CA it is a lowland species. It is found quite commonly throughout the lowlands of southern CA. It is found locally mostly in riparian habitat all the way up through the Central Valley. It penetrates the Bay Area around the periphery of the Central Valley, around the Delta. The best and easiest place to see Black-chinned Hummingbirds in the Bay Area is in extreme northeastern Contra Costa County at Bethel Island. You drive all the way to the end of Bethel Island Road, some of the hummingbirds there are Black-chinneds.

Along riparian habitat corridors in urban areas in Santa Clara County they are a relatively common breeding bird. Access is often difficult there.
The birds like Cottonwoods and broadleaf trees in riparian areas. They frequently forage fairly high up in the trees, which makes them difficult to notice.
Joe found them in southern CA quite commonly in parts of Orange County.
It is the most common hummingbird in southeastern Arizona, vastly outnumbers all the other hummingbirds.
Does not winter in CA, but does winter in some of the gulf states.
Disappears from CA by September. Is very, very scarce by October in southern CA even where they are common in the breeding season. One of the most common errors on CBCs in southern CA is that people don't realize the significance of Black-chinned Hummingbirds and report them. Basically it does not happen that there are any there in the wintertime.
People in the east used to think the only hummingbirds they had were Ruby-throated. Nancy Newfield was the first person to notice that in the winter a lot of these birds that looked like Ruby-throated Hummingbirds actually were Black-chinneds. She started to band them. Several western hummingbirds are now being found wintering in the east. Ten years ago none if this was known.
Outnumbers Ruby-throated in Louisiana in the wintertime, probably by 3:1

FIELD MARKS

Bill longer, slightly more curved than on Ruby-throated.
A little bit of a pale spot behind the eye. Arizona birds frequently show a pale postocular stripe that extends well down towards the folded wing. In CA we don't see that as much.
A little buffy wash on the flanks.
Outermost primaries with blunter tips than Ruby-throated.
The tail wiggles around a lot while they are hovering, Ruby-throated tend to hold their tail still.

Adult Male

Black chin.
Throat may look purple or bluish but never red. Gorget cuts clean across, no "tails" coming down towards the bend of the wing.
Clean white collar.
Pointed tail feathers without white spots.

Female

The green of crown is more muted, sometimes more grayish than on Ruby-throated.
Less black in the lores compared to the crisp black mask on most Ruby-throated. females
Never gets a concentration of spots in the middle of the throat. Instead any spotting that they get is uniformly distributed on the throat. They tend to be quite clean..
Conspicuous white tips to the outer tail feathers. Notice that those tail feathers are quite pointed and compare them to the tail feathers of Anna's Hummingbird and also with the much narrower tail feathers of Costa's Hummingbird which has a short tail.
Black-chinned and Ruby-throated have most white on the tail.
Compare how the tails are shown in Nat Geo and in Sibley, there is quite a difference. Sibley may be more accurate.

SOUNDS

Low-pitched humming sound that they frequently make as they are flying around.

Calypte

Wider inner primaries than *Archilochus*, all primaries are of equal width.
Gorget extending down towards the folded wing so that they do not have the white collar that we saw in *Archilochus*.
The iridescent feathers extend up onto the crown and behind the eye, frequently forming a helmet.
Bill generally shorter than on *Archilochus*.
More likely to sing from a perch than *Archilochus*.
Nest usually fully encrusted with lichens.

Costa's Hummingbird

OCCURRENCE

A lowland desert species, prefers more arid areas than the Black-chinned Hummingbird.
Quite common in places like Borrego Springs, the Anza-Borrego deserts, in arid areas in LA County, Palmdale. In arid areas around the foothills of the Central Valley there are some Costa's Hummingbirds.
In the Bay Area it is a very marginal species. Most frequently seen in Stanislaus County in the lower end of Del Puerto Canyon Road, a famous birdwatching road that extends from Highway 5 up into Santa Clara County, up into San Antonio Valley. There is a plan to build a freeway through that valley.
There is some tree tobacco with tubular yellow flowers there, a favorite food of Costa's.

FIELD MARKS

Adult Male

Gorget extends further down and is somewhat more pointed than on Anna's.
The individual feathers of the gorget extend outward away from the body. They can be spread, the bird uses them in display, spreading them out and showing them off. They are rather long feathers that can move.
Purple or violet coloration on crown and throat. Anna's usually look redder but sometimes show a similar coloration.
A white patch on the side of the face separates the color on the crown from the color on the throat. That bold white contrasting patch is not present on Anna's Hummingbird.
Short, straight bill. Joe disagrees with Sibley, Costa's normally has a straight bill. Black-chinned is more likely to have a curved bill. The one that has the most strongly curved bill is Lucifer. It also may have a Costa's-like throat pattern. Bill deformities are not that rare. Lucifer Hummingbird has never been documented to occur in CA.
Tail quite short, the wing tips extend slightly beyond the tip of the tail when perched, as opposed to Anna's or Black-chinned in which the tail extends beyond the tip of the wing.

Female

A postocular stripe extends from the postocular spot down towards the wings and isolates the gray cheek patch.
White (throat) - gray (cheek patch) - white (postocular stripe) is a pattern that is typical of Costa's Hummingbird.
Older females can get a clump of iridescent spots in the middle of the throat.
Sometimes you get a similar pattern on Anna's Hummingbird however.

Anna's Hummingbird

OCCURRENCE

A bird of the far west.

Has been expanding its range over the last 30 years, taking over the whole west coast.

Found throughout the Central Valley, fairly common in the mountains. They are now in the mountains of Arizona where they are becoming more and more common.

The most common hummingbird in the Bay Area, particularly in SF. The only hummingbird that is present throughout the year. We also get Allen's from February through August and occasionally a few other species as migrants.

They nest almost year round. In the SF Bay Area it is not unusual to find females on their nest as early as December. They frequently are feeding young in January and in February. Then by February all of the Anna's territories are invaded by swarms of Allen's, migrants from the south. In March and April there are Allen's everywhere and relatively few Anna's. Where they go is not entirely clear.

It is not thought to be a migratory species, but there is something called upslope drift. That means that Anna's Hummingbirds in the Central Valley and foothill regions frequently drift upslope in the heat of the summer as the mountain meadows are free of snow and flowers are blooming in the mountains. They take advantage of the temporary food abundance at higher elevations in the Sierra Nevada where they do not breed. They also may disperse to other places.

Joe has seen Anna's nesting in April and May in the foothills around the Bay Area, where Allen's do not occur. Allen's are confined to the immediate coast where there is coastal fog. In the interior east of the Berkeley hills Anna's have a different nesting season. Some of our coastal birds may go there.

FIELD MARKS

Short, somewhat straight bill.

White spot behind the eye or a little postocular stripe.

Does not have the clear white collar of Black-chinned or Ruby-throated.

Green back.

Quite a bit of greenish and greenish gray on the underparts. Grayer and dingier underneath than any of the other three species discussed tonight of which probably Ruby-throated is the whitest.

Tail quite long, wing tips normally do not reach tail tip, but wings may be drooped.

The central tail feathers molt before the outer tail feathers. In molt they can show a forked tail, normally it is not deeply forked.

Adult Male

Iridescent red feathers on the throat and on the crown, depending on light conditions the color sometimes looks magenta or purple. Mostly (when the light does not hit right) the whole head looks black including the chin area.

The gorget extends to a point but is not as outlandishly pointed as on Costa's.

Males do not have white spots on the tip of the tail

Female

Usually, at least in adults, a patch of red spots in the middle lower portion of the throat.

Frequently has a trace of a postocular stripe, somewhat similar to Costa's in that respect. But it does not come down all the way and isolates the gray ear coverts like on Costa's.

White spots in the tail.

DISPLAY SOUND

At the bottom of the dive is a very loud popping sound.

The question how this sound is produced has generated some controversy over the years.

An ornithologist from Cal State Chico published a paper back in the 1950s in which he glued the tail feathers onto a whip and whipped the tail fathers through the air and it made a popping sound just like an Anna's. Nobody else was ever able to duplicate this experiment.

Then Luis Baptista made recordings of the songs and created sonograms and found sounds of the same frequency as the popping sound included with the songs. He concluded that the sound is made vocally.

Recently two students at Berkeley removed the tail feathers and there was no sound!

They filmed the dive with a high speed camera and they performed wind-tunnel studies with the outer tail feathers. We now know how the sound is produced. The bird spreads the tail for 60 milliseconds at the bottom of the dive. The inner vanes of the outer tail feathers then vibrate like a reed in a clarinet, producing the sound.

The researchers speculate that a reason for these hummingbirds to switch to feather sonations might be that it enables them to produce louder sounds than they are able to with their syrinx.

Here are reports of that research:

http://www.physorg.com/news120894475.html

http://www.sciencedaily.com/releases/2008/01/080129191358.htm