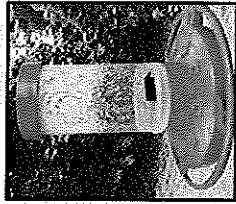
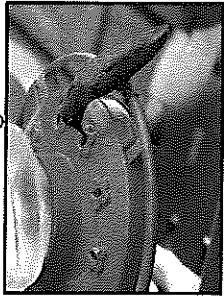


## How to Attract Hummingbirds?

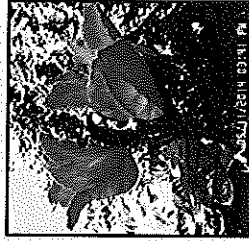
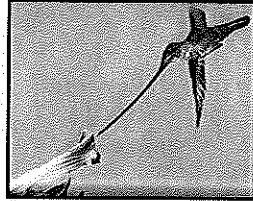
### Feeders

- 1:4 sugar:water ratio
- Replace nectar every 4 days
- clean feeder thoroughly with dilute (1:10) bleach solution
- Hang in visible area from tree or shrub, out of direct sunlight



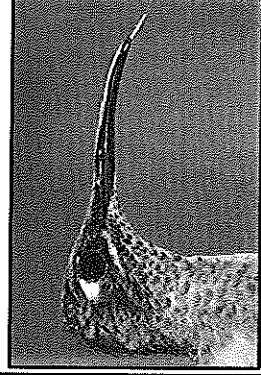
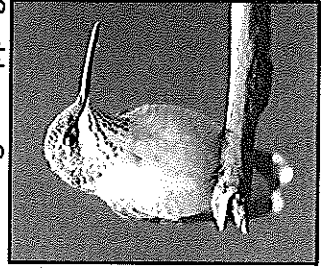
### Flowers

- Often prefer red, elongated, tubular flowers
- Plant popular hummingbird flowers to naturally attract
- Examples: Western Columbine, California Fuchsia, Red Larkspur, Coral Honeysuckle, Nasturtium, Salvia Celestial Blue



### Water

- Hummingbirds need to groom and clean feathers
- A very shallow dish or birdbath may encourage hummingbirds to visit
- Flowing or dripping water is preferred



## Resources

### Books

- Tifford, Tony. *The Complete Book of Hummingbirds*. San Diego, CA: Thunder Bay, 2008. Print.
- Stokes, Donald W., and Lillian Q. Stokes. *Beginner's Guide to Hummingbirds*. New York: Little, Brown, 2002. Print.
- West, George C., and Carol A. Butler. *Do Hummingbirds Hum?: Fascinating Answers to Questions about Hummingbirds*. New Brunswick, NJ: Rutgers UP, 2010. Print.
- Bader, Bonnie. *Hummingbirds*. New York: Penguin Group, 2015. Print.
- Lazaroff, David Wentworth. *The Secret Lives of Hummingbirds*. Tucson, AZ: Arizona-Sonora Desert Museum, 1995. Print.
- Homel, Greg R. *Hummingbirds of North America: A Comprehensive Guide to All Species*. N.p.: Quick Reference, 2014. Print.

### Websites

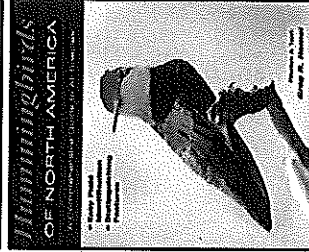
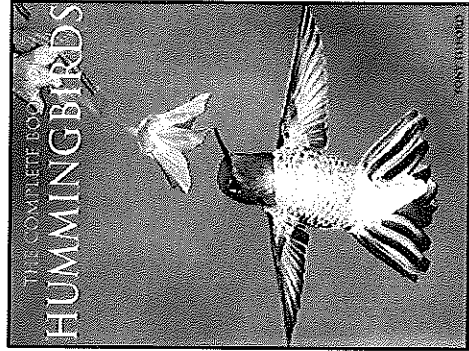
- The Hummingbird Monitoring Network. [www.Hummonnet.org](http://www.Hummonnet.org)
- [www.Hummingbirds.net](http://www.Hummingbirds.net)
- Cornell Lab of Ornithology: All About Birds [www.allaboutbirds.org](http://www.allaboutbirds.org)

### Media

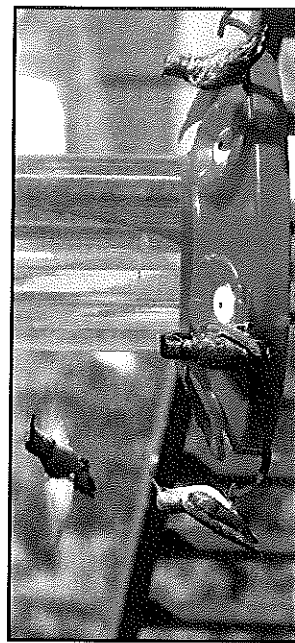
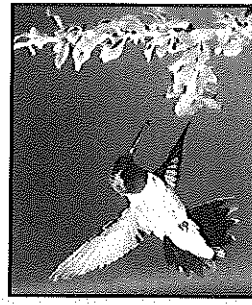
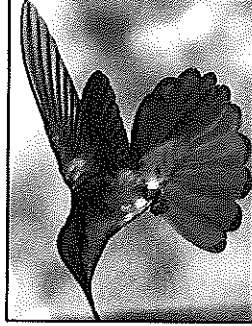
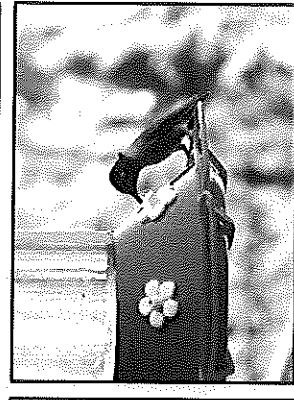
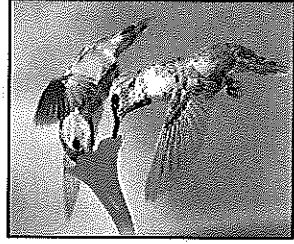
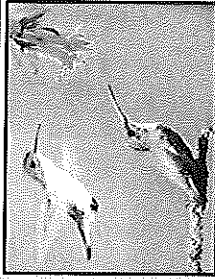
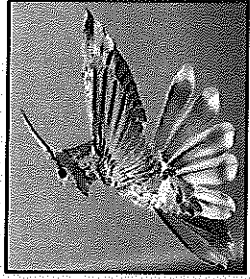
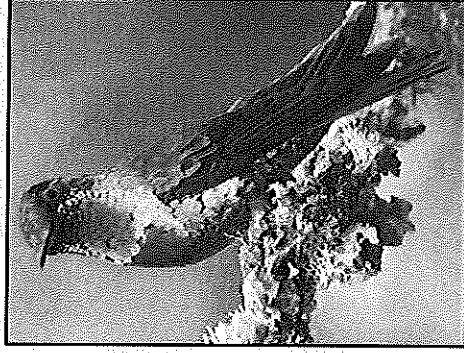
- PBS "Magic in the Air": <https://youtu.be/2iczKc8aNTU>
- "Hundreds of Hummingbirds at Bird Feeder" <https://youtu.be/FAj4uvuITe0>

### Materials

- First Nature 3051 Hummingbird Feeder, 16 oz. \$9 at Amazon.com

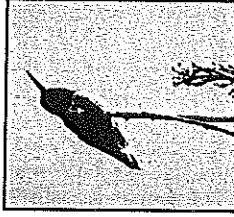
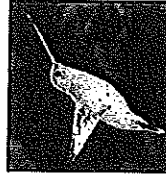


# Hummingbirds



## Hummingbird Facts

- World's smallest bird
- Fastest animal metabolism
- Magnificent colorful plumage
- Over 300 species
- Endemic to Western Hemisphere
- Typical lifespan may exceed 10 years



## Habitat

- Diverse types
- Many species are extremophiles (thriving in extreme conditions)
- Ability to use torpor (greatly reduced metabolic activity) to cope with environmental conditions
- Many species are synanthropic, thriving in association with humans



## Diet

- Nectivorous (energy and water) and Insectivorous (protein)
- Drink up to eight times body weight in water and nectar each day
- Important ecosystem service: pollination
- Close relationship between bill morphology and flower morphology due to mutual benefits and specialization (co-evolution)



## Flight

- Ability to fly in all directions and orientations due to wing anatomy
- Acrobatic, high speed (up to 50 mph) display flight patterns
- Wings can beats from 50 to 200 beats/ second



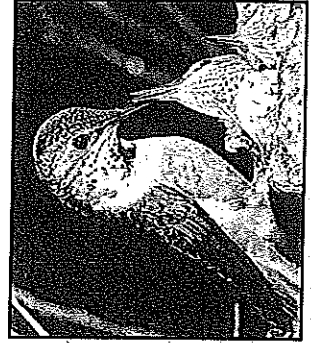
## Physiology

- Ability to use torpor to cope with inability to feed at night
- Can drop body temperature from 40°C to below 20°C
- Heart rate is normally 500- 600 beats per minute, but can exceed 1000 bpm



## Reproduction

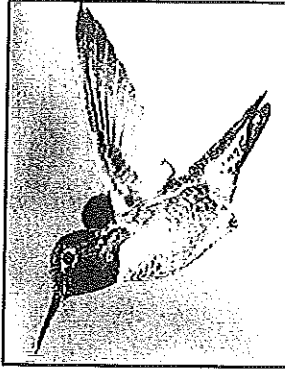
- Colorful, iridescent plumage, and acrobatic courtship displays to attract mates
- Female solely cares for young while males often defend territory
- ~15 day incubation period
- ~20 day nestling period



## Common Southern California Species



Anna's Hummingbird Juvenile



Anna's Hummingbird (M)



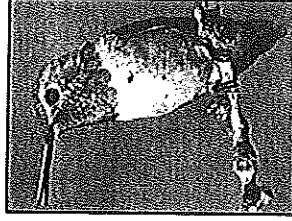
Anna's Hummingbird (F)



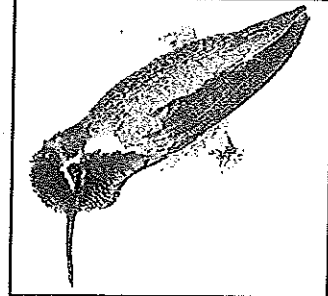
Allen's Hummingbird



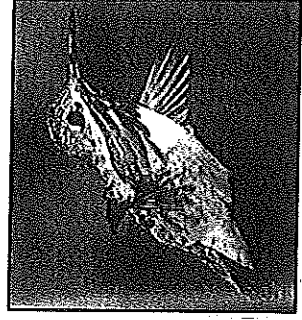
Black-chinned Hummingbird



Rufous Hummingbird



Costa's Hummingbird



Calliope Hummingbird