Thayer Birding Software's
Birds, Birds, Birds

{ewc TSTOOLS2, TsButton2,"Getting Started"[Name=button1] [Macro=JI(`main.mvb>getstart',
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{ewc TSTOOLS2, TsButton2,"Ten Helpful Hints"[Name=button2] [macro=JI(`main.mvb>10hints',
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{ewc TSTOOLS2, TsButton2,"Birder's Diary"[Name=button3] [macro=JI(`main.mvb>tbs',`tbs_text')]
[Font="Arial"/S18/3-]/H30/W220/B0TLBR/ALT/D3}

{ewc TSTOOLS2, TsButton2,"Hot Spots for Birds"[Name=button4] [macro=JI(`main.mvb>hotspots',
`hotspots_text')] [Font="Arial"/S18/3-]/H30/W220/B0TLBR/ALT/D3}

{ewc TSTOOLS2, TsButton2,"Birding Ethics"[Name=button5] [macro=JI(`main.mvb>birdeth',
`birdethics_text')] [Font="Arial"/S18/3-]/H30/W220/B0TLBR/ALT/D3}

{ewc TSTOOLS2, TsButton2,"Identifying Birds"[Name=button6] [macro=JI(`main.mvb>identify',
`identify_text')] [Font="Arial"/S18/3-]/H30/W220/B0TLBR/ALT/D3}

{ewc TSTOOLS2, TsButton2,"Attracting Birds"[Name=button7] [macro=JI(`main.mvb>attract',
`attract_text')] [Font="Arial"/S18/3-]/H30/W220/B0TLBR/ALT/D3}

{ewc TSTOOLS2, TsButton2,"Scientific Classification"[Name=button8] [macro=JI(`main.mvb>s_class', `science_class_text')] [Font="Arial"/S18/3-]/H30/W220/B0TLBR/ALT/D3}

{ewc TSTOOLS2, TsButton2,"Birds' Best Friends"[Name=button9] [macro=JI(`main.mvb>bestfrnd',
`bestfriend_text')] [Font="Arial"/S18/3-]/H30/W220/B0TLBR/ALT/D3}

{ewc TSTOOLS2, TsButton2,"Binoculars and Scopes"[Name=button10] [macro=JI(`main.mvb>glass', `glass_text')] [Font="Arial"/S18/3-]/H30/W220/B0TLBR/ALT/D3}

{ewc TSTOOLS2, TsButton2,"Bird Tours"[Name=button11] [macro=JI(`main.mvb>birdtour',
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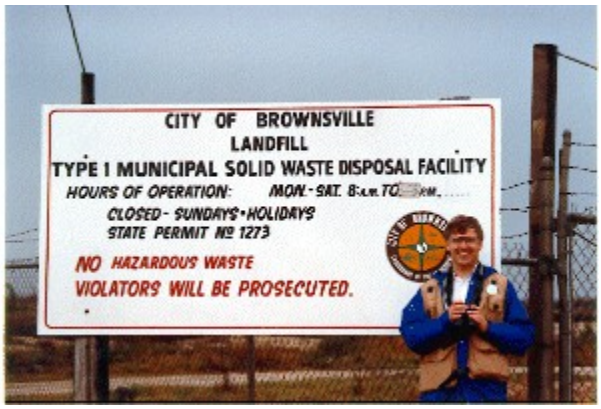
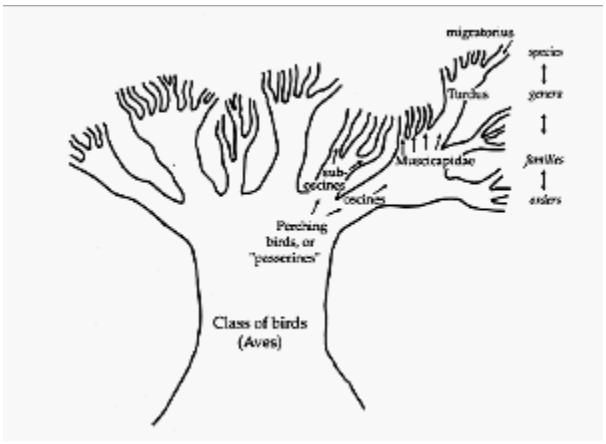
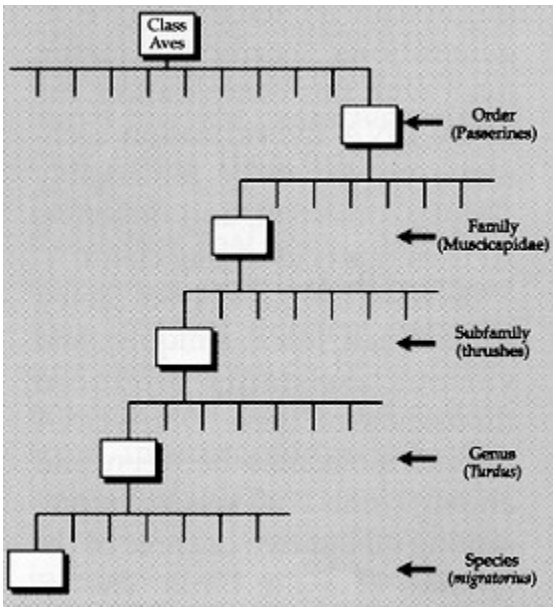
{ewc TSTOOLS2, TsButton2,"Bird Books and Mags"[Name=button12] [macro=JI(`main.mvb>books', `books_text')] [Font="Arial"/S18/3-]/H30/W220/B0TLBR/ALT/D3}

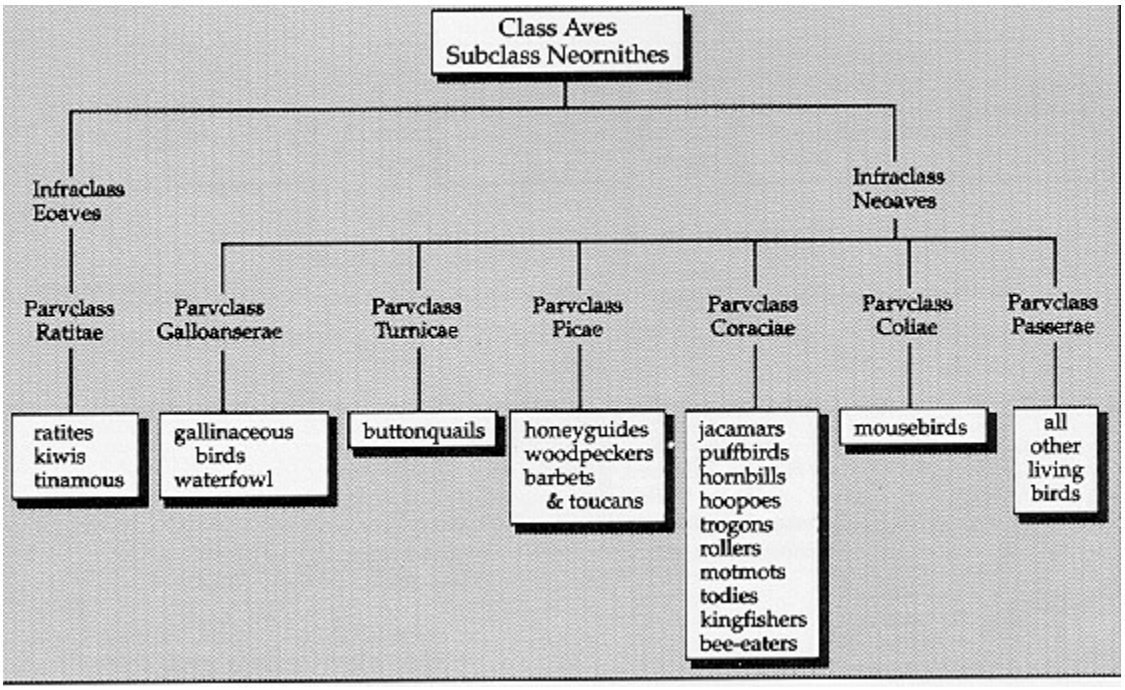
{ewl TSTOOLS2, TsButton2,"Exit"[Name=button13][Macro=Exit()][Font="Arial"/S18/3-]/H30/W220/
B0TLBR/ALT/D3}

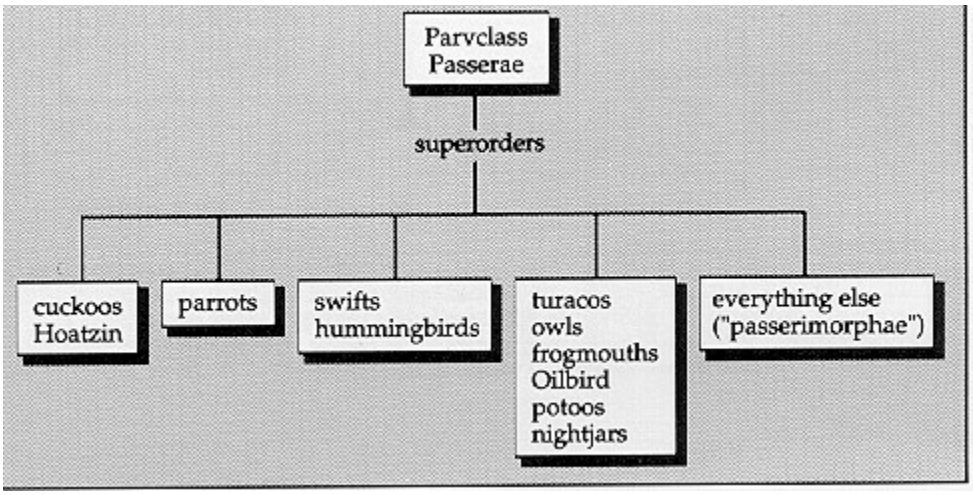
*** POPUP FIGURES ***

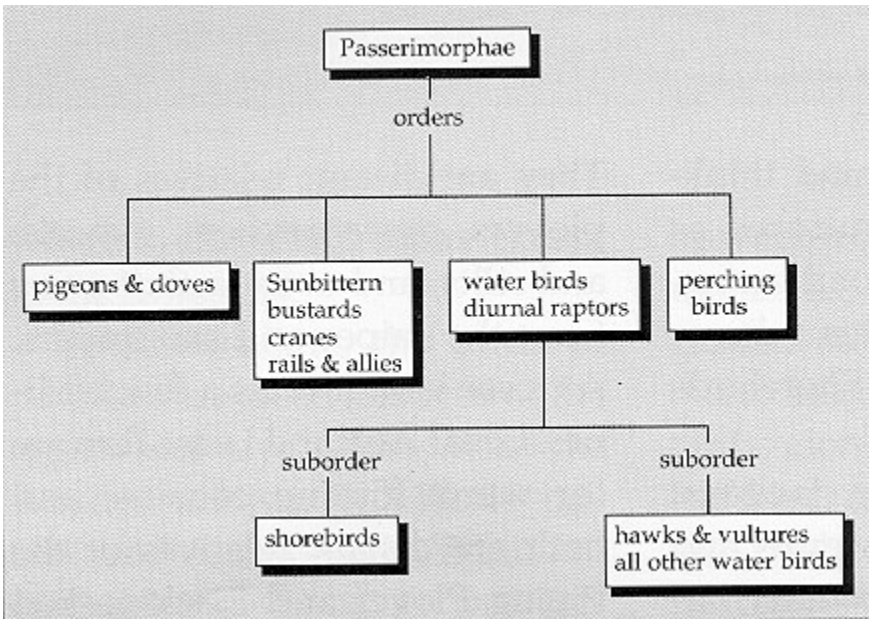

CITY OF BROWNSVILLE
LANDFILL
TYPE I MUNICIPAL SOLID WASTE DISPOSAL FACILITY
HOURS OF OPERATION: MON.-SAT. 8 a.m. TO p.m.
CLOSED - SUNDAYS • HOLIDAYS
STATE PERMIT Nº 1273
NO HAZARDOUS WASTE
VIOLATORS WILL BE PROSECUTED.

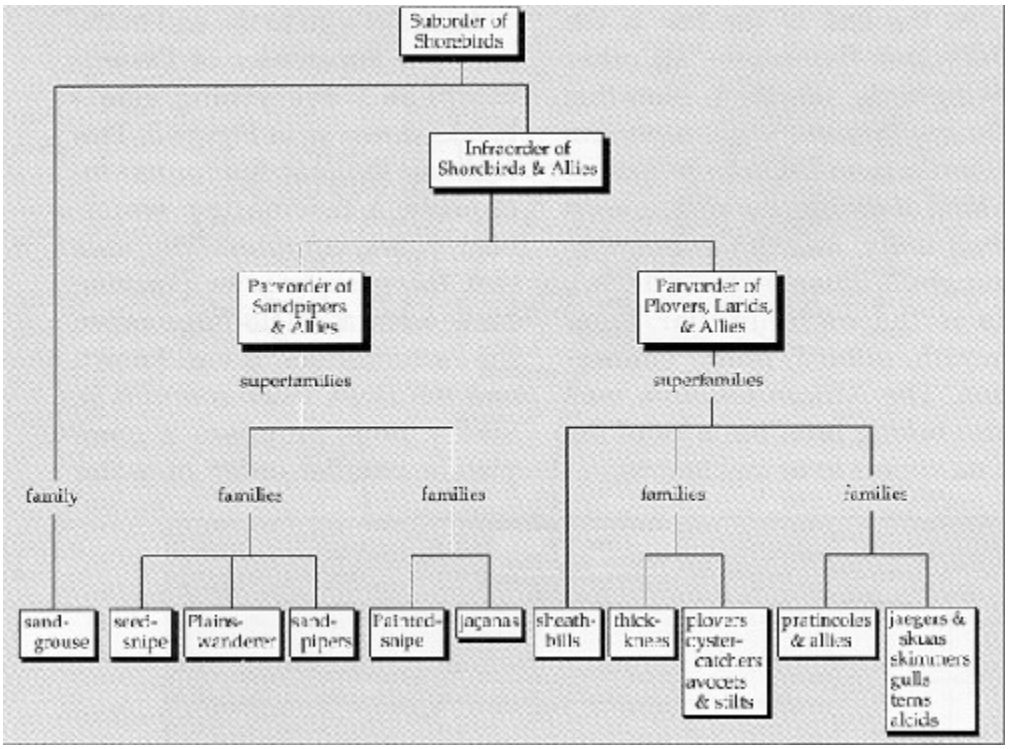

migratorius
species
Turdus
genera
Muscicapidae
families
orders
sub-oscines
oscines
Perching
birds, or
"passerines"
Class of birds
(Aves)

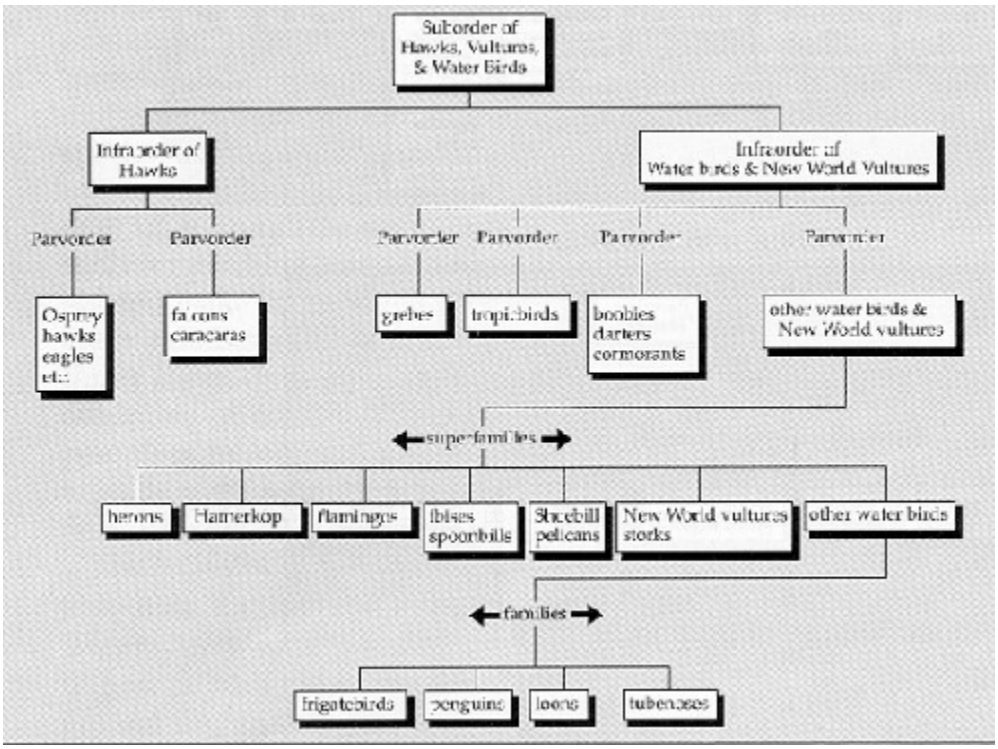

Class
Aves
Order
(Passerines)
Family
(Muscicapidae)
Subfamily
(thrushes)
Genus
(Turdus)
Species
(migratorius)

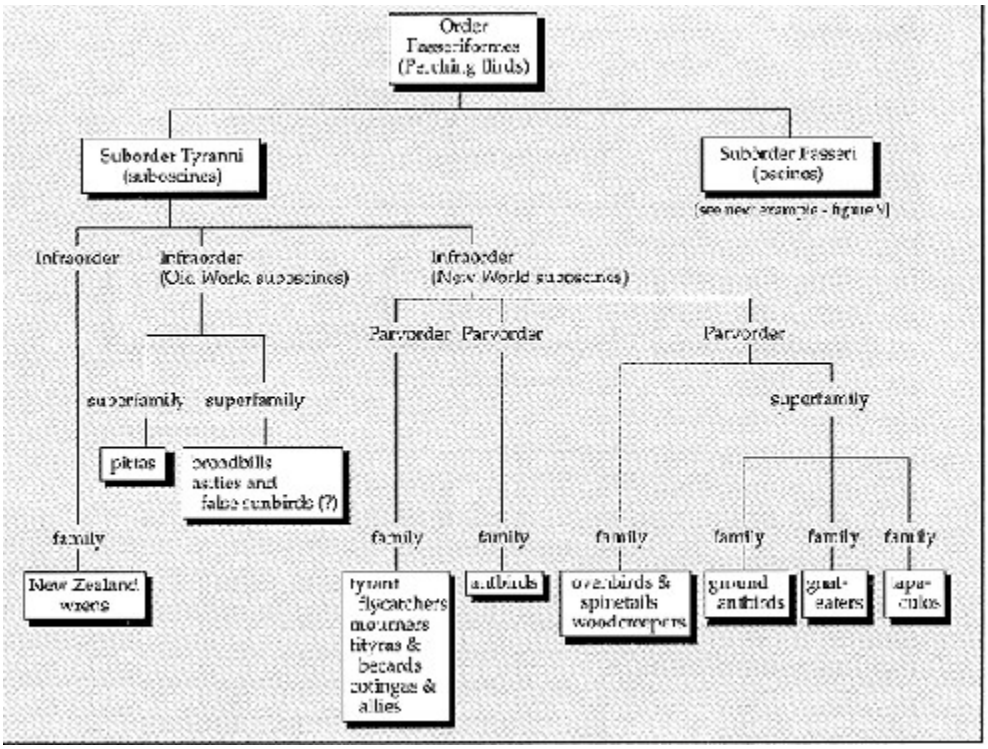

Class Aves
Subclass Neornithes
Infraclass
Eoaves
Infraclass
Neoaves
Parvclass
Ratitae
Parvclass
Galloanserae
Parvclass
Turnicae
Parvclass
Picae
Parvclass
Coraciae
Parvclass
Coliae
Parvclass
Passerae
ratites
kiwis
tinamous
gallinaceous
birds
waterfowl
buttonquails
honeyguides
woodpeckers
barbets
& toucans
jacamars
puffbirds
hornbills
hoopoes
trogons
rollers
motmots
todies
kingfishers
bee-eaters
mousebirds
all
other
living
birds

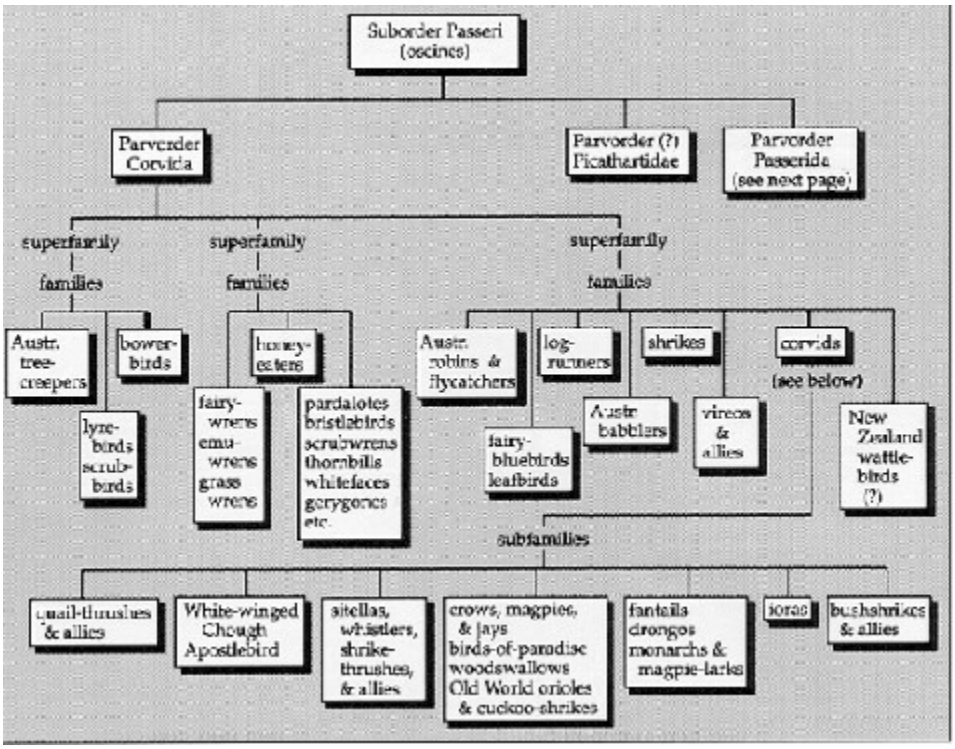

Parvclass
Passerae
superorders
cuckoos
Hoatzin
parrots
swifts
hummingbirds
turacos
owls
frogmouths
Oilbird
potoos
nightjars
everything else
("passerimorphae")

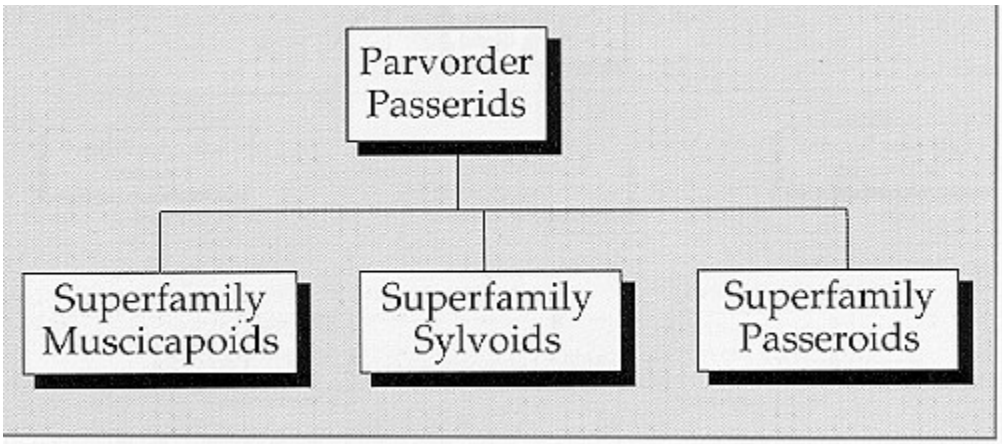

Passerimorphae
orders
pigeons & doves
Sunbittern
bustards
cranes
rails & allies
water birds
diurnal raptors
perching
birds
suborder
suborder
shorebirds
hawks & vultures
all other water birds

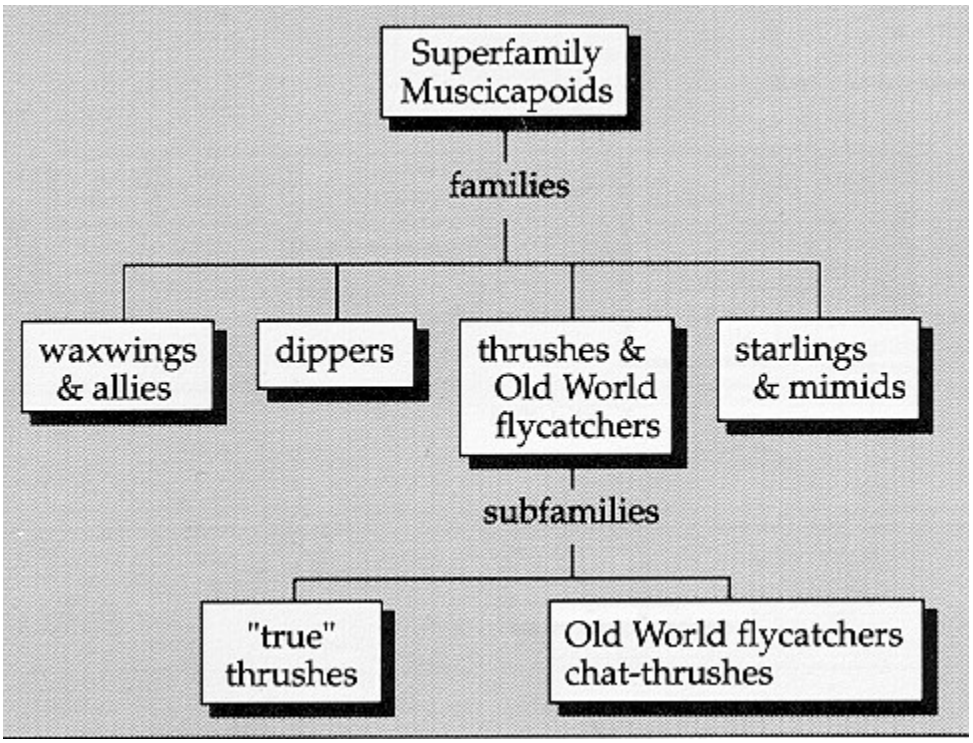

Suborder of Shorebirds
Infraorder of Shorebirds & Allies
Parvorder of Sandpipers & Allies
Parvorder of Plovers, Larids, & Allies
superfamilies
superfamilies
family
families
families
families
families
sand-grouse
seed-snipe
Plains-wanderer
sand-pipers
Painted-snipe
jaçanas
sheath-bills
thick-knees
plovers
oyster-catchers
avocets
& stilts
pratincoles & allies
jaegers & skuas
skimmers
gulls
terns
alcids

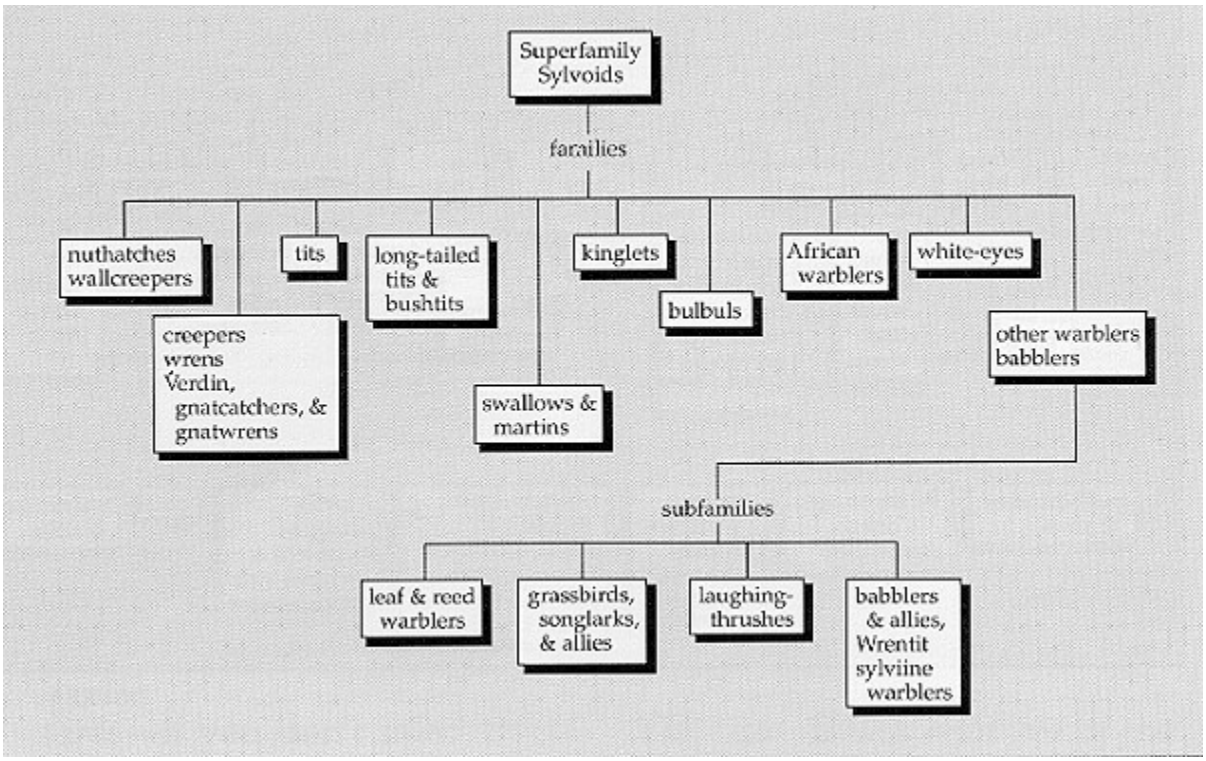

Suborder of Hawks, Vultures, & Water Birds
Infraorder of Hawks
Infraorder of Water birds & New World Vultures
Parvorder
Parvorder
Parvorder
Parvorder
Parvorder
Parvorder
Osprey hawks eagles etc.
falcons caracaras
grebes
tropicbirds
boobies darters cormorants
other water birds & New World vultures
superfamilies
herons
Hamerkop
flamingos
Ibises spoonbills
Shoebill pelicans
New World vultures storks
other water birds
families
frigatebirds
penguins
loons
tubenoses

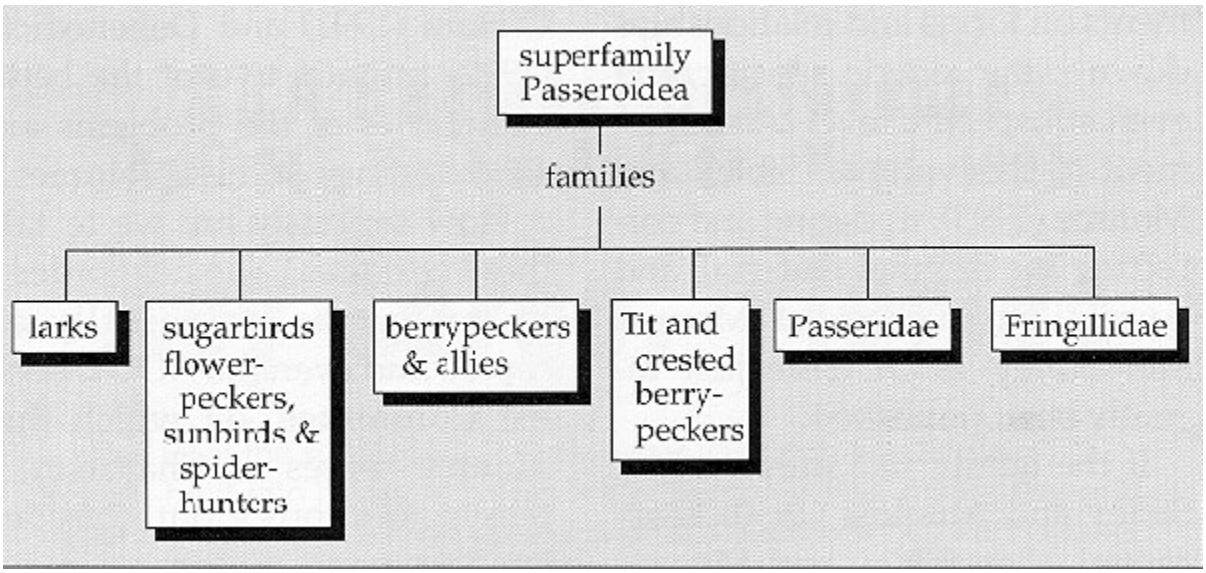

Order
Passeriformes
(Perching Birds)
Suborder Tyranni
(suboscines)
Suborder Passeri
(oscines)
(see next example - figure 5)
Infraorder
Infraorder
(Old World suboscines)
Infraorder
(New World suboscines)
Parvorder
Parvorder
Parvorder
superfamily
superfamily
pittas
broadbills
asities and
false sunbirds (?)
family
family
family
family
family
family
family
New Zealand
wrens
tyrant
flycatchers
motmots
bitterns &
hoatzin
cotingas &
allies
ovenbirds &
spinetails
woodcreepers
ground
antbirds
goat-
eaters
ape-
cuckoos

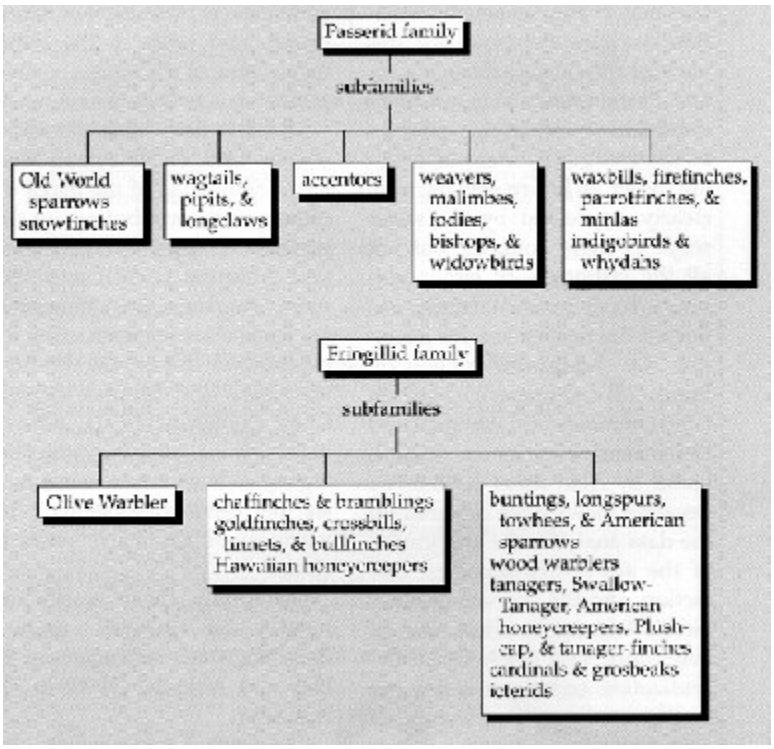

Suborder Passeri (oscines)
Parvorder Corvida
Parvorder (?) Picathartidae
Parvorder Passerida (see next page)
superfamily
families
superfamily
families
superfamily
families
Austr. tree-creepers
bower-birds
lyre-birds
scrub-birds
honey-eaters
fairy-wrens
emu-wrens
grass wrens
pardalotes
bristlebirds
scrubwrens
thornbills
whitefaces
gerygones
etc.
Austr. robins & flycatchers
log-runners
shrikes
corvids
(see below)
Austr babblers
vireos & allies
fairy-bluebirds
leafbirds
New Zealand wattle-birds (?)
subfamilies
quail-thrushes & allies
White-winged Chough
Apostlebird
sittellas, whistlers, shrike-thrushes, & allies
crows, magpies, & jays
birds-of-paradise
woodswallows
Old World orioles
& cuckoo-shrikes
fantails
drongos
monarchs &
magpie-larks
jorao
bushshrikes & allies


Parvorder
Passerids
Superfamily
Muscicapoids
Superfamily
Sylvoids
Superfamily
Passeroids

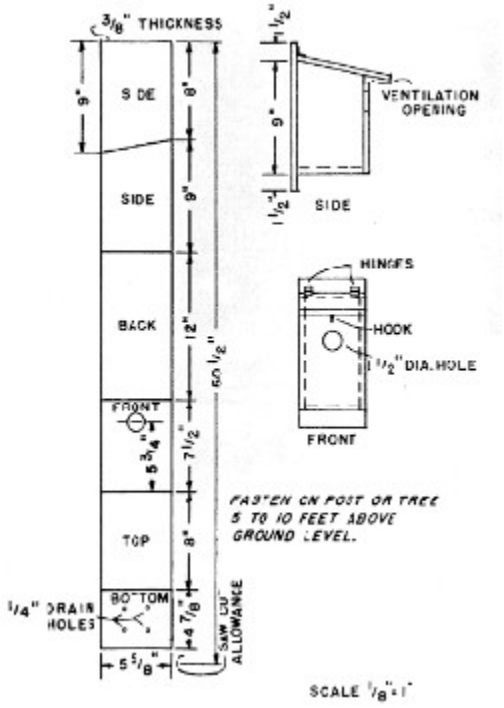

Superfamily
Muscicapoids
families
waxwings
& allies
dippers
thrushes &
Old World
flycatchers
starlings
& mimids
subfamilies
"true"
thrushes
Old World flycatchers
chat-thrushes

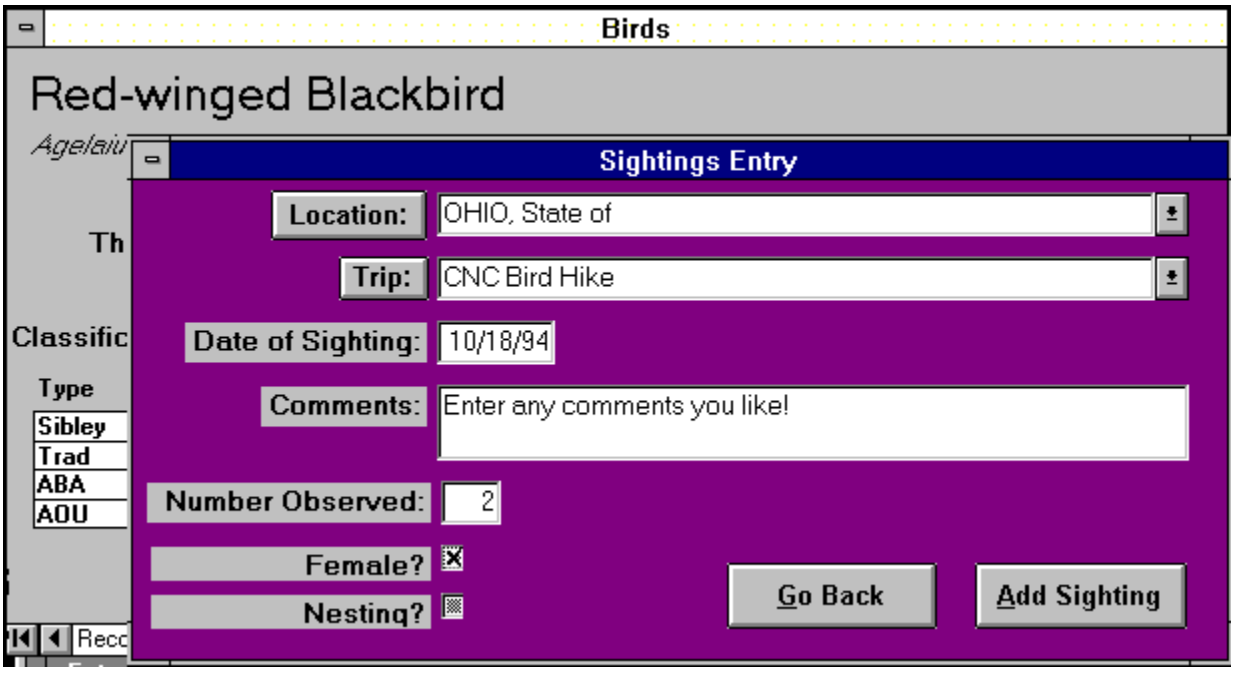

Superfamily
Sylvoids
families
nuthatches
wallcreepers
creepers
wrens
Verdin,
gnatcatchers, &
gnatwrens
tits
long-tailed
tits &
bushtits
swallows &
martins
kinglets
bulbuls
African
warblers
white-eyes
other warblers
babblers
subfamilies
leaf & reed
warblers
grassbirds,
songlarks,
& allies
laughing-
thrushes
babblers
& allies,
Wrentit
sylviine
warblers

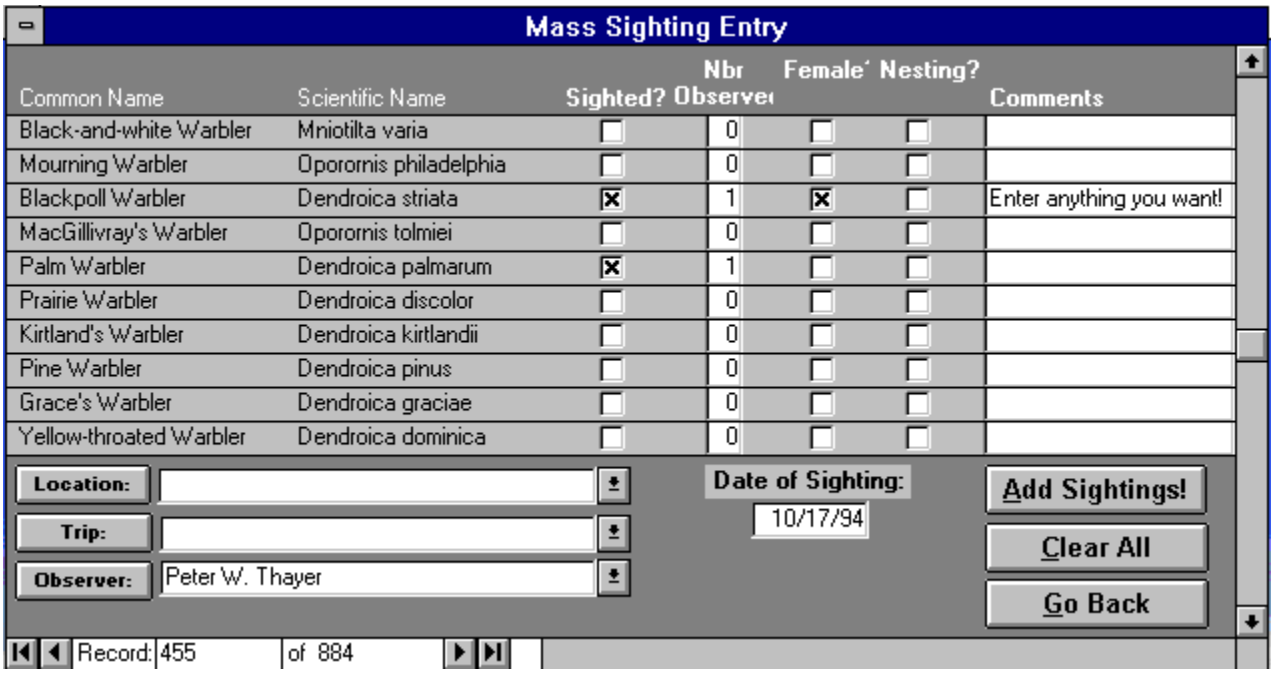

superfamily Passeroidea
families
larks
sugarbirds flower-peckers, sunbirds & spider-hunters
berrypeckers & allies
Tit and crested berry-peckers
Passeridae
Fringillidae

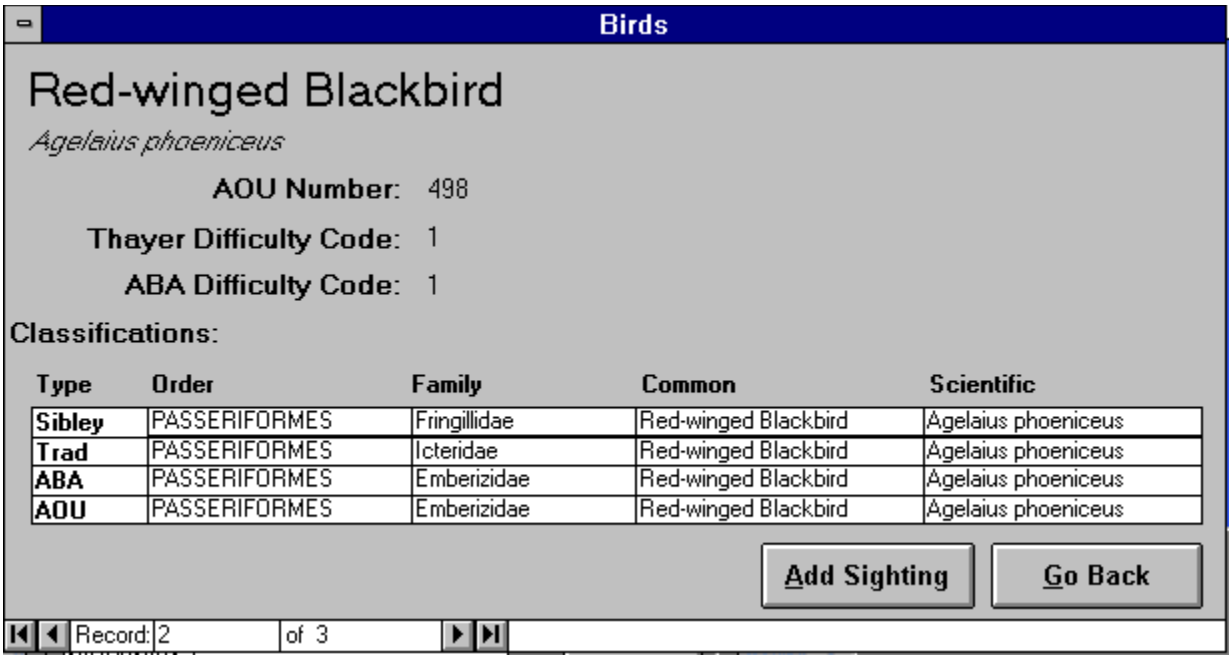

Passerid family
subfamilies
Old World sparrows snowfinches
wagtails, pipits, & longclaws
accentors
weavers, malimbes, fodies, bishops, & widowbirds
waxbills, firefinches, parrotfinches, & minlas
indigobirds & whydahs
Fringillid family
subfamilies
Olive Warbler
chaffinches & bramblings
goldfinches, crossbills, linnets, & bullfinches
Hawaiian honeycreepers
buntings, longspurs, towhees, & American sparrows
wood warblers
tanagers, Swallow-Tanager, American honeycreepers, Plush-cap, & tanager-finches
cardinals & grosbeaks
icterids

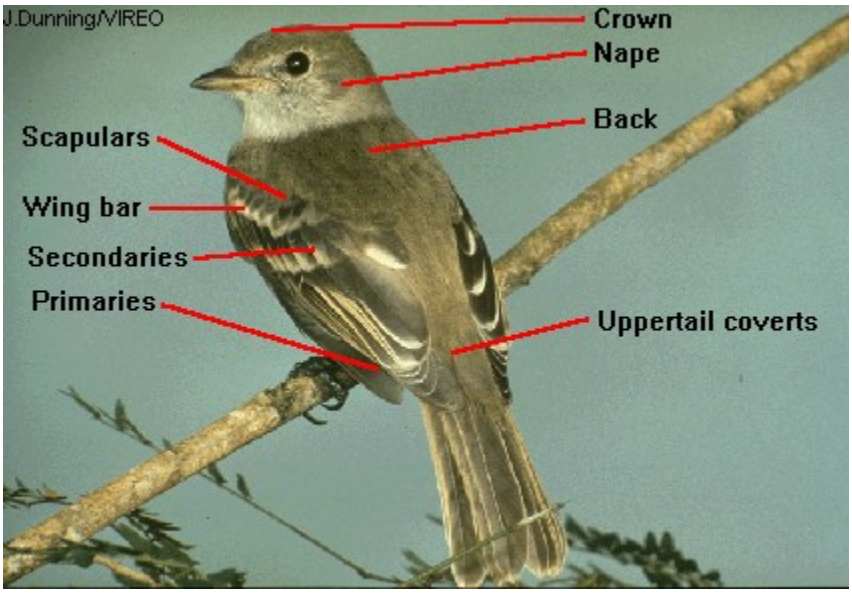
BIRD HOUSE PLANS FOR BLUEBIRDS

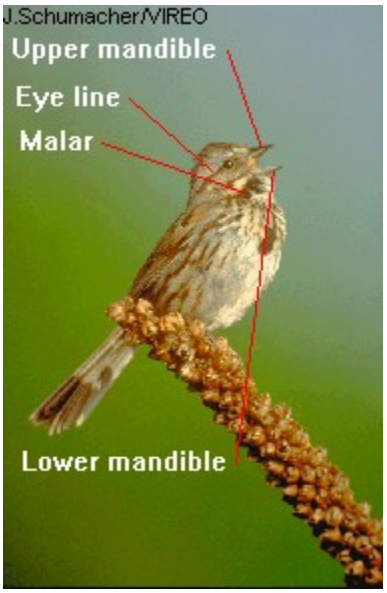


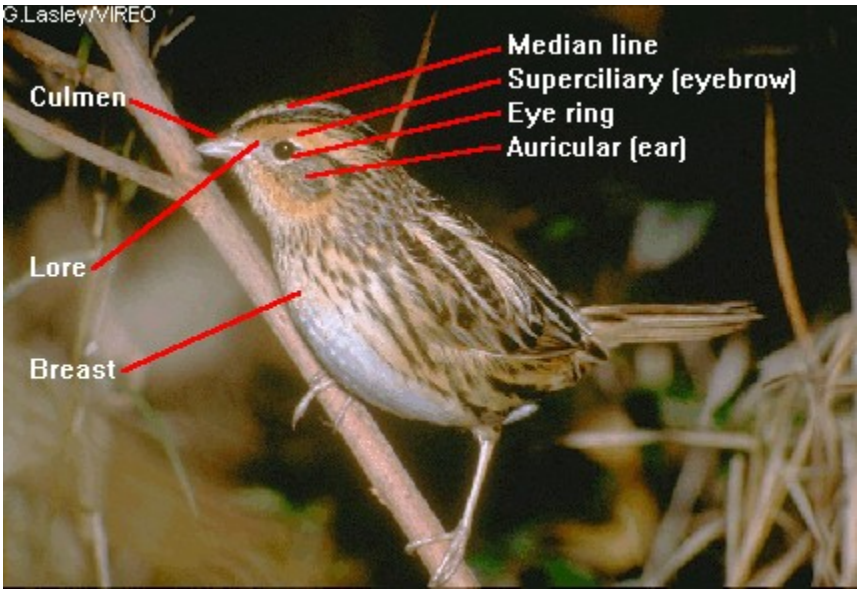

Birds
Red-winged Blackbird
Agelaiu
Th
Classific
Type
Sibley
Trad
ABA
AOU
Recc
Sightings Entry
Location:
OHIO, State of
Trip:
CNC Bird Hike
Date of Sighting:
10/18/94
Comments:
Enter any comments you like!
Number Observed:
2
Female?
Nesting?
Go Back
Add Sighting


Mass Sighting Entry
Common Name
Scientific Name
Sighted?
Nbr Observe
Female
Nesting?
Comments
Black-and-white Warbler
Mniotilta varia
0
Mourning Warbler
Oporornis philadelphia
0
Blackpoll Warbler
Dendroica striata
1
Enter anything you want!
MacGillivray's Warbler
Oporornis tolmiei
0
Palm Warbler
Dendroica palmarum
1
Prairie Warbler
Dendroica discolor
0
Kirtland's Warbler
Dendroica kirtlandii
0
Pine Warbler
Dendroica pinus
0
Grace's Warbler
Dendroica graciae
0
Yellow-throated Warbler
Dendroica dominica
0
Location:
Trip:
Observer:
Peter W. Thayer
Date of Sighting:
10/17/94
Add Sightings!
Clear All
Go Back
Record: 455
of 884


Birds
Red-winged Blackbird
Agelaius phoeniceus
AOU Number: 498
Thayer Difficulty Code: 1
ABA Difficulty Code: 1
Classifications:
Type Order Family Common Scientific
Sibley PASSERIFORMES Fringillidae Red-winged Blackbird Agelaius phoeniceus
Trad PASSERIFORMES Icteridae Red-winged Blackbird Agelaius phoeniceus
ABA PASSERIFORMES Emberizidae Red-winged Blackbird Agelaius phoeniceus
AOU PASSERIFORMES Emberizidae Red-winged Blackbird Agelaius phoeniceus
Add Sighting
Go Back
Record: 2 of 3


J.Dunning/VIREO
Crown
Nape
Back
Scapulars
Wing bar
Secondaries
Primaries
Uppertail coverts


J.Schumacher/VIREO
Upper mandible
Eye line
Malar
Lower mandible


G.Lasley/VIREO
Median line
Superciliary (eyebrow)
Eye ring
Auricular (ear)
Culmen
Lore
Breast

*** GETTING STARTED ***

Press Here To Close This Screen
Press Here To Copy This Topic To The Clipboard

WELCOME TO THAYER BIRDING SOFTWARE'S BIRDS OF NORTH AMERICA

This CD-ROM has lots of places for you to explore. The main part of this CD-ROM is **"Birds of North America"**. Here you will meet the 895 birds that are on the American Birding Association's official list of North American birds. These are birds that have been seen in the United States and Canada (excluding Hawaii). As a special bonus, there are also over 200 birds from around the world. Just look for the **"Birds of the World Sampler"** icon. A world map will quickly take you to each continent for a look at some of the most interesting and colorful birds. The third part of this CD-ROM is called **"Birds, Birds, Birds"**. That's where you are right now. Here is where you will find scientific articles, birding tips, important phone numbers, state bird checklists, the Birder's Code of Ethics, and much, much more.

Show Me How To Use This CD-ROM

Birds of North America. Selecting this green icon takes you to the main part of the CD-ROM. You will be greeted by the call of the Western Meadowlark. There are 895 birds listed in this section. These are all the birds on the American Birding Association's official list of North American birds. Birds are arranged in "taxonomic" order. This means the oldest birds are shown first. The Loons evolved before other birds, so they are shown first in most North American field guides.

To quickly see birds, you may choose the first bird or the last bird on the list.
Just click once on the appropriate button.

You may also search for a specific bird using the Index. This Index appears automatically the first time you open Birds of North America. Just type in a bird's name or use the scroll bar. Let's find a Painted Bunting. Type in the letter "B". Notice how quickly the list jumps as you begin typing. Then type in the letters "U and N" and the list jumps to the Buntings. Now use the arrows on the right side of the list to scroll down to Bunting, Painted. **Click the "OK" button** and you will see a Painted Bunting. (We could also have typed in "P" or "Painted" to jump to the spot on the list where "Painted Bunting" is found.) For advanced birders, you may also select from a list of scientific names of birds. The common names and the scientific names let you scroll up and down the list until you find the bird you want. Most birds are on the list twice.

Here we are at the Painted Bunting. The first thing you will notice is four buttons along the left side of the picture.

The **"Song" button** will play a 15-20 second recording of the bird's song. There are about 550 birds that have songs on this CD-ROM! Some birds do not have a "Song" button. This is because they do not make a distinctive sound or they are usually identified by sight only. (OK, OK, we ran out of room on this CD-ROM so the birds we rarely see do not have songs either.)

The **"Range" button** will show you where the bird has been found. Most birds have a map of North America showing the range. The blue area shows the winter range. Green shows the summer range. Yellow shows locations where the bird can be found at any time of the year. For some birds that are not normally found in North America, a written description of the range is given instead. Remember, just because a bird appears to live in a certain part of North America doesn't mean it is easy to find!

The **"Habitat" button** tells you where to look for the bird once you are within its range. Birds have a favorite habitat. Does the bird like grassy, open fields or does it prefer deep woods? When birds migrate between their summer and winter homes, you may see them almost anywhere.

The **"Size" button** will show you the length of a bird, from the tip of its bill to the end of its tail. For some birds with very long wings, the length from wingtip to wingtip is also shown. A Sparrow is about 6 inches long, a Robin is about 10 inches long and a Crow is about 17 inches long.

Look closely at the Order and Family name just below the bird's common name. These names are written in green. Put the mouse pointer on one of these green words and click. See what happens. Now click again anywhere outside the "pop-up" box and the description will disappear. Look for green words throughout this CD-ROM. The names of each North American bird, as well as the Order and Family, are those currently used by the American Birding Association and the American Ornithologists' Union.

You can easily move from one bird to the next. Just click on the go forward button or the go back button in the lower left corner (just below the "Size" button.) The birds are arranged in "Taxonomic" order, just like a field guide. If you are not familiar with this arrangement, you may want to read more about it later. Just go to the "Birds, Birds, Birds" section of this CD-ROM and click the "Scientific Classification" button.

There are some helpful buttons spread across the top of the computer screen (just above the bird's picture):

The **"Main Menu" button** will return you to the Main Menu. This is the same place we started from. (Remember the Western Meadowlark's call?)

The **"Index" button** will show you an alphabetical list of all 895 birds. Type in a bird's name or scroll down the list. Click the "OK" button in the upper right corner to jump to the bird. You may also select from a listing of Orders, Families or Genus. Just choose from the list near the bottom of the Index box.

The **"Go Back" button** will take you back to look at the last 40 birds you viewed. It will do it in exactly the same order, working backwards. This is helpful if you are jumping around between many birds that are not closely related. It is also helpful if you want to go back a few birds for a comparison of songs, range maps, or anything else.

Click the **"Exit" button** to close the "Birds of North America" program and return to your Windows screen. To get back into "Birds of North America," or another part of the CD-ROM, just click on the appropriate icon in the Thayer Birding Software group.

There are more helpful buttons spread across the very top of the computer screen:

The **"File" button** will show you choices of actions you may take. Here your only choice is to exit the program.

The **"Edit" button** will let you annotate (type notes about each bird). A paperclip design appears next to each bird name where you have added any comments. You may copy these notes to another Windows program, if you wish.

The **"Bookmark" button** will let you mark, and quickly jump to birds you have selected with a "bookmark". This is very helpful if you are studying a group of ten or fewer birds. It is quicker than finding each bird using the Index.

Click the **"Exit" button** to close the "Birds of North America" program and return to your Windows screen. To get back into "Birds of North America," or another part of the CD-ROM, just click on the appropriate icon in the Thayer Birding Software group.

Birds of the World Sampler. Click on this icon and use the map to go anywhere in the world. There are over 9700 birds, so the 200 you will find here are just a small sample of the world's birds. Be sure to visit the Penguins in Antarctica and the colorful birds of Australia and the Pacific Islands.

Birds, Birds, Birds. Click on this icon to learn a lot more about birds and birding. Here is where you will find the birding "secrets" it might have taken years

to discover if you hadn't been smart enough to buy this CD-ROM! Scroll through the topics on the Main Menu. Discover important phone numbers, great products and services for birders, an explanation of why birds are arranged in such an odd order in the bird books, and the best places to look for birds. To make it a bit easier, here is a brief summary of what you will find:

Getting Started. This is where you are right now. To get back to the Main Menu, click on the green words "Press Here to Close this Screen" at the top of the page. Remember -- clicking on green words anywhere in this CD-ROM will make something happen. The mouse pointer will also change to the shape of a hand when it is moved over any green words. This is your sign to click the mouse and jump to another part of the CD-ROM.

Ten Helpful Hints. This is where to go next -- especially if you are a new birder. Be sure you read the bonus hint. To reach this section, return to the Main Menu (click on the green words at the top of this screen). Then click on the button that says "Ten Helpful Hints."

Birder's Diary. Move to this section and discover all the things you can do with Thayer Birding Software's Birder's Diary. Birder's Diary lets you keep track of all the birds you have seen. Take notes on each sighting--up to 35 pages each! Use it as a diary, a listing tool and a recordkeeping tool. It is easy to use. All 9700 birds of the world are listed. You can choose to use the Traditional world list or the Sibley/Ahlquist/Monroe world list. There are two other lists covering North American birds only. One shows the 1968 birds in North and Central America. It is the official list of the American Ornithologists' Union (AOU). The other is the official list of the American Birding Association (ABA) and shows 895 birds that have been seen north of Mexico. **Birder's Diary contains checklists for all states and provinces, great bird quizzes, "difficulty of observing" codes for every bird in the world, the "Rosetta Stone", and much, much more. It will also complete an ABA Annual Report Form with the touch of a button!** ***A great add-on to the Birder's Diary is a book by Dr. Charles G. Sibley called Birds of the World. The book is on 3.5 inch floppy disks. It can be linked with the Birder's Diary and to this CD-ROM. It can also be read alone as a college level textbook of ornithology.***

Hot Spots: Where To See Birds. Find out the top 50 spots for birding in North America. If you could go birding anywhere in the world, where would it be? Where are the best spots for birds in the middle of winter? I will tell you my favorite spots, starting with a garbage dump in Texas! Hot Spots is also the place to look for Rare Bird Alert phone numbers. There is probably one for your area. You will also discover a great place to find "birding stuff" that they never heard of at the mall.

Birding Ethics. The American Birding Association has created a Birder's Code of Ethics. Read it. Then learn from one of America's best birders why hearing a bird can be even more satisfying than seeing a bird. Finally, examine

the pros and cons of using bird tapes to lure a bird out into the open--just so you can see it.

Identifying Birds. This section will show you the names of each part of a bird. There is a lot more to learn than just head, wing, leg and tail. Birders have special names for almost everything. It helps if you know that "primaries" are the main feathers on the wing or that "crown" is the top of the head. Can you point to your supercilium? Do you know where one is on a bird? This section also gives you lots of tips to help you identify a bird. Did you know that a bird's shape can be more important than its color. The habitat and song are also key aids to identifying birds.

Attracting Birds. Browse this section if you want more birds in your yard. There are four things all birds want: food, water, shelter, and nesting sites. How many can they find in your yard? Discover how to attract migrating birds to your yard. Learn about the National Wildlife Federation's Backyard Habitat Program. Check out the plans for building a Bluebird house.

Scientific Classification of Birds. Scientists do not get into fights very often, but they have a dandy one raging now. They are arguing over the proper way to classify the birds of the world. The Traditional classification has been in use for almost a hundred years. A new classification is called the Sibley/Ahlquist/Monroe classification. It is named after the three scientists who created it. Read why twenty years of DNA research is causing such a fuss among scientists. You can also see how the scientific classification system, created in 1758, is still used today.

Bird's Best Friends. This section tells you about many organizations devoted to protecting birds and helping birders. Each one of them deserve your support!

Binoculars & Scopes. Here is where to learn more about the most important tool of every birder--binoculars. The people at the Cornell Laboratory of Ornithology recently tested the best binoculars and spotting scopes for birders. Read their unbiased reviews then decide which are best for you.

Bird Tours. The list of tours offered in one year is unbelievable! Read about the places you can go and the birds you can see. Tours to Arizona and Costa Rica are described in detail. Bird tour companies may offer tours to just one spot or to every continent (including Antarctica). They would all be happy to send you their catalogue. Look here for the phone numbers of some of the larger tour companies.

Bird Books & Magazines. If you want to read more about birds, look here. There are recommendations of places to buy bird books. There are great magazines for birders--reviewed by our "guest" critics Siskin & Egret.

Available Separately:

Birds of the World by Dr. Charles Sibley. Dr. Charles G. Sibley's ***Birds of the World*** is the third part of the Thayer Birding System. (This CD-ROM, "Birds of North America," and "Birder's Diary" are the other two parts). Dr. Sibley, past president of the American Ornithologists' Union, is the senior author of the Sibley/Ahlquist/Monroe classification of birds. Dr. Sibley's research using DNA comparisons has revolutionized the way scientists group bird Orders and Families. Over 75% of Dr. Sibley's results support the traditional classification of birds proposed by Hans Gadow in 1893 and modified by Alexander Wetmore in 1931-1960. Some of the new DNA research has caused quite a bit of debate among scientists. However, the pendulum is swinging to the new Sibley/Ahlquist/Monroe classification. Many scientists believe it is a better model to explain the evolution of birds. Dr. Sibley has written a book that is available on 3.5 inch floppy disks. It covers the Orders and Families in the Sibley/Ahlquist/Monroe classification as well as individual Species. You can access this information via the "Field Guide" in the ***Birder's Diary***. The computerized format allows you to see and hear a bird while viewing Dr. Sibley's comments about the bird and its relatives. You can also read the disk directly from the computer. Think of it as a college-level textbook of ornithology.

Press Here To Close This Screen
Press Here To Copy This Topic To The Clipboard

10 HELPFUL HINTS FOR NEWER BIRDERS

Hint #1:

You need a field guide for your area. A field guide is a book with pictures of the birds and tips for identifying them. The best book for new birders is the *Peterson Field Guide to Eastern Birds* or the *Peterson Field Guide to Western Birds*. When you become familiar with the birds in your area, you will want the *National Geographic Field Guide to the Birds of North America*. For young birders, I recommend *Peterson First Guide: Birds*. It describes 188 common and conspicuous birds and it won't overwhelm them with too many choices. See the section called "Bird Books & Magazines" for more information. This CD-ROM is a field guide too. But it would be a bit awkward to carry a computer with a built-in CD-ROM into the woods with you -- so you need a book too. (I wonder how long it will be before that last sentence is no longer true?)

Hint #2:

You need a binocular to see the birds. You will soon discover an ironic fact. The best birders have the best binoculars-- even though they can identify a bird 100 yards away by its silhouette. Newcomers with a cheap binocular see a fuzzy ball of feathers and don't have a clue which bird it is. There is an unbelievable difference between a $79 binocular and a $900 binocular. For help in selecting the right binocular, at the right price, see the section called "Binoculars & Scopes." Once you have a binocular, buy an OP/TECH strap to hold them--your neck will appreciate it!

Hint 2a: You would need four eyes to use a pair of binoculars. Everyone says "a pair of binoculars" when they really mean a binocular.

Hint #3:

You need to know what to expect in your area. The giant woodpecker you saw in the woods was a Pileated Woodpecker, not an Ivory-billed Woodpecker. Checklists of birds in your area will tell you this. Many State and National parks near you have checklists of the birds seen in the park. Thayer Birding Software's ***Birder's Diary*** has a bird checklist for every State and Province in the United States and Canada. See the section called "Birder's Diary" for a look at the checklists for Ohio, Florida, Texas and California.

Hint #4:

You need to be able to find the birds. To do this, you should learn about the habitat each species of bird prefers. Do they like to spend their time at the top of a tree or on the ground or on a lake? You should learn the bird songs of the birds in your yard. Later, learn the songs of other birds in your area of the country. See the separate section of this CD-ROM called "Birds of North America" for help with this. You might even want to buy a book that can tell you

about good spots in your area to look for the birds. The "ABA/Lane Series" of books is especially recommended for US and Canadian birders. Very detailed state maps by DeLorme are great if you like to go off on your own. See the section called "Books & Magazines" for more information.

Hint #5:

Join a group of other birders. Birders are very friendly and helpful. They are always willing to share their knowledge. We were all beginners once. Start by calling the local Audubon Society, the local Nature Center or Parks Commission, or the local Bird Club. See the section called "Bird's Best Friends" for more ideas. Join the American Birding Association (Call 800-850-2473). You will receive a directory of all members, arranged by ZIP code. If all else fails, go to the park with your binoculars. Someone is sure to strike up a conversation and they might lead you to a whole new group of birding buddies. Also, use your computer to reach other birders! On CompuServe the address for birders is: Outside Forum, Birding Section. On the Internet it is: USENET DISC.GRP REC.BIRDS

Hint #6:

Try a birding trip or tour. Local bird trips are sometimes advertised in the newspapers. These are often led by park rangers or a local Audubon member. To find out about local trips you should also call your local rare bird alert phone number. At the end of these tapes there are often announcements about bird trips in your area. The trips may last a morning or most of the day. These trips are usually free of charge. See the section called "Hot Spots: Where To See Birds" for the phone number for your area. You might also want to join a professional bird guide on a tour. Tour guides charge for their services but they are worth every penny. Birding tours can take you all over the world. See the section called "Bird Tours" for more information. Be sure to read the descriptions of the bird tours offered to Arizona and to Costa Rica.

Hint #7:

Read about birds. There are many good magazines about birds and birding. There are also thousands of books about birds. See the section called "Books & Magazines" for some suggestions and a rating of bird magazines by Siskin & Egret.

Hint #8:

Bring the birds to you. You can attract birds to your yard with just a little work. Planting the right flowers will attract hummingbirds. Sunflower seeds will bring lots of new birds to your house. You might even want to build a bluebird house. Learn about the National Wildlife Federation's "Backyard Habitat" Program. There are lots of ideas for you. See the section called "Attracting Birds."

Hint #9:

Record your bird sightings. You might want to keep a "diary" or a list of the birds you see in your yard. Birders often keep lists for their state and country as well. They may also keep track of all the birds seen in one day or one month or one year. This is all terribly easy to do with a computer listing program. Thayer Birding Software's ***Birder's Diary*** is the easiest to use and the least expensive. It will let you enter your sightings of birds from the United States and Canada as well as every bird in the world!
See the secion called "Birder's Diary".

Hint #10:

HAVE FUN. ASK LOTS OF QUESTIONS. BE KIND TO BIRDS.

Bonus Hint #11:

Birding is what the "cool" people do. **Birdwatching** is what 90 year olds in rocking chairs do when the pigeons come.

Click here to order Birder's Diary

*** BIRDER'S DIARY ***

Return To Main Menu
Press Here To Copy This Topic To The Clipboard

BIRDER'S DIARY

Birder's Diary is a listing and recordkeeping program. **If you bought the Deluxe or Professional version of "Birds of North America", Birder's Diary was included in the box**. ***Birder's Diary*** comes on a series of 3.5 inch disks that you load onto your computer's hard drive. You can order Birder's Diary by calling 800-865-2473.

Birder's Diary **is the world's most advanced computer program for birders. It is also the easiest to use.** It can be used to record anything about the birds you see. It will prepare reports and lists in any imaginable combination. Birder's Diary already knows the name of each bird in the world. Just as there are many languages in the world, there are different ways to list the birds of the world. Birder's Diary already knows the contents and the proper sequencing of the four most important lists. Two lists cover all the birds of the world: the Sibley/Ahlquist/Monroe list and the Traditional list. The other two lists cover just North American birds: the American Birding Association's list (ABA) and the American Ornithologists' Union's list (AOU). You can enter your new sightings one bird at a time (New Sightings) or enter all sightings for an entire day (Mass Sightings).

New Sightings

Mass Sightings

You can take the birding quiz. See the bird, hear it sing, then guess its name from the four choices on the screen. The American Birding Association's Listing Report Form will complete itself at the touch of a button. It reports your sightings for over 20 areas of the world, all 50 states and 13 Canadian Provinces or Territories. Print bird checklists for every state and province in the United States and Canada (plus the District of Columbia). All the birds ever seen in a state are shown on the checklist. Examples for four states are shown below. The ***Birder's Diary*** contains 64 checklists. You can also create your own checklist for your yard, a Christmas Bird Count area, or any other area you define. Learn about the advanced features available nowhere else -- The Rosetta Stone and the Thayer World Birding Code.

Ohio Bird Checklist

Florida Bird Checklist

Texas Bird Checklist

California Bird Checklist

Advanced birders will like the "Rosetta Stone." The original Rosetta Stone helped scientists decipher the Greek hieroglyphics in ancient Egypt. It contained the same inscription in three different languages. Scientists and birders sometimes refer to the same bird by different names. The Order and Family for the same bird are often different in the Traditional classification than they are in the Sibley/Ahlquist/Monroe classification. You can use the "Rosetta Stone" to identify simultaneously the Order, Family, Scientific Name and Common Name of any bird according to the Traditional, Sibley/Ahlquist/Monroe, ABA and AOU lists. Like the Rosetta Stone of old, this feature will help you cut through the confusion that exists today.

The "Rosetta Stone"

How hard is it to see a bird called an Eskimo Curlew? The ***Birder's Diary*** ranks every bird in the world by difficulty of observing them using the Thayer World Birding Code. Each species is coded from 1 (fairly easy to see) to 10 (not seen in years by anyone). Unfortunately, the birds that have become extinct since 1600 have a ranking of 11.

Thayer World Birding Code

Hard To Find North American Birds

Extinct Birds

The CD-ROM "Birds of North America" tells you a little about each bird**. The amount of information shown for a bird can be expanded dramatically.** Just run the "Field Guide" portion of the ***Birder's Diary*** in conjunction with ***Birds of the World by Dr. Charles Sibley.***

One of my favorite parts of the Birder's Diary is "Fun & Games." You can search the scientific or common names of birds and find all the birds named after people. You can locate each bird that has the word blue in its name. You can also search for any phrase or combination of letters in the bird's common or scientific name, such as spotted, lovely, golden or tasty.
(For even more flexibility, use the " * " character as a wildcard in a search.)

ABA Birds Named After People

Birds Named "Spotted"

All of the data contained in the Birder's Diary are in a relational database program called ACCESS 2.0. Users who own a copy of Microsoft's ACCESS 2.0

will be able to create their own queries, forms and reports using data from the Birder's Diary. Nothing in the Birder's Diary is password protected. Advanced computer users can access anything in the entire database, copy it, export it or manipulate it for their own use. By registering as an owner of the program, users will receive advanced details of new updates, periodic revisions to the four bird lists (as changes in species' ranges or taxonomy take place), and looks at new products from Thayer Birding Software. The American Birding Association receives a portion of the proceeds from each sale of Birder's Diary.

Click here to order Birder's Diary or Birds of the World by Dr. Charles Sibley

Return To Birder's Diary Discussion
Press Here To Copy This Topic To The Clipboard

392 BIRDS FOUND IN OHIO

COMMON NAME	SCIENTIFIC NAME
Red-throated Loon	Gavia stellata
Pacific Loon	Gavia pacifica
Common Loon	Gavia immer
Pied-billed Grebe	Podilymbus podiceps
Horned Grebe	Podiceps auritus
Red-necked Grebe	Podiceps grisegena
Eared Grebe	Podiceps nigricollis
Western Grebe	Aechmophorus occidentalis
Black-capped Petrel	Pterodroma hasitata
Leach's Storm-Petrel	Oceanodroma leucorhoa
Northern Gannet	Morus bassanus
American White Pelican	Pelecanus erythrorhynchos
Brown Pelican	Pelecanus occidentalis
Double-crested Cormorant	Phalacrocorax auritus
Anhinga	Anhinga anhinga
Magnificent Frigatebird	Fregata magnificens
American Bittern	Botaurus lentiginosus
Least Bittern	Ixobrychus exilis
Great Blue Heron	Ardea herodias
Great Egret	Casmerodius albus
Snowy Egret	Egretta thula
Little Blue Heron	Egretta caerulea
Tricolored Heron	Egretta tricolor
Cattle Egret	Bubulcus ibis
Green Heron	Butorides virescens
Black-crowned Night-Heron	Nycticorax nycticorax
Yellow-crowned Night-Heron	Nyctanassa violacea
White Ibis	Eudocimus albus
Glossy Ibis	Plegadis falcinellus
White-faced Ibis	Plegadis chihi
Roseate Spoonbill	Ajaia ajaja
Wood Stork	Mycteria americana
Fulvous Whistling-Duck	Dendrocygna bicolor
Tundra Swan	Cygnus columbianus
Trumpeter Swan	Cygnus buccinator
Mute Swan	Cygnus olor
Greater White-fronted Goose	Anser albifrons
Snow Goose	Anser caerulescens
Ross' Goose	Anser rossii
Brant	Branta bernicla
Canada Goose	Branta canadensis

Wood Duck	Aix sponsa
Green-winged Teal	Anas crecca
American Black Duck	Anas rubripes
Mallard	Anas platyrhynchos
Northern Pintail	Anas acuta
Blue-winged Teal	Anas discors
Cinnamon Teal	Anas cyanoptera
Northern Shoveler	Anas clypeata
Gadwall	Anas strepera
Eurasian Wigeon	Anas penelope
American Wigeon	Anas americana
Canvasback	Aythya valisineria
Redhead	Aythya americana
Ring-necked Duck	Aythya collaris
Tufted Duck	Aythya fuligula
Greater Scaup	Aythya marila
Lesser Scaup	Aythya affinis
Common Eider	Somateria mollissima
King Eider	Somateria spectabilis
Harlequin Duck	Histrionicus histrionicus
Oldsquaw	Clangula hyemalis
Black Scoter	Melanitta nigra
Surf Scoter	Melanitta perspicillata
White-winged Scoter	Melanitta fusca
Common Goldeneye	Bucephala clangula
Barrow's Goldeneye	Bucephala islandica
Bufflehead	Bucephala albeola
Hooded Merganser	Lophodytes cucullatus
Common Merganser	Mergus merganser
Red-breasted Merganser	Mergus serrator
Ruddy Duck	Oxyura jamaicensis
Black Vulture	Coragyps atratus
Turkey Vulture	Cathartes aura
Osprey	Pandion haliaetus
American Swallow-tailed Kite	Elanoides forficatus
Mississippi Kite	Ictinia mississippiensis
Bald Eagle	Haliaeetus leucocephalus
Northern Harrier	Circus cyaneus
Sharp-shinned Hawk	Accipiter striatus
Cooper's Hawk	Accipiter cooperii
Northern Goshawk	Accipiter gentilis
Harris' Hawk	Parabuteo unicinctus
Red-shouldered Hawk	Buteo lineatus
Broad-winged Hawk	Buteo platypterus
Swainson's Hawk	Buteo swainsoni
Red-tailed Hawk	Buteo jamaicensis

Rough-legged Hawk	Buteo lagopus
Golden Eagle	Aquila chrysaetos
American Kestrel	Falco sparverius
Merlin	Falco columbarius
Peregrine Falcon	Falco peregrinus
Gyrfalcon	Falco rusticolus
Prairie Falcon	Falco mexicanus
Gray Partridge	Perdix perdix
Ring-necked Pheasant	Phasianus colchicus
Ruffed Grouse	Bonasa umbellus
Greater Prairie-Chicken	Tympanuchus cupido
Wild Turkey	Meleagris gallopavo
Northern Bobwhite	Colinus virginianus
Yellow Rail	Coturnicops noveboracensis
Black Rail	Laterallus jamaicensis
King Rail	Rallus elegans
Virginia Rail	Rallus limicola
Sora	Porzana carolina
Purple Gallinule	Porphyrio martinicus
Common Moorhen	Gallinula chloropus
American Coot	Fulica americana
Sandhill Crane	Grus canadensis
Black-bellied Plover	Pluvialis squatarola
American Golden-Plover	Pluvialis dominica
Wilson's Plover	Charadrius wilsonia
Semipalmated Plover	Charadrius semipalmatus
Piping Plover	Charadrius melodus
Killdeer	Charadrius vociferus
Black-necked Stilt	Himantopus mexicanus
American Avocet	Recurvirostra americana
Greater Yellowlegs	Tringa melanoleuca
Lesser Yellowlegs	Tringa flavipes
Solitary Sandpiper	Tringa solitaria
Willet	Catoptrophorus semipalmatus
Spotted Sandpiper	Actitis macularia
Upland Sandpiper	Bartramia longicauda
Eskimo Curlew	Numenius borealis
Whimbrel	Numenius phaeopus
Hudsonian Godwit	Limosa haemastica
Marbled Godwit	Limosa fedoa
Ruddy Turnstone	Arenaria interpres
Red Knot	Calidris canutus
Sanderling	Calidris alba
Semipalmated Sandpiper	Calidris pusilla
Western Sandpiper	Calidris mauri
Rufous-necked Stint	Calidris ruficollis

Least Sandpiper	Calidris minutilla
White-rumped Sandpiper	Calidris fuscicollis
Baird's Sandpiper	Calidris bairdii
Pectoral Sandpiper	Calidris melanotos
Sharp-tailed Sandpiper	Calidris acuminata
Purple Sandpiper	Calidris maritima
Dunlin	Calidris alpina
Curlew Sandpiper	Calidris ferruginea
Stilt Sandpiper	Micropalama himantopus
Buff-breasted Sandpiper	Tryngites subruficollis
Ruff	Philomachus pugnax
Short-billed Dowitcher	Limnodromus griseus
Long-billed Dowitcher	Limnodromus scolopaceus
Common Snipe	Gallinago gallinago
Eurasian Woodcock	Scolopax rusticola
American Woodcock	Scolopax minor
Wilson's Phalarope	Steganopus tricolor
Red-necked Phalarope	Phalaropus lobatus
Red Phalarope	Phalaropus fulicaria
Pomarine Jaeger	Stercorarius pomarinus
Parasitic Jaeger	Stercorarius parasiticus
Long-tailed Jaeger	Stercorarius longicaudus
Laughing Gull	Larus atricilla
Franklin's Gull	Larus pipixcan
Little Gull	Larus minutus
Common Black-headed Gull	Larus ridibundus
Bonaparte's Gull	Larus philadelphia
Heermann's Gull	Larus heermanni
Mew Gull	Larus canus
Ring-billed Gull	Larus delawarensis
California Gull	Larus californicus
Herring Gull	Larus argentatus
Thayer's Gull	Larus thayeri
Iceland Gull	Larus glaucoides
Lesser Black-backed Gull	Larus fuscus
Glaucous Gull	Larus hyperboreus
Great Black-backed Gull	Larus marinus
Black-legged Kittiwake	Rissa tridactyla
Sabine's Gull	Xema sabini
Ivory Gull	Pagophila eburnea
Caspian Tern	Sterna caspia
Common Tern	Sterna hirundo
Arctic Tern	Sterna paradisaea
Forster's Tern	Sterna forsteri
Least Tern	Sterna antillarum
Large-billed Tern	Phaetusa simplex

Black Tern	Chlidonias niger
Thick-billed Murre	Uria lomvia
Black Guillemot	Cepphus grylle
Ancient Murrelet	Synthliboramphus antiquus
Atlantic Puffin	Fratercula arctica
Rock Dove	Columba livia
Mourning Dove	Zenaida macroura
Passenger Pigeon	Ectopistes migratorius
Carolina Parakeet	Conuropsis carolinensis
Black-billed Cuckoo	Coccyzus erythropthalmus
Yellow-billed Cuckoo	Coccyzus americanus
Groove-billed Ani	Crotophaga sulcirostris
Barn Owl	Tyto alba
Eastern Screech-Owl	Otus asio
Great Horned Owl	Bubo virginianus
Snowy Owl	Nyctea scandiaca
Northern Hawk Owl	Surnia ulula
Burrowing Owl	Speotyto cunicularia
Barred Owl	Strix varia
Great Gray Owl	Strix nebulosa
Long-eared Owl	Asio otus
Short-eared Owl	Asio flammeus
Common Nighthawk	Chordeiles minor
Chuck-will's-widow	Caprimulgus carolinensis
Whip-poor-will	Caprimulgus vociferus
Chimney Swift	Chaetura pelagica
Ruby-throated Hummingbird	Archilochus colubris
Rufous Hummingbird	Selasphorus rufus
Belted Kingfisher	Ceryle alcyon
Red-headed Woodpecker	Melanerpes erythrocephalus
Red-bellied Woodpecker	Melanerpes carolinus
Yellow-bellied Sapsucker	Sphyrapicus varius
Downy Woodpecker	Picoides pubescens
Hairy Woodpecker	Picoides villosus
Red-cockaded Woodpecker	Picoides borealis
Black-backed Woodpecker	Picoides arcticus
Northern Flicker	Colaptes auratus
Pileated Woodpecker	Dryocopus pileatus
Ivory-billed Woodpecker	Campephilus principalis
Olive-sided Flycatcher	Contopus borealis
Eastern Wood-Pewee	Contopus virens
Yellow-bellied Flycatcher	Empidonax flaviventris
Acadian Flycatcher	Empidonax virescens
Alder Flycatcher	Empidonax alnorum
Willow Flycatcher	Empidonax traillii
Least Flycatcher	Empidonax minimus

Gray Flycatcher	Empidonax wrightii
Eastern Phoebe	Sayornis phoebe
Say's Phoebe	Sayornis saya
Vermilion Flycatcher	Pyrocephalus rubinus
Great Crested Flycatcher	Myiarchus crinitus
Western Kingbird	Tyrannus verticalis
Eastern Kingbird	Tyrannus tyrannus
Scissor-tailed Flycatcher	Tyrannus forficatus
Horned Lark	Eremophila alpestris
Purple Martin	Progne subis
Tree Swallow	Tachycineta bicolor
Violet-green Swallow	Tachycineta thalassina
Northern Rough-winged Swallow	Stelgidopteryx serripennis
Bank Swallow	Riparia riparia
Cliff Swallow	Hirundo pyrrhonota
Barn Swallow	Hirundo rustica
Blue Jay	Cyanocitta cristata
Black-billed Magpie	Pica pica
American Crow	Corvus brachyrhynchos
Common Raven	Corvus corax
Black-capped Chickadee	Parus atricapillus
Carolina Chickadee	Parus carolinensis
Boreal Chickadee	Parus hudsonicus
Tufted Titmouse	Parus bicolor
Red-breasted Nuthatch	Sitta canadensis
White-breasted Nuthatch	Sitta carolinensis
Brown Creeper	Certhia americana
Rock Wren	Salpinctes obsoletus
Carolina Wren	Thryothorus ludovicianus
Bewick's Wren	Thryomanes bewickii
House Wren	Troglodytes aedon
Winter Wren	Troglodytes troglodytes
Sedge Wren	Cistothorus platensis
Marsh Wren	Cistothorus palustris
Golden-crowned Kinglet	Regulus satrapa
Ruby-crowned Kinglet	Regulus calendula
Blue-gray Gnatcatcher	Polioptila caerulea
Northern Wheatear	Oenanthe oenanthe
Eastern Bluebird	Sialia sialis
Mountain Bluebird	Sialia currucoides
Townsend's Solitaire	Myadestes townsendi
Veery	Catharus fuscescens
Gray-cheeked Thrush	Catharus minimus
Swainson's Thrush	Catharus ustulatus
Hermit Thrush	Catharus guttatus
Wood Thrush	Catharus mustelinus

American Robin	Turdus migratorius
Varied Thrush	Ixoreus naevius
Gray Catbird	Dumetella carolinensis
Northern Mockingbird	Mimus polyglottos
Brown Thrasher	Toxostoma rufum
American Pipit	Anthus rubescens
Sprague's Pipit	Anthus spragueii
Bohemian Waxwing	Bombycilla garrulus
Cedar Waxwing	Bombycilla cedrorum
Northern Shrike	Lanius excubitor
Loggerhead Shrike	Lanius ludovicianus
European Starling	Sturnus vulgaris
White-eyed Vireo	Vireo griseus
Bell's Vireo	Vireo bellii
Solitary Vireo	Vireo solitarius
Yellow-throated Vireo	Vireo flavifrons
Warbling Vireo	Vireo gilvus
Philadelphia Vireo	Vireo philadelphicus
Red-eyed Vireo	Vireo olivaceus
Blue-winged Warbler	Vermivora pinus
Golden-winged Warbler	Vermivora chrysoptera
Tennessee Warbler	Vermivora peregrina
Orange-crowned Warbler	Vermivora celata
Nashville Warbler	Vermivora ruficapilla
Northern Parula	Parula americana
Yellow Warbler	Dendroica petechia
Chestnut-sided Warbler	Dendroica pensylvanica
Magnolia Warbler	Dendroica magnolia
Cape May Warbler	Dendroica tigrina
Black-throated Blue Warbler	Dendroica caerulescens
Yellow-rumped Warbler	Dendroica coronata
Black-throated Gray Warbler	Dendroica nigrescens
Townsend's Warbler	Dendroica townsendi
Black-throated Green Warbler	Dendroica virens
Blackburnian Warbler	Dendroica fusca
Yellow-throated Warbler	Dendroica dominica
Pine Warbler	Dendroica pinus
Kirtland's Warbler	Dendroica kirtlandii
Prairie Warbler	Dendroica discolor
Palm Warbler	Dendroica palmarum
Bay-breasted Warbler	Dendroica castanea
Blackpoll Warbler	Dendroica striata
Cerulean Warbler	Dendroica cerulea
Black-and-white Warbler	Mniotilta varia
American Redstart	Setophaga ruticilla
Prothonotary Warbler	Protonotaria citrea

Worm-eating Warbler	Helmitheros vermivorus
Swainson's Warbler	Limnothlypis swainsonii
Ovenbird	Seiurus aurocapillus
Northern Waterthrush	Seiurus noveboracensis
Louisiana Waterthrush	Seiurus motacilla
Kentucky Warbler	Oporornis formosus
Connecticut Warbler	Oporornis agilis
Mourning Warbler	Oporornis philadelphia
Common Yellowthroat	Geothlypis trichas
Hooded Warbler	Wilsonia citrina
Wilson's Warbler	Wilsonia pusilla
Canada Warbler	Wilsonia canadensis
Painted Redstart	Myioborus pictus
Yellow-breasted Chat	Icteria virens
Summer Tanager	Piranga rubra
Scarlet Tanager	Piranga olivacea
Western Tanager	Piranga ludoviciana
Northern Cardinal	Cardinalis cardinalis
Rose-breasted Grosbeak	Pheucticus ludovicianus
Black-headed Grosbeak	Pheucticus melanocephalus
Blue Grosbeak	Guiraca caerulea
Indigo Bunting	Passerina cyanea
Dickcissel	Spiza americana
Green-tailed Towhee	Pipilo chlorurus
Rufous-sided Towhee	Pipilo erythrophthalmus
Bachman's Sparrow	Aimophila aestivalis
American Tree Sparrow	Spizella arborea
Chipping Sparrow	Spizella passerina
Clay-colored Sparrow	Spizella pallida
Field Sparrow	Spizella pusilla
Vesper Sparrow	Pooecetes gramineus
Lark Sparrow	Chondestes grammacus
Black-throated Sparrow	Amphispiza bilineata
Lark Bunting	Calamospiza melanocorys
Savannah Sparrow	Passerculus sandwichensis
Baird's Sparrow	Ammodramus bairdii
Grasshopper Sparrow	Ammodramus savannarum
Henslow's Sparrow	Ammodramus henslowii
Le Conte's Sparrow	Ammodramus leconteii
Sharp-tailed Sparrow	Ammodramus caudacutus
Fox Sparrow	Passerella iliaca
Song Sparrow	Melospiza melodia
Lincoln's Sparrow	Melospiza lincolnii
Swamp Sparrow	Melospiza georgiana
White-throated Sparrow	Zonotrichia albicollis
White-crowned Sparrow	Zonotrichia leucophrys

Harris' Sparrow	Zonotrichia querula
Dark-eyed Junco	Junco hyemalis
Lapland Longspur	Calcarius lapponicus
Smith's Longspur	Calcarius pictus
Snow Bunting	Plectrophenax nivalis
Bobolink	Dolichonyx oryzivorus
Red-winged Blackbird	Agelaius phoeniceus
Eastern Meadowlark	Sturnella magna
Western Meadowlark	Sturnella neglecta
Yellow-headed Blackbird	Xanthocephalus xanthocephalus
Rusty Blackbird	Euphagus carolinus
Brewer's Blackbird	Euphagus cyanocephalus
Great-tailed Grackle	Quiscalus mexicanus
Common Grackle	Quiscalus quiscula
Brown-headed Cowbird	Molothrus ater
Orchard Oriole	Icterus spurius
Northern Oriole	Icterus galbula
Brambling	Fringilla montifringilla
Pine Grosbeak	Pinicola enucleator
Purple Finch	Carpodacus purpureus
House Finch	Carpodacus mexicanus
Red Crossbill	Loxia curvirostra
White-winged Crossbill	Loxia leucoptera
Common Redpoll	Carduelis flammea
Hoary Redpoll	Carduelis hornemanni
Pine Siskin	Carduelis pinus
American Goldfinch	Carduelis tristis
Evening Grosbeak	Coccothraustes vespertinus
House Sparrow	Passer domesticus

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475 BIRDS FOUND IN FLORIDA

COMMON NAME	SCIENTIFIC NAME
Red-throated Loon	Gavia stellata
Pacific Loon	Gavia pacifica
Common Loon	Gavia immer
Least Grebe	Tachybaptus dominicus
Pied-billed Grebe	Podilymbus podiceps
Horned Grebe	Podiceps auritus
Red-necked Grebe	Podiceps grisegena
Eared Grebe	Podiceps nigricollis
Western Grebe	Aechmophorus occidentalis
Black-browed Albatross	Diomedea melanophris
Yellow-nosed Albatross	Diomedea chlororhynchos
Black-capped Petrel	Pterodroma hasitata
Cory's Shearwater	Calonectris diomedea
Greater Shearwater	Puffinus gravis
Sooty Shearwater	Puffinus griseus
Manx Shearwater	Puffinus puffinus
Audubon's Shearwater	Puffinus lherminieri
Wilson's Storm-Petrel	Oceanites oceanicus
Leach's Storm-Petrel	Oceanodroma leucorhoa
Band-rumped Storm-Petrel	Oceanodroma castro
White-tailed Tropicbird	Phaethon lepturus
Red-billed Tropicbird	Phaethon aethereus
Masked Booby	Sula dactylatra
Brown Booby	Sula leucogaster
Red-footed Booby	Sula sula
Northern Gannet	Morus bassanus
American White Pelican	Pelecanus erythrorhynchos
Brown Pelican	Pelecanus occidentalis
Great Cormorant	Phalacrocorax carbo
Double-crested Cormorant	Phalacrocorax auritus
Anhinga	Anhinga anhinga
Magnificent Frigatebird	Fregata magnificens
American Bittern	Botaurus lentiginosus
Least Bittern	Ixobrychus exilis
Great Blue Heron	Ardea herodias
Great Egret	Casmerodius albus
Snowy Egret	Egretta thula
Little Blue Heron	Egretta caerulea
Tricolored Heron	Egretta tricolor
Reddish Egret	Egretta rufescens
Cattle Egret	Bubulcus ibis

Green Heron	Butorides virescens
Black-crowned Night-Heron	Nycticorax nycticorax
Yellow-crowned Night-Heron	Nyctanassa violacea
White Ibis	Eudocimus albus
Glossy Ibis	Plegadis falcinellus
White-faced Ibis	Plegadis chihi
Roseate Spoonbill	Ajaia ajaja
Wood Stork	Mycteria americana
Greater Flamingo	Phoenicopterus ruber
Fulvous Whistling-Duck	Dendrocygna bicolor
Black-bellied Whistling-Duck	Dendrocygna autumnalis
Tundra Swan	Cygnus columbianus
Greater White-fronted Goose	Anser albifrons
Snow Goose	Anser caerulescens
Ross' Goose	Anser rossii
Brant	Branta bernicla
Canada Goose	Branta canadensis
Wood Duck	Aix sponsa
Green-winged Teal	Anas crecca
American Black Duck	Anas rubripes
Mottled Duck	Anas fulvigula
Mallard	Anas platyrhynchos
White-cheeked Pintail	Anas bahamensis
Northern Pintail	Anas acuta
Blue-winged Teal	Anas discors
Cinnamon Teal	Anas cyanoptera
Northern Shoveler	Anas clypeata
Gadwall	Anas strepera
Eurasian Wigeon	Anas penelope
American Wigeon	Anas americana
Canvasback	Aythya valisineria
Redhead	Aythya americana
Ring-necked Duck	Aythya collaris
Greater Scaup	Aythya marila
Lesser Scaup	Aythya affinis
Common Eider	Somateria mollissima
King Eider	Somateria spectabilis
Harlequin Duck	Histrionicus histrionicus
Oldsquaw	Clangula hyemalis
Black Scoter	Melanitta nigra
Surf Scoter	Melanitta perspicillata
White-winged Scoter	Melanitta fusca
Common Goldeneye	Bucephala clangula
Bufflehead	Bucephala albeola
Hooded Merganser	Lophodytes cucullatus
Common Merganser	Mergus merganser

Red-breasted Merganser	Mergus serrator
Ruddy Duck	Oxyura jamaicensis
Masked Duck	Oxyura dominica
Black Vulture	Coragyps atratus
Turkey Vulture	Cathartes aura
Osprey	Pandion haliaetus
American Swallow-tailed Kite	Elanoides forficatus
White-tailed Kite	Elanus leucurus
Snail Kite	Rostrhamus sociabilis
Mississippi Kite	Ictinia mississippiensis
Bald Eagle	Haliaeetus leucocephalus
Northern Harrier	Circus cyaneus
Sharp-shinned Hawk	Accipiter striatus
Cooper's Hawk	Accipiter cooperii
Northern Goshawk	Accipiter gentilis
Red-shouldered Hawk	Buteo lineatus
Broad-winged Hawk	Buteo platypterus
Swainson's Hawk	Buteo swainsoni
Red-tailed Hawk	Buteo jamaicensis
Ferruginous Hawk	Buteo regalis
Rough-legged Hawk	Buteo lagopus
Golden Eagle	Aquila chrysaetos
Crested Caracara	Caracara plancus
American Kestrel	Falco sparverius
Merlin	Falco columbarius
Peregrine Falcon	Falco peregrinus
Wild Turkey	Meleagris gallopavo
Northern Bobwhite	Colinus virginianus
Yellow Rail	Coturnicops noveboracensis
Black Rail	Laterallus jamaicensis
Clapper Rail	Rallus longirostris
King Rail	Rallus elegans
Virginia Rail	Rallus limicola
Sora	Porzana carolina
Purple Gallinule	Porphyrio martinicus
Common Moorhen	Gallinula chloropus
American Coot	Fulica americana
Limpkin	Aramus guarauna
Sandhill Crane	Grus canadensis
Whooping Crane	Grus americana
Black-bellied Plover	Pluvialis squatarola
American Golden-Plover	Pluvialis dominica
Snowy Plover	Charadrius alexandrinus
Wilson's Plover	Charadrius wilsonia
Semipalmated Plover	Charadrius semipalmatus
Piping Plover	Charadrius melodus

Killdeer	Charadrius vociferus
Mountain Plover	Charadrius montanus
American Oystercatcher	Haematopus palliatus
Black-necked Stilt	Himantopus mexicanus
American Avocet	Recurvirostra americana
Greater Yellowlegs	Tringa melanoleuca
Lesser Yellowlegs	Tringa flavipes
Solitary Sandpiper	Tringa solitaria
Willet	Catoptrophorus semipalmatus
Spotted Sandpiper	Actitis macularia
Upland Sandpiper	Bartramia longicauda
Whimbrel	Numenius phaeopus
Long-billed Curlew	Numenius americanus
Black-tailed Godwit	Limosa limosa
Hudsonian Godwit	Limosa haemastica
Bar-tailed Godwit	Limosa lapponica
Marbled Godwit	Limosa fedoa
Ruddy Turnstone	Arenaria interpres
Surfbird	Aphriza virgata
Red Knot	Calidris canutus
Sanderling	Calidris alba
Semipalmated Sandpiper	Calidris pusilla
Western Sandpiper	Calidris mauri
Least Sandpiper	Calidris minutilla
White-rumped Sandpiper	Calidris fuscicollis
Baird's Sandpiper	Calidris bairdii
Pectoral Sandpiper	Calidris melanotos
Sharp-tailed Sandpiper	Calidris acuminata
Purple Sandpiper	Calidris maritima
Dunlin	Calidris alpina
Curlew Sandpiper	Calidris ferruginea
Stilt Sandpiper	Micropalama himantopus
Buff-breasted Sandpiper	Tryngites subruficollis
Ruff	Philomachus pugnax
Short-billed Dowitcher	Limnodromus griseus
Long-billed Dowitcher	Limnodromus scolopaceus
Common Snipe	Gallinago gallinago
American Woodcock	Scolopax minor
Wilson's Phalarope	Steganopus tricolor
Red-necked Phalarope	Phalaropus lobatus
Red Phalarope	Phalaropus fulicaria
Pomarine Jaeger	Stercorarius pomarinus
Parasitic Jaeger	Stercorarius parasiticus
Long-tailed Jaeger	Stercorarius longicaudus
South Polar Skua	Catharacta maccormicki
Laughing Gull	Larus atricilla

Franklin's Gull	Larus pipixcan
Little Gull	Larus minutus
Common Black-headed Gull	Larus ridibundus
Bonaparte's Gull	Larus philadelphia
Ring-billed Gull	Larus delawarensis
California Gull	Larus californicus
Herring Gull	Larus argentatus
Thayer's Gull	Larus thayeri
Iceland Gull	Larus glaucoides
Lesser Black-backed Gull	Larus fuscus
Glaucous Gull	Larus hyperboreus
Great Black-backed Gull	Larus marinus
Black-legged Kittiwake	Rissa tridactyla
Sabine's Gull	Xema sabini
Gull-billed Tern	Sterna nilotica
Caspian Tern	Sterna caspia
Royal Tern	Sterna maxima
Sandwich Tern	Sterna sandvicensis
Roseate Tern	Sterna dougallii
Common Tern	Sterna hirundo
Arctic Tern	Sterna paradisaea
Forster's Tern	Sterna forsteri
Least Tern	Sterna antillarum
Bridled Tern	Sterna anaethetus
Sooty Tern	Sterna fuscata
Black Tern	Chlidonias niger
Brown Noddy	Anous stolidus
Black Noddy	Anous minutus
Black Skimmer	Rynchops niger
Dovekie	Alle alle
Common Murre	Uria aalge
Razorbill	Alca torda
Marbled Murrelet	Brachyramphus marmoratus
Atlantic Puffin	Fratercula arctica
Rock Dove	Columba livia
Scaly-naped Pigeon	Columba squamosa
White-crowned Pigeon	Columba leucocephala
Band-tailed Pigeon	Columba fasciata
Eurasian Collared-Dove	Streptopelia decaocto
White-winged Dove	Zenaida asiatica
Zenaida Dove	Zenaida aurita
Mourning Dove	Zenaida macroura
Passenger Pigeon	Ectopistes migratorius
Inca Dove	Columbina inca
Common Ground-Dove	Columbina passerina
Key West Quail-Dove	Geotrygon chrysia

Ruddy Quail-Dove	Geotrygon montana
Budgerigar	Melopsittacus undulatus
Carolina Parakeet	Conuropsis carolinensis
Monk Parakeet	Myiopsitta monachus
Canary-winged Parakeet	Brotogeris versicolurus
Black-billed Cuckoo	Coccyzus erythropthalmus
Yellow-billed Cuckoo	Coccyzus americanus
Mangrove Cuckoo	Coccyzus minor
Smooth-billed Ani	Crotophaga ani
Groove-billed Ani	Crotophaga sulcirostris
Barn Owl	Tyto alba
Flammulated Owl	Otus flammeolus
Eastern Screech-Owl	Otus asio
Great Horned Owl	Bubo virginianus
Burrowing Owl	Speotyto cunicularia
Barred Owl	Strix varia
Long-eared Owl	Asio otus
Short-eared Owl	Asio flammeus
Lesser Nighthawk	Chordeiles acutipennis
Common Nighthawk	Chordeiles minor
Antillean Nighthawk	Chordeiles gundlachii
Chuck-will's-widow	Caprimulgus carolinensis
Whip-poor-will	Caprimulgus vociferus
Black Swift	Cypseloides niger
White-collared Swift	Streptoprocne zonaris
Chimney Swift	Chaetura pelagica
Vaux's Swift	Chaetura vauxi
Antillean Palm-Swift	Tachornis phoenicobia
Broad-billed Hummingbird	Cynanthus latirostris
Buff-bellied Hummingbird	Amazilia yucatanensis
Bahama Woodstar	Calliphlox evelynae
Ruby-throated Hummingbird	Archilochus colubris
Black-chinned Hummingbird	Archilochus alexandri
Anna's Hummingbird	Calypte anna
Calliope Hummingbird	Stellula calliope
Rufous Hummingbird	Selasphorus rufus
Belted Kingfisher	Ceryle alcyon
Red-headed Woodpecker	Melanerpes erythrocephalus
Golden-fronted Woodpecker	Melanerpes aurifrons
Red-bellied Woodpecker	Melanerpes carolinus
Yellow-bellied Sapsucker	Sphyrapicus varius
Downy Woodpecker	Picoides pubescens
Hairy Woodpecker	Picoides villosus
Red-cockaded Woodpecker	Picoides borealis
Northern Flicker	Colaptes auratus
Pileated Woodpecker	Dryocopus pileatus

Ivory-billed Woodpecker	Campephilus principalis
Caribbean Elaenia	Elaenia martinica
Olive-sided Flycatcher	Contopus borealis
Western Wood-Pewee	Contopus sordidulus
Eastern Wood-Pewee	Contopus virens
Yellow-bellied Flycatcher	Empidonax flaviventris
Acadian Flycatcher	Empidonax virescens
Alder Flycatcher	Empidonax alnorum
Willow Flycatcher	Empidonax traillii
Least Flycatcher	Empidonax minimus
Black Phoebe	Sayornis nigricans
Eastern Phoebe	Sayornis phoebe
Say's Phoebe	Sayornis saya
Vermilion Flycatcher	Pyrocephalus rubinus
Ash-throated Flycatcher	Myiarchus cinerascens
Great Crested Flycatcher	Myiarchus crinitus
Brown-crested Flycatcher	Myiarchus tyrannulus
La Sagra's Flycatcher	Myiarchus sagrae
Great Kiskadee	Pitangus sulphuratus
Sulphur-bellied Flycatcher	Myiodynastes luteiventris
Variegated Flycatcher	Empidonomus varius
Tropical Kingbird	Tyrannus melancholicus
Couch's Kingbird	Tyrannus couchii
Cassin's Kingbird	Tyrannus vociferans
Western Kingbird	Tyrannus verticalis
Eastern Kingbird	Tyrannus tyrannus
Gray Kingbird	Tyrannus dominicensis
Loggerhead Kingbird	Tyrannus caudifasciatus
Scissor-tailed Flycatcher	Tyrannus forficatus
Fork-tailed Flycatcher	Tyrannus savana
Horned Lark	Eremophila alpestris
Purple Martin	Progne subis
Cuban Martin	Progne cryptoleuca
Southern Martin	Progne elegans
Tree Swallow	Tachycineta bicolor
Violet-green Swallow	Tachycineta thalassina
Bahama Swallow	Tachycineta cyaneoviridis
Northern Rough-winged Swallow	Stelgidopteryx serripennis
Bank Swallow	Riparia riparia
Cliff Swallow	Hirundo pyrrhonota
Cave Swallow	Hirundo fulva
Barn Swallow	Hirundo rustica
Blue Jay	Cyanocitta cristata
Scrub Jay	Aphelocoma coerulescens
American Crow	Corvus brachyrhynchos
Fish Crow	Corvus ossifragus

Carolina Chickadee	Parus carolinensis
Tufted Titmouse	Parus bicolor
Red-breasted Nuthatch	Sitta canadensis
White-breasted Nuthatch	Sitta carolinensis
Brown-headed Nuthatch	Sitta pusilla
Brown Creeper	Certhia americana
Red-whiskered Bulbul	Pycnonotus jocosus
Rock Wren	Salpinctes obsoletus
Carolina Wren	Thryothorus ludovicianus
Bewick's Wren	Thryomanes bewickii
House Wren	Troglodytes aedon
Winter Wren	Troglodytes troglodytes
Sedge Wren	Cistothorus platensis
Marsh Wren	Cistothorus palustris
Golden-crowned Kinglet	Regulus satrapa
Ruby-crowned Kinglet	Regulus calendula
Blue-gray Gnatcatcher	Polioptila caerulea
Northern Wheatear	Oenanthe oenanthe
Eastern Bluebird	Sialia sialis
Veery	Catharus fuscescens
Gray-cheeked Thrush	Catharus minimus
Swainson's Thrush	Catharus ustulatus
Hermit Thrush	Catharus guttatus
Wood Thrush	Catharus mustelinus
American Robin	Turdus migratorius
Varied Thrush	Ixoreus naevius
Gray Catbird	Dumetella carolinensis
Northern Mockingbird	Mimus polyglottos
Bahama Mockingbird	Mimus gundlachii
Sage Thrasher	Oreoscoptes montanus
Brown Thrasher	Toxostoma rufum
Curve-billed Thrasher	Toxostoma curvirostre
American Pipit	Anthus rubescens
Sprague's Pipit	Anthus spragueii
Cedar Waxwing	Bombycilla cedrorum
Loggerhead Shrike	Lanius ludovicianus
European Starling	Sturnus vulgaris
White-eyed Vireo	Vireo griseus
Thick-billed Vireo	Vireo crassirostris
Bell's Vireo	Vireo bellii
Solitary Vireo	Vireo solitarius
Yellow-throated Vireo	Vireo flavifrons
Warbling Vireo	Vireo gilvus
Philadelphia Vireo	Vireo philadelphicus
Red-eyed Vireo	Vireo olivaceus
Yellow-green Vireo	Vireo flavoviridis

Black-whiskered Vireo	Vireo altiloquus
Bachman's Warbler	Vermivora bachmanii
Blue-winged Warbler	Vermivora pinus
Golden-winged Warbler	Vermivora chrysoptera
Tennessee Warbler	Vermivora peregrina
Orange-crowned Warbler	Vermivora celata
Nashville Warbler	Vermivora ruficapilla
Northern Parula	Parula americana
Yellow Warbler	Dendroica petechia
Chestnut-sided Warbler	Dendroica pensylvanica
Magnolia Warbler	Dendroica magnolia
Cape May Warbler	Dendroica tigrina
Black-throated Blue Warbler	Dendroica caerulescens
Yellow-rumped Warbler	Dendroica coronata
Black-throated Gray Warbler	Dendroica nigrescens
Townsend's Warbler	Dendroica townsendi
Black-throated Green Warbler	Dendroica virens
Golden-cheeked Warbler	Dendroica chrysoparia
Blackburnian Warbler	Dendroica fusca
Yellow-throated Warbler	Dendroica dominica
Pine Warbler	Dendroica pinus
Kirtland's Warbler	Dendroica kirtlandii
Prairie Warbler	Dendroica discolor
Palm Warbler	Dendroica palmarum
Bay-breasted Warbler	Dendroica castanea
Blackpoll Warbler	Dendroica striata
Cerulean Warbler	Dendroica cerulea
Black-and-white Warbler	Mniotilta varia
American Redstart	Setophaga ruticilla
Prothonotary Warbler	Protonotaria citrea
Worm-eating Warbler	Helmitheros vermivorus
Swainson's Warbler	Limnothlypis swainsonii
Ovenbird	Seiurus aurocapillus
Northern Waterthrush	Seiurus noveboracensis
Louisiana Waterthrush	Seiurus motacilla
Kentucky Warbler	Oporornis formosus
Connecticut Warbler	Oporornis agilis
Mourning Warbler	Oporornis philadelphia
Common Yellowthroat	Geothlypis trichas
Hooded Warbler	Wilsonia citrina
Wilson's Warbler	Wilsonia pusilla
Canada Warbler	Wilsonia canadensis
Yellow-breasted Chat	Icteria virens
Bananaquit	Coereba flaveola
Stripe-headed Tanager	Spindalis zena
Summer Tanager	Piranga rubra

Scarlet Tanager	Piranga olivacea
Western Tanager	Piranga ludoviciana
Northern Cardinal	Cardinalis cardinalis
Rose-breasted Grosbeak	Pheucticus ludovicianus
Black-headed Grosbeak	Pheucticus melanocephalus
Blue Grosbeak	Guiraca caerulea
Lazuli Bunting	Passerina amoena
Indigo Bunting	Passerina cyanea
Painted Bunting	Passerina ciris
Dickcissel	Spiza americana
Green-tailed Towhee	Pipilo chlorurus
Rufous-sided Towhee	Pipilo erythrophthalmus
Yellow-faced Grassquit	Tiaris olivacea
Black-faced Grassquit	Tiaris bicolor
Bachman's Sparrow	Aimophila aestivalis
Rufous-crowned Sparrow	Aimophila ruficeps
American Tree Sparrow	Spizella arborea
Chipping Sparrow	Spizella passerina
Clay-colored Sparrow	Spizella pallida
Field Sparrow	Spizella pusilla
Vesper Sparrow	Pooecetes gramineus
Lark Sparrow	Chondestes grammacus
Black-throated Sparrow	Amphispiza bilineata
Lark Bunting	Calamospiza melanocorys
Savannah Sparrow	Passerculus sandwichensis
Grasshopper Sparrow	Ammodramus savannarum
Henslow's Sparrow	Ammodramus henslowii
Le Conte's Sparrow	Ammodramus leconteii
Sharp-tailed Sparrow	Ammodramus caudacutus
Seaside Sparrow	Ammodramus maritimus
Fox Sparrow	Passerella iliaca
Song Sparrow	Melospiza melodia
Lincoln's Sparrow	Melospiza lincolnii
Swamp Sparrow	Melospiza georgiana
White-throated Sparrow	Zonotrichia albicollis
Golden-crowned Sparrow	Zonotrichia atricapilla
White-crowned Sparrow	Zonotrichia leucophrys
Harris' Sparrow	Zonotrichia querula
Dark-eyed Junco	Junco hyemalis
Lapland Longspur	Calcarius lapponicus
Chestnut-collared Longspur	Calcarius ornatus
Snow Bunting	Plectrophenax nivalis
Bobolink	Dolichonyx oryzivorus
Red-winged Blackbird	Agelaius phoeniceus
Tawny-shouldered Blackbird	Agelaius humeralis
Eastern Meadowlark	Sturnella magna

Western Meadowlark	Sturnella neglecta
Yellow-headed Blackbird	Xanthocephalus xanthocephalus
Rusty Blackbird	Euphagus carolinus
Brewer's Blackbird	Euphagus cyanocephalus
Boat-tailed Grackle	Quiscalus major
Common Grackle	Quiscalus quiscula
Shiny Cowbird	Molothrus bonariensis
Bronzed Cowbird	Molothrus aeneus
Brown-headed Cowbird	Molothrus ater
Orchard Oriole	Icterus spurius
Spot-breasted Oriole	Icterus pectoralis
Northern Oriole	Icterus galbula
Purple Finch	Carpodacus purpureus
House Finch	Carpodacus mexicanus
Red Crossbill	Loxia curvirostra
White-winged Crossbill	Loxia leucoptera
Pine Siskin	Carduelis pinus
American Goldfinch	Carduelis tristis
Evening Grosbeak	Coccothraustes vespertinus
House Sparrow	Passer domesticus

Return To Birder's Diary Discussion
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591 BIRDS FOUND IN TEXAS

COMMON NAME	SCIENTIFIC NAME
Red-throated Loon	Gavia stellata
Pacific Loon	Gavia pacifica
Common Loon	Gavia immer
Yellow-billed Loon	Gavia adamsii
Least Grebe	Tachybaptus dominicus
Pied-billed Grebe	Podilymbus podiceps
Horned Grebe	Podiceps auritus
Red-necked Grebe	Podiceps grisegena
Eared Grebe	Podiceps nigricollis
Western Grebe	Aechmophorus occidentalis
Clark's Grebe	Aechmophorus clarkii
Yellow-nosed Albatross	Diomedea chlororhynchos
Cory's Shearwater	Calonectris diomedea
Greater Shearwater	Puffinus gravis
Sooty Shearwater	Puffinus griseus
Manx Shearwater	Puffinus puffinus
Audubon's Shearwater	Puffinus lherminieri
Wilson's Storm-Petrel	Oceanites oceanicus
Leach's Storm-Petrel	Oceanodroma leucorhoa
Band-rumped Storm-Petrel	Oceanodroma castro
Red-billed Tropicbird	Phaethon aethereus
Masked Booby	Sula dactylatra
Blue-footed Booby	Sula nebouxii
Brown Booby	Sula leucogaster
Red-footed Booby	Sula sula
Northern Gannet	Morus bassanus
American White Pelican	Pelecanus erythrorhynchos
Brown Pelican	Pelecanus occidentalis
Double-crested Cormorant	Phalacrocorax auritus
Neotropic Cormorant	Phalacrocorax brasilianus
Anhinga	Anhinga anhinga
Magnificent Frigatebird	Fregata magnificens
American Bittern	Botaurus lentiginosus
Least Bittern	Ixobrychus exilis
Great Blue Heron	Ardea herodias
Great Egret	Casmerodius albus
Snowy Egret	Egretta thula
Little Blue Heron	Egretta caerulea
Tricolored Heron	Egretta tricolor
Reddish Egret	Egretta rufescens
Cattle Egret	Bubulcus ibis

Green Heron	Butorides virescens
Black-crowned Night-Heron	Nycticorax nycticorax
Yellow-crowned Night-Heron	Nyctanassa violacea
White Ibis	Eudocimus albus
Glossy Ibis	Plegadis falcinellus
White-faced Ibis	Plegadis chihi
Roseate Spoonbill	Ajaia ajaja
Jabiru	Jabiru mycteria
Wood Stork	Mycteria americana
Greater Flamingo	Phoenicopterus ruber
Fulvous Whistling-Duck	Dendrocygna bicolor
Black-bellied Whistling-Duck	Dendrocygna autumnalis
Tundra Swan	Cygnus columbianus
Trumpeter Swan	Cygnus buccinator
Greater White-fronted Goose	Anser albifrons
Snow Goose	Anser caerulescens
Ross' Goose	Anser rossii
Brant	Branta bernicla
Canada Goose	Branta canadensis
Muscovy Duck	Cairina moschata
Wood Duck	Aix sponsa
Green-winged Teal	Anas crecca
American Black Duck	Anas rubripes
Mottled Duck	Anas fulvigula
Mallard	Anas platyrhynchos
White-cheeked Pintail	Anas bahamensis
Northern Pintail	Anas acuta
Garganey	Anas querquedula
Blue-winged Teal	Anas discors
Cinnamon Teal	Anas cyanoptera
Northern Shoveler	Anas clypeata
Gadwall	Anas strepera
Eurasian Wigeon	Anas penelope
American Wigeon	Anas americana
Canvasback	Aythya valisineria
Redhead	Aythya americana
Ring-necked Duck	Aythya collaris
Greater Scaup	Aythya marila
Lesser Scaup	Aythya affinis
Harlequin Duck	Histrionicus histrionicus
Oldsquaw	Clangula hyemalis
Black Scoter	Melanitta nigra
Surf Scoter	Melanitta perspicillata
White-winged Scoter	Melanitta fusca
Common Goldeneye	Bucephala clangula
Barrow's Goldeneye	Bucephala islandica

Bufflehead	Bucephala albeola
Hooded Merganser	Lophodytes cucullatus
Common Merganser	Mergus merganser
Red-breasted Merganser	Mergus serrator
Ruddy Duck	Oxyura jamaicensis
Masked Duck	Oxyura dominica
Black Vulture	Coragyps atratus
Turkey Vulture	Cathartes aura
Osprey	Pandion haliaetus
Hook-billed Kite	Chondrohierax uncinatus
American Swallow-tailed Kite	Elanoides forficatus
White-tailed Kite	Elanus leucurus
Snail Kite	Rostrhamus sociabilis
Mississippi Kite	Ictinia mississippiensis
Bald Eagle	Haliaeetus leucocephalus
Northern Harrier	Circus cyaneus
Sharp-shinned Hawk	Accipiter striatus
Cooper's Hawk	Accipiter cooperii
Northern Goshawk	Accipiter gentilis
Crane Hawk	Geranospiza caerulescens
Common Black-Hawk	Buteogallus anthracinus
Harris' Hawk	Parabuteo unicinctus
Gray Hawk	Buteo nitidus
Roadside Hawk	Buteo magnirostris
Red-shouldered Hawk	Buteo lineatus
Broad-winged Hawk	Buteo platypterus
Short-tailed Hawk	Buteo brachyurus
Swainson's Hawk	Buteo swainsoni
White-tailed Hawk	Buteo albicaudatus
Zone-tailed Hawk	Buteo albonotatus
Red-tailed Hawk	Buteo jamaicensis
Ferruginous Hawk	Buteo regalis
Rough-legged Hawk	Buteo lagopus
Golden Eagle	Aquila chrysaetos
Crested Caracara	Caracara plancus
American Kestrel	Falco sparverius
Merlin	Falco columbarius
Aplomado Falcon	Falco femoralis
Peregrine Falcon	Falco peregrinus
Prairie Falcon	Falco mexicanus
Plain Chachalaca	Ortalis vetula
Ring-necked Pheasant	Phasianus colchicus
Greater Prairie-Chicken	Tympanuchus cupido
Lesser Prairie-Chicken	Tympanuchus pallidicinctus
Wild Turkey	Meleagris gallopavo
Montezuma Quail	Cyrtonyx montezumae

Northern Bobwhite	Colinus virginianus
Scaled Quail	Callipepla squamata
Gambel's Quail	Callipepla gambelii
Yellow Rail	Coturnicops noveboracensis
Black Rail	Laterallus jamaicensis
Clapper Rail	Rallus longirostris
King Rail	Rallus elegans
Virginia Rail	Rallus limicola
Sora	Porzana carolina
Paint-billed Crake	Neocrex erythrops
Spotted Rail	Pardirallus maculatus
Purple Gallinule	Porphyrio martinicus
Common Moorhen	Gallinula chloropus
American Coot	Fulica americana
Sandhill Crane	Grus canadensis
Whooping Crane	Grus americana
Double-striped Thick-knee	Burhinus bistriatus
Black-bellied Plover	Pluvialis squatarola
American Golden-Plover	Pluvialis dominica
Snowy Plover	Charadrius alexandrinus
Wilson's Plover	Charadrius wilsonia
Semipalmated Plover	Charadrius semipalmatus
Piping Plover	Charadrius melodus
Killdeer	Charadrius vociferus
Mountain Plover	Charadrius montanus
American Oystercatcher	Haematopus palliatus
Black-necked Stilt	Himantopus mexicanus
American Avocet	Recurvirostra americana
Northern Jacana	Jacana spinosa
Greater Yellowlegs	Tringa melanoleuca
Lesser Yellowlegs	Tringa flavipes
Solitary Sandpiper	Tringa solitaria
Willet	Catoptrophorus semipalmatus
Wandering Tattler	Heteroscelus incanus
Spotted Sandpiper	Actitis macularia
Upland Sandpiper	Bartramia longicauda
Eskimo Curlew	Numenius borealis
Whimbrel	Numenius phaeopus
Long-billed Curlew	Numenius americanus
Hudsonian Godwit	Limosa haemastica
Marbled Godwit	Limosa fedoa
Ruddy Turnstone	Arenaria interpres
Surfbird	Aphriza virgata
Red Knot	Calidris canutus
Sanderling	Calidris alba
Semipalmated Sandpiper	Calidris pusilla

Western Sandpiper	Calidris mauri
Least Sandpiper	Calidris minutilla
White-rumped Sandpiper	Calidris fuscicollis
Baird's Sandpiper	Calidris bairdii
Pectoral Sandpiper	Calidris melanotos
Sharp-tailed Sandpiper	Calidris acuminata
Purple Sandpiper	Calidris maritima
Dunlin	Calidris alpina
Curlew Sandpiper	Calidris ferruginea
Stilt Sandpiper	Micropalama himantopus
Buff-breasted Sandpiper	Tryngites subruficollis
Ruff	Philomachus pugnax
Short-billed Dowitcher	Limnodromus griseus
Long-billed Dowitcher	Limnodromus scolopaceus
Common Snipe	Gallinago gallinago
American Woodcock	Scolopax minor
Wilson's Phalarope	Steganopus tricolor
Red-necked Phalarope	Phalaropus lobatus
Red Phalarope	Phalaropus fulicaria
Pomarine Jaeger	Stercorarius pomarinus
Parasitic Jaeger	Stercorarius parasiticus
Long-tailed Jaeger	Stercorarius longicaudus
Laughing Gull	Larus atricilla
Franklin's Gull	Larus pipixcan
Little Gull	Larus minutus
Common Black-headed Gull	Larus ridibundus
Bonaparte's Gull	Larus philadelphia
Heermann's Gull	Larus heermanni
Mew Gull	Larus canus
Ring-billed Gull	Larus delawarensis
California Gull	Larus californicus
Herring Gull	Larus argentatus
Thayer's Gull	Larus thayeri
Iceland Gull	Larus glaucoides
Lesser Black-backed Gull	Larus fuscus
Slaty-backed Gull	Larus schistisagus
Western Gull	Larus occidentalis
Glaucous Gull	Larus hyperboreus
Great Black-backed Gull	Larus marinus
Black-legged Kittiwake	Rissa tridactyla
Sabine's Gull	Xema sabini
Gull-billed Tern	Sterna nilotica
Caspian Tern	Sterna caspia
Royal Tern	Sterna maxima
Elegant Tern	Sterna elegans
Sandwich Tern	Sterna sandvicensis

Common Tern	Sterna hirundo
Forster's Tern	Sterna forsteri
Least Tern	Sterna antillarum
Bridled Tern	Sterna anaethetus
Sooty Tern	Sterna fuscata
Black Tern	Chlidonias niger
Brown Noddy	Anous stolidus
Black Noddy	Anous minutus
Black Skimmer	Rynchops niger
Rock Dove	Columba livia
White-crowned Pigeon	Columba leucocephala
Red-billed Pigeon	Columba flavirostris
Band-tailed Pigeon	Columba fasciata
White-winged Dove	Zenaida asiatica
Mourning Dove	Zenaida macroura
Passenger Pigeon	Ectopistes migratorius
Inca Dove	Columbina inca
Common Ground-Dove	Columbina passerina
Ruddy Ground-Dove	Columbina talpacoti
White-tipped Dove	Leptotila verreauxi
Carolina Parakeet	Conuropsis carolinensis
Monk Parakeet	Myiopsitta monachus
Red-crowned Parrot	Amazona viridigenalis
Black-billed Cuckoo	Coccyzus erythropthalmus
Yellow-billed Cuckoo	Coccyzus americanus
Mangrove Cuckoo	Coccyzus minor
Greater Roadrunner	Geococcyx californianus
Groove-billed Ani	Crotophaga sulcirostris
Barn Owl	Tyto alba
Flammulated Owl	Otus flammeolus
Eastern Screech-Owl	Otus asio
Western Screech-Owl	Otus kennicottii
Great Horned Owl	Bubo virginianus
Snowy Owl	Nyctea scandiaca
Northern Pygmy-Owl	Glaucidium gnoma
Ferruginous Pygmy-Owl	Glaucidium brasilianum
Elf Owl	Micrathene whitneyi
Burrowing Owl	Speotyto cunicularia
Mottled Owl	Strix virgata
Spotted Owl	Strix occidentalis
Barred Owl	Strix varia
Long-eared Owl	Asio otus
Short-eared Owl	Asio flammeus
Northern Saw-whet Owl	Aegolius acadicus
Lesser Nighthawk	Chordeiles acutipennis
Common Nighthawk	Chordeiles minor

Pauraque	Nyctidromus albicollis
Common Poorwill	Phalaenoptilus nuttallii
Chuck-will's-widow	Caprimulgus carolinensis
Whip-poor-will	Caprimulgus vociferus
White-collared Swift	Streptoprocne zonaris
Chimney Swift	Chaetura pelagica
White-throated Swift	Aeronautes saxatalis
Green Violet-ear	Colibri thalassinus
Broad-billed Hummingbird	Cynanthus latirostris
White-eared Hummingbird	Hylocharis leucotis
Berylline Hummingbird	Amazilia beryllina
Buff-bellied Hummingbird	Amazilia yucatanensis
Violet-crowned Hummingbird	Amazilia violiceps
Blue-throated Hummingbird	Lampornis clemenciae
Magnificent Hummingbird	Eugenes fulgens
Lucifer Hummingbird	Calothorax lucifer
Ruby-throated Hummingbird	Archilochus colubris
Black-chinned Hummingbird	Archilochus alexandri
Anna's Hummingbird	Calypte anna
Costa's Hummingbird	Calypte costae
Calliope Hummingbird	Stellula calliope
Broad-tailed Hummingbird	Selasphorus platycercus
Rufous Hummingbird	Selasphorus rufus
Allen's Hummingbird	Selasphorus sasin
Elegant Trogon	Trogon elegans
Ringed Kingfisher	Ceryle torquata
Belted Kingfisher	Ceryle alcyon
Green Kingfisher	Chloroceryle americana
Lewis' Woodpecker	Melanerpes lewis
Red-headed Woodpecker	Melanerpes erythrocephalus
Acorn Woodpecker	Melanerpes formicivorus
Golden-fronted Woodpecker	Melanerpes aurifrons
Red-bellied Woodpecker	Melanerpes carolinus
Yellow-bellied Sapsucker	Sphyrapicus varius
Red-naped Sapsucker	Sphyrapicus nuchalis
Williamson's Sapsucker	Sphyrapicus thyroideus
Ladder-backed Woodpecker	Picoides scalaris
Downy Woodpecker	Picoides pubescens
Hairy Woodpecker	Picoides villosus
Red-cockaded Woodpecker	Picoides borealis
Northern Flicker	Colaptes auratus
Pileated Woodpecker	Dryocopus pileatus
Ivory-billed Woodpecker	Campephilus principalis
Northern Beardless-Tyrannulet	Camptostoma imberbe
Greenish Elaenia	Myiopagis viridicata
Tufted Flycatcher	Mitrephanes phaeocercus

Olive-sided Flycatcher	Contopus borealis
Greater Pewee	Contopus pertinax
Western Wood-Pewee	Contopus sordidulus
Eastern Wood-Pewee	Contopus virens
Yellow-bellied Flycatcher	Empidonax flaviventris
Acadian Flycatcher	Empidonax virescens
Alder Flycatcher	Empidonax alnorum
Willow Flycatcher	Empidonax traillii
Least Flycatcher	Empidonax minimus
Hammond's Flycatcher	Empidonax hammondii
Dusky Flycatcher	Empidonax oberholseri
Gray Flycatcher	Empidonax wrightii
Cordilleran Flycatcher	Empidonax occidentalis
Black Phoebe	Sayornis nigricans
Eastern Phoebe	Sayornis phoebe
Say's Phoebe	Sayornis saya
Vermilion Flycatcher	Pyrocephalus rubinus
Dusky-capped Flycatcher	Myiarchus tuberculifer
Ash-throated Flycatcher	Myiarchus cinerascens
Great Crested Flycatcher	Myiarchus crinitus
Brown-crested Flycatcher	Myiarchus tyrannulus
Great Kiskadee	Pitangus sulphuratus
Sulphur-bellied Flycatcher	Myiodynastes luteiventris
Tropical Kingbird	Tyrannus melancholicus
Couch's Kingbird	Tyrannus couchii
Cassin's Kingbird	Tyrannus vociferans
Thick-billed Kingbird	Tyrannus crassirostris
Western Kingbird	Tyrannus verticalis
Eastern Kingbird	Tyrannus tyrannus
Gray Kingbird	Tyrannus dominicensis
Scissor-tailed Flycatcher	Tyrannus forficatus
Fork-tailed Flycatcher	Tyrannus savana
Rose-throated Becard	Pachyramphus aglaiae
Masked Tityra	Tityra semifasciata
Horned Lark	Eremophila alpestris
Purple Martin	Progne subis
Gray-breasted Martin	Progne chalybea
Tree Swallow	Tachycineta bicolor
Violet-green Swallow	Tachycineta thalassina
Northern Rough-winged Swallow	Stelgidopteryx serripennis
Bank Swallow	Riparia riparia
Cliff Swallow	Hirundo pyrrhonota
Cave Swallow	Hirundo fulva
Barn Swallow	Hirundo rustica
Steller's Jay	Cyanocitta stelleri
Blue Jay	Cyanocitta cristata

Green Jay	Cyanocorax yncas
Brown Jay	Psilorhinus morio
Scrub Jay	Aphelocoma coerulescens
Gray-breasted Jay	Aphelocoma ultramarina
Pinyon Jay	Gymnorhinus cyanocephalus
Clark's Nutcracker	Nucifraga columbiana
Black-billed Magpie	Pica pica
American Crow	Corvus brachyrhynchos
Mexican Crow	Corvus imparatus
Fish Crow	Corvus ossifragus
Chihuahuan Raven	Corvus cryptoleucus
Common Raven	Corvus corax
Carolina Chickadee	Parus carolinensis
Mountain Chickadee	Parus gambeli
Plain Titmouse	Parus inornatus
Tufted Titmouse	Parus bicolor
Verdin	Auriparus flaviceps
Bushtit	Psaltriparus minimus
Red-breasted Nuthatch	Sitta canadensis
White-breasted Nuthatch	Sitta carolinensis
Pygmy Nuthatch	Sitta pygmaea
Brown-headed Nuthatch	Sitta pusilla
Brown Creeper	Certhia americana
Cactus Wren	Campylorhynchus brunneicapillus
Rock Wren	Salpinctes obsoletus
Canyon Wren	Catherpes mexicanus
Carolina Wren	Thryothorus ludovicianus
Bewick's Wren	Thryomanes bewickii
House Wren	Troglodytes aedon
Winter Wren	Troglodytes troglodytes
Sedge Wren	Cistothorus platensis
Marsh Wren	Cistothorus palustris
American Dipper	Cinclus mexicanus
Golden-crowned Kinglet	Regulus satrapa
Ruby-crowned Kinglet	Regulus calendula
Blue-gray Gnatcatcher	Polioptila caerulea
Black-tailed Gnatcatcher	Polioptila melanura
Eastern Bluebird	Sialia sialis
Western Bluebird	Sialia mexicana
Mountain Bluebird	Sialia currucoides
Townsend's Solitaire	Myadestes townsendi
Veery	Catharus fuscescens
Gray-cheeked Thrush	Catharus minimus
Swainson's Thrush	Catharus ustulatus
Hermit Thrush	Catharus guttatus
Wood Thrush	Catharus mustelinus

Clay-colored Robin	Turdus grayi
White-throated Robin	Turdus assimilis
Rufous-backed Robin	Turdus rufopalliatus
American Robin	Turdus migratorius
Varied Thrush	Ixoreus naevius
Aztec Thrush	Ridgwayia pinicola
Gray Catbird	Dumetella carolinensis
Northern Mockingbird	Mimus polyglottos
Sage Thrasher	Oreoscoptes montanus
Brown Thrasher	Toxostoma rufum
Long-billed Thrasher	Toxostoma longirostre
Curve-billed Thrasher	Toxostoma curvirostre
Crissal Thrasher	Toxostoma crissale
American Pipit	Anthus rubescens
Sprague's Pipit	Anthus spragueii
Bohemian Waxwing	Bombycilla garrulus
Cedar Waxwing	Bombycilla cedrorum
Gray Silky-flycatcher	Ptilogonys cinereus
Phainopepla	Phainopepla nitens
Northern Shrike	Lanius excubitor
Loggerhead Shrike	Lanius ludovicianus
European Starling	Sturnus vulgaris
White-eyed Vireo	Vireo griseus
Bell's Vireo	Vireo bellii
Black-capped Vireo	Vireo atricapillus
Gray Vireo	Vireo vicinior
Solitary Vireo	Vireo solitarius
Yellow-throated Vireo	Vireo flavifrons
Hutton's Vireo	Vireo huttoni
Warbling Vireo	Vireo gilvus
Philadelphia Vireo	Vireo philadelphicus
Red-eyed Vireo	Vireo olivaceus
Yellow-green Vireo	Vireo flavoviridis
Black-whiskered Vireo	Vireo altiloquus
Yucatan Vireo	Vireo magister
Blue-winged Warbler	Vermivora pinus
Golden-winged Warbler	Vermivora chrysoptera
Tennessee Warbler	Vermivora peregrina
Orange-crowned Warbler	Vermivora celata
Nashville Warbler	Vermivora ruficapilla
Virginia's Warbler	Vermivora virginiae
Colima Warbler	Vermivora crissalis
Lucy's Warbler	Vermivora luciae
Northern Parula	Parula americana
Tropical Parula	Parula pitiayumi
Crescent-chested Warbler	Parula superciliosa

Yellow Warbler	Dendroica petechia
Chestnut-sided Warbler	Dendroica pensylvanica
Magnolia Warbler	Dendroica magnolia
Cape May Warbler	Dendroica tigrina
Black-throated Blue Warbler	Dendroica caerulescens
Yellow-rumped Warbler	Dendroica coronata
Black-throated Gray Warbler	Dendroica nigrescens
Townsend's Warbler	Dendroica townsendi
Hermit Warbler	Dendroica occidentalis
Black-throated Green Warbler	Dendroica virens
Golden-cheeked Warbler	Dendroica chrysoparia
Blackburnian Warbler	Dendroica fusca
Yellow-throated Warbler	Dendroica dominica
Grace's Warbler	Dendroica graciae
Pine Warbler	Dendroica pinus
Prairie Warbler	Dendroica discolor
Palm Warbler	Dendroica palmarum
Bay-breasted Warbler	Dendroica castanea
Blackpoll Warbler	Dendroica striata
Cerulean Warbler	Dendroica cerulea
Black-and-white Warbler	Mniotilta varia
American Redstart	Setophaga ruticilla
Prothonotary Warbler	Protonotaria citrea
Worm-eating Warbler	Helmitheros vermivorus
Swainson's Warbler	Limnothlypis swainsonii
Ovenbird	Seiurus aurocapillus
Northern Waterthrush	Seiurus noveboracensis
Louisiana Waterthrush	Seiurus motacilla
Kentucky Warbler	Oporornis formosus
Connecticut Warbler	Oporornis agilis
Mourning Warbler	Oporornis philadelphia
MacGillivray's Warbler	Oporornis tolmiei
Common Yellowthroat	Geothlypis trichas
Gray-crowned Yellowthroat	Geothlypis poliocephala
Hooded Warbler	Wilsonia citrina
Wilson's Warbler	Wilsonia pusilla
Canada Warbler	Wilsonia canadensis
Red-faced Warbler	Cardellina rubrifrons
Painted Redstart	Myioborus pictus
Slate-throated Redstart	Myioborus miniatus
Golden-crowned Warbler	Basileuterus culicivorus
Rufous-capped Warbler	Basileuterus rufifrons
Yellow-breasted Chat	Icteria virens
Olive Warbler	Peucedramus taeniatus
Hepatic Tanager	Piranga flava
Summer Tanager	Piranga rubra

Scarlet Tanager	Piranga olivacea
Western Tanager	Piranga ludoviciana
Crimson-collared Grosbeak	Rhodothraupis celaeno
Northern Cardinal	Cardinalis cardinalis
Pyrrhuloxia	Cardinalis sinuatus
Rose-breasted Grosbeak	Pheucticus ludovicianus
Black-headed Grosbeak	Pheucticus melanocephalus
Blue Bunting	Cyanocompsa parellina
Blue Grosbeak	Guiraca caerulea
Lazuli Bunting	Passerina amoena
Indigo Bunting	Passerina cyanea
Varied Bunting	Passerina versicolor
Painted Bunting	Passerina ciris
Dickcissel	Spiza americana
Olive Sparrow	Arremonops rufivirgatus
Green-tailed Towhee	Pipilo chlorurus
Rufous-sided Towhee	Pipilo erythrophthalmus
Canyon Towhee	Pipilo fuscus
White-collared Seedeater	Sporophila torqueola
Yellow-faced Grassquit	Tiaris olivacea
Bachman's Sparrow	Aimophila aestivalis
Botteri's Sparrow	Aimophila botterii
Cassin's Sparrow	Aimophila cassinii
Rufous-crowned Sparrow	Aimophila ruficeps
American Tree Sparrow	Spizella arborea
Chipping Sparrow	Spizella passerina
Clay-colored Sparrow	Spizella pallida
Brewer's Sparrow	Spizella breweri
Field Sparrow	Spizella pusilla
Black-chinned Sparrow	Spizella atrogularis
Vesper Sparrow	Pooecetes gramineus
Lark Sparrow	Chondestes grammacus
Black-throated Sparrow	Amphispiza bilineata
Sage Sparrow	Amphispiza belli
Lark Bunting	Calamospiza melanocorys
Savannah Sparrow	Passerculus sandwichensis
Baird's Sparrow	Ammodramus bairdii
Grasshopper Sparrow	Ammodramus savannarum
Henslow's Sparrow	Ammodramus henslowii
Le Conte's Sparrow	Ammodramus leconteii
Sharp-tailed Sparrow	Ammodramus caudacutus
Seaside Sparrow	Ammodramus maritimus
Fox Sparrow	Passerella iliaca
Song Sparrow	Melospiza melodia
Lincoln's Sparrow	Melospiza lincolnii
Swamp Sparrow	Melospiza georgiana

White-throated Sparrow	Zonotrichia albicollis
Golden-crowned Sparrow	Zonotrichia atricapilla
White-crowned Sparrow	Zonotrichia leucophrys
Harris' Sparrow	Zonotrichia querula
Dark-eyed Junco	Junco hyemalis
Yellow-eyed Junco	Junco phaeonotus
McCown's Longspur	Calcarius mccownii
Lapland Longspur	Calcarius lapponicus
Smith's Longspur	Calcarius pictus
Chestnut-collared Longspur	Calcarius ornatus
Snow Bunting	Plectrophenax nivalis
Bobolink	Dolichonyx oryzivorus
Red-winged Blackbird	Agelaius phoeniceus
Eastern Meadowlark	Sturnella magna
Western Meadowlark	Sturnella neglecta
Yellow-headed Blackbird	Xanthocephalus xanthocephalus
Rusty Blackbird	Euphagus carolinus
Brewer's Blackbird	Euphagus cyanocephalus
Great-tailed Grackle	Quiscalus mexicanus
Boat-tailed Grackle	Quiscalus major
Common Grackle	Quiscalus quiscula
Shiny Cowbird	Molothrus bonariensis
Bronzed Cowbird	Molothrus aeneus
Brown-headed Cowbird	Molothrus ater
Black-vented Oriole	Icterus wagleri
Orchard Oriole	Icterus spurius
Hooded Oriole	Icterus cucullatus
Altamira Oriole	Icterus gularis
Audubon's Oriole	Icterus graduacauda
Northern Oriole	Icterus galbula
Scott's Oriole	Icterus parisorum
Pine Grosbeak	Pinicola enucleator
Purple Finch	Carpodacus purpureus
Cassin's Finch	Carpodacus cassinii
House Finch	Carpodacus mexicanus
Red Crossbill	Loxia curvirostra
White-winged Crossbill	Loxia leucoptera
Common Redpoll	Carduelis flammea
Pine Siskin	Carduelis pinus
Lesser Goldfinch	Carduelis psaltria
Lawrence's Goldfinch	Carduelis lawrencei
American Goldfinch	Carduelis tristis
Evening Grosbeak	Coccothraustes vespertinus
House Sparrow	Passer domesticus

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585 BIRDS FOUND IN CALIFORNIA

COMMON NAME	SCIENTIFIC NAME
Red-throated Loon	Gavia stellata
Arctic Loon	Gavia arctica
Pacific Loon	Gavia pacifica
Common Loon	Gavia immer
Yellow-billed Loon	Gavia adamsii
Least Grebe	Tachybaptus dominicus
Pied-billed Grebe	Podilymbus podiceps
Horned Grebe	Podiceps auritus
Red-necked Grebe	Podiceps grisegena
Eared Grebe	Podiceps nigricollis
Western Grebe	Aechmophorus occidentalis
Clark's Grebe	Aechmophorus clarkii
Wandering Albatross	Diomedea exulans
Short-tailed Albatross	Diomedea albatrus
Black-footed Albatross	Diomedea nigripes
Laysan Albatross	Diomedea immutabilis
Northern Fulmar	Fulmarus glacialis
Mottled Petrel	Pterodroma inexpectata
Murphy's Petrel	Pterodroma ultima
Cook's Petrel	Pterodroma cookii
Stejneger's Petrel	Pterodroma longirostris
Streaked Shearwater	Calonectris leucomelas
Pink-footed Shearwater	Puffinus creatopus
Flesh-footed Shearwater	Puffinus carneipes
Wedge-tailed Shearwater	Puffinus pacificus
Buller's Shearwater	Puffinus bulleri
Sooty Shearwater	Puffinus griseus
Short-tailed Shearwater	Puffinus tenuirostris
Manx Shearwater	Puffinus puffinus
Black-vented Shearwater	Puffinus opisthomelas
Wilson's Storm-Petrel	Oceanites oceanicus
Fork-tailed Storm-Petrel	Oceanodroma furcata
Leach's Storm-Petrel	Oceanodroma leucorhoa
Ashy Storm-Petrel	Oceanodroma homochroa
Wedge-rumped Storm-Petrel	Oceanodroma tethys
Black Storm-Petrel	Oceanodroma melania
Least Storm-Petrel	Oceanodroma microsoma
White-tailed Tropicbird	Phaethon lepturus
Red-billed Tropicbird	Phaethon aethereus
Red-tailed Tropicbird	Phaethon rubricauda
Masked Booby	Sula dactylatra

Blue-footed Booby	Sula nebouxii
Brown Booby	Sula leucogaster
Red-footed Booby	Sula sula
American White Pelican	Pelecanus erythrorhynchos
Brown Pelican	Pelecanus occidentalis
Double-crested Cormorant	Phalacrocorax auritus
Neotropic Cormorant	Phalacrocorax brasilianus
Brandt's Cormorant	Phalacrocorax penicillatus
Pelagic Cormorant	Phalacrocorax pelagicus
Anhinga	Anhinga anhinga
Magnificent Frigatebird	Fregata magnificens
Great Frigatebird	Fregata minor
American Bittern	Botaurus lentiginosus
Least Bittern	Ixobrychus exilis
Great Blue Heron	Ardea herodias
Great Egret	Casmerodius albus
Snowy Egret	Egretta thula
Little Blue Heron	Egretta caerulea
Tricolored Heron	Egretta tricolor
Reddish Egret	Egretta rufescens
Cattle Egret	Bubulcus ibis
Green Heron	Butorides virescens
Black-crowned Night-Heron	Nycticorax nycticorax
Yellow-crowned Night-Heron	Nyctanassa violacea
White Ibis	Eudocimus albus
White-faced Ibis	Plegadis chihi
Roseate Spoonbill	Ajaia ajaja
Wood Stork	Mycteria americana
Fulvous Whistling-Duck	Dendrocygna bicolor
Black-bellied Whistling-Duck	Dendrocygna autumnalis
Tundra Swan	Cygnus columbianus
Whooper Swan	Cygnus cygnus
Trumpeter Swan	Cygnus buccinator
Greater White-fronted Goose	Anser albifrons
Snow Goose	Anser caerulescens
Ross' Goose	Anser rossii
Emperor Goose	Anser canagica
Brant	Branta bernicla
Canada Goose	Branta canadensis
Wood Duck	Aix sponsa
Green-winged Teal	Anas crecca
Baikal Teal	Anas formosa
American Black Duck	Anas rubripes
Mallard	Anas platyrhynchos
Northern Pintail	Anas acuta
Garganey	Anas querquedula

Blue-winged Teal	Anas discors
Cinnamon Teal	Anas cyanoptera
Northern Shoveler	Anas clypeata
Gadwall	Anas strepera
Eurasian Wigeon	Anas penelope
American Wigeon	Anas americana
Common Pochard	Aythya ferina
Canvasback	Aythya valisineria
Redhead	Aythya americana
Ring-necked Duck	Aythya collaris
Tufted Duck	Aythya fuligula
Greater Scaup	Aythya marila
Lesser Scaup	Aythya affinis
King Eider	Somateria spectabilis
Steller's Eider	Polysticta stelleri
Harlequin Duck	Histrionicus histrionicus
Oldsquaw	Clangula hyemalis
Black Scoter	Melanitta nigra
Surf Scoter	Melanitta perspicillata
White-winged Scoter	Melanitta fusca
Common Goldeneye	Bucephala clangula
Barrow's Goldeneye	Bucephala islandica
Bufflehead	Bucephala albeola
Smew	Mergellus albellus
Hooded Merganser	Lophodytes cucullatus
Common Merganser	Mergus merganser
Red-breasted Merganser	Mergus serrator
Ruddy Duck	Oxyura jamaicensis
Turkey Vulture	Cathartes aura
California Condor	Gymnogyps californianus
Osprey	Pandion haliaetus
White-tailed Kite	Elanus leucurus
Mississippi Kite	Ictinia mississippiensis
Bald Eagle	Haliaeetus leucocephalus
Northern Harrier	Circus cyaneus
Sharp-shinned Hawk	Accipiter striatus
Cooper's Hawk	Accipiter cooperii
Northern Goshawk	Accipiter gentilis
Common Black-Hawk	Buteogallus anthracinus
Harris' Hawk	Parabuteo unicinctus
Red-shouldered Hawk	Buteo lineatus
Broad-winged Hawk	Buteo platypterus
Swainson's Hawk	Buteo swainsoni
Zone-tailed Hawk	Buteo albonotatus
Red-tailed Hawk	Buteo jamaicensis
Ferruginous Hawk	Buteo regalis

Rough-legged Hawk	Buteo lagopus
Golden Eagle	Aquila chrysaetos
American Kestrel	Falco sparverius
Merlin	Falco columbarius
Peregrine Falcon	Falco peregrinus
Gyrfalcon	Falco rusticolus
Prairie Falcon	Falco mexicanus
Chukar	Alectoris chukar
Ring-necked Pheasant	Phasianus colchicus
Blue Grouse	Dendragapus obscurus
White-tailed Ptarmigan	Lagopus leucurus
Ruffed Grouse	Bonasa umbellus
Sage Grouse	Centrocercus urophasianus
Sharp-tailed Grouse	Tympanuchus phasianellus
Wild Turkey	Meleagris gallopavo
Gambel's Quail	Callipepla gambelii
California Quail	Callipepla californica
Mountain Quail	Oreortyx pictus
Yellow Rail	Coturnicops noveboracensis
Black Rail	Laterallus jamaicensis
Clapper Rail	Rallus longirostris
Virginia Rail	Rallus limicola
Sora	Porzana carolina
Purple Gallinule	Porphyrio martinicus
Common Moorhen	Gallinula chloropus
American Coot	Fulica americana
Sandhill Crane	Grus canadensis
Black-bellied Plover	Pluvialis squatarola
Pacific Golden-Plover	Pluvialis fulva
American Golden-Plover	Pluvialis dominica
Mongolian Plover	Charadrius mongolus
Snowy Plover	Charadrius alexandrinus
Wilson's Plover	Charadrius wilsonia
Semipalmated Plover	Charadrius semipalmatus
Piping Plover	Charadrius melodus
Killdeer	Charadrius vociferus
Mountain Plover	Charadrius montanus
Eurasian Dotterel	Eudromias morinellus
American Oystercatcher	Himantopus mexicanus
American Avocet	Recurvirostra americana
Greater Yellowlegs	Tringa melanoleuca
Lesser Yellowlegs	Tringa flavipes
Spotted Redshank	Tringa erythropus
Solitary Sandpiper	Tringa solitaria
Willet	Catoptrophorus semipalmatus
Wandering Tattler	Heteroscelus incanus

Gray-tailed Tattler	Heteroscelus brevipes
Spotted Sandpiper	Actitis macularia
Terek Sandpiper	Xenus cinereus
Upland Sandpiper	Bartramia longicauda
Little Curlew	Numenius minutus
Whimbrel	Numenius phaeopus
Long-billed Curlew	Numenius americanus
Hudsonian Godwit	Limosa haemastica
Bar-tailed Godwit	Limosa lapponica
Marbled Godwit	Limosa fedoa
Ruddy Turnstone	Arenaria interpres
Black Turnstone	Arenaria melanocephala
Surfbird	Aphriza virgata
Red Knot	Calidris canutus
Sanderling	Calidris alba
Semipalmated Sandpiper	Calidris pusilla
Western Sandpiper	Calidris mauri
Rufous-necked Stint	Calidris ruficollis
Little Stint	Calidris minuta
Long-toed Stint	Calidris subminuta
Least Sandpiper	Calidris minutilla
White-rumped Sandpiper	Calidris fuscicollis
Baird's Sandpiper	Calidris bairdii
Pectoral Sandpiper	Calidris melanotos
Sharp-tailed Sandpiper	Calidris acuminata
Rock Sandpiper	Calidris ptilocnemis
Dunlin	Calidris alpina
Curlew Sandpiper	Calidris ferruginea
Stilt Sandpiper	Micropalama himantopus
Buff-breasted Sandpiper	Tryngites subruficollis
Ruff	Philomachus pugnax
Short-billed Dowitcher	Limnodromus griseus
Long-billed Dowitcher	Limnodromus scolopaceus
Jack Snipe	Lymnocryptes minimus
Common Snipe	Gallinago gallinago
Wilson's Phalarope	Steganopus tricolor
Red-necked Phalarope	Phalaropus lobatus
Red Phalarope	Phalaropus fulicaria
Pomarine Jaeger	Stercorarius pomarinus
Parasitic Jaeger	Stercorarius parasiticus
Long-tailed Jaeger	Stercorarius longicaudus
South Polar Skua	Catharacta maccormicki
Laughing Gull	Larus atricilla
Franklin's Gull	Larus pipixcan
Little Gull	Larus minutus
Common Black-headed Gull	Larus ridibundus

Bonaparte's Gull	Larus philadelphia
Heermann's Gull	Larus heermanni
Mew Gull	Larus canus
Ring-billed Gull	Larus delawarensis
California Gull	Larus californicus
Herring Gull	Larus argentatus
Thayer's Gull	Larus thayeri
Lesser Black-backed Gull	Larus fuscus
Yellow-footed Gull	Larus livens
Western Gull	Larus occidentalis
Glaucous-winged Gull	Larus glaucescens
Glaucous Gull	Larus hyperboreus
Black-legged Kittiwake	Rissa tridactyla
Sabine's Gull	Xema sabini
Gull-billed Tern	Sterna nilotica
Caspian Tern	Sterna caspia
Royal Tern	Sterna maxima
Elegant Tern	Sterna elegans
Sandwich Tern	Sterna sandvicensis
Common Tern	Sterna hirundo
Arctic Tern	Sterna paradisaea
Forster's Tern	Sterna forsteri
Least Tern	Sterna antillarum
Sooty Tern	Sterna fuscata
Black Tern	Chlidonias niger
Black Skimmer	Rynchops niger
Common Murre	Uria aalge
Thick-billed Murre	Uria lomvia
Pigeon Guillemot	Cepphus columba
Marbled Murrelet	Brachyramphus marmoratus
Kittlitz's Murrelet	Brachyramphus brevirostris
Xantus' Murrelet	Synthliboramphus hypoleucus
Craveri's Murrelet	Synthliboramphus craveri
Ancient Murrelet	Synthliboramphus antiquus
Cassin's Auklet	Ptychoramphus aleuticus
Parakeet Auklet	Cyclorrhynchus psittacula
Least Auklet	Aethia pusilla
Crested Auklet	Aethia cristatella
Rhinoceros Auklet	Cerorhinca monocerata
Tufted Puffin	Fratercula cirrhata
Horned Puffin	Fratercula corniculata
Rock Dove	Columba livia
Band-tailed Pigeon	Columba fasciata
Spotted Dove	Streptopelia chinensis
White-winged Dove	Zenaida asiatica
Mourning Dove	Zenaida macroura

Inca Dove	Columbina inca
Common Ground-Dove	Columbina passerina
Ruddy Ground-Dove	Columbina talpacoti
Canary-winged Parakeet	Brotogeris versicolurus
Black-billed Cuckoo	Coccyzus erythropthalmus
Yellow-billed Cuckoo	Coccyzus americanus
Greater Roadrunner	Geococcyx californianus
Groove-billed Ani	Crotophaga sulcirostris
Barn Owl	Tyto alba
Flammulated Owl	Otus flammeolus
Western Screech-Owl	Otus kennicottii
Great Horned Owl	Bubo virginianus
Snowy Owl	Nyctea scandiaca
Northern Pygmy-Owl	Glaucidium gnoma
Elf Owl	Micrathene whitneyi
Burrowing Owl	Speotyto cunicularia
Spotted Owl	Strix occidentalis
Barred Owl	Strix varia
Great Gray Owl	Strix nebulosa
Long-eared Owl	Asio otus
Short-eared Owl	Asio flammeus
Northern Saw-whet Owl	Aegolius acadicus
Lesser Nighthawk	Chordeiles acutipennis
Common Nighthawk	Chordeiles minor
Common Poorwill	Phalaenoptilus nuttallii
Chuck-will's-widow	Caprimulgus carolinensis
Whip-poor-will	Caprimulgus vociferus
Black Swift	Cypseloides niger
White-collared Swift	Streptoprocne zonaris
Chimney Swift	Chaetura pelagica
Vaux's Swift	Chaetura vauxi
White-throated Swift	Aeronautes saxatalis
Broad-billed Hummingbird	Cynanthus latirostris
Xantus' Hummingbird	Hylocharis xantusii
Violet-crowned Hummingbird	Amazilia violiceps
Blue-throated Hummingbird	Lampornis clemenciae
Ruby-throated Hummingbird	Archilochus colubris
Black-chinned Hummingbird	Archilochus alexandri
Anna's Hummingbird	Calypte anna
Costa's Hummingbird	Calypte costae
Calliope Hummingbird	Stellula calliope
Broad-tailed Hummingbird	Selasphorus platycercus
Rufous Hummingbird	Selasphorus rufus
Allen's Hummingbird	Selasphorus sasin
Belted Kingfisher	Ceryle alcyon
Lewis' Woodpecker	Melanerpes lewis

Red-headed Woodpecker	Melanerpes erythrocephalus
Acorn Woodpecker	Melanerpes formicivorus
Gila Woodpecker	Melanerpes uropygialis
Yellow-bellied Sapsucker	Sphyrapicus varius
Red-naped Sapsucker	Sphyrapicus nuchalis
Red-breasted Sapsucker	Sphyrapicus ruber
Williamson's Sapsucker	Sphyrapicus thyroideus
Ladder-backed Woodpecker	Picoides scalaris
Nuttall's Woodpecker	Picoides nuttallii
Downy Woodpecker	Picoides pubescens
Hairy Woodpecker	Picoides villosus
White-headed Woodpecker	Picoides albolarvatus
Three-toed Woodpecker	Picoides tridactylus
Black-backed Woodpecker	Picoides arcticus
Northern Flicker	Colaptes auratus
Pileated Woodpecker	Dryocopus pileatus
Olive-sided Flycatcher	Contopus borealis
Greater Pewee	Contopus pertinax
Western Wood-Pewee	Contopus sordidulus
Eastern Wood-Pewee	Contopus virens
Yellow-bellied Flycatcher	Empidonax flaviventris
Alder Flycatcher	Empidonax alnorum
Willow Flycatcher	Empidonax traillii
Least Flycatcher	Empidonax minimus
Hammond's Flycatcher	Empidonax hammondii
Dusky Flycatcher	Empidonax oberholseri
Gray Flycatcher	Empidonax wrightii
Pacific-slope Flycatcher	Empidonax difficilis
Cordilleran Flycatcher	Empidonax occidentalis
Black Phoebe	Sayornis nigricans
Eastern Phoebe	Sayornis phoebe
Say's Phoebe	Sayornis saya
Vermilion Flycatcher	Pyrocephalus rubinus
Dusky-capped Flycatcher	Myiarchus tuberculifer
Ash-throated Flycatcher	Myiarchus cinerascens
Great Crested Flycatcher	Myiarchus crinitus
Brown-crested Flycatcher	Myiarchus tyrannulus
Sulphur-bellied Flycatcher	Myiodynastes luteiventris
Tropical Kingbird	Tyrannus melancholicus
Cassin's Kingbird	Tyrannus vociferans
Thick-billed Kingbird	Tyrannus crassirostris
Western Kingbird	Tyrannus verticalis
Eastern Kingbird	Tyrannus tyrannus
Scissor-tailed Flycatcher	Tyrannus forficatus
Fork-tailed Flycatcher	Tyrannus savana
Eurasian Skylark	Alauda arvensis

Horned Lark	Eremophila alpestris
Purple Martin	Progne subis
Tree Swallow	Tachycineta bicolor
Violet-green Swallow	Tachycineta thalassina
Northern Rough-winged Swallow	Stelgidopteryx serripennis
Bank Swallow	Riparia riparia
Cliff Swallow	Hirundo pyrrhonota
Cave Swallow	Hirundo fulva
Barn Swallow	Hirundo rustica
Gray Jay	Perisoreus canadensis
Steller's Jay	Cyanocitta stelleri
Blue Jay	Cyanocitta cristata
Scrub Jay	Aphelocoma coerulescens
Pinyon Jay	Gymnorhinus cyanocephalus
Clark's Nutcracker	Nucifraga columbiana
Black-billed Magpie	Pica pica
Yellow-billed Magpie	Pica nuttalli
American Crow	Corvus brachyrhynchos
Common Raven	Corvus corax
Black-capped Chickadee	Parus atricapillus
Mountain Chickadee	Parus gambeli
Chestnut-backed Chickadee	Parus rufescens
Plain Titmouse	Parus inornatus
Verdin	Auriparus flaviceps
Bushtit	Psaltriparus minimus
Red-breasted Nuthatch	Sitta canadensis
White-breasted Nuthatch	Sitta carolinensis
Pygmy Nuthatch	Sitta pygmaea
Brown Creeper	Certhia americana
Red-whiskered Bulbul	Pycnonotus jocosus
Cactus Wren	Campylorhynchus brunneicapillus
Rock Wren	Salpinctes obsoletus
Canyon Wren	Catherpes mexicanus
Bewick's Wren	Thryomanes bewickii
House Wren	Troglodytes aedon
Winter Wren	Troglodytes troglodytes
Sedge Wren	Cistothorus platensis
Marsh Wren	Cistothorus palustris
American Dipper	Cinclus mexicanus
Dusky Warbler	Phylloscopus fuscatus
Golden-crowned Kinglet	Regulus satrapa
Ruby-crowned Kinglet	Regulus calendula
Blue-gray Gnatcatcher	Polioptila caerulea
Black-tailed Gnatcatcher	Polioptila melanura
California Gnatcatcher	Polioptila californica
Red-flanked Bluetail	Tarsiger cyanurus

Northern Wheatear	Oenanthe oenanthe
Western Bluebird	Sialia mexicana
Mountain Bluebird	Sialia currucoides
Townsend's Solitaire	Myadestes townsendi
Veery	Catharus fuscescens
Gray-cheeked Thrush	Catharus minimus
Swainson's Thrush	Catharus ustulatus
Hermit Thrush	Catharus guttatus
Wood Thrush	Catharus mustelinus
Rufous-backed Robin	Turdus rufopalliatus
American Robin	Turdus migratorius
Varied Thrush	Ixoreus naevius
Wrentit	Chamaea fasciata
Gray Catbird	Dumetella carolinensis
Northern Mockingbird	Mimus polyglottos
Sage Thrasher	Oreoscoptes montanus
Brown Thrasher	Toxostoma rufum
Bendire's Thrasher	Toxostoma bendirei
Curve-billed Thrasher	Toxostoma curvirostre
California Thrasher	Toxostoma redivivum
Crissal Thrasher	Toxostoma crissale
Le Conte's Thrasher	Toxostoma lecontei
Yellow Wagtail	Motacilla flava
Gray Wagtail	Motacilla cinerea
White Wagtail	Motacilla alba
Black-backed Wagtail	Motacilla lugens
Red-throated Pipit	Anthus cervinus
American Pipit	Anthus rubescens
Sprague's Pipit	Anthus spragueii
Bohemian Waxwing	Bombycilla garrulus
Cedar Waxwing	Bombycilla cedrorum
Phainopepla	Phainopepla nitens
Brown Shrike	Lanius cristatus
Northern Shrike	Lanius excubitor
Loggerhead Shrike	Lanius ludovicianus
European Starling	Sturnus vulgaris
White-eyed Vireo	Vireo griseus
Bell's Vireo	Vireo bellii
Gray Vireo	Vireo vicinior
Solitary Vireo	Vireo solitarius
Yellow-throated Vireo	Vireo flavifrons
Hutton's Vireo	Vireo huttoni
Warbling Vireo	Vireo gilvus
Philadelphia Vireo	Vireo philadelphicus
Red-eyed Vireo	Vireo olivaceus
Yellow-green Vireo	Vireo flavoviridis

Blue-winged Warbler	Vermivora pinus
Golden-winged Warbler	Vermivora chrysoptera
Tennessee Warbler	Vermivora peregrina
Orange-crowned Warbler	Vermivora celata
Nashville Warbler	Vermivora ruficapilla
Virginia's Warbler	Vermivora virginiae
Lucy's Warbler	Vermivora luciae
Northern Parula	Parula americana
Yellow Warbler	Dendroica petechia
Chestnut-sided Warbler	Dendroica pensylvanica
Magnolia Warbler	Dendroica magnolia
Cape May Warbler	Dendroica tigrina
Black-throated Blue Warbler	Dendroica caerulescens
Yellow-rumped Warbler	Dendroica coronata
Black-throated Gray Warbler	Dendroica nigrescens
Townsend's Warbler	Dendroica townsendi
Hermit Warbler	Dendroica occidentalis
Black-throated Green Warbler	Dendroica virens
Golden-cheeked Warbler	Dendroica chrysoparia
Blackburnian Warbler	Dendroica fusca
Yellow-throated Warbler	Dendroica dominica
Grace's Warbler	Dendroica graciae
Pine Warbler	Dendroica pinus
Prairie Warbler	Dendroica discolor
Palm Warbler	Dendroica palmarum
Bay-breasted Warbler	Dendroica castanea
Blackpoll Warbler	Dendroica striata
Cerulean Warbler	Dendroica cerulea
Black-and-white Warbler	Mniotilta varia
American Redstart	Setophaga ruticilla
Prothonotary Warbler	Protonotaria citrea
Worm-eating Warbler	Helmitheros vermivorus
Ovenbird	Seiurus aurocapillus
Northern Waterthrush	Seiurus noveboracensis
Louisiana Waterthrush	Seiurus motacilla
Kentucky Warbler	Oporornis formosus
Connecticut Warbler	Oporornis agilis
Mourning Warbler	Oporornis philadelphia
MacGillivray's Warbler	Oporornis tolmiei
Common Yellowthroat	Geothlypis trichas
Hooded Warbler	Wilsonia citrina
Wilson's Warbler	Wilsonia pusilla
Canada Warbler	Wilsonia canadensis
Red-faced Warbler	Cardellina rubrifrons
Painted Redstart	Myioborus pictus
Yellow-breasted Chat	Icteria virens

Hepatic Tanager	Piranga flava
Summer Tanager	Piranga rubra
Scarlet Tanager	Piranga olivacea
Western Tanager	Piranga ludoviciana
Northern Cardinal	Cardinalis cardinalis
Pyrrhuloxia	Cardinalis sinuatus
Rose-breasted Grosbeak	Pheucticus ludovicianus
Black-headed Grosbeak	Pheucticus melanocephalus
Blue Grosbeak	Guiraca caerulea
Lazuli Bunting	Passerina amoena
Indigo Bunting	Passerina cyanea
Varied Bunting	Passerina versicolor
Painted Bunting	Passerina ciris
Dickcissel	Spiza americana
Green-tailed Towhee	Pipilo chlorurus
Rufous-sided Towhee	Pipilo erythrophthalmus
California Towhee	Pipilo crissalis
Abert's Towhee	Pipilo aberti
Cassin's Sparrow	Aimophila cassinii
Rufous-crowned Sparrow	Aimophila ruficeps
American Tree Sparrow	Spizella arborea
Chipping Sparrow	Spizella passerina
Clay-colored Sparrow	Spizella pallida
Brewer's Sparrow	Spizella breweri
Field Sparrow	Spizella pusilla
Black-chinned Sparrow	Spizella atrogularis
Vesper Sparrow	Pooecetes gramineus
Lark Sparrow	Chondestes grammacus
Black-throated Sparrow	Amphispiza bilineata
Sage Sparrow	Amphispiza belli
Lark Bunting	Calamospiza melanocorys
Savannah Sparrow	Passerculus sandwichensis
Baird's Sparrow	Ammodramus bairdii
Grasshopper Sparrow	Ammodramus savannarum
Le Conte's Sparrow	Ammodramus leconteii
Sharp-tailed Sparrow	Ammodramus caudacutus
Fox Sparrow	Passerella iliaca
Song Sparrow	Melospiza melodia
Lincoln's Sparrow	Melospiza lincolnii
Swamp Sparrow	Melospiza georgiana
White-throated Sparrow	Zonotrichia albicollis
Golden-crowned Sparrow	Zonotrichia atricapilla
White-crowned Sparrow	Zonotrichia leucophrys
Harris' Sparrow	Zonotrichia querula
Dark-eyed Junco	Junco hyemalis
McCown's Longspur	Calcarius mccownii

Lapland Longspur	Calcarius lapponicus
Smith's Longspur	Calcarius pictus
Chestnut-collared Longspur	Calcarius ornatus
Little Bunting	Emberiza pusilla
Rustic Bunting	Emberiza rustica
Snow Bunting	Plectrophenax nivalis
Bobolink	Dolichonyx oryzivorus
Red-winged Blackbird	Agelaius phoeniceus
Tricolored Blackbird	Agelaius tricolor
Western Meadowlark	Sturnella neglecta
Yellow-headed Blackbird	Xanthocephalus xanthocephalus
Rusty Blackbird	Euphagus carolinus
Brewer's Blackbird	Euphagus cyanocephalus
Great-tailed Grackle	Quiscalus mexicanus
Common Grackle	Quiscalus quiscula
Bronzed Cowbird	Molothrus aeneus
Brown-headed Cowbird	Molothrus ater
Orchard Oriole	Icterus spurius
Hooded Oriole	Icterus cucullatus
Streak-backed Oriole	Icterus pustulatus
Northern Oriole	Icterus galbula
Scott's Oriole	Icterus parisorum
Brambling	Fringilla montifringilla
Pine Grosbeak	Pinicola enucleator
Purple Finch	Carpodacus purpureus
Cassin's Finch	Carpodacus cassinii
House Finch	Carpodacus mexicanus
Red Crossbill	Loxia curvirostra
White-winged Crossbill	Loxia leucoptera
Common Redpoll	Carduelis flammea
Pine Siskin	Carduelis pinus
Lesser Goldfinch	Carduelis psaltria
Lawrence's Goldfinch	Carduelis lawrencei
American Goldfinch	Carduelis tristis
Evening Grosbeak	Coccothraustes vespertinus
House Sparrow	Passer domesticus

Return To Birder's Diary Discussion
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EXTINCT BIRDS

Akialoa
Alaotra Grebe
Amaui
Atitlan Grebe
Auckland Islands Merganser
Banggai Crow
Black Mamo
Black-fronted Parakeet
Bogota Sunangel
Bonin Grosbeak
Bonin Pigeon
Brace's Emerald
Bush Wren
Canary Island Oystercatcher
Carolina Parakeet
Cerulean Paradise-Flycatcher
Chatham Islands Fernbird
Chatham Rail
Choiseul Pigeon
Colombian Grebe
Crested Shelduck
Cuban Macaw
Delalande's Coua
Dieffenbach's Rail
Dodo
Glaucous Macaw
Grand Cayman Thrush
Great Auk
Greater Amakihi
Greater Koa-Finch
Guadalupe Caracara
Guadalupe Storm-Petrel
Guam Flycatcher
Hawaii Mamo
Hawaii Oo
Hawaiian Crake
Himalayan Quail
Hispaniolan Macaw
Huia
Imperial Woodpecker
Jamaican Poorwill
Kauai Oo

Kioea
Kittlitz's Thrush
Kona Grosbeak
Kosrae Crake
Kosrae Starling
Labrador Duck
Lanai Finch
Laughing Owl
Laysan Crake
Lesser Koa-Finch
Lord Howe Gerygone
Lord Howe Swamphen
Mascarene Parrot
Mauritius Blue-Pigeon
Molokai Creeper
Mysterious Starling
New Caledonian Lorikeet
New Caledonian Owlet-Nightjar
New Caledonian Rail
New Zealand Quail
Newton's Parakeet
Norfolk Gerygone
Norfolk Kaka
Oahu Oo
Pallas' Cormorant
Paradise Parrot
Passenger Pigeon
Pink-headed Duck
Red-moustached Fruit-Dove
Reunion Solitaire
Reunion Starling
Robust White-eye
Rodrigues Solitaire
Rodrigues Starling
Ryukyu Pigeon
Samoan Moorhen
Seychelles Parakeet
Sharpe's Rail
Slender-billed Grackle
Society Parakeet
Stephen Island Wren
Sunda Lapwing
Tahiti Rail
Tanna Ground-Dove
Ula-ai-hawane
Wake Island Rail

White-winged Sandpiper

Return To Birder's Diary Discussion
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HARD TO FIND ABA BIRDS

Thayer World Birding Code	Common Name
11	Great Auk
11	Labrador Duck
11	Passenger Pigeon
11	Carolina Parakeet
10	Bachman's Warbler
10	Ivory-billed Woodpecker
9	California Condor
9	Eskimo Curlew
7	Thick-billed Parrot
7	Short-tailed Albatross
7	Slender-billed Curlew
6	Whiskered Auklet
6	Stejneger's Petrel
6	Spoonbill Sandpiper
6	Bahama Swallow
5	Murphy's Petrel
5	White-tailed Eagle
5	Steller's Sea-Eagle
5	Spotted Rail
5	Paint-billed Crake
5	Herald Petrel
5	Craveri's Murrelet
5	Boreal Owl
5	Black-capped Petrel
5	Yellow Rail
5	Baikal Teal
5	Ivory Gull

Return To Birder's Diary Discussion
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THAYER WORLD BIRDING CODE

1 Moderately easy to find. You can easily get to the bird's habitat from some commercial airport in the world. You have an 80% probability of finding the bird within a day. Some driving or a scheduled pelagic trip may be involved.

2 Moderately difficult to find even if you look in the correct habitat and pick the right time of the year to search for the bird. You have a 40% probability of finding the bird within a day. If you fly to a very small airfield or make a special effort to hire transportation, you may reach a spot within a day where you have an 80% probability of seeing the bird.

3 Difficult to find even if habitat and time of year are right. A little patience may be needed to see the bird. Also, a common bird located in a remote spot on earth. You have a 5% probability of finding the bird within one day unless special transportation arrangements are made.

4 Bird is uncommon or secretive. Sparse distribution or rugged or remote habitat make the bird hard to find on a regular basis. You certainly have to make a second plane trip or hire special transportation to reach the bird's habitat.

5 Bird is very uncommon. Limited distribution. A special effort is required to reach the bird. Professional guides are very helpful in finding these birds. Also, a somewhat common bird in an incredibly remote spot on earth.

6 Bird is vulnerable AND hard to find. May have extremely limited distribution or very hard to reach habitat.

7 Bird is very vulnerable. Classified in books as "rare." Very hard to find. A special effort is often required to reach the bird's habitat. This bird is easily the highlight of any extended birding trip.

8 Endangered bird AND very rare. A very special effort is needed to reach this bird. You must be incredibly lucky to see the bird.

9 Critically endangered bird. Extremely difficult to find the bird. Extremely difficult and expensive to get to the bird. Weeks may have to be spent under terrible conditions to even have a chance to glimpse the bird. Also, birds that are extinct in the wild.

10 Probably extinct - not seen or heard in years by anyone.

11 Extinct.

Explanation of Thayer World Birding Code

I spent two weeks on Attu, Alaska in May of 1992 with fifty other crazed fanatics. We went to the edge of the earth (or at least the remotest edge of North America) to see birds. We saw Code 3 birds, we saw Code 4 birds. Sometimes we had to pedal from Murder Point to Alexi Point to see them, but it was worth it. For a code 5 bird we would have run naked to Temnak Valley. (I personally sprinted from a comfortable seat in the outhouse to see a Fork-tailed Swift -- my first Code 5 bird.)

Benton Basham was there on Attu. He invented this code system which is used in the American Birding Association's Checklist. Code 1 means the bird is easily found in the ABA area. Code 5 birds are accidentals that may be seen only a few times each century. Codes 2,3 and 4 fall somewhere in between. It is a very good system. It works well. The late Louis Banker stayed by the fire for two weeks telling us his wonderful birding stories, but even he ran to see a Code 5 bird.

Because the ABA Code works so well, it seems to me that a World Birding Code would also be useful. Perhaps it might even be more helpful. We are all somewhat familiar with the birds in our own area. But a birding trip to a new part of the world can be overwhelming. A World Birding Code for every species of bird would help to quantify the probability of seeing a particular bird and would help in preparing for a trip to a new location. It might also bring attention to the plight of the truly endangered birds of the world. **It is terrifying to see that many of the world's rarest birds (with a Thayer World Birding Code of 8, 9 or 10) are located in countries where little is being done to promote conservation efforts.**

The Thayer World Birding Code uses a range of numbers from 1 to 10. Code 1 birds are fairly easy to see. Code 10 birds may not have been seen anywhere in the world by anyone in over a dozen years. Code 11 birds are extinct.

Some birds that may be coded a 4 or 5 by Benton Basham in the ABA area could be coded 1 in the Thayer World Birding Code. For example the White-collared Seedeater is a common bird in Mexico and is given a Thayer code of 1 while the ABA code is 4. On the other hand, a hard-to-see bird may have a Thayer World Birding Code of 5 or 6 and an ABA code of 4. This is because the Thayer World Birding Code ranges from 1 to 10 while the ABA code ranges from 1 to 5.

The Thayer World Birding Code is designed to be mathematically logical. We all know that the birds and mother nature are not this precise. But it seems better to have some logical break points along the spectrum when we line up 9700 birds in assending order, from easiest to most difficult to see. The number of species in each higher code group declines in a systematic way, based on the square of the numbers between one and ten. By dividing the square of each code by 385 and reversing the order, the number of birds in each code can be computed.

Cumulative Thayer Code	Ratio	Percentage of Birds	Percentage
1	100/385	25.97%	25.97%
2	81/385	21.04%	47.01%
3	64/385	16.62%	63.63%
4	49/385	12.73%	76.36%
5	36/385	9.35%	85.71%
6	25/385	6.49%	92.20%
7	16/385	4.16%	96.36%
8	9/385	2.34%	98.70%
9	4/385	1.04%	99.74%
10	1/385	.26%	100.00%

This chart shows that 25.97% of the birds in the world have a Thayer World Birding Code of 1. These birds are fairly easy to see. Only 4.16% of the world's birds have a Thayer World Birding Code of 7. The table also shows that 92.20% of the birds in the world have a Thayer World Birding Code of 6 or less.

A World Birding Code **could** place 10% of the world's birds into each code. But that doesn't "seem" right**. Like many things in nature, the distributions of the World Birding Code look like the right side of a bell-shaped curve**. Only a few birds are at the extreme edge. This mathematical array recognizes this. The number of species in each code needs to match the mathematical array I have imposed on the Thayer World Birding Code. The descriptions of the efforts required to see a bird were written with that goal in mind. If knowledgable world birders would not place about 26% of the world's birds into code 1, then the code description will have to be revised until they agree that about 26% of the birds DO fall into that written description. For example, a code 1 bird's description may have to be changed so that the probability of seeing a bird within a day is not 80%, but 70% -- or 90%. The World Birding Code really does not work at all unless the verbal and the mathematical descriptions lead to the same codes being assigned to the same species by two different birders. More experienced birders may be able to make some very positive suggestions about future changes to this code in order to make the birds assigned to each code match the

mathematical assumptions. The percentages for each code are **NOT a "prediction"** of how many birds are in this category. Rather, the breakpoints between the codes are just a logical spot to draw an arbitrary line. I could easily have drawn a line at 10%, 20%, 30%, etc. but as I said before, this doesn't "seem" right nor does it reflect mother nature's bell shaped distribution of most naturally occuring things. The other logical break points would be at 1,2,3,4 and 5 standard deviations--but that puts too many birds into codes 1 and 2. The Code would not be very helpful.

This code is admitedly arbitrary and less precise than the table above would indicate. However, I do believe that some sort of World Code is important. This is the first, raw attempt. I have been told by many knowledgable people that 10 categories is too many. Such precision is not possible. It has also been suggested that what I am really trying to show are two separate factors, in one code. They suggest that a "Difficulty of Reaching the Bird Code" should be combined with a "Difficulty of Seeing the Bird Code". They may be right. But for now, I offer this as a starting point. The actual codes in the 1994 release of "Birder's Diary" are certainly not complete or even terribly accurate (although future updates will be more accurate). Warning: Many birds have been coded "2" as a "default" when I was uncertain about the "correct" code. But enough people have reviewed parts of the list to release it now as a rough "ballpark estimate". I would be very interested in hearing from birders about the future direction for a World Birding Code. Is one number the right approach, or should the code cover two separate factors with codes ranging from 1 to 5 for "ease-of-seeing" and a code of A through E for "difficulty-of-reaching" the proper habitat? If we choose that path, there will be 25 possible code combinations, not just ten. The codes covering two factors will be revised more often than a code that combines all factors into just one number. Send your comments to Thayer Birding Software, P.O. Box 243, Milford, Ohio 45150.

Keep in mind that the Thayer World Birding Code covers all the birds on the planet. It ignores all political boundaries. No one needs to debate whether the Iiwi you saw in Hawaii should be "countable." You were on the planet earth, so it counts for your world list. **This is a global code. Assume that you can instantly appear at any airport in the world that is regularly served by commercial jets, on any day of the year that you choose. Also assume that one of the area's better birders meets you at the airport with a car--now look at the codes to see how difficult it will be for you to see the bird that day.** You may drive to the dock and board a scheduled pelagic trip or drive on nice roads to the bird's habitat. If you have an 80% probability of seeing the bird that day, it is probably a code 1 bird. If you need to board a small plane and fly to a small airport that cannot handle jets, the birds you see there may be code 2, even though you will see them about 80% of the time. If you need to charter your own boat or plane, be helicoptered into a remote jungle, or pay many thousands

of dollars to get to the only spot to see a bird, it is probably a code 3 bird if you have an 80% probability of seeing the bird. As the time you devote to finding the bird increases and as the remoteness and physical stress required to reach and find the bird increases, the code increases. Once you reach the correct habitat, if the probability of finding the bird is only 40% (rather than 80%) on any given day, the code increases by one. If the probability of finding the bird is only 5%, the code increases by two. Gallinaceous birds may be widespread and "common", but your probability of finding one--even when you choose the day and the spot, may be only 5%. This is NOT a code 1 bird. On the other hand, there may be only one sole surviving individual of an entire species anywhere in the world. But if it comes to roost on top of the Washington Monument every evening at 6 pm, that is a code 1 bird.

Some "rare" birds are actually code 1 birds--WHEN YOU USE THESE ASSUMPTIONS! You can see a Red-tailed Tropicbird quite easily. Assume that you can snap your fingers and you are at the Lihue airport in Kauai, Hawaii on July 15. One of the islands' better birders meets you in his car and you drive less than two hours to the Kilauea lighthouse. If you didn't see a Red-tailed Tropicbird as you passed the "Sleeping Giant" rock, you will almost certainly see one glide by Kilauea point. [Since we are talking about assumptions, you can assume that a future release of "Birder's Diary" will contain the precise latitude and longitude to search for a bird and the best day of the year to find each of the world's 9700 birds! I view that, not as crazy, but as the next logical extension of the ABA/Lane Birdfinding Guides. Of course, you will each have a Geographical Positioning System receiver on your belt to tell you when you reach the right coordinates.]

Codes do change. When a bird tour company starts going to see a special and rare bird--the code drops by two or three. Simply signing up for a tour that will take you to see a Blue-throated Macaw, for example, does not mean that the bird remains a code 9. What was certainly a code 9 bird five years ago, becomes a code 6 or 7 when two or more tour companies now offer trips to see it. Codes change as the time and effort involved in seeing a bird changes.

Codes change as bird populations grow or shrink. Codes also change over time as escaped cage birds become established and breed. The Java sparrow is a good example. It is much easier to see one near the San Juan, Puerto Rico airport than it is in its native land.

Codes change for political reasons too. A bird may be fairly common, but if you have to risk you life to go see it, the code increases drastically. Certain birds in Colombia or Yemen might drop from a code 7 or 8 to a code 2 or 3 once travel becomes safer in those areas. **Remember, the World Birding Code is designed ONLY to give a birder, with plenty of time and money, a rough idea of the hassle involved in trying to see a specific bird**. It says nothing about how rare or endangered the bird may be. It DOES attempt to pull together all the factors involved in finding a bird and distills all of these factors into one

number.

I am very indebted to many world-class birders, tour leaders and authors who helped me in assigning codes to many of the world's birds: **however, the coding of 9700 birds is definitely a "work-in-progress."**

Please send any suggested changes to:
Thayer Birding Software
P. O. Box 243
Milford, Ohio 45150

Compuserve ID: 74644,2577

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ABA AREA BIRDS NAMED AFTER PEOPLE

Abert's Towhee
Allen's Hummingbird
Anna's Hummingbird
Audubon's Oriole
Audubon's Shearwater
Bachman's Sparrow
Bachman's Warbler
Baird's Sandpiper
Baird's Sparrow
Barrow's Goldeneye
Bell's Vireo
Bendire's Thrasher
Bewick's Wren
Bonaparte's Gull
Botteri's Sparrow
Brandt's Cormorant
Brewer's Blackbird
Brewer's Sparrow
Buller's Shearwater
Cassin's Auklet
Cassin's Finch
Cassin's Kingbird
Cassin's Sparrow
Chuck-will's-widow
Clark's Grebe
Clark's Nutcracker
Cook's Petrel
Cooper's Hawk
Cory's Shearwater
Costa's Hummingbird
Couch's Kingbird
Craveri's Murrelet
Forster's Tern
Franklin's Gull
Gambel's Quail
Grace's Warbler
Hammond's Flycatcher
Harris' Hawk
Harris' Sparrow
Heermann's Gull
Henslow's Sparrow
Hutton's Vireo

Kirtland's Warbler
Kittlitz's Murrelet
La Sagra's Flycatcher
Lawrence's Goldfinch
Le Conte's Sparrow
Le Conte's Thrasher
Leach's Storm-Petrel
Lewis' Woodpecker
Lincoln's Sparrow
Lucy's Warbler
MacGillivray's Warbler
McCown's Longspur
McKay's Bunting
Middendorff's Grasshopper-Warbler
Murphy's Petrel
Nuttall's Woodpecker
Nutting's Flycatcher
Pallas's Reed-Bunting
Ross' Goose
Ross' Gull
Sabine's Gull
Say's Phoebe
Scott's Oriole
Smith's Longspur
Sprague's Pipit
Stejneger's Petrel
Steller's Eider
Steller's Jay
Steller's Sea-Eagle
Strickland's Woodpecker
Swainson's Hawk
Swainson's Thrush
Swainson's Warbler
Temminck's Stint
Thayer's Gull
Townsend's Solitaire
Townsend's Warbler
Vaux's Swift
Virginia's Warbler
Williamson's Sapsucker
Wilson's Phalarope
Wilson's Plover
Wilson's Storm-Petrel
Wilson's Warbler
Worthen’s Sparrow
Xantus' Hummingbird

Xantus' Murrelet

Return To Birder's Diary Discussion
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WORLD BIRDS WITH "SPOTTED" IN THEIR COMMON NAME

Black-spotted Barbet
Black-spotted Bare-eye
Blue-spotted Wood-Dove
Buff-spotted Flufftail
Buff-spotted Woodpecker
Emerald-spotted Wood-Dove
Fine-spotted Woodpecker
Forty-spotted Pardalote
Golden-spotted Ground-Dove
Gray-spotted Flycatcher
Great Spotted Cuckoo
Great Spotted Kiwi
Great Spotted Woodpecker
Greater Spotted Eagle
Heart-spotted Woodpecker
Lesser Spotted Eagle
Lesser Spotted Woodpecker
Little Spotted Kiwi
Many-spotted Hummingbird
Middle Spotted Woodpecker
Olive-spotted Hummingbird
Orange-spotted Bulbul
Pearl-spotted Owlet
Pink-spotted Fruit-Dove
Spotted Antbird
Spotted Antpitta
Spotted Bamboowren
Spotted Barbtail
Spotted Berrypecker
Spotted Bowerbird
Spotted Bush-Warbler
Spotted Buttonquail
Spotted Catbird
Spotted Crake
Spotted Creeper
Spotted Crocias
Spotted Dove
Spotted Eagle-Owl
Spotted Eared-Nightjar
Spotted Fantail

Spotted Flycatcher
Spotted Forktail
Spotted Greenbul
Spotted Ground-Thrush
Spotted Harrier
Spotted Honeyeater
Spotted Honeyguide
Spotted Imperial-Pigeon
Spotted Jewel-babbler
Spotted Kestrel
Spotted Kingfisher
Spotted Laughingthrush
Spotted Morning-Thrush
Spotted Nightingale-Thrush
Spotted Nightjar
Spotted Nothura
Spotted Nutcracker
Spotted Owl
Spotted Owlet
Spotted Pardalote
Spotted Piculet
Spotted Puffbird
Spotted Quail-thrush
Spotted Rail
Spotted Redshank
Spotted Sandgrouse
Spotted Sandpiper
Spotted Shag
Spotted Tanager
Spotted Thick-knee
Spotted Tody-Flycatcher
Spotted Whistling-Duck
Spotted Wood-Owl
Spotted Wood-Quail
Spotted Woodcreeper
Spotted Wren
Spotted Wren-Babbler
Star-spotted Nightjar
Unspotted Saw-whet Owl
White-spotted Antvireo
White-spotted Flufftail
White-spotted Munia
White-spotted Wattle-eye
White-spotted Woodpecker
Yellow-spotted Barbet
Yellow-spotted Honeyeater

Yellow-spotted Nicator
Yellow-spotted Petronia

*** SCIENTIFIC CLASSIFICATION OF BIRDS ***

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SCIENTIFIC CLASSIFICATION OF BIRDS

In 1758 a man named Carolus Linnaeus developed a classification system for all animals. He divided the animal Kingdom into groups that each had things in common. Then he divided those groups into smaller groups that had even more things in common. When he finally finished, there were seven levels in his system. At the lowest level is the Species. His scientific classification system is still used today.

These seven levels are shown below. Here is how scientists classify an American Robin:

Level	Name	Description
Kingdom	Animalia	Animals
Phylum	Chordata	Animals with backbones
Class	Aves	Animals called Birds
Order	Passeriformes	Birds that perch
Family	Turdidae	All Thrushes
Genus	Turdus	Similar Thrushes
Species	Turdus migratorius	American Robin

Notice that the species has two names. The names are in Latin. The first name is the Genus and the second is another name that often describes a prominent feature of the bird. The second name may also be a person's name -- often the name of the ornithologist that first discovered the bird.

Scientists sometimes will talk about "races" or "tribes" of one species. Human Beings are a species but there are many races of humans. The same is true for birds. When you go birding you may notice that some birds, such as the Yellow-rumped Warbler, look different in the East than the same species does in the West. Different races of the same species often are separated geographically.

Birds have feathers and lay eggs. All birds have wings. However, not all birds can fly. The Ostrich is too heavy to fly. Penguins use their wings to swim, instead of to fly. A few birds "forgot" how to fly because they spent all their time on the ground. After many centuries, their descendants had evolved to the point where they were unable to fly. Often these birds live on remote islands in the Pacific Ocean. They are vulnerable to introduced animals and snakes.

As scientists learn more about birds, they try to arrange the 9700 species of birds into the "correct" Order, Family and Genus. There is a surprising amount of debate about some birds. Are they really a species or not? They may actually be a race of a similar species in the same genus. For example, the Baltimore Oriole is not a species any more. About twenty years ago scientists decided it was the

same species as the Bullock's Oriole. The Baltimore Oriole lives in the Eastern United States and the Bullock's Oriole lives in the Western United States. Both birds are now called the Northern Oriole. Of course, just the opposite can happen. A bird called the Rosy Finch was recently declared to be THREE different birds! Scientists can change their minds after more evidence is produced. For example, many scientists believe that the Northern Oriole may soon be split back into two separate species again!

Combining two apparent species into just one new species is called "lumping." Separating a species into two or more species is called "splitting." Birders like it when scientists decide to "split" a bird because then there are more species of birds to see. Their "Life List" of birds may go up because they had already seen both "races" of the old species. There seems to be a trend today toward splitting birds. This is because better methods of research are now available to examine birds at the microscopic level.

Today there are many scientists investigating birds. They work at places like The Academy of Natural Sciences in Philadelphia or Cornell Laboratory of Ornithology or Pennsylvania State University or Louisiana State University. It is certain that their work will make bird species appear and disappear as they continue lumping and splitting. That is why a computerized list of the world's birds makes more sense than a printed list in a book. You can update your computer and always have the best, most current classification list possible. A book listing all the birds of the world is obsolete by the time you read it. At least that is my unbiased opinion.

Scientific classification is undergoing a big change. Dr. Charles G. Sibley has been doing research for over twenty years using DNA from bird's blood. He and his associates suggested a new way to classify the 9700 birds of the world. His new system is called the Sibley/Ahlquist/Monroe classification or SAM for short. Dr. Sibley discovered that some species are more closely related than anyone though. He also rearranged the Orders and Families in a way that is quite unexpected. Additional research being done today is proving that Dr. Sibley is probably right. The SAM classification seems, to many scientists, to be better than the one used for the last 100 years. However, most bird books and checklists have not been changed yet to show the new SAM classification. Scientists want to be very sure this new classification is better than the traditional classification before they make an official change.

The Thayer Birding Software's ***Birder's Diary*** lets you look at birds of the world using either the Sibley/Ahlquist/Monroe classification or the traditional classification. This CD-ROM lists North American birds using the classification currently used by the American Birding Association. This is the traditional classification. In a year or two, the American Birding Association might decide to use the Sibley/Ahlquist/Monroe classification. The Birds of the World Sampler, however, arranges birds according to the Sibley/Ahlquist/Monroe classification. If

you want to read more about the SAM classification, click one of the topics below.

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SIBLEY'S CLASSIFICATION OF BIRDS

by Eric Salzman

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How are birds related? This is not just an academic question. Every living thing is the end-product of an evolutionary history and carries the evidence of that descent. Until recently there were only two ways to reconstruct this history: from the fossil record and from the constitution and distribution of living things. Now there is a third: the comparative studies of DNA and its byproducts, which form the basis of the work of Charles Sibley and his collaborators.

Compared with microbiology, ecology, and field work, taxonomy has not been very sexy, at least until now. But no one with a serious interest in birds can ignore the big picture from the micro-shuffle of races and species to the macro-levels of families, orders, and subclasses--even if it is just a matter of finding your way around the field guides, keeping up with what you can count on a life list, or trying to make sense of a new and exotic avifauna.

The classification of birds and other living things is based on a few simple premises. Life on earth has a single origin. All birds are of a feather--descended from a reptilian or reptile-like ancestry. The key to the reconstruction of the evolutionary history (or, the phylogeny) of the 9000 to 10,000 living kinds of birds is getting a satisfactory picture of how they are related to one another.

Many students have tried to find that grand design. The modern classification of birds goes back to 1867 and the work of Darwin's great disciple, Thomas Henry Huxley. Huxley (1867) was followed by, among others, Hans Friedrich Gadow (1891, 1893) and Erwin Stresemann (1934) in Germany, and Alexander Wetmore (1951) and Ernst Mayr and Dean Amadon (1951) in the US. These men all proposed avian classifications based on physical characters supplemented by behavior. Anyone can recognize a parrot, and it is immediately obvious that all parrots are more closely related to one another than any of them is to anything else. In this case, the physical relationships are external and easily seen. Other relationships are less obvious. Swallows are unrelated to swifts, and hummingbirds are unrelated to sunbirds, but swifts and hummingbirds are distant cousins of each other; the evidence for this relationship comes more from internal physical characters--anatomy rather than external morphology. Two *Empidonax* flycatchers that show almost no consistent physical differences may frequent different habitats, sing different songs, build different kinds of nests, and refrain from interbreeding; behavior keeps the birds apart and populations that live together and do not interbreed are good species by definition.

Nevertheless, form (morphological characters, physical structure) or form-plus-function (physical characters plus behavior) do not always provide enough information. Interbreeding or the lack thereof is useful only at the species level and for overlapping populations. Closely related species may take up different modes of life and drift apart in appearance and lifestyle while unrelated creatures with similar lifestyles may come to look alike--the well-known phenomenon of convergent evolution. There is no certain way to know if a shared character is the result of common ancestry or an artifact of convergent evolution.

Selection, natural or otherwise, works on the individual, on the so-called "phenotype" (the realization of one organism's genetic program as shaped by its environment), by removing or not removing its particular genotype from the population. In most natural circumstances, selection pressure produces a fairly stable phenotype that is well adapted to its environment but a genotype that contains far more information than is actually used at any given time. Some of this represents the potential for change, and even small genetic differences can be reflected in big structural or behavioral differences (the reverse is also true, that big genetic differences may only add up to small differences in the phenotype). But, surprisingly, most genes and most genetic changes are neutral; that is, they have no discernible effect on the phenotype and they are relatively immune to selection pressure. Therefore, most genetic change in most populations is slow and governed by the laws of chance. Accidents, "misprints," or "slippage" produce the phenomenon known as "genetic drift." Allowing for certain adjustments, this rate of drift averages out over time to a constant rate. If this is so, then the comparison of DNA from different species would give an objective view of the amount of time that has passed since these species embarked on their separate evolutionary paths, and a hierarchy of relatedness could be discovered.

The theory is simple enough, but the sheer amount of information in the genetic material is vast, and the sheer magnitude of the task of analysis is challenging. The solution devised by Sibley and his cohorts is the so-called DNA-DNA hybridization. Thanks to Maurice Wilkins, Rosalind Franklin, Francis Crick, and James Watson (the last-named a birder, by the way), we know that DNA takes the form of two intertwined helical chains or strands--the well-known double helix--bonded together by cross-beams; the structure has been compared to a twisted ladder with rungs binding the two sides firmly together. These rungs can be melted by high heat, permitting the strands to be separated; cooling them down permits the rungs to reform and the strands to reunite. Hybrid DNA molecules are made out of separated strands from different species that are then allowed to unite--the so-called "hybridization." The rate and extent to which these unmatched strands can unite provides an objective measure of similarity or difference.

There was one big hitch with this technique. Sibley and his colleagues began

with the assumption that the rate of change in the genotype was universal and statistically predictable over time. But species that begin breeding early accumulate changes at a faster rate than those that mature more slowly, requiring what we might call a "length-between-generations" correction factor. Even with this complication, the DNA-DNA hybridization technique proved to be remarkably simple, consistent, and objective. At least this is its strong claim.

Between 1975 and 1986, Sibley, his associate Jon E. Ahlquist, and various assistants produced thousands of these DNA-DNA hybrid molecules between and among some 1700 species, representing all but two or three of the families of living birds. The results have been published in two hefty volumes from Yale University Press: a 976-page *Phylogeny and Classification of Birds: A Study in Molecular Evolution* (1990) by Sibley and Ahlquist, and a 1111-page volume on the *Distribution and Taxonomy of Birds of the World* (1990) by Sibley and Burt L. Monroe, Jr., chairman of the AOU Checklist Committee on Classification and Nomenclature and former president of the AOU.

Since the days of Linnaeus (1758), the basic unit of biology has been recognized as the *species*, usually defined (in some way) as a breeding population or a group of populations that interbreed; closely related species are grouped into the higher category of *genus* (plural: genera). To choose an obvious example, there are many closely related thrushes around the world in the genus *Turdus;* only one, the species *migratorius,* occurs in most of North America. *Turdus migratorius* is, of course, the American Robin.

So far, so good. But what do we do with birds that we call thrushes but that differ in essential ways from *Turdus?* Clearly there are a number of genera that make up the thrush family; but how inclusive should this family be? Are the obviously related chats, European robins, and nightingales also thrushes? And what about the Old World flycatchers, warblers, kinglets, and babblers? The "true" thrushes, *Turdus* and relatives, turn out to be only a subfamily in a huge assemblage of hundreds of species and any number of families and subfamilies. The issue becomes one about drawing lines. The more subtle the system, the more divisions: subspecies and superspecies, subfamilies and superfamilies. Finally, all the thrushes, all their allies, and all the other songbirds (or perching birds, the passerines) make up an order. There are a number of orders, sometimes themselves divided into suborders or combined into superorders, making up the class of animals with feathers that we call Aves, or birds.

The family of birds might be shown in the form of a tree (Figure 1) or as a genealogy (Figure 2). Trees grow from the ground up; genealogies work from the top down (there are other representations that read like books, from left to right). In these representations, the older, more "primitive" forms are meant to come first and the more recently evolved ones later. Most recent reference books, including modern field guides, begin with penguins, ratites (Ostrich, rheas, Emu, cassowaries, kiwis), loons, grebes, and tubenoses, and they end with perching

birds (finches or corvids depending on whether the point of view is American or European). Old and primitive lead to modern and complex. Closeness on the list signifies closeness of relationship.

In 1960, Alexander Wetmore divided living birds into two superorders, one consisting of penguins, the other of everything else. This arrangement, often referred to as Wetmorean, is typical; it is the arrangement of orders and families that you now see in the AOU, ABA, and Clements checklists, for example. North Americans (who have lots of sparrows and bunting) put the finches last, arguing that seedeating is the latest and fastest-growing trend in bird evolution,. European-trained systematists prefer to end up with the corvids, bowerbirds, and Birds of Paradise; they argue that intelligence, architectural ability, and complex behavior represent advanced evolution. Europeans also lump the thrushes and their relatives into one huge family, the Muscicapidae. Other ornithologists hold that a finch is not always a finch and split them into weavers and Old World sparrows, waxbills, northern or true finches, and finally, the American sparrows, buntings, and southern grosbeaks lumped with the wood warblers, tanagers, and icterids in that massive pile-up known as the New World nine-primaried oscines. Check your field guide. Peterson sticks pretty closely to Wetmore. The National Geographic Society field guide follows the pre-Sibley revisionists. These views--now incorporated in the AOU and ABA checklists--are, however, only cosmetic compared with what is being put forth as the result of the DNA-DNA hybridization studies.

What follows here is a quick and vastly simplified overview of what Sibley and his co-workers are proposing, with brief notes on some of the implications. The birds themselves are the same, but our way of looking and thinking about them has been altered, and the birder who is interested in the larger issues of bird evolution, kinship, and biogeography should be fascinated and stimulated. [The DNA-DNA hybridization technique does not, it should be said, revolutionize everything. Support for many traditional ideas can be counted among its major accomplishments and may offer some of the best evidence for their validity.]

The first thing to notice is that the bird universe has been carved up into many more categories and subdivisions than we have been used to. In this system there are--reading from top to bottom--subclasses, infraclasses, parvclasses, superorders, orders, suborders, infraorders, parvorders, superfamilies, families, subfamilies, even tribes and subtribes, and all before we get to the level of genus and species.

Right off the bat, the subclass of living birds (Neornithes) is divided up into two Infraclasses and seven Parvclasses (Figure 3). There are big differences between these groups, and, therefore, their ancestry is considered to be very ancient. One should not jump to the conclusion that, for example, gamebirds and waterfowl are closely related--although the fact that they might share a common ancestor is of interest. If we follow the breakdown to the lower levels--not shown

here--we find that:

- all of the waterfowl, except for screamers, Australian magpie-goose, and whistling-ducks, belong to a single family;
- American (New World) quail are in their own family separated from all the other quail, grouse, and pheasants (which are together in a different family of their own);
- woodpeckers are distant relatives of barbets and toucans and are not as close to jacamars and puffbirds as previously thought;
- jacamars, puffbirds, hornbills, hoopoes, and trogons each get an order of their own;
- the families of rollers, cuckoo-rollers, motmots, todies, bee-eaters, and three families (!) of kingfishers make up another single order;
- American barbets are in a separate family, not very closely related to African and Asian barbets;
- toucans are merely a variety of American barbet

At the end of the line is the Parvclass Passerae--all other living birds (Figure 4). Note that the mysterious South American Hoatzin is, as has been proposed, a kind of cuckoo; the parrots keep their unity; and the swift/hummingbird alliance is confirmed, as is the owl/nightjar/frogmouth/oilbird/potoo connection. The African touracos may also belong here, but a lot of the data appear to be ambiguous.

Again, let's go to the end of the line. The superorder of Passerimorphae (everything else) breaks down as in (Figure 5). This is almost too neat: four orders including a fascinating waterbird/hawk complex. The idea that the passerines or perching birds form a single huge order, the Passeriformes, is well known and the DNA work confirms it. Sibley now proposes a completely parallel order of water birds--if you don't mind thinking of hawks and vultures as water birds--the Ciconiiformes, or stork-like birds. This scheme deserves a closer look. Shorebirds come first (Figure 6).

Not unexpectedly, jaegers, skimmers, and larids (gulls and terns)--and, unexpectedly, alcids--are all in a single family. They are distant relatives of the plovers, oystercatchers, avocets, and stilts, and even farther away from the snipes and sandpipers. A closer look reveals a few oddities. Great Auk and Least Tern are (or were) kissing cousins, and both are distant relatives of the Piping Plover and Black-necked Stilt; and all of these are more closely related to each other than any of them are to any sandpiper. These arrangements may yet be subject to reshuffles, but the message is clear: Shorebirds are an older and more diversified group than their appearance and way of life might suggest.

The relationship of water birds to the diurnal raptors is even more striking and unsuspected, as shown in Figure 7. Classifying American vultures with storks is not the most radical thing about this rearrangement of life forms. There used to be widespread agreement that penguins, grebes, loons, and tubenoses belonged at or near the base of the avian family tree and that pelicans, cormorants,

darters, boobies, and tropicbirds formed a single order, also low on the totem pole. Sibley et al. have quite a different view. If they are correct, then all these birds, along with the pigeons and doves and the bustard/crane/rail complex, are not at all primitive, but, in fact, share a common ancestor with the passerines! [The vulture/stork relationship and a repositioning of the loons have both been suggested before; the DNA evidence makes a strong case for these changes.]

This brings us to the great order of perching birds. Sibley and Monroe are generous in their estimates: 5712 species, constituting 59 percent of their total of 9672. They do not disagree with their predecessors in regarding the passerines as a relatively recent and not highly diversified offshoot of the great tree of avian life. All of the songbirds are much more closely related to one another than, say, swifts are to hummingbirds. Like their predecessors, these authors also divide the passerines into suboscines (New Zealand wrens, Old World pittas and broadbills, New World flycatchers and cotingas, and furnarids), and oscines (songbirds), as in Figure 8

The New World flycatchers are united with the mourners, tityras and becards, cotingas, and manakins into one big family, supporting what many ornithologists have long advocated. But the real antbirds are now separated from the various antthrushes and antpittas and these so-called ground antbirds, along with the little-known gnateaters and the tapaculos, are placed nearer the ovenbirds, spinetails, and wood-creepers that they are to the other antbirds.

Sibley and his co-workers divide the true passerines or oscine songbirds into three Parvorders: a huge Australasian group, a small and little-known African group, and everything else (Figure 9). Here, first of all, is the evidence for the true uniqueness of the Australasian avifauna. All these birds appear to be descended from ancestors who were stranded Down Under when Australia and New Guinea were separated from the rest of the world a long time ago. As their names suggest, many of these creepers, wrens, robins, flycatchers, and babblers used to be thought of as outlying relatives of widespread groups. Instead, they turn out to be textbook examples of adaptive radiation and convergent evolution.

Most of these birds stayed in Australasia, but a few made it back into the rest of the world: the widespread shrikes, the corvids, and, most surprising of all, the American vireos and greenlets. The ancestral home of crows, magpies, and jays is Australia, although, oddly enough, the crows and ravens found there today are recent colonizers from Asia. No vireos and greenlets live anywhere in the world today except in the Americas.

In this scheme, the birds of paradise are close relatives of the crows and jays (along with the wood-swallows, Old World orioles, and cuckoo-shrikes) but not of the lyrebirds or, as was formerly widely believed, of the bowerbirds. The fantails and monarchs, almost invariably regarded as flycatchers, also turn out to be corvids of a kind. These birds, along with drongos, ioras, leaf-birds, and bush-

shrikes, have also pushed out of Australia into nearby Asia and Africa.

Most of our familiar northern temperate songbirds belong to the other main branch of the oscines--the so-called passerids (Passerida). Like Gaul, the passerids are divided in three parts (Figure 10).

The muscicapoids (or *Musicapoides*) break down into families and subfamilies (Figure 11). Here are some old notions confirmed and a lot of new ideas. The close relationship between the Old World starlings and the New World mockingbirds, catbirds, and thrashers is a real surprise. The fact that they are in the same superfamily with the thrushes, Old World flycatchers, dippers, and waxwings is somewhat less surprising. Notice that the so-called chat-thrushes--including the European Robin and the nightingales--are more closely related to the Old World flycatchers than they are to the true thrushes. Old World warblers, babblers, kinglets, bulbuls, and their allies are conspicuously and startlingly absent. To find them, we have to turn to the next superfamily, the Sylvioids (Figure 12).

A lot of apple carts are upset by this collection of ten closely related families. Gnatcatchers are not, as previously thought, a New World offshoot of the Old World Warblers, but are relatives of creepers and wrens. Kinglets get their own family, as do cisticolas and prinia (African warblers). So do nuthatches, tits, long-tailed tits and bushtits, bulbuls, white-eyes, and (in somewhat surprising company) swallows and martins. The rest of the Old World warblers are in a single family with the babblers. At the subfamily level, the babblers (minus the laughing-thrushes but including our Wrentit) are merged with the Sylviini or Mediterranean warblers. The fact that the Wrentit lives, looks, and behaves like a Dartford Warbler may turn out to be more than coincidence or mere convergent evolution!

We are approaching the highest and bushiest branches of this family tree--the passeroid superfamily (Figure 13). Larks, as well as sugarbirds, flowerpeckers, and sunbirds, turn out to be relatives of the finches.

What then are finches? Seedeating birds with conical bills suitable for cracking open seeds have always been regarded as finches, a term that traditionally includes sparrows, buntings, grosbeaks, and the like. All the finches were considered to belong to the same family or were divided into two groups. Modern systematists have tended to take the view that finches evolved several times from different ancestors in order to exploit the widespread availability of a good food source. Weaver finches (including the House Sparrow) became just plain weavers and were in turn split off from the *Estrilda* finches or waxbills. As we have seen, the American sparrows, all the buntings, and most of the grosbeaks (excluding a few of the northern ones) were lumped with the American wood warblers, tanagers, and icterids. The term finch became restricted to a relatively small group of northern seed-eaters. This four-way split is reflected in many

recent checklists, papers, books, etc. But just when the finch problem appeared to be resolved, along come Sibley and his crew with another view (Figure 14).

We're back to a two-way split but with some notable differences. One group includes the Old World sparrows, weavers, and waxbills (each with allies) in individual subgroups along with, quite unexpectedly, wagtails, pipits, and accentors. The other family contains the Olive Warbler, all the northern true finches in a second subfamily, and the American sparrows in a third together with the warblers, tanagers, grosbeaks, and icterids, all now finches of a kind.

Within the subfamilies, the groups are so close that Sibley and Ahlquist can break them out only as tribes. In short, all the finches fall into two related families that divide into eight subfamilies. This does not confirm the complex and multiple origins that many modern workers have suggested for the finches, but rather suggests the reverse--the diffusion and radiation of one or two lineages into multiple lines of descent, producing several kinds of finches as well as new types not normally thought of as finches at all.

For more detail, we must leave Sibley and Ahlquist (1990) and turn to the sister volume, *Distribution and Taxonomy of the Birds of the World* (Sibley and Monroe 1990). There are a generous 10,000 species here--the authors tend to be splitters rather than lumpers--arranged, above genus level at least, in a sequence based on the DNA-DNA hybridization studies completed up to 1989-1990. The accounts include notes on habitat, geographic distribution, and cross-references to various Latin and English names that have appeared in the literature over the years, as well as comments on forms and relationships down to the generic, specific, and even subspecific level. A supplement to this volume, Sibley and Monroe (1993), updating and correcting the original material, and a useful world checklist (Monroe and Sibley 1993) have just recently been published.

If the family tree proposed by Sibley and Ahlquist (1990) is accepted, then Sibley and Monroe (1990) will be the new bible. Details may change as new information becomes available, but this view of the evolutionary history and living relationships of birds is already a stimulating challenge to the traditional view of avian life. Most of the reviewers were clearly impressed by the sheer scope of these volumes, but not all the critiques--of either volume--have unhesitatingly endorsed the results; see, for example, the thoughtful review by Frank Gill and Frederick Sheldon (1991) of Sibley and Ahlquist and the extensive write-up of both books by Alan Knox (1991). The negative views have centered on the data analysis, the application of the age-at-first-breeding correction, and the absence of other factors that might affect rates of evolution. The DNA-DNA hybridization technique is not operative at the species level (and only partially so at the generic level) and several of the reviewers have been at particular pains to resist the trend to use Sibley and Monroe as the basis for future taxonomic and comparative work (e.g., Lanyon 1992, Peterson 1992, Peterson and Stotz 1992, Siegel-Causey 1992). And, as is perhaps inevitable, many errors and

inconsistencies are being found (e.g., DeBenedictis 1992, Parkes 1992, Siegel-Causey 1992; Sibley and Monroe have corrected at least some of these errors in their 1993 supplement). O'Hara (1991) and DeBenedictis (1992) provide two of the better summaries of the problems and shortcomings of these volumes.

How seriously are we to take these critiques? The new order is by no means universally accepted and even the AOU Checklist Committee, on which Burt Monroe serves as Chairman, is moving cautiously. But, considering how many apple carts are upset, the amount of controversy generated is probably not exceptional, and most of the critics (even some of the more negative) preface or conclude their remarks with lines like tour de force (Parkes 1992, on Sibley and Monroe (1990)), one of the major ornithological contributions of this generation (Blem 1991, on Sibley and Ahlquist (1990)) and the most complete series of hypotheses to date for reconstructing the evolution of birds (Storer 1992, on Sibley and Monroe (1990)). Even Peterson (1992), who is highly critical, says that the phylogeny will certainly serve as a starting point for systematic investigations for many years to come.

Obviously, these works can hardly be ignored. Robert Raikow (1991), writing about Sibley and Ahlquist (1990) in *The Auk,* says:

The work summarized in this book has revolutionized systematic ornithology, and only time will tell how pervasive its effects will ultimately be. Sibley and Ahlquist have given us more to ponder and debate than anyone else in 20th-century avian systematics. They will keep us busy for a long time to come.

But perhaps readers of *Birding* will most appreciate Carey Krajewski's (1991) remarks:

Their work will be cited by virtually every avian systematist for the foreseeable future.... I asked Jon Ahlquist how he felt about this incredible accomplishment. He shrugged, smiled, and said, Not bad for a couple of bird-watchers. Not bad indeed.

Not bad indeed.

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ON THE PHYLOGENY AND CLASSIFICATION OF LIVING BIRDS

by Charles G. Sibley

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The first comparisons between molecules were made a century ago by the early serologists, but the molecular age of evolutionary biology truly began with the determination of the structure of DNA by Watson and Crick (1953). As the coding relationships among DNA, RNA and proteins became clear it was apparent that these molecules contain potential evolutionary information and methods to exploit them were soon in use. At Cornell University in 1956 I began to use electrophoresis to compare blood and egg-white proteins (e.g., Sibley 1960, 1970). These studies solved few problems, but they provided experience and contacts with persons who were developing improved procedures. I tried the "agar column" method of DNA-DNA hybridization in 1963, without success. It was the hydroxyapatite technique, perfected in the late 1960's, that made DNA hybridization useful for phylogenetic research and I began to use this method at Yale University in 1974, with the collaboration of Jon Ahlquist. Between early-1975 and mid-1986, we made more than 26,000 DNA-DNA comparisons among ca. 1700 bird species, representing all of the orders and 168 of the 171 families in Wetmore's (1960) classification. A new classification was proposed (Sibley et al. 1988). Sibley and Ahlquist (1990) provide details of the history, methods and data. A book on the distribution and taxonomy of the bird species of the world (Sibley and Monroe 1990) used the DNA-based classification and a supplement was published in 1993. A brief update (Sibley 1991) included comments and corrections for several group names. Monroe and Sibley (1993) is a list of living species with brief distributional information and corrections to date.

The DNA-DNA hybridization technique

DNA-DNA hybridization measures the degree of genetic similarity between complete genomes. The comparison may be between the two DNA strands of an individual, or of different individuals representing different levels of genetic and taxonomic divergence. "Hybrid" double-stranded DNA molecules are formed from the single strands of the DNAs of two species. The hybrid molecules are then dissociated ("melted") in a thermal gradient under controlled conditions such that a measure of the melting temperature of the hybrid duplex may be calculated. The experimental conditions are set so that only homologous sequences can form double-stranded structures. The melting temperature of a DNA duplex molecule is a function of the

number of correctly base-paired nucleotides, thus it is a measure of the degree of genetic similarity between the two single strands forming the duplex. Data are expressed as melting curves and as distances between the midpoints of the melting curves. Dendrograms that do, and do not, assume equal rates of genomic evolution along all branches may be constructed to represent the branching pattern of the phylogeny indicated by the distance values. Phylogenetic trees may be constructed from the melting temperature data, using several methods of analysis. The technique, data analysis, and other aspects of the procedures are described by Sibley and Ahlquist (1983, 1987, 1990). The principal steps in the DNA-DNA hybridization technique follow:

(1). Extract and purify DNA from cell nuclei = remove proteins, RNAs, etc.
(2). Shear long-chain DNA strands into fragments ca. 400-600 bases in length.
(3). Remove most of the copies of repeated sequences from selected species to produce "single-copy" DNA, which contains copies of all sequences in the genome.
(4). "Label" the single-copy DNA with a radioactive isotope to produce a "tracer" DNA of one species = Species A*. The asterisk* identifies the radio-labeled taxon.
(5). Combine the single-stranded tracer DNA of Species A* with the single-stranded "driver" DNA of the same species (A* A = homoduplex), and with the single-stranded driver DNAs of other species (A* B, A* C, A* D, etc.= heteroduplexes). Each combination is placed in a separate vial.
(6). Incubate the vials in a waterbath at 60 C for 120 hours to permit the formation of double-stranded hybrid molecules composed of one strand of the tracer (A*) and one strand of the driver (B, C, D, etc.) to produce the hybrids: A* x A, A* x B, A* x C, A* x D, etc.
(7). Place the DNA-DNA hybrids on hydroxyapatite (HAP) columns. Double-stranded DNA binds to HAP; single-stranded DNA does *not* bind to HAP.
(8). Place the columns in a heated waterbath and raise the temperature in 2.5 C increments from 55 to 95 C (= 17 increments). At each temperature, wash off (elute) the single-stranded DNA resulting from the "melting" of the hydrogen bonds between base pairs. Collect each eluted sample in a separate vial and assay the radioactivity in each vial. The percentage of the total radioactivity that elutes at each of the 17 temperatures is an index to the degree of base pairing, which is a product of genetic similarity.
(9). Use the amount of radioactivity ("counts") in each sample to construct melting curves and to calculate genetic distance values. Construct "trees" from the genetic distance values.

In the classification of Sibley et al. (1988) the boundaries of categories were based on a DNA hybridization distance measurement, DT50H, defined as the temperature in degrees Celsius between the 50% hybridization level of a homoduplex melting curve and the 50% hybridization level of a heteroduplex melting curve. For example, Orders were defined as groups that differ from one another by an average DT50H value between 20 and 22; Families differ by D9-11, etc. We have used the following categories and ranges of DT50H values: Class (31-33), Subclass (29-31), Infraclass (27-29), Parvclass (24.5-27), Superorder (22-24.5), Order (20-22),

Suborder (18-20), Infraorder (15.5-18), Parvorder (13-15.5), Superfamily (11-13), Family (9-11), Subfamily (7-9), and Tribe (4.5-7).

Results and problems

At least 75% of our results agree with traditional views of the boundaries of natural clusters of species, such as the ratites, woodpeckers, gallinaceous birds, ducks and geese, parrots, pigeons, passerines, etc. This is some of the strongest evidence that DNA-DNA hybridization detects natural groups. Our work mainly concerned the higher categories; we did not attempt to measure relationships among species or genera, although such evidence emerged in a few cases. Most of the differences between our classification and traditional classifications are of three kinds. (1) Some of the groups we recognized differ from those in previous classifications, i.e., there is a disagreement about categorical ranking. (2) Some groups revealed unexpected internal genetic diversity which required recognition in the classification. (3) We found a few major subdivisions of the Class Aves which we called Parvclasses, namely: Ratitae, Galloanserae, Turnicae, Coliae, and Passerae. The most controversial subgroup in the Passerae is the Order Ciconiiformes, which includes several "traditional" Orders, namely, Charadriiformes, Falconiformes, Podicipediformes, Pelecaniformes, Ciconiiformes, Sphenisciformes, Gaviiformes, and Procellariiformes. These groups are morphologically and ecologically diverse and classifications based on morphology have viewed them as so taxonomically diverse that they "merit" recognition as Orders. Contrast this view with the Passeriformes, long recognized as an Order because passerine species are mainly arboreal, small in size, and morphologically similar to the human eye. Within our Ciconiiformes most of the Families cluster according to traditional ideas of relationships, with the exception of the Pelecaniformes, of which more below.

Previous classifications were based on morphological characters in which categorical levels were subjectively defined by the human eye. The classification of birds most widely used today is that of Alexander Wetmore who based it mainly on the work of Hans Gadow (1893). Wetmore published the first edition in 1930 and the latest of five in 1960. There were few changes during the intervening years and the classification remains essentially that of Gadow, developed from comparisons of 40 characters a century ago. Such classifications provide a taxonomy and usually associate closely-related species, but seldom reflect phylogeny. They are also prone to errors due to interpreting convergent morphological similarities as evidence of close relationship (e.g., the Australo-Papuan endemics discussed below). Classifications based on comparisons of DNAs reflect phylogeny because genomes evolve in a reasonably "clocklike" manner, i.e., the degrees of difference among the DNAs of different species are correlated with time, although the correlation is not perfect. Thus, the most objective and quantitative methods for the reconstruction of phylogeny are those that *measure* degrees of similarity between the DNAs of different species. Measurement is the essence of science and DNA-DNA hybridization and DNA sequencing are the best available methods; each has strengths and weaknesses, but a combination of these two techniques is our best

hope for understanding the phylogeny of birds and other organisms. Sibley and Ahlquist (1990:184-245) reviewed the classification of birds.

Our phylogeny and classification have been criticized for various reasons, including the claim that our methods were imprecise and that our choice of T50H as the thermal stability index was inappropriate to resolve higher-category relationships. However, a portion of our non-passerine phylogeny has been re-examined by Bleiweiss, Kirsch and Shafi (in press) who used DNA-DNA hybridization to compare seven taxa from five non-passerine Orders. They developed a complete matrix among a duck (*Anas*), an owl (*Bubo*), two pigeons (*Zenaida, Columba*), a mousebird (*Colius*), and two galliforms (*Gallus, Coturnix*), with a reptile (*Alligator*) as the outgroup. They analyzed their data in several ways and concluded that their results "...support Sibley and Ahlquist's use of DT50H to assess ordinal patterns ...." and their data confirm a portion of our phylogeny based on the same technique.

John Kirsch and colleagues (Univ. of Wisconsin, Madison) have found that with as few as half of the cells of a matrix filled, it is possible to obtain the same tree as that based on a complete table. They also used the Sibley/Ahlquist data for the same taxa, which comprise ca. 39% of the possible comparisons, and achieved the same resolution as with their complete data set, except for the ambiguous position of *Colius.*

Bleiweiss, Kirsch and Matheus (1994) confirmed our subfamilial division of the hummingbirds. Bleiweiss, Kirsch and LaPointe (in press) analyzed a nearly complete matrix of DNA hybridization distance measurements among a hummingbird (*Colibri*), typical swift (*Chaetura*), crested swift (*Hemiprocne*), duck (*Anas*), woodpecker (*Melanerpes*), kingfisher (*Megaceryle*), mousebird (*Colius*), owl (*Bubo*), nightjar (*Chordeiles*) and a suboscine flycatcher (*Myiarchus*). They concluded that "Despite significant rate variation among different taxa, these results largely concur with those obtained with the same technique by Sibley and Ahlquist, who used the DT50H measure and UPGMA analysis. This agreement lends credence to some of their more controversial claims." Their data supported our conclusion that the woodpeckers represent an early branch and that passerines arose from within the non-passerine assemblage. These results, as well as the sister-group relationship of the two swift families and of both with respect to hummingbirds, were strongly supported by bootstrapping and jackknifing tests of their trees.

The detailed DNA hybridization study of the cranes by Krajewski (1989) also agreed with our more limited comparisons among cranes. Mindell and Honeycutt (1989) reported ribosomal DNA evidence that supports some aspects of our phylogeny.

Several DNA sequence studies have supported other portions of our work; they are noted in the following comments about some of the most interesting and/or controversial results from our research using DNA hybridization.

Loons and Grebes
The loons (Gaviidae) and grebes (Podicipedidae) have been associated in classifications from the earliest times to the present, sometimes in the same Order or in adjacent Orders. There have been morphological studies in the past that demonstrated many differences between them and concluded that their similarities are superficial and due to convergence. However, neither seemed to have other close relatives, so authors have continued to place them together. The DNA hybridization comparisons showed that the grebes are distant from other living groups, but the loons cluster with the penguins and tubenoses (petrels, shearwaters, albatrosses). We now have mtDNA sequence evidence that supports this arrangement (Hedges and Sibley, in press).

Ratites
Our studies showed that there are three groups of ratites: Ostrich, the two rheas, and the Emu-cassowary-kiwi cluster. The tinamous are their closest living relatives. In earlier publications (e.g., Sibley and Ahlquist 1981) we assumed that the opening of the Atlantic ca. 80 MYA during the breakup of Gondwanaland separated Africa and South America and split a common ancestor that evolved into the living rheas and Ostrich. The UPGMA method of tree-building (Sibley and Ahlquist 1990:839) supported that assumption. However, the phylogenetic trees for the ratites based on the PHYLIP computer program link the rheas more closely to the Australian Emu and cassowaries (Sibley and Ahlquist 1990:810-811). This raises the possibility that the ancestor of the rheas reached South America from Australia via Antarctica ca. 35-40 MYA, as suggested by the fossil of the first land mammal found in Antarctica (Woodburne and Zinsmeister 1984). If this is correct, our calibration of the rate of DNA evolution based on the ratites must be revised to ca. DT50H 1.0 = 2.2 MY, instead of ca. 4.7 MY (Sibley and Ahlquist 1990:286). All calibrations are tentative and subject to further correction.

From comparisons of the tongue apparatus, Bock and Bühler (1990) proposed that the Ostrich and the elephant-birds (*Aepyornis*) should be associated in a suborder Struthioni, that the other ratites and the tinamous should be placed in the suborder Tinami, and that there is no evidence for dispersal between Africa and South America that would support a closer relationship between the Ostrich and rheas. I agree that the rheas are probably closer to the Australian-New Zealand ratites than to the Ostrich, but do not agree that the tinamous are members of the clade that includes the Ostrich, rheas, emu, cassowaries and kiwis. Our DNA hybridization data consistently place the tinamous outside the ratite clade.

Galliforms
Most classifications have assigned the New World quail to the Phasianidae (exceptions noted in Sibley and Ahlquist 1990). We found that the New World quail clade is the sister group of the phasianid-numidid clade (Parvorder Phasianida), so we placed the New World quail in an adjacent Parvorder Odontophorida, Family Odontophoridae. This has been supported by mitochondrial DNA sequence evidence by Kornegay et al. (1993), who also found that the cracids (chachalacas,

guans, etc.) are the sister group of the typical galliforms plus the New World quail. Avise et al. (unpubl.) also confirmed our placement of the New World quail. We assigned the cracids and megapodes to the Order Craciformes.

Buttonquails
The Turnicidae have been assigned to the Gruiformes in most classifications. We found that *Turnix* is not a gruiform and has no close living relatives, hence we placed it in its own Order Turniciformes. Our data also showed that the Plains-wanderer (*Pedionomus*) of Australia is not related to *Turnix*, but is closest to the seedsnipe (Thinocoridae) of South America, thus supporting Olson and Steadman (1981). DNA of the Lark Buttonquail (*Ortyxelos*) was not available and its relationships remain uncertain.

Barbets and toucans
The New World and Old World barbets have been placed in the Capitonidae; the toucans in the Ramphastidae. We found that the New World barbets are more closely related to the toucans than to the Old World barbets. This has been supported by mtDNA sequence data (Lanyon and Hall, 1994). We place the toucans and New World barbets in the Ramphastidae, superfamily Ramphastoidea. The Asian barbets (Megalaimidae) and African barbets (Lybiidae) are sufficiently distinct to be placed in separate superfamilies.

Hoatzin
The South American Hoatzin *Opisthocomus hoazin* has been assigned to the Galliformes, Cuculiformes, or to a monotypic Order. Comparisons of the electrophoretic patterns of the egg-white proteins of the Hoatzin, several cuckoos, galliforms and species in other groups indicated that the Hoatzin is most closely related to the anis (*Crotophaga*) and the Guira Cuckoo *G. guira* (Sibley and Ahlquist 1973). The Hoatzin shares several behavioral and plumage characters with the anis and the Guira Cuckoo and DNA hybridization comparisons also indicated a cuculiform alliance. Bock (1992) disagreed because the Hoatzin has anisodactyl toes and the cuckoos have the zygodactyl arrangement. Our DNA hybridization data indicate that the cuckoos are genetically diverse and Berger (1960) found comparable diversity in morphology. The relationships of the Hoatzin remain unclear, but I believe that it is most closely related to the Guira Cuckoo, the anis and the roadrunners.

Gruiforms
Sibley et al. (1988) and Sibley and Ahlquist (1990) placed the Limpkin (*Aramus*) and the Sungrebe (*Heliornis*) as subfamilies in the Heliornithidae. This may have been an error and it is being re-examined by DNA sequencing in the laboratory of Carey Krajewski at Southern Illinois Univ. Our DNA hybridization data for the relationships among the rails, the other gruiforms and the charadriiforms were re-examined by Sibley et al. (1993). We concluded that these three groups are close relatives.

Pelecaniforms

The members of the traditional Order Pelecaniformes share many morphological characters, but our DNA comparisons suggested that (1) the tropicbirds (*Phaethon*) are not closely related to the other taxa; (2) the frigatebirds (*Fregata*) are most closely related to the petrels, penguins and loons; (3) the boobies, gannets, anhingas and cormorants form a monophyletic cluster, and (4) the pelicans are most closely related to the Shoebill *Balaeniceps rex*. Most of these suggestions are opposed by other evidence and by many avian systematists. I questioned all but the tropicbird position and the monophyly of the booby/anhinga/cormorant clade. Our proposal that the traditional Order Pelecaniformes is polyphyletic "may be the most controversial conclusion of our entire study and we expect it to be disbelieved." (Sibley and Ahlquist 1990:527). However, Blair Hedges (Penn. State Univ.) has completed an mtDNA sequence study of 16 species of birds that supports pelecaniform polyphyly, including the pelican-Shoebill alliance (Hedges and Sibley, in press). John Kirsch is using DNA-DNA hybridization to re-examine the "pelecaniform problem".

Storks and New World vultures
Morphological evidence that the New World vultures (Cathartinae) are more closely related to the storks (Ciconiinae) than to the Old World vultures (Accipitridae) was proposed by Garrod (1873) and supported by Ligon (1967), but ignored by avian systematists until DNA hybridization also suggested this relationship (Sibley and Ahlquist 1990).

Loons and grebes
The loons (Gaviidae) and grebes (Podicipedidae) often have been placed in the same, or adjacent, Orders. Their morphological similarities have been interpreted as due to common ancestry or to convergent evolution. Our DNA comparisons indicate that the grebes have no close living relatives and that the loons are members of the radiation that includes the petrels (Procellariidae), penguins (Spheniscidae) and frigatebirds (Fregatidae), all placed in the Superfamily Procellarioidea. The association of penguins and petrels has long been accepted, but the assignment of loons and frigatebirds to this cluster is certain to be controversial.

Suboscine passerines
That the New World suboscine groups radiated in South America during the long isolation of that continent is apparent, but their morphological diversity has made it difficult to arrive at a consensus about their classification. The DNA comparisons seem to have solved some of the problems, but others remain. We defined a subgroup of the tyrannids, the Pipromorphinae (= "Mionectinae"), that may or may not be supported by other evidence. The Broad-billed Sapayoa *Sapayoa aenigma* remains an enigma.

Starlings and mockingbirds
It was surprising to discover that the Old World starlings and the New World mockingbirds and thrashers are closest living relatives (Sibley and Ahlquist 1980,

1984, 1990). This has been supported by mtDNA sequencing in John Avise's laboratory at the Univ. of Georgia (Prinsloo et al. unpubl.).

The Australo-Papuan endemic radiation

Our most important discovery may be the evidence that the old endemic passerine groups of Australia and New Guinea are the results of adaptive radiation within that area, not the products of a series of invasions from Asia. This is a complex situation; for details see Sibley and Ahlquist (1985) and (1990). Our data showed that the birds-of-paradise are more closely related to the corvoid cluster (corvines, artamines, etc.) than to the bowerbirds, with which they usually have been associated. This conclusion has been supported by mtDNA sequence data (Helm-Bychowski and Cracraft 1993). We also found that the bowerbirds are closest to the lyrebirds (*Menura*), but Cracraft (pers. comm.) reports mtDNA evidence that the bowerbirds and lyrebirds are not as closely related to one another as the lyrebirds are to the meliphagoid cluster (honeyeaters, e.g.). This fits one of our data analyses using the FITCH routine of the PHYLIP program (Sibley and Ahlquist 1990:831) and may be correct, but our UPGMA analysis (p. 859) allies the bowerbirds with the lyrebirds. I have doubts about our placement of the Australo-Papuan treecreepers (Climacteridae), which we viewed as the sister group of the lyrebird-bowerbird clade. Baverstock et al. (1991), using microcomplement fixation, supported most of our conclusions about the origin and relationships of the Australo-Papuan passerines, but they concluded that the climacterids have no close living relatives although they may be closest to the honeyeaters (Meliphagidae). They may be right.

The old endemic Australo-Papuan groups are those noted above, plus the fairywrens (Maluridae), pardalotes, bristlebirds, scrubwrens, thornbills and allies (Pardalotidae), Australian robins (Petroicidae), log-runners (Orthonychidae), Australian babblers (Pomatostomidae), true shrikes (Laniidae), vireos and allies (Vireonidae) and the members of an enlarged family Corvidae, the members of which are separated by unexpectedly small DNA hybridization distances. The ancestors of the crows, jays and magpies of the world originated in Australia and our Corvidae also includes the quail-thrushes, Apostlebird, White-winged Chough, sittellas, whistlers, currawongs, woodswallows, birds-of-paradise, Old World orioles, cuckooshrikes, fantails, drongos, monarchs, magpie-larks, bush-shrikes, helmet-shrikes, and vangas. The latter three groups occur in Africa and Madagascar. Some of these groups had been included in Eurasian families, such as the Muscicapidae and Sylviidae. Eurasian or African groups represented in Australia include the larks, thrushes, swallows, white-eyes, sunbirds and estrildines. Presumably, these are recent arrivals that entered Australia after it had drifted close to southeastern Asia.

Conclusions and comments

There are many problems of avian relationships that deserve study and their results will modify or verify our conclusions. As noted above, several DNA sequence

studies and DNA-DNA hybridization studies have supported our conclusions. I am aware of no extensive studies that have falsified them. Our book (Sibley and Ahlquist 1990) was reviewed about 30 times in nine languages with a wide range of opinions, but I have never seen a critical review of Wetmore's classification, except in the cited book. Alex Wetmore was a dear friend and I treasure the memory of our friendship during the last 37 years of his long life. He was convinced that his classification was as close to perfection as it was possible to achieve. On one occasion, many years ago, he said to me, "With just a little more tinkering I think we'll have it about right." I wonder what he would think about the present "tinkering". Will we ever "have it about right"? I think we will.

I expect that more of our results will be verified and that some will be found to be incorrect. I believe that our phylogeny and classification represent improvements over past arrangements, but that further improvements will be made.

A frequent criticism of our work has been that our phylogeny is not based on a "complete matrix" of distance values. There are, at least, three answers: (1). Reciprocity in DNA-DNA comparisons is usually good enough so that it is not necessary to make two-way comparisons in all cases. (2). As noted above, John Kirsch and colleagues at the University of Wisconsin in Madison have shown that the same tree obtained from a complete matrix can also be obtained from as little as 50% of the cells in that matrix. (3). At the average rate of data production we achieved from 1975 to 1986 it would take ca. 1251 years to produce a complete matrix for the 1700 species used in our experiments.

At least two methods will be used to correct or confirm our results. DNA-DNA hybridization will be most useful for the resolution of the older branches because it averages the entire genome. DNA sequence studies have confirmed some of our conclusions and will become even more important when nuclear sequences of 10,000 to 50,000 bases become routine because the level of confidence will be improved and older branches can be resolved. Methods are now available to obtain phylogenies that reflect the history of life on Earth.

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THE NEW TAXONOMY

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Q: Checklist Order and the Current Turmoil in Taxonomy

As a relatively novice birder, I am confused by the order of the birds listed in Birds of the World: A Check List by James F. Clements (4th ed. 1991). My AOU Checklist and field guides to North American birds seem to follow quite a different order. In Clements, for example, the loons appear on page 100, after the gulls, terns, and alcids. The grebes, on the other hand, seem regularly placed.

But further, waterfowl, coming before herons and egrets? And, amidst the Passeriformes: swallows coming after vireos and corvids? Chickadees after nuthatches? Shrikes before waxwings and thrushes? Kinglets after all of the above? New World warblers after Fringillids? And is Bobolink positively the last bird on the List?

Just what is the justification for all of this? Or, what do you recommend we do, we who have so religiously followed the current order? It has been established within our computers, upon our historic lists, upon our yearly lists, etc. etc. In other words, just what is going on here anyhow?
Dick Tafel
Corbeil, Ontario

Mr. Tafel has asked very good questions that deserve better answers than I can provide. It is hard to justify any of the turmoil he observes beyond nothing that all the facts still are not known. Well-designed field guides arrange species to put similar ones close to one another so that they can be compared easily. Checklists, on the other hand, usually adopt some other sequence. In fact, if you look at your guides carefully, you will discover that the species sequence in the guide may be different from the checklist sequence in the same guide! But why do different checklists have different sequences?

Ornithologists have been struggling to classify the birds of the world for about the past three centuries. Now most of the living entities that ornithologists need to classify are known, so the question becomes how to arrange them. Suggestions cover a range of ideas, not excluding alphabetically! Biologists who classify plants and animals generally agree that a classification that reflects similarities and evolutionary relationships between species is best. Further, within this framework there is general agreement that forms that are most like "ancestral"

types should appear first in a classification list.

Systematic ornithology involves putting entities into groups and deciding what is related to what and what came first (and how and why). Birds have been especially vexing because they are so committed to flight, a characteristic that produces light-boned animals that leave a poor fossil record and that places great constraints on the ways they can vary in size and shape. Most classifications put about half of the world's birds into one order, Passeriformes--perching birds--and divide the remainder into about 25 to 50 orders, depending on who is responsible, with fair disagreement as to which orders are related to which. Similarly, the species of perching birds are grouped into 50 to 100 or so families of birds, with equal uncertainty as to their interrelationships.

The classification used in the current AOU and ABA checklists is intellectually derived from an arrangement which was proposed by Hans Gadow at the end of the nineteenth century and modified by Alexander Wetmore (in particular) and many others in this century but one which has never been formally justified very well. In the past twenty-five years, advances in biochemistry and cell biology have provided biologists with new tools to examine these old problems, and the many changes you are seeing are reflections of the activity that these new techniques have stimulated. They promise to settle many of the questions.

What is in store? First, biochemical methods are beginning to bring order to the classification of song birds. Broadly speaking, there seem to be two big groups of families. One group includes the crow-like birds and their relatives (shrikes and vireos are the only other members of this complex in North America); the other includes all our other perching birds (except Tyrant Flycatchers, which are not song birds). Relationships in the latter cluster are still being debated. Non-passerines are somewhat more difficult to classify, but there appear to be about four to eight major groups ("orders") of families, of which ratites, waterfowl, and fowl appear to be the "most primitive." Many of the orders now recognized seem to be no more distinct than are families of perching birds, so you can expect some of these to be merged as well. But ornithologists are still arguing about what is related to what, so it is best to be prepared for changes and not to worry a lot about them until agreement is reached. This debate may get settled pretty well over the next ten or so years.

Finally, these new biochemical techniques are being applied to many of the cases in which it has been difficult to decide if various forms of birds belong to one species or to many, and equal headway is being made on many of these problems. But as in all things human, sometimes changes are also a matter of fashion. We are moving from a period in which it was fashionable to lump things together to one when splitting is more in vogue. Be prepared for changes in what you can count as species. With few exceptions these new species are already appearing in the more recent guides to North American birds as well as in the pages of *Birding*. But since this is work in progress, it also should be treated as

tentative until the evidence for new arrangements becomes overwhelming. In the meantime, you should follow the AOU (and ABA) checklists as the official arbitrators of the classification of North American birds.

Paul A. DeBenedictis, Chair
ABA Checklist Committee

**** HOT SPOTS ***

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HOT SPOTS: WHERE TO SEE BIRDS

Some locations attract so many birds or such a variety of interesting birds that they are known as "HOT SPOTS." Some of these hot spots are in rather obscure or remote locations like Kenya or Costa Rica or Papua New Guinea. Other hot spots attract birds because of a quirk of geography. It can be a point of land extending into Lake Erie, mountains in the middle of an Arizona desert, or a sharp drop-off in the ocean floor near Monterey, California.

Everyone has their own favorite hot spot. Sometimes these hot spots are swarming with birds only during the spring or fall migration. Some hot spots are best in the middle of winter. For a look at Birding "Hot Spots" in the United States and around the world, click on the topics shown below.

Peter Thayer's Top 10 Hot Spots

Steve Hilty's Top 12 South American Hot Spots

ABA members Top 50 North America Hot Spots

Foreign Countries Most Visited by ABA Members

Winter Hot Spots: The Top Christmas Bird Count Areas

Sometimes birds will show up in a location where they do not normally appear. When this happens the phones start ringing and birders race off to see the rarity. This can be lots of fun. (It can become an obsession if you are trying to see 700 species in the ABA area.) **Here are some special phone numbers that have recordings about birds in your area.** These phone numbers also may have descriptions of upcoming field trips that you can join. A new message appears every few days. Call the one in you area today and find out where the action is! There is even a North American Rare Bird Alert. It is run by Mike Austin of the Houston Audubon Society. Funds generated by NARBA subscriptions are used to support the society's extensive refuge system on the Upper Texas coast. For more information, call 800-458-BIRD or write to NARBA at Houston Audubon Society, 807 South Friendswood Drive, Suite 6A, Friendswood, TX 77546.

Bird Hot Line Phone Numbers

Did you ever wonder how many bird species you could see in just one day? Birders participate in events called "Big Days." They see how many species their group of 3-4 people can see or hear in 24 hours. Big Day events help raise money for conservation efforts. Friends will pledge 10 cents to a dollar or more

for each species seen by the group. Some events like New Jersey's "World Series of Birding" receive national attention and draw birders from all over the world each May.

Did you ever wonder how many species you could see in your entire life? Each year the American Birding Association (ABA) reports the number of species seen by some of its members. A few ABA members think keeping a list of birds seen is silly. However, most others take great pride in their "Life Lists." There are records kept for about 20 different regions of the world as well as each State and Canadian Province or Territory. The ***Birder's Diary*** will keep track of all your life lists. It will also automatically fill out the ABA Listing Report Form each year based on all the past sightings you have entered.

The ABA region is the most popular area. It covers the United States and Canada (excluding Hawaii). The ABA area also extends 200 miles out to sea. Yes, birds do live out there. Once you have seen 550 birds in the ABA area you may report your totals each year. To reach 600 species on your ABA Life List is quite a milestone. To reach 700 is a feat few people have achieved. In 1994 there were only 183 people on the list that had seen 700 or more species. Leading the list is a very nice doctor. His name is Benton Basham and he has seen 817 species! He told me that he keeps a suitcase packed at all times for spur-of-the-moment trips. People from all over the country call him whenever there is a rare bird sighted. There are currently 895 species on the ABA list.

Another popular region is the entire world. You may report your world total to the ABA once you reach 1200 birds. Only 141 people have reported seeing over 3000 species. Phoebe Snetsinger of Missouri leads the way--with over 7500 species and counting. She told me she plans to slow down once she reaches 8000!

ABA Listing Regions Defined

Before you begin to travel across the United States and Canada, do yourself a favor. Call David and Sue Yee at ***Wandering Tattler***. Their phone number is 800-231-9209**.** They sell dozens of great gadgets and clothes that are made just for birders! Their free catalogue is an eclectic mix of weird stuff you never even new existed. But they have EXACTLY what you need for extended birding trips in the US and around the world. Take a look at their Galapagos hat, Wellington boots and Telescope carrying slings. They also have good prices on Zeiss, Bausch & Lomb and Kowa optics. One of the best things they have is a "Birder's Travel Pack" for Texas, Arizona, Florida and California.

Return To Hot Spots Discussion
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PETER THAYER'S TOP 10 HOT SPOTS

1. Brownsville, Texas city dump

This is the only reliable spot in the ABA area to see a Mexican Crow. You quickly become the center of attention when you mention that you "just returned from a birding trip to the Brownsville, Texas dump." You create a whole new image for yourself too. While you are there (in January or February) you can also stop at Laguna Atascosa National Wildlife Refuge, Santa Anna National Wildlife Refuge, Bentsen Rio Grande State Park, and Falcon Dam. The Lower Rio Grande valley is one of the best birding Hot Spots in the US. There is a birdguide book for the Rio Grande Valley (part of the ABA/Lane series of guides). Most people go up to Rockport, Texas and to Aransas National Wildlife Refuge to see the Whooping Cranes while they are in south Texas.

Press Here To See A Photo Of Mr. Thayer At His #1 Hot Spot!

2. Southeast Arizona -- Huachuca and Chiricahua Mountains

Hummingbirds and stray birds from Mexico are the highlights here. A July or August trip starts in Tucson, moves to Madera Canyon, then Ramsey Canyon, over to Cave Creek Canyon and Portal, Arizona and back down to Patagonia, Arizona. Hardy birders may find a five-striped sparrow in California Gulch. There is also an ABA/Lane guide for this area. Call the rare bird hot line before you get there to see if White-eared or Violet-crowned Hummingbirds are being seen. Make reservations ahead of time at Ramsey Canyon.

3. Attu, Alaska

Larry Balch (Call 708-831-0207) takes people to the outermost of the Aleutian islands in the middle of the Bering Sea. When I went in May of 1992 we could not land on the first day because of 80 mile-per-hour winds. Since this chunk of rock is technically in North America, many people go here to push their ABA list to 700 or higher. Sooner or later something will be blown over from Japan or Siberia. Conditions are primitive, World War II relics are strewn everywhere, travel is by bicycle, and the scenery and birds are spectacular. The birding is a cooperative effort unlike anything you are used to. Take the long treck to Temnack Valley to see the White-tailed Eagle. The stream along the way is 3 feet deep, 30 feet wide and FREEZING! Think of Attu as a "wilderness style" camp for fanatic birders. You will love the people you meet. You will never forget it. You will question your sanity on day two when you are too sore to get back on your bicycle. Take earplugs! (50 grumpy old men snoring make an ungodly sound).

4. **Toledo, Ohio**

No, I am not kidding. All of you who live in Ohio are nodding your heads in agreement. The rest of you do not have a clue why I put Toledo, Ohio on my Top 5 list. The second week in May is the time to go. Crane Creek State Park, east of Toledo has a boardwalk where all the warblers in North America seem to come to party. The birds fly north, see Lake Erie, and stop here for a few days to rest. Bring your close-focus binoculars -- or be prepared to back up to get the male Blackburnian Warblers in focus. One mile west is Ottawa National Wildlife Refuge. Bald eagles can be seen near the shore. Every migrant that prefers swamps and lakes to tangled underbrush is over here (Bring your scope). The next day head west of town to the Oak openings. Birds like Lark Sparrows, found nowhere else in the Eastern US, can be found here. At dusk, go to Irwin Prairie to watch the woodcock courtship flight or listen to the rails. Eat dinner at Tony Pakos -- tell them Klinger sent you.

5. **Dry Tortugas / Florida Keys / Everglades, Florida**

For an exotic birding trip, its hard to beat south Florida. Late April is a great time to visit -- before the mosquitoes become unbearable. Herons, Egrets, Boobies and Pelicans are abundant. A two or three day boat trip to Fort Jefferson 90 miles west of Key West is a thrilling journey. Spring migrants fall from the sky into the courtyard of the Fort and cluster near the water fountain. There is not much for a bird to eat, so some, especially the Cattle Egrets, do not make it to the mainland. The Brown Boobies and Magnificent Frigatebirds (with their inflated red pouches) are clustered on the island next to the Fort. The trip back to Key West veers out into the ocean where Bridled Terns can often be found. The Keys might produce a Mangrove Cuckoo or a La Sagra Flycatcher. Stop at Eco Pond in the Everglades to see a Roseate Spoonbill. Hike the Snake Bight Trail. If you drive back to Miami, you might want to look for the Spot-breasted Oriole (Buy the ABA/Lane guide for South Florida).

5a. **Ding Darling Wildlife Refuge -- Sanibel Island, Florida**

Perhaps no other spot is responsible for so many people becoming birders. The five mile drive through these mangrove lagoons in South-west Florida brings the Anhingas and Ibises and Herons closer than you will get anywhere else. The birds are BIG and EASY TO SEE and RIGHT THERE and ...OH MY GOD! ...an ALLIGATOR! Bring the kids. This is the "spark" they need to become birders and conservationists for the rest of their lives. (If Alex Trebec asks, Ding Darling designed the first Duck Hunting stamp).

6. **Westport / Gray's Harbor, Washington**

Birds live out at sea too. A trip on a boat is called a "pelagic" trip. You will try one after you notice all those big gaps on your bird checklist. Birds like Shearwaters, Puffins, Alcids, Petrels, and Albatrosses can often be seen only out at sea. Leave your telescope at home. Bring saltines and Dramamine. You won't get sick--even though all your friends tell you that you will. BIG HINT: Keep your eyes on the horizon--DO NOT GO INSIDE AND LAY DOWN!

On a pelagic trip, here is what happens first. "Shearwater at 3 o'clock." Run to the right side of the boat. Did you see the smudge of white on the underside of the gray dot that just disappeared behind a wave? It was a "lifer" for you. Congratulations! But it gets better.

On board, directions refer to a clock face. The boat is always pointing at "12 o'clock." After the second hour you realize you should probably stay in one spot. (I like near the stern best). The bird at "2 o'clock" soon becomes the bird "going left at 6 o'clock" so standing still isn't so bad. When they start "chumming" (tossing out dead fish), hundreds of birds from miles around converge on the back of your boat, floating like paper kites and giving you great views through your binoculars. I was on the "mother of all pelagic trips" on September 12, 1992 out of Westport. We ran into a fishing fleet and a huge processing ship that looked like Darth Vader's battlecruiser. It spewed out fish guts by the ton. We spent an hour comparing all the plumages of Long-tailed Jaegers, Parasitic Jaegers and Pomarine Jaegers-- easy to do since there were so many of them flying so close together. There had to be 25,000 birds following that ship.

7. **Monterey, California**

This is often one of the first places a birder from the east goes to see the "western" birds. There are so many different habitats near here that a week-long tour can easily add over 100 new birds to your life list. This is also a great spot for a pelagic trip (usually with Debra Shearwater -- yes, that is her legal name. She runs Shearwater Journeys, P. O. Box 1445, Soquel, CA 95073). The Moss Landing / Elkhorn Slough area just north of Monterey is fantastic for shorebirds and ducks. The chaparral area east of town has its own list of residents you will not find back east. Visit the aquarium while you are here. In one exhibit, live birds are just inches away from your face -- and nothing stands between the two of you.

8. **Whitefish Point / Sault St. Marie, Michigan**

Once in a great while the owls invade from the North. Winter birding in the upper

peninsula of Michigan is fantastic -- but wait for an "invasion year." I saw twelve Great Gray Owls all at once on February 15, 1992. We were on an island near Sault St. Marie. Later, a Hawk Owl swept down and took a live mouse from the top of a birders' head. Whitefish Point is a great spot every April. Hawks migrate overhead, loons fly low over the ice, and Bohemian Waxwings hide in the pine trees. You will stay in Paradise, Michigan since it has the only motel for miles around. The plows have been dumping mountains of snow in front of the motel all winter long. These 30 feet tall snow piles are a great storage place to keep your pop and beer.

9. **Salton Sea / Palm Springs, California**

This "sea" is below sea level. South of Palm Springs, it is a great one day trip if you are out there at a conference. In the spring and winter there are thousands of shorebirds -- especially along the southeastern side. In summer this place is a little warmer than Hell -- but you wanted adventure, right? There can be some really rare birds that show up here. Burrowing Owls and huge flocks of Snow Geese like the south end of the sea in winter. To cool off, take the cable car in Palm Springs up the mountain and look for White-headed Woodpeckers. Big Morongo, near Palm Springs, is a great western "riparian" habitat. (Riparian is a word birders use. It means "a bunch of bushes and trees growing near the only stream within 50 miles of here.")

10. **I do not have a #10**

. . . . because I have not been everywhere yet. I liked Point Pelee, Ontario -- (it was almost as good as Toledo). But what about Churchill, Manitoba in June, or Cape May, New Jersey, or Hawk Mountain, Pennsylvania in the fall... or the Colorado Rockies? What about the Platte River in Nebraska in March? What about High Island, Texas during the spring migration? What about Alaska and Mt. Danali in June? I will get back to you.

Return To Hot Spots Discussion
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STEVE HILTY'S TOP 12 SOUTH AMERICAN HOT SPOTS

1. Old Buenaventura Road. Columbia
2. Cuzco Shintuya Road. Peru
3. Hato el Cedral. Venezuela
4. Itatiaia National Park. Brazil
5. Escalera (Tepuis). Venezuela
6. Road from Trinidad to La Habana. Bolivia
7. Rancho Grande (Henri Pittier Nat'l Park). Venezuela
8. La Selva Lodge. Ecuador
9. Puracé Park. Columbia
10. Emas National Park. Brazil
11. Alta Floresta. Brazil
12. Iguazú Falls. Argentina/Brazil

These choices include a comfort factor as well as a "quality of birding" factor.

Steve Hilty is the senior author of *A Guide to the Birds of Columbia*. He is currently revising the *Guide to the Birds of Venezuela*, which will be published by Princeton Press. He is a director of Victor Emanuel Nature Tours, and specializes in leading South American tours.

Return To Hot Spots Discussion
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TOP 50 "HOT SPOT" PICKS OF ABA MEMBERS

Hot Spot	State	Picks
Cave Creek/Portal	AZ	15
Santa Ana NWR	TX	15
Point Pelee	ON	12
Everglades National Park	FL	11
Madera Canyon	AZ	10
Bentsen Rio Grande State Park	TX	10
Ramsey Canyon	AZ	9
Cape May	NJ	9
High Island	TX	9
Dry Tortugas	FL	7
Patagonia	AZ	6
Chiricahua Mountains	AZ	5
San Pedro River	AZ	5
Big Bend National Park	TX	5
Salton Sea	CA	4
Sanibel Island	FL	4
Cheyenne Bottoms	KS	4
Outer Banks	NC	4
Huntington Beach State Park	SC	4
Rio Grande Valley	TX	4
Texas Coast	TX	4
Alaskan Islands (Gambell, Attu)	AK	3
Monterey Bay	CA	3
San Diego/Tijuana Slough	CA	3
Bombay Hook NWR	DE	3
Florida Keys	FL	3
Loxahatchee NWR	FL	3
Whitefish Point	MI	3
Aransas National Wildlife Reserve	TX	3
Brazos Bend State Park	TX	3
Laguna Atascosa NWR	TX	3
Dauphin Island	AL	2
Sonoita Creek	AZ	2
Reifel Sanctuary	BC	2
Joshua Tree National Monument	CA	2
Newport Bay	CA	2
Point Reyes	CA	2
Corkscrew Swamp	FL	2
Ding Darling	FL	2

Merrit Island	FL	2
St. Marks NWR	FL	2
Riding Mountain National Park	MB	2
Medicine Lake NWR	MT	2
Brigantine National Wildlife Refuge	NJ	2
Crane Creek	OH	2
Presque Isle State Park	PA	2
Falcon Dam	TX	2
Rockport	TX	2
Chincoteague NWR	VA	2
Westport	WA	2

In all, over 150 hot spots were mentioned by the ABA members. The totals for the top ten states are shown below:

Texas	**68**
Arizona	**55**
Florida	**40**
California	**29**
Ontario	**13**
New Jersey	**12**
North Dakota	**8**
Massachusetts	**7**
North Carolina	**6**
Delaware	**5**

Return To Hot Spots Discussion
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25 MOST-BIRDED FOREIGN COUNTRIES

By Ro Wauer

This table originally appeared in the December, 1992 issue of *Birding*, a publication of the American Birding Association

Country	Number of Trips
Mexico	316
Great Britain	193
Costa Rica	134
Australia	115
Kenya	77
Peru	63
Trinidad/Tobago	60
Ecuador	57
New Zealand	51
Venezuela	47
Germany	39
Panama	39
Japan	31
Belize	29
Brazil	28
France	25
Spain	24
Bahamas	21
Guatemala	20
India	20
Jamaica	19
Netherlands	19
Italy	18
Malaysia	18
Thailand	18

(1284 responses)

Return To Hot Spots Discussion
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BIRDS IN WINTER

This article originally appeared in *American Birds*,
1992 Christmas Bird Count issue

150 or more species recorded on the 93rd (1992-1993) Christmas Bird Count (North of the Mexican Border)

		Number of Species
1	Corpus Christi, TX	224
2	Freeport, TX	214
3	Moss Landing, CA	203
3	Morro Bay, CA	203
5	Point Reyes Peninsula, CA	200
6	Santa Barbara, CA	198
7	Orange County, CA	195
8	San Diego, CA	191
8	Western Sonoma County, CA	191
10	Crystal Springs, CA	188
10	Bolivar Peninsula, TX	188
10	Coastal Tip, TX	188
13	Marin County (southern), CA	185
14	Santa Cruz County, CA	184
15	Palos Verdes Peninsula, CA	180
15	Ventura, CA	180
17	Oceanside-Vista-Carlsbad, CA	178
18	Ano Nuevo, CA	175
19	Hayward-Fremont, CA	173
20	Oakland, CA	171
21	La Purisima, CA	170
21	Malibu, CA	170
23	Centerville Beach to King Salmon	169
23	Del Norte County, CA	169
23	Laguna Atascosa, TX	169
26	Monterey Peninsula, CA	168
26	Palo Alto, CA	168
26	Corpus Christi (Flour Bluff), TX	168
29	Galveston, TX	167
29	Houston, TX	167
31	Long Beach-El Dorado, CA	166
31	Rancho Santa Fe, CA	166
31	San Francisco, CA	166
31	Cocoa, FL	166
31	Port Aransas, TX	166

36	Southport, Bald Head, Oak Islands, NC	165
36	San Bernard N.W.R., TX	165
38	San Jose, CA	164
39	Santa Maria-Guadalupe, CA	163
39	Sabine N.W.R., LA	163
41	Arcata, CA	162
41	St. Marks, FL	162
43	Benicia, CA	161
43	Attwater Prairie Chicken N.W.R., TX	161
45	Creole, LA	160
45	Hilton Head Islands, SC	160
47	Contra Costa County, CA	159
47	Southern Hancock County, MS	159
49	Orange County (northeastern), CA	158
50	San Jacinto Lake, CA	157
50	Stockton, CA	157
50	Santa Ana N.W.R., TX	157
53	Crowley, LA	156
53	McClellanville, SC	156
55	Morehead City, NC	155
56	Merritt Island N.W.R., FL	152
56	St. Petersburg, FL	152
56	Aransas N.W.R., TX	152
56	LaSal Vieja, TX	152
60	Gulf Shores, AL	151
60	Los Angeles, CA	151
60	Kingsville, CA	151
60	Cape Charles, VA	151
64	Jacksonville, FL	150
64	Tampa, FL	150

Return To Hot Spots Discussion
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RARE BIRD ALERT PHONE NUMBERS

State	Area/City	Phone:
Alabama	Statewide	(205) 987-2730
Alaska	Statewide	(907) 338-2473
Alaska	Kachemak Bay	(907) 235-7337
Arizona	Phoenix	(602) 832-8745
Arizona	Tucson	(602) 798-1005
Arkansas	Statewide	(501) 753-5853
California	SW Sierra	(209) 782-1237
California	Arcata	(707) 826-7031
California	Los Angeles	(213) 874-1318
California	Monterey	(408) 375-9122
California	Monterey Updates	(408) 375-2577
California	Morro Bay	(805) 528-7182
California	Northern California	(510) 524-5592
California	Orange County	(715) 563-6516
California	Sacramento	(916) 481-0118
California	San Bernadino	(909) 793-5599
California	San Diego	(619) 479-3400
California	San Joaquin Valley	(209) 271-9420
California	Santa Barbara	(805) 964-8240
Colorado	Statewide	(303) 279-3076
Connecticut	Statewide	(203) 254-3665
Delaware	Statewide	(215) 567-2473
D. C.	Districtwide	(301) 652-1088
Florida	Statewide	(813) 984-4444
Florida	Miami	(305) 667-7337
Florida	Lower Keys	(305) 294-3438
Georgia	Statewide	(404) 493-8862
Idaho	Northern	(208) 882-6195
Idaho	Southern	(209) 236-3337
Illinois	Central Illinois	(217) 785-1083
Illinois	Chicago	(708) 671-1522
Illinois	DuPage	(708) 960-5559
Indiana	Statewide	(317) 259-0911
Iowa	Sioux City	(712) 262-5958
Iowa	Statewide	(319) 338-9881
Kansas	Statewide	(913) 372-5499
Kansas	Kansas City	(913) 342-2473
Kansas	Wichita	(316) 681-2266
Kentucky	Statewide	(502) 894-9538
Louisiana	Baton Rouge	(504) 293-2473
Louisiana	New Orleans	(504) 246-2473

Maine	Statewide	(207) 781-2332
Maine	Downeast/Central	(207) 288-2829
Maryland	Statewide	(301) 652-1088
Massachusetts	Boston	(617) 259-8805
Massachusetts	Western Mass.	(413) 253-2218
Michigan	Statewide	(616) 471-4919
Michigan	Detroit	(313) 477-1360
Michigan	Sault Ste. Marie	(705) 256-2790
Minnesota	Duluth	(218) 525-5952
Minnesota	Statewide	(612) 827-3161
Missouri	Kansas City	(913) 342-2473
Missouri	Statewide	(314) 445-9115
Missouri	St. Louis	(314) 935-8432
Montana	Statewide	(406) 626-2473
Montana	Big Fork	(406) 756-5595
Nebraska	Statewide	(402) 292-5325
Nevada	Southern	(702) 649-1516
Nevada	Northwest	(702) 324-2473
New Hampshire	Statewide	(603) 224-9900
New Jersey	Cape May	(609) 884-2626
New Jersey	Statewide	(908) 766-2661
New Mexico	Statewide	(505) 662-2101
New York	Albany	(518) 439-8080
New York	Buffalo	(716) 896-1271
New York	Cayuga Lake Basin	(607) 254-2429
New York	Lower Hudson Vly	(914) 666-6614
New York	New York City	(212) 979-3070
New York	Rochester	(716) 461-9593
New York	Syracuse	(315) 682-7039
North Carolina	Statewide	(704) 332-2473
Ohio	Cincinnati	(513) 521-2847
Ohio	Cleveland	(216) 321-7245
Ohio	Columbus	(614) 221-9736
Ohio	Blendon Woods Pk	(614) 895-6222
Ohio	SW Ohio	(513) 277-6446
Ohio	NW Ohio	(419) 875-6889
Ohio	Youngstown	(216) 742-6661
Oklahoma	Oklahoma City	(405) 373-4531
Oklahoma	Statewide	(918) 669-6646
Oregon	Statewide	(503) 292-0661
Oregon	Northeastern	(208) 882-6195
Pennsylvania	Allentown	(215) 252-3455
Pennsylvania	Philadelphia	(215) 567-2473
Pennsylvania	Western Penn.	(412) 963-0560
Pennsylvania	Wilkes-Barre	(717) 825-2473
Pennslyvania	SE/SC Penn.	(610) 383-8840

Rhode Island	Statewide	(401) 231-5728
South Carolina	Statewide	(704) 332-2473
Tennessee	Statewide	(615) 356-7636
Tennessee	Chattanooga	(615) 843-2822
Texas	Statewide	(713) 992-2757
Texas	Austin	(512) 483-0952
Texas	Northcentral	(817) 329-1270
Texas	Northeast	(903) 759-8989
Texas	Lower Rio Grande	(210) 565-6773
Texas	San Antonio	(210) 733-8306
Texas	Sinton	(512) 364-3634
Utah	Statewide	(801) 538-4730
Vermont	Statewide	(802) 457-4861
Virginia	Statewide	(804) 238-2713
Virginia	Statewide	(301) 652-1088
Washington	Statewide	(206) 526-8266
Washington	Southeastern	(208) 882-6195
Wisconsin	Madison	(608) 255-2476
Wisconsin	Statewide	(414) 352-3857
Wyoming	Statewide	(307) 265-2473
Alberta	Calgary	(403) 237-8821
Alberta	Edmonton	(403) 433-2473
British Columbia	Vancouver	(604) 737-9910
British Columbia	Victoria	(604) 592-3381
New Brunswick	Provincewide	(506) 382-3825
Nova Scotia	Provincewide	(902) 852-2428
Ontario	Provincewide	(519) 586-3959
Ontario	Durham	(905) 668-3070
Ontario	Ottawa	(613) 761-1967
Ontario	Sault Ste. Marie	(705) 256-2790
Ontario	Toronto	(416) 350-3000
Ontario	Windsor / Detroit	(313) 477-1360
Ontario	Windsor / Pt. Pelee	(519) 252-2473
Ontario	Hamilton	(905) 648-9537
Ontario	Long Pt Bird Obs.	(519) 586-3959
Quebec	Montreal	(514) 355-6549
Quebec (French)	Eastern Quebec	(418) 660-9089
Quebec (French)	Montreal	(514) 355-7255
Quebec (French)	Saueny/Lac StJean	(418) 696-1868
Quebec (French)	Bas St. Laurent	(418) 725-5118
Quebec (French)	Western Quebec	(819) 778-0737
Saskatchewan	Regina	(306) 761-2094

Return To Hot Spots Discussion
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DESCRIPTION OF ABA LISTING REGIONS

Map of ABA Listing Regions

The entire world is divided into nine Regions as shown on the map and as supplemented by the specific descriptions below. In the event of apparent conflict with the map, the descriptions are controlling.

Each of the five continental Regions includes (a) all interior seas; (b) all "related" islands that lie within 200 nautical miles of the continent; and (c) a "pelagic belt," extending seaward 200 nautical miles from the coastline and/or from related islands, or half the distance to another continent (or to islands in an ocean Region) if closer.

The **North America Region** includes all of the Aleutian Islands, and is divided from Eurasia by a line in the Bering Sea running midway between Attu, St. Matthew, St. Lawrence, and Little Diomede islands on the North American side, and Mednyy (in the Commander Islands), the Siberian coast, and Diomede Islands on the Eurasian side. The North American Region includes other related islands within 200 nautical miles of the Pacific and Atlantic coasts; the Bahamas, all of the cays and islands lying between Nicaragua and Jamaica, and all of the Greater and Lesser Antilles south to and include Grenada and Barbados (but excluding Trinidad and Tobago and the other Caribbean islands specifically included in the South American Region). The North American Region includes all of Panama, and extends across the Caribbean Sea halfway to South America and its related islands.

The **South America Region** includes the entire continent from the Panama/Columbia border south to Cape Horn, and includes Fernando de Noronha, Trinidad, Tobago, the Venezuelan islands near 12 degrees north latitude, Bonaire, Curacao, and Aruba; and extends across the Caribbean Sea halfway to North America and its related islands. Excluded are Isla de Malpelo (west of Columbia), the Galapagos Islands and the Falkland Islands.

The **Eurasia Region** includes in Europe: Malta, Great Britain and Ireland, and the Hebrides, Rockall, and Shetland Islands, but excludes the Faeroe Islands. In Asia it includes Wrangel, Diomede, and the Commander islands, the Izu Islands (excluding Nampo Shoto and the Daito Islands), the Ryukyu Islands, and the Andaman and Nicobar Islands, but excludes the Laccadive Islands, Maldive Islands, and Christmas Island in the Indian Ocean. The Suez Canal separates Eurasia from Africa. The dividing line between the Eurasia and Australasia Regions runs through Lombok Strait, Makassar Strait, and the Celebes Sea, midway between Bali, Kangean Island, Borneo, the Sula Archipelago, and Mindanao (on the Eurasian side), and Lombok, Sulawesi (Celebes), the Sangi

and Talaud Islands, and Miangas Island (on the Australasian side).

The **Africa Region** includes Socotra in the Arabian Sea, Sao Tome and Annobon in the Gulf of Guinea, and the Canary Islands, but excludes Madeira. The Africa Region does not include Madagascar or the Comoro Islands, which are in the Indian Ocean Region.

The **Australasia Region** includes Lombok, Sulawesi (Celebes), Morotai, Halmehera, New Guinea (with Waigeo, Biak, Woodlark, and the Louisade Archipelago), the Admiralty Islands, and the Bismarck Archipelago; but excludes the Micronesian islands of Tobi, Helen, and Kapingamarangi, and excludes Green Islands, Bougainville, and the Solomon Islands.

The **South Polar Region** includes all land and ocean south of 52 degrees south latitude in the Atlantic and Indian Oceans, and south of 56 degrees south latitude in the Pacific Ocean. Where 56 degrees S in the Pacific reaches the 200 nautical-mile pelagic belt of South America, the boundary follows the edge of the pelagic belt around the tip of South America and northward in the Atlantic ocean to 54 degrees S, thence eastward to 50 degrees W longitude, thence northward to 52 degrees S latitude, thence eastward to 147 degrees E longitude (the boundary of the Pacific Ocean Region), thence southward to 56 degrees S. This boundary approximates the Antarctic Convergence. The South Polar Region includes Shag Rocks, South Georgia, Bouvet (near 5 degrees E), and the Heard Island group. Excluded are the Falkland Islands, Kerguelen, and Macquarie Island.

The **Atlantic/Arctic Ocean Region, Pacific Ocean Region,** and **Indian Ocean Region** include all oceans and islands not included in any Continental Region nor its pelagic belt. Each extends south to 52 degrees S or 56 degrees S latitude, as defined for the South Polar Region.

Prepared by the ABA Listing Rules Committee

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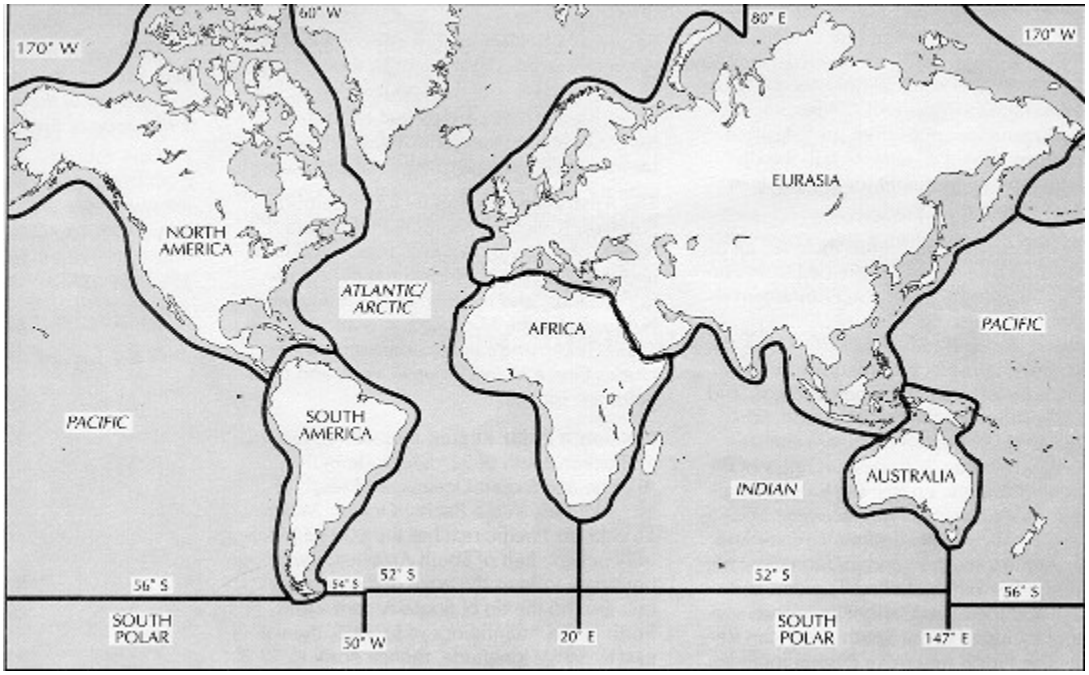

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BIRDING ETHICS

One thing you may not know is that birders can cause harm to a bird. Too many people trying to see a rare bird can do some pretty stupid things. Here is the Code of Ethics for birders. You need to read it.

ABA Code of Ethics

There can also be a lot of damage done to a bird's habitat when a bird is heard, but we can't see them. People go walking into a marsh to see a rail, for example. Read why the American Birding Association now allows "heard" birds to be counted on their annual listing form.

Why Heard Birds Count

Recording a bird's song and then playing it back can often attract the bird out into the open. Is this acceptable--or are we harassing the birds? Read the pros and cons about this common birding technique and then decide for yourself.

Tape Playback: Is It Ethical?

Return To Ethics Menu
Press Here To Copy This Topic To The Clipboard

AMERICAN BIRDING ASSOCIATION CODE OF ETHICS

We, the Membership of the American Birding Association, believe that all birders have an obligation at all times to protect wildlife, the natural environment, and the rights of others. We therefore pledge ourselves to provide leadership in meeting this obligation by adhering to the following general guidelines of good birding behavior.

I. Birders must always act in ways that do not endanger the welfare of birds or other wildlife.

In keeping with this principle, we will:

Observe and photograph birds without knowingly disturbing them in any significant way.

Avoid chasing or repeatedly flushing birds.

Only sparingly use recordings and similar methods of attracting birds and not use these methods in heavily birded areas.

Keep an appropriate distance from nests and nesting colonies so as not to disturb them or expose them to danger.

Refrain from handling birds or eggs unless engaged in recognized research activities.

II. Birders must always act in ways that do not harm the natural environment.

In keeping with this principle, we will:

Stay on existing roads, trails, and pathways whenever possible to avoid trampling or otherwise disturbing fragile habitat.

Leave all habitat as we found it.

III. Birders must always respect the rights of others.

In keeping with this principle, we will

Respect the privacy and property of others by observing "No Trespassing" signs

and by asking permission to enter private or posted lands.

Observe all laws and the rules and regulations which govern public use of birding areas.

Practice common courtesy in our contacts with others. For example, we will limit our requests for information, and we will make them at reasonable hours of the day.

Always behave in a manner that will enhance the image of the birding community in the eyes of the public.

IV. Birders in groups should assume special responsibilities.

As group members, we will:

Take special care to alleviate the problems and disturbances that are multiplied when more people are present.

Act in consideration of the group's interest, as well as our own.

Support by our actions the responsibility of the group leader(s) for the conduct of the group.

As group leaders, we will:

Assume responsibility for the conduct of the group.

Learn and inform the group of any special rules, regulations, or conduct applicable to the area or habitat being visited.

Limit groups to a size that does not threaten the environment or the peace and tranquillity of others.

Teach others birding ethics by our words and example.

Return To Ethics Menu
Press Here To Copy This Topic To The Clipboard

WHY HEARD BIRDS COUNT

by Kenn Kaufman
This article originally appeared in the
March, 1994 issue of *Winging It*,
a publication of the American Birding Association

At its November 1993 meeting, the ABA Board of Directors voted (by an overwhelming majority) to make a change in the official bird-listing rules. According to this change, birds identified by sound will qualify to be counted on any list reported to ABA--including world life lists and ABA Area life lists, which formerly required that the bird had to be seen. For purposes of listing, heard birds will be on equal footing with seen birds.

Most members are aware of this change, because it was already mentioned by Greg Butcher in *Winging It* and by Dan Williams in *Birding*. But since this was the first time that the entire Board had acted to change the listing rules, ABA members may be interested to know how this came about.

Many readers will recall that a 1991 survey in *Winging It* sought members' opinions on whether the rule should be changed, allowing heard birds to count on ABA Area and world life lists. The results of that survey (some of which were published in *Winging It*, March 1992 and June 1992) were quite revealing. Some 85 percent of the membership at that time did not respond, implying that they would go along with any policy suggested by the ABA. Among those who responded, opinion was almost evenly divided. In the absence of a strong majority either way, our Listing Rules Committee took the conservative approach of not changing the rule. The rule that remained in force at that time stipulated that, for ABA Area or world life lists, birds would have to be seen to be counted.

However, the survey in *Winging It* had elicited many extensive comments in addition to simple yes/no votes. These comments were very valuable, for they provided good insight into the reasons behind the two opposing viewpoints. There were well-stated arguments both against the change (i.e., against counting heard birds) and for the change (i.e., making heard birds countable). However, boiled down to simplest terms, those opposed felt that this change would have a negative impact on the sport of birding. Those in favor felt that it would have a positive impact on the birds themselves. And both of these aspects merit serious consideration.

Impact of the rule change on birders

ABA came into existence as the first organization to promote the hobby and sport of birding . . . and at the outset that mostly meant listing. The pursuit of lists has

come in for some bashing by ornithologists and "serious" birders recently. However, many of these same people got their early field experience by running around the countryside, playing the listing game for all it was worth. It's hardly fair for them to criticize those who are list-chasing now. Bird listing remains a perfectly legitimate pursuit. It requires more brainpower than most outdoor sports, it often leads to greater knowledge of bird distribution, it rarely harms the environment, and it's a lot of fun! And even with our broadened scope of recent years, ABA remains more relevant to the concerns of the listers than any other organization.

So with that in mind, how did our correspondents think that the change in listing rules was going to detract from their birding?

One argument was that listing heard-only birds could lead to sloppy birding or misidentifications. The obvious flip side to that, of course, is that *any* kind of listing *could* lead to sloppy birding. The desire to tick off another new one could tempt people to fudge their sightings. But we know that, by and large, this never happens. Bird listers derive great personal satisfaction from their lists, and they want to be sure of every addition.

Birders in general are oriented toward a visual approach. Most of us tend to be conservative about anything that's not actually seen. This is not likely to change with the new countability of heard birds. (The new rule doesn't say that you *have to* count heard birds, just that you *can* count them if you wish.) No one is going to say anything like, "The trip leader pointed out the chip-note of a Cerulean Warbler, so I'm counting it on my life list." And if someone ever did, so what? It would be a sad thing for the birder who did not try to see this little gem of the treetops, but it wouldn't hurt anyone else.

However, the most frequent argument against counting heard birds was that it would make lists less comparable. This is where we get into tricky territory. It prompts us to look at the competitive side of birding and to ask, when are lists really comparable anyway? What can a comparison of lists actually prove?

In most sports, the scores mean something. On any one golf course, the person who consistently gets the best scores is likely to be the best golfer. The target shooter who hits the most bull's-eyes is probably the best shot. But what about scores in birding? Is the person with the biggest list the "best" birder? No, not necessarily. It doesn't work that way.

Let me illustrate with a hypothetical comparison. Birder A goes out every week to make a thorough survey of the birds in her three-county home region. Birder B never goes out at all--not until the hotline reports something he "needs" for the state. Birder B has a bigger state list, but who really knows the birds better? What's the point of comparing their lists?

There are many things that confound comparisons. For example, some people always go on guided tours, having all their birds pointed out to them, while others insist on finding and identifying every bird for themselves. Some people will count a bird after a quick glimpse, while others will not count it until they have gotten to know it thoroughly. Can you say that their list totals are really comparable?

In giving these examples, I'm not criticizing anyone's approach. the "right" way to work on a list is simply the way **YOU** enjoy it; only you can decide. All I'm saying is that--although a Birder's list may mean a lot to that person--*comparisons* of people's list totals are virtually meaningless. Bird listing is a great game, but it's a game in which we compete only against ourselves. There's nothing that ABA can do, nothing that anyone can do, to make list totals truly comparable.

Of course, a change in rules won't force anyone to count heard birds on their life lists. So the objection seems to be driven by the fear that *somebody else* will get to count that elusive bird without having to work as hard for it. Taken down to this basic level, the sentiment doesn't sound very appealing, does it?

Some perspectives on hearing, seeing, and "knowing" the birds

We might say that what birding is all about (as opposed to bird-listing) is getting to know the birds. And there are many different levels of experience that contribute to how well we know them.

One level would be simply to read about a bird, or to look at pictures. Another level would be to hear the bird in the field. Another level would be to see it. But there's no reason why that should be the cut-off point. Just because you've seen a bird once, that doesn't mean you *know* it.

Let me re-phrase that. Maybe *you* know the bird, but I sure don't. Although I've spent most of my life birding, I still don't feel that I know the birds thoroughly. I've seen the Kentucky Warbler hundreds of times, maybe thousands, but I've never seen its nest. Without stopping to check a range map, I can't tell you the status of Turkey Vulture in North Dakota. I've never seen the courtship display of the Sanderling. I don't know the diet of the Bufflehead. And I've seen Great Gray Owls in several states and provinces, but have never heard one! There's a major gap between seeing a bird once and actually knowing it.

On the other hand, sometimes you can learn a lot about a bird by just hearing it.

Suppose you have heard Common Poorwill in several places without actually seeing it. Don't you know something about this bird? You know it begins calling at dusk, and that it may still be calling in the hours after midnight when many nocturnal birds have fallen silent. You know it does not inhabit deep forest

of the mountains, nor usually unbroken desert flats, seeming to favor canyon walls, rocky outcrops, and foothills. You know something about its distribution, based on your own experience. You can guess that it must sing from the ground and forage from the ground, because you have found it in places where it had little else but the ground on which to perch. You have had field experience with this bird, and if you are keeping a life list, there is no reason why you should not count Common Poorwill.

Ultimately, though, these philosophical points had little to do with the Board's decision to make heard birds countable.

The impact of the rule change on the birds themselves

If this had been solely a debate on the sport of birding , it could have gone either way. But it was our judgment, finally, that this was a conservation issue.

This reflects the unique nature of our pursuit of birding as a sport or game. If the czars of sport decide to change the football rules, the football itself is not going to care. But we're not playing a game with inanimate objects. Our actions can affect the living birds for better or for worse. And it seems clear that our attempts to see (rather than just to hear) those super-elusive skulkers can affect the birds for the worse at times.

This was very clearly reflected in the comments from members who wrote in. Of the hundreds who supported the counting of heard birds, the vast majority stated one overriding reason: a desire to reduce the pressure placed on hard-to-see birds and their habitat.

Do birders ever cause disturbance to birds? Of course we do. (And so does everyone else. When you drive to work in the morning, you may flush the doves that are trying to feed along the roadside. What are you going to do about it? Stay home?) The warbler that stops feeding and comes flitting over to check out our screech-owl imitation is disturbed, yes, but only for a moment, and this is only a minor event in a day when the bird is frequently responding to other things in its environment. The disturbance we cause is usually minor, and we more than balance it out by our support for environmental protection.

Occasionally, though, we may slip over the line into irresponsible behavior. (I'm sure that I have, perhaps many times, so I'm not preaching here.) And it's particularly likely to happen with those birds that are easy to hear and hard to see. It's an uncomfortable feeling to recall such situations: when that calling nightjar or rail or owl is being extraordinarily invisible, when time is running out, when birders who have traveled X miles and spent X dollars are worrying that they won't get to *count this bird*, when some reckless member of the group starts to suggest desperate measures to push it out into the open . . .

But what if the voice were countable, and the birders didn't have to see the bird? Instantly, those desperate measures would seem less tempting. Reason and responsibility would be more compelling. The marsh or the thicket could be left intact, the spotlight could be turned off. We've heard the bird; it counts.

That scenario, essentially, is why the Board voted to change the listing rule. Everyone knows that the American Birding Association has been taking the lead in promoting responsible birding. Our **ABA Code of Ethics** is widely noted and quoted. The Board saw that a simple change in the listing rules would make it far easier for ABA members to pursue their lists without straying into irresponsible behavior.

And if the heard-birds rule results in *any* reduction of pressure on the birds or on their habitat, the change will have been well worthwhile.

I'd like to close with a personal note on Yellow Rail, a bird mentioned often in the heard-versus-seen letters.

For a few years, under pressure from birders, a wildlife refuge on the Gulf Coast was offering "rail buggy" trips to look for Yellow Rails on their wintering grounds. A balloon-tired tractor would pull a trailer around and around in wet meadows, flushing recalcitrant marsh birds out into the open. Although we were assured that this did not cause permanent damage to the birds or their habitat, I can recall feeling distinctly uneasy about it. Watching the panicky rails when they were finally driven to fluttering flight, wondering about the confused birds than ran toward the wheels instead of away from them and then never re-emerged, looking back at the broad swaths of flattened grass, I had to wonder about the wisdom of our attempts to see these birds. And what had we gained, anyway? A quick look at a frantic bundle of feathers, with a white patch in the wing? Oh, boy. Lifer look. List 'em and leave 'em, and don't look back too carefully at the tire tracks.

Contrast that to another memory--of a night in the Prairie Provinces when we went to listen to Yellow Rails and made no attempt to see them. After the long northern twilight had melted into darkness, after the Le Conte's Sparrows had fallen silent, while the ghostly winnowing of the snipe drifted across the meadows, we sat on the road and listened. And presently we heard it: that sudden crackling *tick tictick tictictic tictick tictictic tictick tictictic*, startling in its loudness and urgency. Another one answered from far across the marsh, and then another from off to the south, and we sat and listened to their odd metallic chorus. Apparently there were about five territorial male Yellow Rails within earshot, and we could follow their progress as they moved about the marshy meadows, rattling out their percussive calls. The rails were in their element here. They were in command of the marsh, in harmony with summer on the high prairies. It seemed only natural when we turned around and saw that the sky to the north was painted with the wavering curtains of color of the Northern

Lights.

At that moment I wanted to forget the winter sightings, banish them from memory forever--forget those frightened, clumsy birds that had scuttled away from the crushing wheels. It was infinitely better to *hear* the Yellow Rails. This was a lifer experience worth counting, worth savoring, worth repeating again and again, with no harm done to the birds themselves.

Return To Ethics Menu
Press Here To Copy This Topic To The Clipboard

TAPE PLAYBACK: IS IT ETHICAL?

by Peter W. Thayer
President, Thayer Birding Software

Birders love to look at birds. So it makes sense that we would invent ways to coax birds out into the open. New birders quickly learn about "pishing". Pishing is the sound we create by repeatedly making a "P" sound and then blowing air though our teeth. It sounds a lot like the word "pish." It also sounds a lot like the scolding chatter of a titmouse or chickadee. In fact, that is the whole idea. Birds will pop up out of the thickets to see what the fuss is all about. They expect to see an intruder like a snake or a hawk being harassed by other birds. Instead, they see you looking at them through a binocular.

Variations on pishing include the sound you get by loudly kissing the back of your hand. (DO NOT do this if you just sprayed yourself with insect repellent. Trust me--I know what I'm talking about!) Advanced birders may imitate the sound of an owl to attract other birds. Barred Owl and Great Horned Owl calls work well in North America. The repeated short whistling sounds of a pygmy owl work well in the tropics.

Is pishing unethical? Is it harmful to birds? Probably not. It certainly is effective--if it was not, we would stop doing it. Many of us find it hard to believe that pishing bothers the birds. Birds are constantly reacting to sounds and sights in their environment. A birder pishing into the wind is probably causing as much distress to a bird as a ringing telephone causes a human.

The ethical questions become harder to answer when birders use a tape recorder to play back a bird's own voice. Here is an interesting question: Is using a prerecorded song of the same species "better" or "more ethical" than using a tape recording of a specific bird's own voice? Here is another interesting ethical question: Birders can now carry the CD-ROM "Birds of North America" into the field and quickly play any one of 550 songs using a portable computer with a built-in CD-ROM. There is no need to fumble with a tape recorder, trying to find the right spot on a 90 minute tape. Does this recent improvement in technology mean that this CD-ROM is suddenly unethical?

The CD-ROM "Birds of North America" and the Peterson Field Guides "Bird Songs" contain a warning label that says:
A word of caution: Playing these recordings in the field should be undertaken in a responsible manner. While playback is known to attract birds, it can also disturb them. Playback should NOT be done near birds engaged in nesting and should be terminated IMMEDIATELY whenever a bird shows signs of becoming frantic.

But is this enough? Or is this WAY too much--since the problems it warns about don't even exist?

Mr. Greg Budney, Director of the Cornell Laboratory of Ornithology's Library of Natural Sounds, believes that birders often do not use recorded songs responsibly. "People are not educated. It is important that you understand what you are communicating to a bird when you play a tape." Mr. Budney believes that the late Ted Parker understood this better than anyone.

"I've seen Ted Parker use a tape to lure a shy forest bird to a precise spot in a rainforest. He made sure every member of the tour group was in place, and quiet before playing the tape. The song of the Rusty-belted Tapaculo was then played back a couple of times and we waited. Patience is the key. Ted knew the bird and its habitat--and he knew exactly how the bird would react to the sound of 'another' bird. Within ten minutes, the tapaculo walked in the small area, as he had predicted, and everyone got a great look at the tapaculo. Without his skillful use of playback, the group would likely not have seen this bird."

Mr. Budney has seen too many birders using a tape recording as if they were trolling for fish. "Walking along a trail while 'fishing' for birds is crude. The person obviously does not understand how territory, time of year, and reactions to conspecific birds affect a bird's behavior." Someone like Ted Parker may play a song once and then wait patiently for half an hour for the bird to appear. A novice may play the call of a Mangrove Cuckoo in the Florida Keys over and over until the bird appears. He then continues playing the tape until the agitated bird whips itself into a frenzy and finally flies away. Both birders used a tape to lure a bird out into the open. But there is a huge difference in how "ethical" each birder behaved.

Some birders believe that the playback of recorded songs causes actual harm to a bird. Predators may be attracted, nests may be abandoned or a bird may be driven off its territory. The US National Park Service recently banned the use of recorded playbacks in certain parks--even for those conducting scientific surveys! This may be an example of overreacting to the problem. Surprisingly, there have been no studies of the effects of taped bird songs on wild birds. Many people just "assume" tapes are bad.

In places like Cave Creek Canyon, Mr. Budney believes that taped bird calls may have become so common that the birds simply learned not to respond to "yet another Peterson Field Guide impostor". Signs posted at some of the more popular birding spots now ask birders not to play tapes. The incessant taped calls were becoming a distraction for birders as well as the birds.

Mr. Budney, in commenting on this article, made the following points:

> "There is no definitive research that shows birds are driven off territory

through playback. At the same time no doubts exist that birds do react to playback.

Birds have very discriminating hearing, evidenced by the acoustically complex nature of the sounds they make The full detail of bird sounds is not obvious to the human ear until a recording is slowed down to half or quarter speed, at which point the rich details are revealed such as frequency (pitch) sweeps, modulation and amplitude (loudness) shifts. Birds perceive this detail and science is still unlocking the phenomenon of how they produce and hear these sounds that give us so much pleasure.

There is reason to believe, once a bird has experienced the playback of a prerecorded signal (e.g. a sound from a Peterson Field Guide tape), it would habituate to the sound and no longer respond. Repetition of the same exact sound on low fidelity, such as a cassette copy of a cassette, may increase the likelihood an impostor is recognized for what it is. I am told Zigzag Herons at La Selva are less responsive to playback than when this species was first detected there. Zigzag Herons are still present at La Selva. The possibility exists they now recognize a Zigzag Heron recording played back loudly with its excessive tape hiss as an impostor.

Despite increased birding activity (and playback) over the last two decades, no adverse effects have been observed on the population of the Eared Trogons in the southwest United States. Circumstances may be similar to those of the Zigzag Heron. Better to have a skilled tour guide using playback to draw a bird into view for a group than to have 10-12 people walking through the bird's territory."

Perhaps it is time for some scientific research into a very emotional question. Do taped calls upset the birds? Do taped calls cause actual harm to birds? Doesn't the benefit that birders do for the environment and public awareness of birds far outweighed the temporary distress a tape may cause to one bird?

It helps to keep things in perspective. Millions of birds fly into windows and die each year--yet none of us would suggest that glass windows be banned. The negative impact of taped calls on the entire population of birds is insignificant when compared to the harm one skyscraper in New York does to birds. Personally, I believe that the intelligent use of taped bird songs is acceptable. Birders who have watched Ted Parker or Steve Hilty use a tape recorder in the tropics have seen how tape recordings can be use prudently. Birders who use the tape recorder to go "fishing" for birds can be shown how to use tapes prudently. There is no need to scold. Just show them how much more productive a tape can be when used properly and with a little patience! They will change their behavior because it is in their own best interest to do so. They will see more birds--and be able to teach others how to do it right. Birders and the birds will both benefit.

**** IDENTIFYING BIRDS ***

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IDENTIFYING BIRDS

Even if you are not Colonel Sanders, the founder of Kentucky Fried Chicken, you need to know the names of the parts of a bird. You already know most of the important names. You will soon discover that birders seem to have given a name to every little line on a bird. Do you know where to find a bird's wing bars, primaries, superciliary and malar stripe? Bird books often refer to these to help you identify a bird. Click below to see the names given to parts of a bird.

Parts of a Bird - Figure 1

Parts of a Bird - Figure 2

Parts of a Bird - Figure 3

Learning to identify birds is fun. A field guide will help you attach a name to all the birds you see. Field guides are books with pictures and descriptions of the birds. A field guide typically shows birds of just one country or even one part of a country. Here are some tips to make identifying birds easier. First ask "How big is the bird?" Is it as big as a sparrow, a robin, a pigeon, a chicken or an ostrich? Is the bird fat or skinny, long or short. Look at each part of the bird. Is its bill short or long, thick or thin, curved or straight? How about the tail? What shape is it? Is it forked? Are the bird's wings pointed or curved, long or short?

After you do all this then notice the main colors of the bird. This sounds crazy, but it works. If you do not believe me, turn to the Roadside silhouettes inside the front cover of your *Peterson Field Guide to Eastern Birds* or *Peterson Field Guide to Western Birds.* With practice, you will be able to recognize all these birds just by their silhouette. If you don't have a Peterson Field Guide yet, I will wait here while you go get one. They are in the library and you can buy one in almost every bookstore.

The colors of a bird can play tricks on you. A bird's colors look different when the bird is at the top of a tree at sunset than it does at noon. Check the color of each major body part. Sometimes just the color of a bird's legs can help you tell one species from another. Also check to see if the bird has wing bars or an eye-ring or a patch of color on its rump. Many birds found near water have distinctive markings on their wings or tail.

Finally, look around you. Are you and the bird deep in a forest, on your lawn or 50 miles out at sea? Each bird likes a certain habitat. Habitat refers to things like plants and trees in the area, the elevation (are you in the mountains or at the shore?), the climate in the area and the type of water nearby. See if the bird is

swimming or wading. Can the bird climb trees? Does it wag its tail a lot? When it flies, does it go straight or up and down like a roller coaster?

If you can answer many of these questions, you have a very good chance of finding your bird in the field guide. There is a very good book called An *Audubon Handbook: How To Identify Birds.* It can help you a lot with bird identification. When you understand how your field guide arranges all of the birds, it will become even easier to quickly turn to the right page. Here is a hint: look for little birds you see in trees in the back half of your book. To learn why your bird book puts the birds in such a confusing order, look at the section of this CD-ROM called "Scientific Classification of Birds."

I have one final secret to tell you. Really good birders can "see" more birds with their eyes closed than I can see with my eyes open! They know the songs a bird sings. Even one chip note might tell them a bird called a Rose-breasted Grosbeak is hiding in the bushes. This actually happened to me when I was birding with Tom Kemp near Toledo, Ohio. That was when I realized I had a lot to learn.

What I learned is ... **LISTEN !** A bird's song can tell you to START LOOKING FOR ME. Some birds such as rails and bitterns live deep in the swamp. You may never see them. Birders can identify them by their call or their song. The "Birds of North America" section of this CD-ROM has bird songs for many of your favorite birds. Check out the American Bittern, Yellow-headed Blackbird, Common Eider, Ring-necked Pheasant or Common Loon for some WEIRD sounds! My favorite songs are those of the Western Meadowlark and the Wood Thrush.

To Hear **Weird** Bird Songs -- Click on the Bird's Name Below

American Bittern

Yellow-headed Blackbird

Common Eider

Ring-necked Pheasant

Common Loon

To Hear **Nice** Bird Songs -- Click on the Bird's Name Below

Western Meadowlark

Wood Thrush

The folks at the Cornell Laboratory of Ornithology picked the following birds as

having the STRANGEST songs among all the birds of the world. See if you agree. Click on the bird’s name to hear the "song."

Common Potoo

Musician Wren

Pale-winged Trumpeter

Horned Screamer

Grey-necked Wood-Rail

**** BIRDS BEST FRIENDS ***

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BIRD'S BEST FRIENDS

There are many wonderful birding organizations.
Some organizations focus on conservation efforts,
habitat protection, and the study of birds.
Others focus on the sport of birding.
These are all tax-free organizations.
Most publish magazines for their members.

American Birding Association
P.O. Box 6599
Colorado Springs, CO 80934
Promotes recreational birding in the US and Canada.
Premier US organization for birders.
Special programs and half-price memberships if under 18.
Publishes *Birding* and *Winging It*.
800-850-2473

Birdlife International
219C Huntingdon Road
Cambridge, England CB3 0DL
Coordinates international responses to threats to bird habitat.
Formerly named International Council for Bird Preservation

Cornell Laboratory of Ornithology
159 Sapsucker Woods Road
Ithaca, NY 14850
Devoted to the study, appreciation and conservation of birds.
The lab has the world's largest collection of bird songs.
Publishes *Living Bird*.
607-254-2473

National Audubon Society
950 Third Ave.
New York, NY 10022
Preservation of habitat, education. Conservation organization.
Organizes the Christmas Bird Counts.
Publishes *National Audubon Society Field Notes*.
212-832-3200

National Wildlife Federation
1400 Sixteenth Street, N.W.
Washington, D.C. 20036-2266

Conservation education organization informs people about the wise management of natural resources and the importance of a clean environment. Sponsors the Backyard Wildlife Habitat Program.
800-432-6564

(OSNA) Ornithological Societies of North America
American Ornithologists' Union
Association of Field Ornithologists
Cooper Ornithological Society
Wilson Ornithological Society
P.O. Box 1897
Lawrence, KS 66044-8897
Four organizations for professional ornithologists, scientists and researchers. Publishes *The Auk*, *Journal of Field Ornithology, The Condor, and The Wilson Bulletin*
913-843-1221

RARE Center for Tropical Bird Conservation
19th & the Parkway
Philadelphia, PA 19103
Works to preserve the habitat of Tropical Birds.
215-299-1182

The Nature Conservancy
1815 North Lynn Street
Arlington, VA 22209
Preserves wildlife habitat worldwide.
703-841-5300

VIREO (Visual Resources for Ornithology)
1900 Ben Franklin Parkway
Philadelphia, PA 19103
Preserves visual images and supplies photographs for a wide variety of uses. This division of The Academy of Natural Sciences has the world's largest collection of bird photographs.
215-299-1069

Click here to learn more about VIREO

Bird's Good Buddies

Two other organizations you should know about:

The Roger Tory Peterson Institute of Natural History
311 Curtis Street

Jamestown, NY 1701
Works with educators to create passion for, and knowledge of,
the natural world in the hearts and minds of children.
Also sponsors annual forums on Wildlife Art, Photography, Writing.
716-665-2473

The Leigh Yawkey Woodson Art Museum
Franklin and Twelfth Streets
Wausau, WI 54401-5077
Sponsors annual "Birds in Art" competition.
Houses the world's top collection of bird art.
715-845-7010

Return To Birds Best Friends Menu
Press Here To Copy This Topic To The Clipboard

VISUAL RESOURCES FOR ORNITHOLOGY
THE NORTH AMERICAN CATALOG

THE ACADEMY OF NATURAL SCIENCES,
1900 BEN FRANKLIN PARKWAY,
PHILADELPHIA, PA. 19103-1195

CONTRIBUTING SLIDES TO VIREO

VIREO continues to expand its worldwide coverage of birds. Gaps in the North American collection can be seen in this catalog wherever codes are missing. If you have slides which would help fill these gaps and wish to share your photographic successes with other birders, ornithologists, teachers and students please contact VIREO.

This catalog lists duplicate slides available from VIREO for the birds of North America, including vagrants. For each species, we list categories of photographs: Male = M, Female = F, Adult = A, Winter = W, Immature = I, Nest = N, Flight = L, Painting = P, and Scientific specimen or mounted bird = S, if obviously captive the slide is listed as Zoo = Z or Handheld = H.

To select the catalog images you want, find the species and circle the codes that correspond to the desired duplicates. The minimum order is 5 slides. See last page to order slides not listed or for Artist's Reference.

HOW TO ORDER VIREO DUPLICATE SLIDES

Catalog Slides $3.00

Circle the codes on the pages below for desired duplicates. The minimum order is 5 slides.

Non-Catalog Slides $4.00

You can order any of the over 5,000 species represented in VIREO's worldwide collection. To order, send us a list of desired species with a secondary list of alternate species. To aid us in quickly and accurately filling your order, please list scientific names if possible. Mention the reference used, particularly if it is not a new one. If you have precise photographic needs for a particular behavior or specific age, race, color phase, or alternate plumage please describe your requirements in an attached letter. If VIREO does not have exactly what you request, we will substitute as close an image as possible of the same species,

unless specifically requested not to do so. Minimum order is 5 slides.

Artist's Reference $10.00

Individual professional artists may order slides to be used as research aids (not to be copied in any form). No minimum order size.

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Bird Families of the World	(213 slides)	$325.00	_____
Bird Orders (subset of above)	(40 slides)	70.00	_____
Familiar Eastern Birds	(80 slides)	120.00	_____
Endangered & Extinct Species	(35 slides)	65.00	_____
Eastern Wood Warblers	(40 slides)	70.00	_____
North American Waterfowl	(60 slides)	90.00	_____
North American Falconiformes	(50 slides)	75.00	_____
North American Shorebirds	(60 slides)	90.00	_____
N. American Herons & Allies	(40 slides)	60.00	_____
North American Owls	(20 slides)	30.00	_____

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Organization_____

Address_____

City, State, Zip_____

Phone # (__ __ __)__ __ __-__ __ __ __

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1900 Ben Franklin Parkway
Philadelphia, PA 19103-1195

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Non-Catalog Slides	$ 4.00	_____	minimum order 5
Artist's Reference	$10.00	_____	no minimum
Slide Sets		_____	

Add 100% for rush service 2 week turnaround

Federal Express shipping extra

_____
No charge for shipping by first class mail.

Please make check payable to: VIREO/ANSP TOTAL $_____

VISA __ __ __ __ __-__ __ __ __-__ __ __ __-__ __ __ __ Exp_____

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* We can not accept checks drawn on Non-USA banks. All checks must be drawn in USA dollars from banks with branches in the USA. International money orders are also acceptable.

**** BINOCULARS AND SCOPES ***

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BINOCULARS & SCOPES

BINOCULARS

Binoculars are indispensable tools for birders. The singing speck at the top of a tree becomes a brilliant flame-orange bird with a black head and black wings. You even see a white wing bar through your binocular when the bird turns just so. Binoculars can be expensive. **Of all the advice I ever received from other birders--the best advice was "BUY THE BEST BINOCULAR YOU CAN POSSIBLY AFFORD."**

The folks at the Cornell Laboratory of Ornithology can help you decide which binocular is best for you. **Their top choices are the Leica BA Ultra, Bausch & Lomb Elite, Zeiss 7 x 42, and Zeiss 10 x 42 B/GAT.** These have suggested list prices of $1200 to $1900. Read the ads in the birding magazines and make a few phone calls. You will find them for much lower prices.

Binocular Quest (Cornell Lab's review of Binoculars)

SCOPES

Loons bobbing on the lake, eiders out past the jetty, or thousands of "peeps" on the mudflat. Quick! Get the scope! No one has bad breath. We are talking about telescopes--or "scopes" if you are a birder who knows the lingo . Spotting scopes are great for viewing birds that are just too far away to see with binoculars. With luck the birds are sitting still and the scope is stabilized on a good tripod (Bogen tripods are great!).

The Cornell Laboratory of Ornithology has also taken a look at spotting scopes. **The hands-down winner is Questar**. But you pay for quality and not all of us can afford over $2000 for a scope (that's discount--not retail). Click the hot spot "A Birder's Guide to Spotting Scopes" for the Lab's unbiased review of spotting scopes for birders.

Birding etiquette hint #1: Offer to carry someone else's scope after they have been kind enough to let you use it.

A Birder's Guide to Spotting Scopes

Return To Binoculars and Scopes Discussion
Press Here To Copy This Topic To The Clipboard

BINOCULAR QUEST

by Todd A. Culver and Heather Gerhart
This article originally appeared in the
Autumn, 1992 issue of *Living Bird* magazine,
a publication of the Cornell Laboratory of Ornithology

Ready for a new pair of binos?
Lab staffers selected the best for you.

Birders love to argue about binoculars. The five veteran birders who make up the Lab's resident big day team, the Sapsuckers--Tim Gallagher, Kevin McGowan, Ken Rosenberg, Ned Brinkley, and Todd Culver--are no exception; they all have strong (and sometimes conflicting) opinions about which binoculars are best for bird watching. Last May when we headed down to New Jersey for the World Series of Birding (a grueling 24-hour birding competition covering the entire state) our borrowed Ford Explorer was packed full of birding experience, along with more than $10,000 worth of optical equipment being field tested for this article. What we learned about the latest binoculars should be helpful to you when you go shopping for your next pair.

The first two questions to ask yourself at the start of a quest for new optics are: 1) How much can I afford to spend? and 2) What magnification power is best for my needs-- 7x, 8x, or 10x? The Sapsuckers all agreed on the first point: spend as much money as you can afford. A thousand dollars or more may seem like an obscenely large amount of money to spend on binoculars, but when you divide that figure by the number of years you'll be using the binoculars, and then consider how much top quality optics will enhance your day-to-day birding enjoyment, you may decide the investment is worthwhile.

But ask a birder which magnification power is best and you'll likely get an earful. Ken, Ned, and Tim all prefer 10x, which provides an image magnified 10 times greater than what you would see with your naked eye. When the birds are far away-- hawk watching, shorebirding--10x binoculars are required equipment. However, for spotting close-up warblers flitting through dense foliage, many birders prefer 7x binoculars, which usually provide a brighter image and wider field of view than 10x. Also hand vibration is less noticeable with 7x. Kevin and I both carry 7x binoculars. We had over a week during pre-big day scouting to settle the dispute over which magnification power is best, but at the end we all still swore by our original choices. So on the question of which magnification power is best, you'll have to decide for yourself.

May 16, 1992 -- The World Series of Birding

New Jersey's Kearny Marsh is an exciting place at midnight. Half the excitement for us comes from starting the big day. The other half comes from seeing the gang of young hoodlums-in-training hanging out under the nearby railroad bridge. (I doubt that they're looking for marsh birds.) A mallard and then a Virginia rail sound off nervously. Ken and Ned bellow bird calls into the marsh, trying to get a coot to answer. No luck. Our maniacal bird calls seem to keep the "locals" under the bridge at bay. Kevin and I quickly scan the water's edge. Both of us carry Zeiss 7x42s, binoculars that gather more light than your eyes. I've owned mine for over a year now and I still gasp at how bright the image is. As I look across this urban marsh with my binoculars at midnight, there's enough light to see logs, reeds, pop bottles, rats, and other Kearny Marsh specialties. But I can't find any birds. Suddenly a nighthawk booms overhead. "Got it!" we scream together, then run back to our Explorer to continue our adventure.

An hour after the sun was supposed to rise, we're looking for warblers and a hermit thrush in the pouring rain. "Redstart singing behind," whispers Ken. "Got it!" "Cerulean in the top of the maple next to the spruce." "Got it!" "Solitary vireo over the road." "Got it!" We spot several more species and check them off the list in less than five minutes. Our bright, easy-to-handle 7x42 binoculars have been great for picking out birds in these dimly lit woods.

Twenty minutes after we pull into Brigantine National Wildlife Refuge, a dense fog rolls in from the ocean. This time I grab the Leica 10 x 40s; Kevin also puts away his 7x42s and straps on the Bausch & Lomb Elite 10x40s. Scanning flocks of peeps through the fog, we try to pick out white-rumped and western sandpipers from the hoards of semipalmated and leasts. In shorebirding, the differences between species are subtle. "You've got to have 10x binoculars," says Ken. "A 7x may be bright, but what good is it if you can't see the field marks? And besides, the best 10x binoculars are still *really* bright, so you don't give up much to get the extra magnification." For hawk watching, or birding on the coast, or in the tropics, I think he's right to choose 10x binoculars. But I still won't give up my 7x42s for finding warblers.

The Criteria

Before we left for New Jersey to compete in the World Series, we got together with the Crow's Nest Birding Shop staff and did some extensive testing under controlled conditions. A battery of indoor and outdoor tests revealed which binoculars were best suited for birding. We began by compiling useful information about each model. The table lists some basic statistics: prism design (roof, Porro, or reverse Porro), with or without armor-coating, extent of warranty, and more.

Prism design

Modern binoculars come in three basic designs: Porro prism, reverse Porro prism, and roof prism. Porro prisms have been around the longest. You can

recognize them easily because their ocular (eyepiece) lenses are much closer together than their objective (front) lenses. These are the standard "workhorse" binoculars you see everywhere. The better Porro prism binoculars are rugged, dependable, and less expensive than comparable roof prism binoculars. On the down side, however, standard Porro prism binoculars tend to be heavier, bulkier, and less water-resistant.

With reverse Porro prism binoculars, the manufacturers have inverted the standard design, placing the objective lenses closer together than the eyepieces. This design is used in a number of compact binoculars.

Roof prism binoculars have eyepieces directly in line with their objective lenses. They weigh significantly less and are more compact than comparable Porro prism binoculars, and they can be sealed more effectively against moisture. And most people find roof prism binoculars more comfortable to hold. But they tend to be expensive.

Interpupil Distance

Take a close look at any group of birders. You'll notice that some have close-set eyes, while others have eyes that are widely spaced. Binoculars are hinged, allowing birders to adjust them to match the distance between their eyes. Unfortunately, some binoculars may not adjust far enough to fit you correctly. And a good fit is just as important when buying binoculars as it is when buying eyeglasses. Using a clear plastic ruler, we measured the minimum and maximum distances between each binocular's eyepieces. (You can also use a clear plastic ruler to measure the interpupil distance of your eyes).

Weight

Next we weighed each binocular (without its strap) on the Lab's postal scale. Something that hangs around your neck all day should be as lightweight as possible (although the neoprene straps now available on the market can make heavy binoculars easier to carry).

Focusing

We measured the amount of rotation needed to change the binocular's focus wheel from closest focus to infinity. The numbers in the table are degrees of rotation (360 degrees is a full circle). Binoculars with low numbers are the fastest to focus. The smoothness of the focus mechanisms was also rated. Low quality binoculars feel like there's grit in the mechanism.

Brightness

The relative brightness between binoculars is generally determined by

comparing exit pupil sizes. To figure out exit pupil size, you simply divide the power of the given binoculars into the size of the objective lens. In 7x35 binoculars, for example, the 7x represents the power, and the 35 represents the diameter of the objective lens in millimeters. According to this formula, 7x35 binoculars have an exit pupil of 5 millimeters, while 10x40 binoculars have an exit pupil of 4 millimeters. Does that mean that 7x35 binoculars should be brighter in low light conditions than 10x40 binoculars? In theory, yes. But an inexpensive pair of 7x35 binoculars might lose so much light to poor optics and inadequately coated lenses that the exit pupil figures become meaningless. We decided to try a more direct method for comparing relative brightness. Using the dimmer switch in the Lab's auditorium, we created an artificial sunset. To simulate trying to spot a bird's wing bars or eye-rings, we taped a page of laser-printed text to one wall and sat in the dimly lit room, trying to read the page. Eye fatigue forced us to do this test twice, but we finally reached agreement on which binoculars were brightest and which were unacceptably dim.

Optical Performance

Optical performance--a measure of how sharp an image appears in binoculars--is critical for watching birds. We dug out the eye chart we used in the last binocular review ("Scanning for Optics," Autumn 1988 *Living Bird*). After bribing some Lab staffers (Tim Dillon, Cynthia Berger, Tim Gallagher, Melanie Jordan, and Diane Tessaglia) with free pizza, we hauled them and over 50 binoculars to the Cornell University football field. We set up the eye chart in the end zone and recorded the smallest line of letters we could read clearly from the midfield line.

Minimum Focusing Distance

We laid a 25-foot measuring tape on the artificial turf in front of the eye chart. Inching closer and closer to the chart, we measured each binocular's minimum focusing distance. Just as we were finishing up, an eager group of soccer players swarmed onto the field. Only a lightning retreat prevented thousands of dollars worth of optical equipment (and several Lab staffers) from being trampled.

Field of View

As the soccer game started, we stood on the sideline and counted the number of vertical posts in the handrail along the stands. The posts were exactly 5 feet apart, allowing us to calculate the field of view at 230 feet, The numbers in the table allow binoculars to be compared but are not the same as the field of view that may be stamped on some models. This value is usually measured at 1000 feet. We packed up and hauled the binoculars back to the parking lot, only to find that our car had been ticketed by campus security.

Water Resistance

It's easy to forget about water resistance until you get caught in a summer thunderstorm or fall through a frozen pond in winter (as one Lab staffer did during a Christmas Bird Count). One sunny afternoon I carefully laid the binoculars out on some large slabs of limestone in the Lab's bird feeding garden and hosed them down several times. After baking in the sun, the binoculars were stacked in a refrigerator for a couple of hours, forcing any moisture that had leaked inside to condense on the lenses. The test quickly pointed out which binoculars were adequately sealed.

The Results

At the top of the heap are Bausch & Lomb Elites, Leica BA Ultras, and Zeiss 7x42s and 10x40s. You can't go wrong with any of these binoculars. Choosing among them is a matter of personal preference. Eyeglass wearers, however, did not get along with Leica's high-tech retractable eyecups. They don't allow birders with thick eyeglasses to get a full field of view. As we found in our 1988 review, the Zeiss 7x42s are still the brightest binoculars. But four years ago they were head and shoulders above the rest. Now the Leica 8x42 and the Bausch & Lomb Elite 8x42 and 7x36 binoculars are nipping at their heels. In the field, the differences among these glasses are virtually undetectable.

We picked our favorite binoculars in four price ranges. The new Bausch & Lomb Elite 7x36s are a lot of binocular in a small package. Bright and tack sharp, they weigh only 25.4 ounces and focus down to 5 feet. These binoculars *are* expensive, but you're getting sealed optics and a lifetime "no questions asked" warranty. If they break, they are fixed or replaced. They are truly the last binoculars you'll ever have to buy.

But you don't need to spend $1000 to get a first-rate image. Check out Nikon's new E series 8 x 30 and Optolyth's Touring models. Both were given a #1 rating in optical quality and produce an excellent image for watching birds. The Nikon E weighs only 20 ounces; it's a pleasure to carry and handles beautifully. Optolyth's Touring 10x40 compares favorably with binoculars costing twice as much. But I wish they had sent us their Touring 7x42 to review; it's probably brighter than their 10x40. The biggest drawback with both binoculars is that they couldn't stand up to our fogging test. However, at half the price of the top-rated models, they are worth checking out if you're on a budget.

At a suggested retail price of $345, Swift's new Ultra Lite 8x42 is the best binocular for the buck. Birds look bright and crisp through the Ultra Lites. Their 21-ounce weight and armored coating make them the most comfortable Porro prism we examined. Amazingly, they were the only Porro prism binoculars to pass the fogging test. I wish I'd had a pair of these when I first started birding.

The Bushnell Birders continue to amaze us. Priced at only $75, they outperform many more expensive binoculars. Their greatest strength is the brightness of the

image they provide. But handle your Birders with care; one hard jolt and they may be knocked out of alignment. Bushnell Birders are perfect for beginners (or kids) who want to try bird watching but aren't sure they'll get addicted, or for those who crave a pair of first-rate optics but need to save their pennies. After the review, I was so impressed with them that I bought a pair to carry around in my car.

Finally, if you're looking for a pair of compacts, the Bausch & Lomb Custom Compacts are the only choice. They're amazing, offering a full-size image in a compact package that will fit nicely in your shirt pocket. The other compacts are difficult, if not impossible, to use for birding.

Binoculars are a birder's most important tool. We hope our review will help you to pick a new piece of glass. But remember: this review should serve only as a guide in selecting your new binoculars. Where you bird and personal preference will determine which binoculars are best for you. Always test binoculars before you buy them. How? local bird club field trips can provide a smorgasbord of optical equipment. Dress neatly, comb your hair, and people will most likely give you a look through even the most expensive optics. And talk to people. Birders love to talk about their binoculars.

Good Birding!

The tables below use a rating system of 1 through 5, 1 is the best.

Top rated shown in red

Over $800	**Bausch & Lomb Elite 10x42**	**Bausch & Lomb Elite 8x42**	**Bausch & Lomb Elite 7x36**	**Leica Ultra 10x42 BA**
List Price	$1,956	$1,900	$1,704	$1,590
Prism	Roof	Roof	Roof	Roof
Armor?	Yes	Yes	Yes	Yes
Warranty	Ltd Lifetime	Ltd Lifetime	Ltd Lifetime	Lifetime
Interpupal Dist.	2 3/16-2 7/8"	2 3/16-2 7/8"	2 3/16-2 7/8"	2 3/16-2 7/8"
For Eyeglasses?	2	1	1	2
Weight (ounces)	28.1	29.1	25.4	32.0
Play of Focus	400 deg.	400 deg.	400 deg.	330 deg.
Focus Feel	1	1	1	1
Brightness	2	1	1	2
Optical Perf.	1	1	1	1
Min. Focus Dist.	11'	10.5'	5'	14'
Field/View (230')	23.8'	27.5'	30'	20'
Fog	No	No	No	No

Over $800 Continued	**Leica Ultra 8x42 BA**	**Nikon Classic Eagle 8x40 DFC**	**Zeiss Dialyt 10x40 B/GAT**	**Zeiss Dialyt 7x42 B/GAT**
List Price	$1,590	$1,232	$1,250	$1,215

Prism	Roof	Roof	Roof	Roof
Armor?	Yes	No	Yes	Yes
Warranty	Lifetime	25 year Ltd.	Lifetime	Lifetime
Interpupal Dist.	2 3/16-2 7/8"	2 1/8-2 13/16"	2 3/16-3"	2 1/4-2 15/16"
For Eyeglasses?	2	2	2	1
Weight (ounces)	32.0	28.2	26.4	28.2
Play of Focus	330 deg.	190 deg.	330 deg.	450 deg.
Focus Feel	1	1	2	1
Brightness	1	3	3	1
Optical Perf.	1	2	1	1
Min. Focus Dist.	12’	14.5’	15’	9.5’
Field/View (230’)	20’	27.5’	20’	30’
Fog	No	No	No	No

$500 - $800	**aus Jena Luxus 10x40**	**Bausch & Lomb Custom 10x40**	**Nikon Execulite 9x30**
List Price	$775	$528	$567
Prism	Roof	Porro	Roof
Armor?	No	Yes	No
Warranty	Ltd Lifetime	Ltd Lifetime	25 year Limited
Interpupal Dist.	2 3/16-2 7/8"	2 1/4-2 13/16"	2 3/16-2 7/8"
For Eyeglasses?	3	2	4
Weight (ounces)	24.6	30.9	16.7
Play of Focus	270 deg.	460 deg.	630 deg.
Focus Feel	1	1	1
Brightness	3	3	5
Optical Perf.	2	2	2
Min. Focus Dist.	18’	12’	11’
Field/View (230’)	20’	20’	22.5’
Fog	No	Yes	Yes

$500 - $800 Continued	**Nikon E CF HP 8x30**	**Optolyth Touring 10x40**	**Swift Audubon 7x35**
List Price	$512	$608	$600
Prism	Porro	Roof	Roof
Armor?	No	Yes	Yes
Warranty	25 year Ltd.	Ltd Lifetime	Lifetime
Interpupal Dist.	1 7/8-2 7/8"	2 1/8-3"	2 1/4-3 1/16"
For Eyeglasses?	2	2	2
Weight (ounces)	20.0	24.0	21.0
Play of Focus	330 deg.	410 deg.	460 deg.
Focus Feel	1	2	2
Brightness	2	3	2
Optical Perf.	1	1	2
Min. Focus Dist.	11’	16’	10’
Field/View (230’)	32.5’	27.5’	20’
Fog	Yes	Yes	No

$200 - $500	**Celestron**	**Celestron**	**Minolta**	**Optolyth**

	Ultima 10x42	**Ultima 8x32**	**Weath'mtc 7x42**	**Alpin 10x40**
List Price	$350	$330	$406	$360
Prism	Porro	Porro	Roof	Porro
Armor?	No	No	Yes	Yes
Warranty	Ltd Lifetime	Ltd Lifetime	25 year Ltd	Ltd Lifetime
Interpupal Dist.	2 -2 7/8"	2 -3"	2 1/4-2 7/8"	2 -2 3/4"
For Eyeglasses?	2	2	1	4
Weight (ounces)	19.7	17.4	29.1	18.2
Play of Focus	360 deg.	370 deg.	270 deg.	690 deg.
Focus Feel	1	2	1	1
Brightness	2	4	3	3
Optical Perf.	2	3	3	3
Min. Focus Dist.	15'	12'	12'	14'
Field/View (230')	23.8'	30'	25'	25'
Fog	Yes	Yes	No	Yes

$200 - $500 Continued	**Optolyth Alpin 7x42**	**Optolyth Alpin 8x30**	**Pentax DCF 8x42**	**Pentax PCF 7x50**
List Price	$360	$298	$375	$220
Prism	Porro	Porro	Roof	Porro
Armor?	Yes	No	No	No
Warranty	Ltd Lifetime	Ltd Lifetime	Orig. owner	Orig. owner
Interpupal Dist.	2 -2 3/4"	2 -2 3/4"	2 1/4-2 7/8"	2 13/16-2 3/4"
For Eyeglasses?	2	4	2	2
Weight (ounces)	18.1	14.9	31.0	31.8
Play of Focus	690 deg.	690 deg.	360 deg.	590 deg.
Focus Feel	1	1	1	2
Brightness	5	5	5	1
Optical Perf.	3	3	3	3
Min. Focus Dist.	27'	13'	24'	15'
Field/View (230')	25'	32.5'	27.5'	22.5'
Fog	No	Yes	No	Yes

$200 - $500 Continued	**Pentax PCF 7x35**	**Redfield WP 10x50**	**Redfield WP 7x35**
List Price	$200	$407	$361
Prism	Porro	Roof	Roof
Armor?	No	Yes	Yes
Warranty	Orig. owner	Ltd Lifetime	Ltd Lifetime
Interpupal Dist.	2 13/16-2 3/4"	2 3/8-3 1/16"	2 5/16-3 1/16"
For Eyeglasses?	3	3	2
Weight (ounces)	24.3	28.6	20.5
Play of Focus	560 deg.	170 deg.	170 deg.
Focus Feel	2	2	2
Brightness	3	4	4
Optical Perf.	4	3	3
Min. Focus Dist.	7'	24.5'	10.5'
Field/View (230')	25'	22.5'	25'
Fog	Yes	No	No

$200 - $500	**Swift**	**Swift**	**Swift**

Continued	**Audubon 8.5x44**	**Ultra Lite 8x42 ZWCF**	**Egret 10x42 HCF**
List Price	$399	$345	$288
Prism	Porro	Porro	Roof
Armor?	No	Yes	Yes
Warranty	Lifetime	Lifetime	Lifetime
Interpupal Dist.	2 1/8-2 3/4"	2 -2 15/16"	2 1/4-3 2 13/16"
For Eyeglasses?	2	2	4
Weight (ounces)	28.9	21.0	18.3
Play of Focus	460 deg.	370 deg.	320 deg.
Focus Feel	1	1	1
Brightness	3	2	5
Optical Perf.	2	2	3
Min. Focus Dist.	10.5’	16’	14’
Field/View (230’)	31.25’	20’	25’
Fog	Yes	No	No

Under $200	**Bushnell Birder 7x35**	**Minolta Standard 7x35**
List Price	$75	$141
Prism	Porro	Porro
Armor?	No	Yes
Warranty	Ltd. Lifetime	25 year Limited
Interpupal Dist.	2 13/16-2 7/8"	2 3/16-2 13/16"
For Eyeglasses?	3	3
Weight (ounces)	18.8	26.8
Play of Focus	460 deg.	270 deg.
Focus Feel	2	2
Brightness	2	3
Optical Perf.	3	3
Min. Focus Dist.	13’	12.5’
Field/View (230’)	22.5’	32’
Fog	Yes	Yes

Compacts	**Bausch & Lomb Cust. Cmpct 7x26**	**Leica 10x25 BCA**	**Leica 8x20 BCA**
List Price	$457	$645	$615
Prism	Rev. Porro	Roof	Roof
Armor?	No	Yes	Yes
Warranty	Ltd Lifetime	Ltd Lifetime	Ltd Lifetime
Interpupal Dist.	2 1/4-3 1/8"	1 1/4 -3 1/4"	1 1/4 -3 1/4"
For Eyeglasses?	2	4	4
Weight (ounces)	11.5	8.8	8.1
Play of Focus	370 deg.	740 deg.	740 deg.
Focus Feel	1	3	3
Brightness	1	4	4
Optical Perf.	2	3	4
Min. Focus Dist.	6’	16’	8’
Field/View (230’)	27.5’	20’	26.3’
Fog	Yes	No	No

Compacts Continued	**Minolta Pocket 7x21**	**Minolta Compact 8x23**	**Nikon Travelite III 9x25**
List Price	$137	$132	$156
Prism	Rev. Porro	Rev. Porro	Rev. Porro
Armor?	No	No	No
Warranty	25 year Ltd	25 year Ltd	25 year Ltd
Interpupal Dist.	1 3/8-2 3/4"	2 1/4 -2 7/8"	2 1/8 -2 7/8"
For Eyeglasses?	4	4	4
Weight (ounces)	9.7	8.8	9.4
Play of Focus	350 deg.	340 deg.	350 deg.
Focus Feel	2	2	2
Brightness	4	3	2
Optical Perf.	5	5	3
Min. Focus Dist.	6’	21’	12’
Field/View (230’)	26.3’	25’	20’
Fog	No	Yes	Yes

Compacts Continued	**Pentax UCF 8x24**	**Redfield 8x24**	**Swift Micron 8x25 CF**	**Zeiss Design Selctn 8x20 BT**
List Price	$160	$210	$120	$530
Prism	Rev. Porro	Roof	Rev. Porro	Roof
Armor?	No	No	No	No
Warranty	Ltd Lifetime	Ltd Lifetime	Ltd Lifetime	25 yr parts
Interpupal Dist.	2 3/16-2 5/16"	1 3/8 -3 1/16"	2 1/4 -2 13/16"	1 1/4-2 7/8"
For Eyeglasses?	4	4	4	4
Weight (ounces)	9.9	9.6	10.1	6.4
Play of Focus	590 deg.	270 deg.	740 deg.	350 deg
Focus Feel	3	2	2	2
Brightness	2	4	3	3
Optical Perf.	5	5	4	4
Min. Focus Dist.	8.5’	14.5’	6’	8’
Field/View (230’)	25’	28.5’	20’	25’
Fog	No	No	Yes	Yes

Return To Binoculars and Scopes Discussion
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A BIRDER'S GUIDE TO SPOTTING SCOPES

by Tim Gallagher and Heather Gerhart
This article originally appeared in the
Spring, 1994 issue of *Living Bird* magazine,
a publication of the Cornell Laboratory of Ornithology

Lab reviewers compare the latest scopes for birding

One thing we learned quickly while conducting this scope review is that scopes are a heck of lot harder to compare than binoculars. Thing about it: Each binocular has only one pair of built-in eyepieces. To run a comparison test you just get a stack of binoculars and compare them side by side in a variety of situations. What could be simpler? Most scopes, on the other hand, have optional, inter-changeable eyepieces. With one scope model, you might have the choice of half a dozen or more different fixed-power eyepieces and a couple of zoom eyepieces. To make matters worse, a scope may excel with one eyepiece while being nearly useless with another.

To simplify matters, we decided to compare each scope using eyepieces of exactly the same power, if available. We chose the 20X-60X zoom eyepiece, which is popular with many birders because of its versatility. Optical pursuits may cringe to read this. The conventional wisdom has always been that zoom eyepieces are never as sharp and bright as fixed-power eyepieces. This was largely true in the past, but recently several optical companies have developed zoom eyepieces that are excellent for birding. Considering the convenience of zoom eyepieces and the fact that many of them have improved so drastically, we can no longer see any reason to opt for fixed-power eyepieces.

We had at first considered comparing all the scopes using 20X wide-angle eyepieces, which are also popular, but decided against it because there's so much less difference between the scopes at this power. Let's give them a real test, we thought. Zoom them from 20X to 60X on a dreary day and see which ones deliver the clearest, most watchable image.

A dreary day is just what we got. Instead of conducting this review during the long, balmy days of summer, as we usually do, we opted for late October. It sounded like a great idea when we thought of it. But later, as we stood shivering under leaden skies with snow threatening, we had our doubts.

Six birders participated in (or, should we say, endured) the review. Four were present or former members of the Sapsuckers-- the Lab's resident big day birding team--and have competed at least twice in New Jersey's annual World Series of Birding. The reviewers included Ken Rosenberg, senior scientist of the Lab's

Bird Population Studies program, Kevin McGowan, curator of Cornell's Bird Collection, Ned Brinkley, a Cornell grad student, Cynthia Berger, managing editor of *Living Bird*, Heather Gerhart, Crow's Nest Birding Shop manager, and Tim Gallagher, editor-in-chief of *Living Bird* and past captain of the Sapsuckers.

As you might expect in a review of this kind, the top contenders also tended to be the most expensive scopes. In terms of brightness and clarity at high powers, **the Questar was unbeatable**, which is no doubt the reason that most major bird tour companies carry one along on all their trips. This scope can bring in a recognizable image of a bird at impossibly long distances. The Questar switches easily from low-power to high-power by turning a tiny lever. One thing that might bother some people is that the image is reversed--if you pan the scope to the right, the image in the eyepiece moves to the left-but Questar fans claim that this is easy to get used to. The worst thing we can say about the Questar is that it costs at least twice as much as any of the other top-rated scopes. Ned Brinkley summed up the reviewers' opinions well: "Questars are the toys of the super-rich...I want one!"

Moving down into a more affordable price realm, we found four outstanding spotting scopes in the $1,000 to $1,600 range: the Kowa Prominar TSN-4, the Bausch & Lomb Elite 77mm with ED-prime glass, the Optolyth TBG-80 HD, and the Swarovski ST-80. For several years, the Kowa TSN-4 has been the undisputed champ in its class. Its fluorite objective lens and excellent zoom eyepiece provide a bright, clear image, even in poor light. With all these great contenders emerging on the scope market, the venerable TSN-4 wobbled, but did not quite topple from its place at the top of its class. According to Cynthia Berger, the TSN-4 had the most natural-looking color of the scopes we tested. And Ken Rosenberg, who owns a TSN-4, said that after comparing his scope side by side with the other top scopes, "I can see no reason to prefer any of the others over mine."

Before we move on to the next scope model, however, we should offer one word of caution about the Kowa scope line: a number of birders have complained about Kowa's uneven quality control. It appears that not all Kowa scopes are created equal. Some individual scopes of the same model seem superior to others. Ken Rosenberg's battered five-year-old TSN-4, for example, was noticeably sharper than a brand new TSN-4 we set up next to it. This should not necessarily discourage you from purchasing a Kowa scope if you are so inclined, but *do* be sure to but it from a dealer who will exchange your scope if you're dissatisfied for any reason. Hopefully, the top managers at Kowa will get the message and be discouraged from sitting on their laurels.

The other scopes in the top group are definitely worth looking at. You might find that some of their features make them better than a TSN-4 for your particular needs. The Bausch and Lomb Elite 77mm with ED-prime glass echoes many of the good points of the TSN-4: it has a convenient, easy-to-use focusing knob that

allows you to change the focus with one finger, bayonet-mounted eyepieces, a built-in, pull-out lens shade, and it produces an equally bright, sharp image. Most of the reviewers liked the look and feel of the Bausch and Lomb scope more than the Kowa. While looking through this scope, however, we did notice a slight yellowish tint that was not present with the other scopes. The color shift is probably not pronounced enough to cause confusion in bird identifications, and it may be something that is only detectable on a bleak day. The Bausch and Lomb's 20X-60X zoom eyepiece did not perform as well for eyeglass wearers as the Kowa's.

The Optolyth TBG-80 HD is also a very good scope, only marginally less bright and sharp than the two mentioned above, and uses a similar knob mechanism to focus. Some birders may prefer this scope because of its ruggedness and armor coating. We took one with us on the World Series of Birding a couple of years ago, and it definitely proved its worth in the field. On the down side, when the eyepiece is zoomed out, the field of view is very narrow, especially for someone who wears eyeglasses. In addition, the TBG-80 HD uses screw-in eyepieces, which are more trouble to switch quickly in the field than bayonet-mounted eyepieces, and there's also a danger of cross-threading them.

Of the scopes in our top class, the Swarovski ST-80 is the only one that doesn't have either an ED-prime or fluorite objective lens. Both ED (Extra-low Dispersion) glass and fluorite help to bring the principal primary colors into focus together, thereby significantly reducing color fringing and enhancing image clarity and color transmission. As good as the ST-80 is now, we can't help but think how much better it might have been if the manufacturer had used ED glass or fluorite. This scope *did*, however, prove to be one of the most "eyeglass-friendly" of the ones we tested. Though the Swarovski is a little darker and fuzzier than the others at 60X, the field of view is incredible-almost twice the field of view at that power than the others have. "The Swarovski would be excellent for my research," says Kevin McGowan. "I spend long periods trying to read crow wing tags at a distance using 60X. Speaking as an eyeglass wearer, the comfort of viewing is probably worth the slight step down in sharpness from the other scopes in its class."

Unlike the other top-rated scopes, the ST-80 employs a moveable collar around its barrel to adjust its focus. None of the reviewers liked this kind of focusing mechanism as much as a focusing knob. Instead of simply turning a small knob with your fingertip, you have to grasp the focusing collar and turn it with your entire hand, which tends to shake the scope and make viewing more difficult while focusing.

Celestron now produces an 80mm ED scope that is less expensive than the other scopes we have so far mentioned. The Celestron SS80 looks more like something you would use for star-glazing than for birding, but it *is* an impressively bright scope. We spent some time watching Mallards and Black

Ducks with it next to the pond in Sapsucker Woods, using the 18mm (22X) eyepiece that comes with the scope. The SS80 captured the feather detail of these waterfowl very well. This scope employs an external, rack-and-pinion style focusing mechanism, which may make it less moisture resistant than the others. It also has a narrow field of view for eyeglass wearers and is not quite as bright and sharp as the scopes in the top group.

A surprising runner-up to the 77mm and 80mm scopes is the Nikon 60mm Field Scope with ED-prime glass. The numbers 60mm, 77mm, and 80mm refer to the size of the objective lens at the front of a scope - the larger the number, the larger the lens size and the more light-gathering ability a scope has. But with only a 60mm objective lens, this scope delivers brightness and clarity that rival the best of the big scopes. And, for non-eyeglass wearers, the Nikon 20X-45X zoom lens is excellent. The only negative comments we have for this scope are 1) it has the focusing collar on the barrel, 2) it uses screw-in eyepieces, 3) for eyeglass wearers, the zoom lens has a very narrow field of view at mid- to high-power, and 4) in extremely low light, the 60mm objective lens will not deliver as much brightness as a 77mm or an 80mm lens. But if space and weight are concerns for you, this lightweight, compact scope is definitely worth serious consideration.

The Bushnell Spacemaster, the scope everyone used before the Kowa invasion, is still around, and it's now available in a reasonably priced ED model. Although we prefer the general look and feel and especially the focusing mechanism of the Spacemaster to that of the Nikon ED Fieldscope, the image it produces is nowhere near as bright and sharp as the Nikon's. As we mentioned in our last scope review, the Bushnell zoom lens is particularly poor. Equipped with a 22X wide-angle eyepiece the Spacemaster ED is not bad - but for an ED scope, it's disappointing.

At this point in the comparison we brought out some of the non-ED models made by the same manufacturers as the top contenders. We found that the Nikon Fieldscope with ED-prime glass far surpasses its non-ED sister scope, which gives you some idea of what a difference the type of glass can make in the quality of a scope. Comparing the Kowa TSN-4 and TSN-2 scopes side by side under adverse lighting conditions was also very interesting. The two scopes are identical except for the fluorite lens (and whopping price tag) of the TSN-4. The TSN-2 held its own remarkably well with its pricier cousin at the lower powers, but zooming all the way up to 60X in bleak light, the TSN-4 gave a graphic demonstration of its superiority, still providing a sharp, bright image when the TSN-2's image had turned dark and fuzzy. Of course, you can buy two TSN-2s for the price of one TSN-4, which makes the less-expensive scope a pretty good bargain.

The non-ED Bausch and Lomb Elite 77mm scope is inferior to the same scope with ED glass, but it compares favorably with the Kowa TSN-2. Before the new

Elite's introduction last year, the TSN-2 had pretty well captured the market in its price range. Now it has a stiff competitor. The two are similar in price, feel and function, and optical quality, but several of the reviewers said they preferred the Elite slightly over the TSN-2.

One decent inexpensive scope we tried out was the Swift Panther 60mm equipped with a 20X eyepiece. Though it doesn't really compare with the high-priced scopes, it's a good buy if you need a little more power than your binoculars will deliver but you don't want to go too far into hock. We also took another look at the Swift Searcher, a scope that received a poor rating in our last review. This scope has been improved, and it performed noticeably better this time. The Searcher is an unusual design. Two eyepieces-a 20X and a 40X-are mounted on a swiveling turret that you can twist around to change the magnification power of the scope. The turret mechanism represents a noble attempt on the part of the manufacturer to provide multiple magnification powers using two fixed-power eyepieces rather than one, possibly inferior, zoom eyepiece. Unfortunately, none of us really cared for the way it works. Swiveling from 20X to 40X, you usually have to refocus the scope, and sometimes you also have to relocate the bird you were looking at. We would prefer it if the Searcher used a good zoom eyepiece or just a single fixes-power eyepiece. Using the 20X eyepiece, the Searcher performed as well as the Panther and the non-ED Bushnell Spacemaster. But eyeglass wearers beware: the eyepieces on the Searcher do not have fold-down rubber cups to protect your glasses.

The Celestron C90 was one of only two catadioptric scopes we tested (the other was the Questar). A catadioptric scope has a large concave mirror at the back that magnifies the image and bounces it back to a smaller mirror up front, which in turn bounces the image back to the eyepiece. This is a popular design in astronomy telescopes. The C90 provides a good, bright view in a relatively small package. It may be less rugged than a conventional spotting scope, and some birders will find it awkward to use. (The large focusing collar is especially cumbersome.) But it's definitely a great scope for the price.

Moving into the more compact scopes, we looked at the Bausch and Lomb Elite 15X-45X 60mm Zoom, the Leupold 12X-40X 60mm Variable, and the Leupold 20X50mm. The Elite has a sleek roof prism design and rubber armoring. At low power, it provides a crisp, clear, bright image, but the view deteriorates quickly as you zoom up in power, particularly if you're wearing eyeglasses. On the plus side, this scope is nitrogen-purged to make it waterproof and fogproof. The Leupold 12X-40X is also waterproof, but it is heavier, bulkier, and not as sharp as the Elite. The other Leupold, the 20X50mm, was the smallest scope we tested. It fits easily in a small backpack. Though the scope has some limitations-the 50mm objective lens is not as bright as a 60mm in dim light-it is water resistant, lightweight, incredibly compact, and produces a decent image. Most of the reviewers said they would like to have one to take along traveling if they didn't have room in their luggage for a large scope. We also looked at a

50mm scope from Celestron, the S-50, but it did not compare to the smaller Leupold in brightness, clarity, or ease of use.

As you may have discovered from reading this review, there are a lot of scopes to choose from, most with their own distinct advantages and disadvantages. How can you hope to choose between them? Ask yourself a few questions about what you require in a scope. Do you need a scope that's great in dim light? Are size and weight factors in your decision? Are ruggedness and moisture resistance important? How much money can you afford to spend? Look at the chart that accompanies this article, and compare the individual scope ratings.

Rather than giving each scope an overall rating, we rated the scopes in several categories-sharpness, brightness, color fidelity, zoom lens rating, eyeglass rating, and ease of focus. We'll leave it up to you to determine which factors are most important to you. For eyeglass wearers, the column called "Eyeglass Rating" should be one of the most important categories. No matter how optically sharp and bright a scope is, it doesn't do you any good if you can't see a big enough image through it. The key is to define your own particular needs. Only then can you be assured of getting the scope that's best for you.

In the tables below, each scope comparison category (sharpness, brightness, etc.) is rated on a scale from 1 to 5, 1 being the best. A plus or a minus sign indicates that the scope scored slightly higher or slightly lower, respectively, than the given rating number. A "*" indicates the price includes eyepiece. Please note: Suggested retail prices are only provided as a basis for comparison. Actual street prices vary widely and are often considerably lower.

Group I	
(over $2,000)	**Questar ***
In a class by itself	
Objective lens diam.	89mm
Eyepiece	54x, 87x
Case	Yes
Armor	No
Waterproof	No
Weight (ounces)	70.9
Approx. length (in.)	11.75
Sharpness	1
Brightness	1
Color	1
Zoom rating	NA
Eyeglass rating	1
Focus	1-
Retail price	$2,985

Group II	**Bausch & Lomb**	**Kowa**
($1,000- $2,000)		

Top of the line for professionals & serious amateurs	**Elite with ED Prime Glass**	**Prominar TSN-4**	**Optolyth TBG 80 HDF**
Objective lens diam.	77mm	77mm	60mm
Eyepiece	20x-60x zoom	20x-60x zoom	20x-60x zoom
Case	No	No	No
Armor	No	No	Yes
Waterproof	No	No	Yes
Weight (ounces)	43.9	41.0	46.0
Approx. length (in.)	13.5	14.7	15.0
Sharpness	1	1	1-
Brightness	1	1	1-
Color	2	1	1
Zoom rating	2	1-	2
Eyeglass rating	2	1-	2
Focus	1	1	1
Retail price	$1,400	$1,500	$1,600

Group II ($1,000- $2,000) Continued **Top of the line for professionals& serious amateurs**	**Nikon Fieldscope II-ED**	**Swarovski ST-80**	**Leupold 12x-40x 60mm variable**
Objective lens diam.	60mm	80mm	60mm
Eyepiece	15x-45x zoom	20x-60x zoom	12x-40x zoom
Case	Yes	No	Yes
Armor	No	Yes	Yes
Waterproof	Splashproof	Resists	Yes
Weight (ounces)	39.1	51.9	32.0
Approx. length (in.)	11.4	15.5	11.5
Sharpness	1	2	3
Brightness	2	2	3
Color	1	2-	3
Zoom rating	2	1-	3
Eyeglass rating	2	1	3
Focus	2	2	2-
Retail price	$1,090	$1,340	$1,026

Group III ($500- $999) Mid range models for serious birders	**Bausch & Lomb Elite**	**Bausch & Lomb Elite 60mm Zoom ***	**Celestron SS80 ***	**Celestron C90***
Objective lens diam.	77mm	60mm	80mm	90mm
Eyepiece	20x-60x zoom	15x-45x zoom	18mm (22x)	30mm (33x)
Case	No	Yes	No	Yes
Armor	No	Yes	No	No
Waterproof	No	Yes	No	No
Weight (ounces)	37.9	26.4	35.0	52.0
Approx. length (in.)	14.0	12.25	13.5	7.75
Sharpness	2	3	2	1-
Brightness	2	3	2	1-

Color	2	2	1-	1
Zoom rating	2	3	NA	NA
Eyeglass rating	2	3	2	1
Focus	1	2-	2	3
Retail price	$640	$590	$798	$920

Group III ($500- $999) Continued **Mid range models for serious birders**	**Kowa TSN-2**	**Leupold 20x50 ***	**Nikon Fieldscope II angled body**
Objective lens diam.	77mm	50mm	60mm
Eyepiece	20x-60x zoom	20x	15x-45x zoom
Case	No	No	Yes
Armor	No	Yes	No
Waterproof	No	Yes	Splashproof
Weight (ounces)	41.0	20.5	38.5
Approx. length (in.)	14.7	9.4	11.4
Sharpness	2	3	3
Brightness	2	3	3
Color	2	3	2
Zoom rating	2	NA	2
Eyeglass rating	2	2	2
Focus	1	2-	2
Retail price	$795	$646	$740

Group IV (under$500) For birders on a budget	**Bushnell Spacemaster ED glass**	**Bushnell Spacemaster**	**Celestron S-50 ***
Objective lens diam.	60mm	60mm	50mm
Eyepiece	22x wide ang.	22x wide ang.	25x
Case	No	No	No
Armor	No	No	No
Waterproof	No	No	No
Weight (ounces)	38.4	28.4	21.0
Approx. length (in.)	11.6	11.6	9.0
Sharpness	2-	3	3
Brightness	2-	3	3
Color	2-	3	3
Zoom rating	NA	NA	NA
Eyeglass rating	3	3	3
Focus	1	1	2
Retail price	$480	$248	$218

Group IV (under$500) Continued For birders on a budget	**Swift Panther**	**Swift Searcher**

Objective lens diam.	60mm	60mm
Eyepiece	22x wide angle	20x and 40x
Case	No	No
Armor	No	Yes
Waterproof	No	No
Weight (ounces)	32.0	48.0
Approx. length (in.)	12.4	12.6
Sharpness	3	3
Brightness	3	3
Color	3	3
Zoom rating	NA	NA
Eyeglass rating	3	3-
Focus	1	2-
Retail price	$280	$460

**** BIRD TOURS ***

Press Here To Close This Screen
Press Here To Copy This Topic To The Clipboard

BIRD TOURS

Local birding trips in your own area are often organized by the Audubon Society, the local bird club, or other nature groups. These trips may last a morning, or all day. Once you become familiar with the local birds, you may want to explore other areas. Birders like to see new birds in new settings. The pages of "Birding" magazine and "Birder's World" magazine contain dozens of descriptions for tours to wonderful birding locations. A tour may last only a few days or it may last a few weeks. Tours to Africa may last for a month or more. Tours take you to the best birding areas in the United States and the world (see "Hot Spots: Where To See Birds" in another section of this CD-ROM.) A guided tour with a professional leader is often the best way to explore a new region. Quite often you will discover that your tour leader also wrote the bird book for the country you are visiting!

The largest tour companies, with the most trips to offer are VENT, Field Guides and Wings. There are dozens of other good tour companies such as King Bird Tours (Asia Specialist, 212-866-7923). Many advertise in the birding magazines. All will be happy to send you their tour schedule--just call!

VENT (Victor Emanuel Nature Tours) **800-328-8368**
Field Guides **512-327-4953**
Wings, Inc. **602-749-1967**

To give you an idea of what to expect, here are some tour descriptions taken from the VENT catalog.

Trip Description-Grand Arizona

Trip Description-Best of Costa Rica

Camp Chiricahua for 13-17 year old Birders

Field Guides' most popular tours will take you all over the globe.

Field Guides' Top 10 Tours

Return To Bird Tours Discussion
Press Here To Copy This Topic To The Clipboard

GRAND ARIZONA

They have been called the Mexican Mountains and Sky Islands. The Santa Ritas, Huachucas, and especially the Chiricahuas are islands of cool greenery rising from the deserts and grasslands of southeastern Arizona. As the northernmost outliers of the Mexican Sierra Madre, these ranges and their well-watered canyons host many species of Mexican birds. These mountains are also the southernmost limits of the Rockies, and species of northern origin follow the spruce and fir forests south to their terminus on the crests of the Mexican mountains. Consequently, one finds such seemingly incongruous pairs as Zone-tailed Hawk and Northern Goshawk, or Rose-throated Becard and Evening Grosbeak. Because of the diversity of habitats, this region has a greater variety of breeding landbirds than any area of comparable size in the United States.

In the canyons, the calls of the Elegant Trogon (the Arizona "bird of paradise"), the squeals of Sulphur-bellied Flycatchers, and the mellow songs of Painted Redstarts ring through the oaks and sycamores. Higher, where Gambel oaks mingle with conifers, the Olive Warbler, Mexican Chickadee, and striking Red-faced Warbler inhabit the cool ponderosa pine and fir forests. Along desert washes, one may find plum-colored Varied Buntings, plain Lucy's Warblers trilling in the mesquites, and the very local Rufous-winged Sparrow, restricted in the United States to a small area centered on Tucson.

Owls and hummingbirds deserve special mention. Nowhere in North America can one find more species of owls in such a small area. Our tours have seen 12 species, and 7 or more can be expected on any given trip in the spring. The summer is hummingbird season in southeastern Arizona, and after breeding the birds move into the canyons and high mountain meadows in abundance. We may even find a Mexican hummer that has drifted north, such as the Berylline or White-eared hummingbirds or the Plain-capped Starthroat. Previous trips have recorded a total of 13 hummingbird species.

One of the allures of southeastern Arizona, as if the 190 species of breeding birds were not enough, is the ever-present possibility of vagrants from Mexico. Five-striped Sparrow, Thick-billed Kingbird, and Buff-collared Nightjar have become regular breeding birds, albeit in small numbers. Others, like Eared Trogon, Yellow Grosbeak, Black-capped Gnatcatcher, Flame-colored Tanager and Rufous-capped, Fan-tailed, and Crescent-chested warblers, remain true vagrants.

May tours are better for song, nesting activity, and owling; summer tours are remarkably cool, offer good chances for strays and post-breeding wanderers, and are better for rare hummingbirds.

Our summer Grand Arizona tour will offer an optional extension to the White Mountain region of east central Arizona. With its cool spruce and fir forests, aspen groves, and montane meadows, this area provides a striking counterpoint to the Mexican border ranges. The birdlife is also very different, with specialties like Blue Grouse, Lewis' and Tree-toed woodpeckers, Williamson's Sapsucker, Pinyon and Gray jays, Clark's Nutcracker, Townsend's Solitaire, American Dipper, and Green-tailed Towhee.

Southeastern Arizona is one of our favorite areas. The scenic beauty, wealth of birdlife, charming accommodations, and short drives between major destinations combine to make this trip a pure joy.

Return To Bird Tours Discussion
Press Here To Copy This Topic To The Clipboard

GRAND COSTA RICA

Often called the Switzerland of Central America, Costa Rica is a stable country with a prosperous middle class, a fine educational system, and spectacular highland terrain. For its small size, it may be the richest country in the world for birds, with more than 830 species in an area smaller then West Virginia. It boasts the finest national park system in Latin America (encompassing more than 10 percent of the land), systematically protecting examples of all habitats and the flora and fauna therein. There is nowhere else in Central America where such diversity exists and can be reached comfortably and easily.

The four major regions of Costa Rica form distributional boundaries for birds, and we will visit all of them. The semiarid ranchlands of Guanacaste in the northwest are the southern limit for the birds of the Pacific dry forest. The humid Caribbean lowlands and foothills are directly linked to the great lowland rainforests of South America, with many rainforest birds spilling across the Panama land bridge to reach their northern limit here. In southwestern Costa Rica, an isolated region once covered by humid forest, a number of species have evolved in isolation. Most important, much of the country is a large highland block dominated by immense volcanoes and rugged cordilleras. Here the birdlife is completely different from that of the lowlands and include a high number of endemics found nowhere else except adjacent Panama. With extensive highland forest still readily accessible, Costa Rica is the place to see these specialties.

Our next Grand Cost Rica tour is the most comprehensive yet. We begin our tour in the south, with a visit to the famed Osa Peninsula. The lush forests and mangrove swamps of this area are prime areas for finding three of Costa Rica's most sought-after birds--the Yellow-billed Cotinga, Mangrove Hummingbird, and Black-cheeked Ant-Tanager. This is also an excellent area for Bare-throated Tiger-Heron, Boat-billed Heron, Gray-necked Wood-Rail, Scarlet Macaw, Fiery-billed Aracari, American Pygmy Kingfisher, Blue-throated Goldentail, Long-tailed Woodcreeper, Golden-naped Woodpecker, Black-bellied Wren, and others. Visits to offshore islands will allow us close studies of Brown Boobies and Magnificent Frigatebirds, as well as exciting snorkeling opportunities over a coral reef.

As we continue to the northern areas of Costa Rica, we will explore the dry thorn forests of Guanacaste Province in the northwest. This area, with its strong Mexican faunal influence, is home to many species not found elsewhere in Costa Rica, including Elegant and Black-headed trogons, Yellow-naped and White-fronted parrots, Turquoise-browed Motmot, Cinnamon Hummingbird, Ivory-billed Woodcreeper, Long-tailed Manakin, Nutting's Flycatcher, Streak-backed Oriole, and others. Costa Rica is one of the world's top natural history destinations. A

highlight of any Costa Rican trip is Monteverde--the enchanting "cloud" forest, where great sheets of mist sweep up lush slopes and envelop epiphytel aden trees in a blanket of moisture. The profusion of plant life is almost unbelievable. Some of the finest birds of Central America inhabit this unique reserve and a fine trail system allows easy access to their habitat. Here we will search for the fabulous Resplendent Quetzal, Orange-bellied Trogon, Green-crowned Brilliant, Purple-throated Mountaingem, Prong-billed Barbet, Emerald Toucanet, among others, and listen for the incredible calls of displaying Three-wattled Bellbirds.

Finally we will find ourselves in the lowlands of northeastern Costa Rica, at La Selva Field Station, featuring an undisturbed tract of tall rainforest. The trail system here gives access to all of the area's diverse habitats, and birds we will seek are Spectacled Owl, Slaty-tailed Trogon, Amazon Kingfisher, Broad-billed and Rufous motmots, Red-capped and White-collared manakins, and hope for an encounter with an army ant swarm and the attendant "professional" followers--Ocellated, Bicolored and Spotted antbirds, and Barred and Plain-brown woodcreepers.

Join us for the most complete tour to Costa Rica ever!

Return To Bird Tours Discussion
Press Here To Copy This Topic To The Clipboard

CAMP CHIRICAHUA

A Summer Camp for Young Birders
Camp Chiricahua is an opportunity for boys and girls between the ages of 13 and 17 to become familiar with the fauna and flora of southeastern Arizona. The primary focus is on the birdlife of this rich region, but we look at all living things. Campers do not need to be expert birders but do need to have an interest in birds and nature.

The camp begins and ends in Tucson. Most of our time is spent in the Chiricahuas, an isolated desert mountain range that rises up to 10,000 feet and encompasses five life zones from lower Sonoran up to Canadian. There the camp is based in cabins on the Cave Creek Ranch, which is located right where the mesquite grasslands meet the oak-pinyon woodlands and is bisected by a rushing mountain stream. The climate is mild, with warm afternoons and cool nights.

Campers should expect to see most of the special birds of Arizona, including such spectacular species as Elegant Trogon and Red-faced Warbler, a good variety of hummingbirds, and as many as eight species of owls. On night drives we will look for mammals and reptiles.

This is a rare chance for young birders and naturalists to be in the field with their peers and with expert leaders. Together we will all come to learn and appreciate more fully the complex and beautiful ecosystems of the Southwest.

*A few scholarships are available based on need.

Return To Bird Tours Discussion
Press Here To Copy This Topic To The Clipboard

FIELD GUIDES' TOP 10 TOURS

The following 10 destinations are among Field Guides Incorporated's most popular tours. Each holds a special attraction to birders not only for the remarkable birds to be found there, but also for spectacular features among other aspects of natural history, landscape, and culture.

Alaska (June)
The most grand of all North American destinations, Alaska represents, for many birders, North America's ultimate birding frontier. It is a prime place to go for so many species, from myriad auklets and puffins to Red-legged Kittiwake, Spectacled and Stellar's Eiders, Bristle-thighed Curlew, and Gyrfalcon, not to mention a wealth of shorebirds, all against the backdrop of truly spectacular landscape.

Big Bend (May)
So different Is Big Bend from the rest of Texas (and North America, for that matter), it could be a different country. Its remarkable combination of desert grandeur, limestone canyons carved by the Rio Grande, and handsome mountains create the perfect retreat in which to search for the highly sought Colima Warbler and many southwestern specialty birds. More species of birds have been recorded here than for any other North American national park, and regular specialties include Lucifer Hummingbird, Varied Bunting, and Crissal Thrasher.

Churchill & Southern Manitoba (June)
This perennial favorite among Field Guides birders features tremendously varied birding, from the sweeping prairies of southern Manitoba, with such specialties as Baird's Sparrow, Sprague's Pipit, and Chestnut-collared Longspur, to the fingers of boreal forest at the edge of true tundra on the shores of Hudson Bay, where rare Ross's Gulls nest. The landbirding is fabulous, the shorebirds are at the height of courtship and display on the tundra, and the intensity of the short northern breeding season quickens the birding pulse.

Costa Rica
Deserving of the praise it has received for its forward-looking conservation policies, Costa Rica is a small, friendly, and tremendously bird-rich country. Imagine traveling in a country the size of West Virginia for 18 days and seeing 500 species of birds! A fabulous mix of truly tropical birds of various families as well as more familiar species wintering from North America combine for a rich experience in many of this country's fine nature reserves.

Kenya
Kenya is unsurpassed in its combined wealth of bird life and mammal spectacle,

and we believe the best way to see this great wealth is in a small group (6 participants). We have included In our itinerary several exciting areas not covered by most birding tours to Kenya.

Madagascar
A birding trip to Madagascar is remarkable for the numerous bizarre and endemic birds (there are five endemic f*amilies* of birds here, including the ground-rollers, vangas, and asities), the fabulous lemurs (a primate group including the remarkable wailing Indri and the handsome sifakas), the sometimes disorienting landscape (imagine walking through the spiny forest), and the long-isolated culture. It is one of the most unusual faunas and locations to visit on Earth.

Malaysia
Spanning the Malay Peninsula and the northern portions of the great island of Borneo, Malaysia offers a rich cross section of the birds of tropical Asia. From the huge lowland forest reserve at Taman Negara to the towering giant trees of Danum or the lofty slopes of Mount Kinabalu, there are fine birding sites in which to watch the many remarkable hornbills, broadbills, barbets, babblers, and bulbuls that haunt these parts. And, of course, who would want to miss the Orang-utan?

Manu National Park, Peru
It is more and more difficult to find vast natural areas that are removed enough from civilization to offer a true wilderness experience. Peru's Manu National Park, tucked into a corner of southwestern Amazonia, is one such remaining place. Remarkably, it is located in the world's most biologically diverse region and is home to an incomparably rich tropical avifauna. Manu offers the uncontained possibilities of pristine wilderness.

Papua New Guinea
New Guinea is perhaps the single most exotic place birders can visit. The bird life is rich and extravagant, with remarkable creatures like King of Saxony Bird of Paradise, Black Sicklebill, Ribbon-tailed Astrapia, Short-tailed Paradigalla, and New Guinea Harpy Eagle, and a diversity of beautiful parrots, parakeets, pigeons, and fruit-doves that boggles the mind. And birding in New Guinea is frequently against the backdrop of an ancient highland culture that, in places, has changed remarkably little since first contact was made with the outside world in the 1930s to 1950s.

Southeastern Brazil
Brazil's Southeast is a region of lush forests and mountains. It has been isolated from the wet forests of Amazonia for a long time, and a huge number of organisms found nowhere else have evolved here. From the beautiful mountains of Itatiaia National Park to the endangered Atlantic Forest, there are myriad specialties to see, from Black-headed Berryeater and Swallow-tailed Cotinga to Frilled Coquette and Tawny-browed Owl. It is one of the great birding

regions of the world - but only a few birders have discovered it.

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BIRD BOOKS AND MAGAZINES

BOOKS

There are hundreds and hundreds of books that have been written about birds. Some describe the birds of one country. Other books may focus on one Family of birds such as the hummingbirds. Bird books can guide you to good birding spots or tell you about famous ornithologists of the past. Books by advanced birders can show you how to tell apart two different species that are almost identical. For an incredible article on "Building a Birder's Library", call the American Birding Association and order the February, 1993 issue of *Birding* (Item #380, $5.00). The American Birding Association has a nice catalog of birding books, tapes and equipment. **ABA members enjoy discounts on most merchandise. Call 800-634-7736.**

For the newest bird books as well as the harder to find books and an incredible selection (largest in the USA) **try Buteo Books. Call 800-722-2460** for their catalogue of ornithology books. They stock every significant title in the English language on the subject of birds. At last count, they had over 1200 titles in stock! Buteo also buys used bird books. Their mailing address is Buteo Books, Route 1, Box 242, Shipman, VA 22971.

The **Los Angeles Audubon Society Bookstore** is another great place to buy books. Their phone number is **213-876-0202** and their FAX number is 213-876-7609. Their address is 7377 Santa Monica Boulevard, West Hollywood, CA 90046-6694.

MAGAZINES

The following magazines were rated by "Siskin & Egret."

Bird Watcher's Digest P.O. Box 110, Marietta, OH 45750. 6 issues/year for $17.95. Call 800-879-2473. A wonderful magazine for the back-yard birder. They have great articles by people like Roger Tory Peterson. Their articles are fun to read. They deal with the joys of birding more than any other magazine we have seen. The magazine's format is similar to *Reader's Digest.* Nice "first person" stories. Less emphasis on "ticking" birds on a life list -- more stories about how it "felt" to watch the birds. We give it EIGHT PRIMARIES UP.

Birder's World 44 E. 8th Street, Suite 410, Holland, MI 49423. 6 issues/year for $25.00. (Mention Thayer Birding Software and the first year's price will be $19.75) Call 616-396-5618. Colorful, slick, well done magazine. "The magazine

exploring wild birds and birding". Great articles about specific species, birding "Hot Spots", identification articles by Kenn Kaufman, bird photography and art. Fantastic color photos. Also some articles about non-US birds. The one to get if you get only one magazine. We give it TEN PRIMARIES UP.

Birding P.O. Box 6599, Colorado Springs, CO 80934. Membership and 6 issues/year for $36.00. Call 800-850-2473. Official magazine of American Birding Association. The monthly newsletter "Winging It" is also included with "Birding". Birding is a very nice, well done publication for the intermediate and advanced birder. Articles by some of the best field birders in the US. Many "How-to-identify" articles. A must for serious US birders. We give it TEN PRIMARIES UP.

Field Notes 700 Broadway, New York, NY 10003. 5 issues/year for $25.00. Call 212-979-3000. Published by the National Audubon Society. For "hard core" US birders. Huge Christmas Bird Count Issue. Each issue has an extensive analysis of bird population trends, unusual sightings and regional highlights from all areas of the US and Canada. Previously called American Birds. If your ABA list is over 500 you probably subscribe already. For advanced birders, We give it NINE PRIMARIES UP.

Living Bird 159 Sapsucker Woods Rd, Ithaca, NY 14850. Membership and 4 issues/year for $30.00. Call 607-254-BIRD. Publication of Cornell Laboratory of Ornithology. Cornell has the worlds largest library of bird songs. Well done magazine focuses on the Lab's work. Many colorful articles. International scope. We give it EIGHT PRIMARIES UP.

The Auk, Journal of Field Ornithology, The Condor and The Wilson Bulletin P.O. Box 1897, Lawrence Kansas 66044. Membership prices vary--call 913-843-1221. These are four magazines for the ornithological societies in North America. They are each very, very technical and clinical (no color pictures and lots of footnotes!) For the intermediate birder we give them each FIVE PRIMARIES UP. For grad students and PhDs in ornithology they are probably must-have publications. If you want to try just one, The Auk wins by a pinfeather. (The British Ornithologists' Union publishes The Ibis. You can order it from the address shown above.)

WildBird P.O. Box 57900, Los Angeles, CA 90057-0900. 12 issues/year for $23.97. Call 303-786-7306. This magazines has really improved its quality lately! Articles about birding "Hot Spots" and Birds. Annual photo contest for readers, reviews of birding equipment, articles for kids. Lots of great color pictures. We give it NINE PRIMARIES UP.

Winging It P.O. Box 6599, Colorado Springs, CO 80934. 12 issues/year. Call 800-835-2473. Free to American Birding Association members. Monthly newsletter of the American Birding Association, Inc. Current articles on rare sightings in the ABA area. Conference updates. Maps to good birding locations.

Annual Life List and Big Day Report. We give it EIGHT PRIMARIES UP.

This list is for US publications. There are a number of very good birding magazines in Great Britain also.
The best is probably British Birds. Their address is Fountains, Park Lane, Blunham, Bedford, MK44 3NJ, United Kingdom.

Did you know there are three handbooks listing thousands of bird species that have appeared on over 4000 different postage stamps of the world. The cost for all three is $30. Write to the American Topical Association, P.O. Box 630, Johnstown, PA 15907 for more information. Ask for ATA handbooks 106, 106-1 and 106-2.

**** ATTRACTING BIRDS ***

Press Here To Close This Screen
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ATTRACTING BIRDS

Birds will come to your yard if you give them what they need.

- **FOOD**
- **WATER**
- **NESTING SITES**
- **SAFETY**

Each species of bird has its own likes and dislikes. To quickly attract a variety of birds, offer a variety of food. To keep the birds coming back, year after year, plan ahead. Plant flowers and shrubs the birds can use for food or shelter. Plant trees that provide seeds and places to build nests. One of the best ways to attract birds is to leave dead trees standing in your yard. Woodpeckers love them. Songbirds sing from the bare branches--where they are easy to see. Leave some thickets for the birds. Tangled branches are a great place to hide.

Read about landscaping your yard for migrant birds. See how to create a back yard habitat that will make your property more attractive to birds. Learn how you can help scientists by monitoring the birds at your feeder. Finally, use the simple plans to build a Bluebird house.

Landscaping for Migrant Birds

Saving Migratory Birds

Backyard Habitat

Project Feederwatch

Build a Bluebird House

Return To Attracting Birds Discussion
Press Here To Copy This Topic To The Clipboard

LANDSCAPING FOR MIGRANT BIRDS

Saving Migratory Birds: A Project for the Private Landowner, by Jamie K. Doyle,
Bird Conservation Specialist, Smithsonian Migratory Bird Center

Birds need **WATER**, **FOOD** and **SHELTER**. Whatever size your property - and your budget - you can help meet their needs and enliven your yard. These are some of the ways you can provide, **WATER, FOOD** and **SHELTER** in the natural surroundings of your yard.

WATER

Birds need water for drinking and bathing. If your resources are unlimited, you can add a pond to your landscape. Short of that, you can buy a bird bath or put a shallow dish of water in your yard. A large plastic plant saucer works well. Here are some things to remember.

The water should be less than 2' deep, at least in part, so the birds can bathe. Birds will drink at ground level, but putting their water up on a pedestal or stump, or hanging it from a tree limb, gives them a better view of predators. A quick escape route from predators - such as an overhanging branch or a nearby bush - is essential.

The water should always be clean; regular scrubbing is required.
Ponds should be placed in sunny locations, bird baths in shady ones.
Birds are attracted to running water. If you can, hand a dripping hose or bucket over the water source, and conserve water with a recirculating pump.

FOOD

Birds need a variety of foods depending on the season. Migratory birds arrive with the first spring caterpillars, and find them a succulent source of protein. Berries provide carbohydrates and fats, especially in the late summer and fall. Try to:

- Plant a wide variety of fruiting and flowering plants, plants that bloom or bear fruit from early spring through late fall.
- Include plants that attract insects. Oaks, hickories and maples are good choices, as well as any type of rotting wood.
- Go native. Native plants are well-adapted to local soils and climates and require less water, fertilizer and pest control. The also offer the best overall food sources, and birds will help to disperse their seeds.

SHELTER

Shelter includes nesting places that protect birds from predators such as hawks

and cats, and from harsh weather. Evergreen trees, shrubs and thick brush piles provide good cover.

HOW TO START

Figure out what you have and what you want. Map your yard on graph paper, and have your soil tested, before you change the landscape. Reduce the size of your lawn. Lawns are of little use to wildlife and they require extra water, fertilizer and pesticides. Cluster plants, taking into account their full-grown size and need for light. Value trees, including some dead trees, and take a long-range view. Some small, quickly accomplished projects such as adding a bird bath to the garden will make a big difference, but landscaping for wildlife can become a rewarding, life-long project.

These sources will help you plan a garden for migratory birds.

Dennis, John V. (1985) THE WILDLIFE GARDENER. New York: Alfred A. Knopf.

Kress, Stephen M. (1985) THE AUDUBON SOCIETY GUIDE TO ATTRACTING BIRDS. New York: Scribner's Sons.

National Wildlife Foundation (1986) PLANTING AN OASIS FOR WILDLIFE. Distributed by Sewall Company, Lincoln, MA.

Tekulsky, Matthew (1986) THE HUMMINGBIRD GARDEN. Crown Publ.

Terres, John K. (1987) SONGBIRDS IN YOUR GARDEN. New York: Harper and Row.

Return To Attracting Birds Discussion
Press Here To Copy This Topic To The Clipboard

SAVING MIGRATORY BIRDS

A Project for the Backyard Conservationist (Part 2)

by: Jamie K. Doyle, Smithsonian Migratory Bird Center
and
Craig Tufts, National Wildlife Federation

Part 1 stressed the role of the private landowner in migratory bird conservation and "considerate landscaping." Here we address threats that migrants face within the human landscape, suggest ways to get others involved, and provide a resource list for further information.

DANGERS IN THE GARDEN

Having invited migratory birds into your yard, you have a responsibility to protect them from hazards associated with the human community.

Cats

***The Problem*:** Dr. Stanley Temple and Mr. John Colemen of the University of Wisconsin estimate that rural cats in Wisconsin kill 20-150 million songbirds (35% of a rural cat's diet) annually. Many people believe that a collar bell will alert birds to danger, but research shows that cats either sit and wait for their prey or stalk very slowly. By the time a bell rings, it is too late. Research has also shown that declawing a cat does not prevent it from killing wildlife.

***The Solution*:** Cats should either be confined indoors or be restricted to a fenced area.

Predators

***The Problem*:** Bird feeders, unsecured garbage cans, open landfills and deliberate handouts all act to artificially increase the numbers of predators that feed on migratory birds in a given area. Mammalian threats to migrants include raccoons, skunks, squirrels, and feral cats. Birds that eat the eggs and young of migrant songbirds include jays, crows, and grackles. Cowbirds lay their eggs in the nests of many songbirds. Because cowbirds hatch earlier and grow faster than the young of migrants, they receive a disproportional amount of the food. As a result, the true offspring starve or are crowded out of the nest, to perish on the forest floor.

***The Solution*:** Refrain from placing food scraps out for wildlife. See that your local landfill covers debris on a daily basis and ask local farmers to refrain from feeding their livestock in low, open trays.

Reflective Windows

***The Problem*:** Dr. Daniel Klem of Southern Illinois University estimates that 95-

950 million birds are killed annually when they strike reflective windows. Project Feeder Watch, run by the Cornell Laboratory of Ornithology, has data suggesting that 100 million birds die each year due to window strikes (this sample is heavily biased toward "feeder species" and may underestimate deaths of other birds).

***The Solution*:** Break up the reflective qualities of glass by rubbing soap over the outside surface to create a dull appearance, installing screens, one-way tinting, hanging streamers, or other objects on the window. Or, mount plastic garden protection netting on a frame installed approximately one foot from the glass surface. Birds that hit the screening will bounce off unharmed. Several commercial establishments sell falcon silhouettes, claiming that the image warns birds away from the windows. Research has shown that these silhouettes are ineffective unless a number of them are used together. This works not because the birds are scared of the falcon image, but because the pattern of images breaks up the reflection on the glass.

Pesticides

The Problem: Countless birds die each year from direct (eating pesticide granule or being sprayed) or indirect (eating a poisoned prey item) contact with landscape and agricultural chemicals.

***The Solution*:** Reduce dependence on chemical fertilizers and pesticides by cultivating native plants and reducing lawn area. Control insects with pest specific traps, interplanting plants that repel insect pests, and increasing natural insect predators, such as lacewings, ladybird beetles, toads, and those birds that the garden was intended to attract in the first place. Use leaf and compost mulches to add nutrients to the soil. Refer to books on natural organic gardening and let your yard "go wild."

Return To Attracting Birds Discussion
Press Here To Copy This Topic To The Clipboard

THE NATIONAL WILDLIFE FEDERATION'S BACKYARD WILDLIFE HABITAT PROGRAM

The National Wildlife Federation began its BACKYARD WILDLIFE HABITAT PROGRAM in 1973 as a way to acknowledge the efforts of people who were "gardening for wildlife" around their homes - from small city gardens to large, suburban lots.

The program encourages everyone - home-owner, teacher, leader - to plan their landscaping with the needs of wildlife in mind. Why? Because wildlife is enjoyed by nearly everyone; and because habitat restoration is a critical need for wildlife in urban and suburban settings where building and development infringe on natural areas that wildlife needs in order to thrive.

Providing wildlife habitat in your yard - food, water, cover, and places to raise young - is easy to achieve and the results are beautiful to be around. As one habitat provider recently wrote: "The important thing is the pleasure that our yard has given us. It is such a joy to look out the window and see the rabbits chasing around the bushes and squirrels playing "tag" in the maple trees. There is no end to the activity."

As a first step in providing backyard wildlife habitat, you should assess your yard or garden space as it is right now, to identify the habitat elements that already exist for wildlife. Plants that provide food - seeds, fruits and nuts - are important to birds and squirrels, for example. A dense area of shrubbery or stand of evergreen trees will provide cover - protection from wind and predators. A dying tree in the corner of the yard may provide space - in knotholes or woodpecker excavations - for a den of flying squirrels, a family of crested flycatchers, or a colony of honey bees. Plants are the key to attracting wildlife, but water is also important to wildlife for drinking and bathing. For many types of wildlife, water also offers cover and a place for raising young. Water can be provided in many ways - with birdbaths, a small pool, or simply a natural spring or existing stream.

Food

- Shrubs and trees provide fruits and seeds throughout the year. Among the garden's 35 types of woody, food-providing plants are sweetgum, blueberry, sumac, bayberry and several varieties of holly, viburnum, cotoneaster, and crabapple.
- Perennials and annuals are planted to provide nectar for butterflies and hummingbirds. Butterflies visit the butterfly weed, lantana, purple coneflower, garden phlox, zinnias and marigolds planted in the habitat. Butterfly bush, a shrub, is another dependable plant for attracting butterflies. Hummingbirds visit

the cardinal flower and pineapple sage.

- Supplemental feeders provide sunflower, niger, and millet seed, and in summer, a nectar solution for hummingbirds.

Water

- A small, shallow water dish provides this critical habitat element for drinking and bathing. Placed on the ground, this simple bird bath also provides water for mammals, reptiles and amphibians.
- An attractive pedestal-mounted bird bath adds to the habitat a touch of decorative statuary. The heavy base provides stable support for the easy-to-clean top.
- A submersible bath heater, installed in a bird bath, provides a critical winter need for wildlife - unfrozen water.
- Two small ponds, easily placed in most home landscapes, provide an aquatic habitat for dragonflies, fish, frogs and other aquatic life. One pond is made of premolded fiberglass; the other is flexible, PVC plastic liner material.

Cover

- A number of evergreen trees and shrubs provide year-round protective cover from weather and predators. Featured in this garden are juniper, hemlock, grapeholly, Austrian pine and several varieties of holly.
- Masses of deciduous shrubs offer effective summer cover from predators. Red-twig dogwood, bayberry and several varieties of viburnum, barberry and cotoneaster are massed in this habitat.
- Rock, log and mulch piles offer very effective cover. Small mammals, reptiles, amphibians and a great variety of insects and other small animals find homes in these simple-to-construct structures.

Places to Raise Young

- Nest boxes for bluebirds, chickadees, wrens and purple martins have been placed in the habitat.
- Evergreen and deciduous trees and shrubs provide additional nesting areas for birds.
- Rabbits, shrews, mice, snakes and salamanders lay their eggs or raise their young under the boughs of plants or in the rock, log or mulch piles.
- Aquatic animals, such as frogs, fish, dragonflies and other insects, deposit their eggs in the ponds.
- Butterfly eggs and caterpillars find safety among the herbs, flowers, shrubs and trees of the habitat.

If you're in the Washington, DC area, be sure to visit the National Wildlife Federation's own demonstration Backyard Wildlife Habitat. Located in Vienna, VA, this wildlife-attracting landscape features over 50 kinds of wildlife-attracting flowers, trees and shrubs. The demonstration habitat is located at 8925 Leesburg Pike, Vienna, Va. While the habitat is open daily, Laurel Ridge

Conservation Education Center is open weekdays 8am-4:30pm.

For a more lengthy, informative booklet on Backyard Wildlife Habitat, and an application so that you might certify your own property as an official Backyard Wildlife Habitat, **send $5.50 to:**

Backyard Wildlife Habitat
Department TBS
NATIONAL WILDLIFE FEDERATION
1400 Sixteenth Street, N.W., Washington, D.C. 20036-2266

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PROJECT FEEDERWATCH

The Cornell Laboratory of Ornithology and Long Point Bird Observatory have 10,000 FeederWatchers counting birds. You can join them. They need your help to learn more about bird populations. Schools and Nature Centers can also join. Volunteers report their sightings to Cornell where scientists feed the information into a computer. They are studying trends in bird populations. They are especially interested in the activity of birds in the winter. You can join by sending you participant's fee to:

Project FeederWatch
Cornell Laboratory of Ornithology
P.O. Box 11
Ithaca, NY 14851-0011
(or call 800-843-BIRD) $14.00 (US Funds)

If you live in Canada, write to:
Project FeederWatch
Long Point Bird Observatory
P.O. Box 160
Port Rowan, Ontario N0E 1M0 $16.00 (Canadian Funds)

Your contribution helps defray the cost of materials and data analysis.
Make you check payable to Project FeederWatch. (Fee subject to change).

According to Project FeederWatch, these were the birds that came to 25% or more of the feeders in North America last year:

SPECIES	Percentage of Feeders Visited
Dark-eyed Junco	83%
American Goldfinch	69%
Blue Jay	68%
House Finch	67%
Mourning Dove	64%
Downy Woodpecker	64%
Northern Cardinal	60%
House Sparrow	58%
Black-capped Chickadee	57%
European Starling	52%
White-breasted Nuthatch	47%
American Robin	44%
Tufted Titmouse	43%
Common Grackle	40%

Pine Siskin	39%
Red-bellied Woodpecker	39%
Hairy Woodpecker	38%
Red-breasted Nuthatch	36%
Red-winged Blackbird	33%
Song Sparrow	33%
White-throated Sparrow	33%
Purple Finch	33%
Northern Flicker	32%
American Crow	30%
Carolina Wren	30%
Brown-headed Cowbird	30%
Common Redpoll	29%
Carolina Chickadee	27%

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BUILD A BIRDHOUSE

Species	Length and width (inches)	Depth of Cavity (inches)	Entrance to floor (inches)	Diameter of entrance (inches)	Height above ground (feet)
Bluebird	4 x 4	9	7	1 1/2	4 to 6
Chickadee	4 x 4	9	7	1 1/8	6 to 10
Nuthatch	4 x 4	9	7	1 1/4	12 to 20
Wren	4 x 4	7	4	1	6 to 12
Titmouse	4 x 4	9	7	1 1/4	8 to 15
Swallow	5 x 5	6	4	1 1/2	10 to 15
Purple Martin	6 x 6	6	1	2 1/2	15 to 20
Woodpecker	6 x 6	14	11	1 3/4	12 to 20
Flicker	7 x 7	17	15	2 1/2	6 to 20
Screech Owl	8 x 8	14	11	3	10 to 20
Barn Owl	10 x 18	17	4	6	12 to 18
Wood Duck	10 x 18	20	14	4	8 to 20

Birdhouse Plans

(Plans for the bluebird house are provided courtesy of the Game Division, Michigan Department of Conservation and cooperative extension service, Michigan State College.)

Use wood for your birdhouse. Do not paint it a bright color--natural colors are better. Put a few small holes in the floor so water can drain out. Also make small holes in the walls, just below the roof. This gives some extra ventilation. The inner surface of the house should be rough so young birds can climb out when they are big enough. The entrance should face away from the prevailing winds--this will keep the young birds drier when it rains. Clean out the birdhouse early each spring.

Return To Dr. Sibley's Article
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BIOGRAPHICAL SKETCH

CHARLES G. SIBLEY, born August 7, 1917, Fresno, California.

A.B. 1940; Ph.D. 1948 in Zoology, University of California, Berkeley.
Minor fields: Paleontology, Botany.

1940-1941: Graduate School, University of California, Berkeley.
1941-1942: Field Biologist, Bubonic Plague Suppressive Measures, U.S. Public Health Service.
1942-1945: U.S. Navy, Ensign to Lieut. Communications and Medical Service Corps.
1946-1948. Graduate School, University of California, Berkeley.
1948-1949: Instructor in Zoology and Curator of Birds, University of Kansas.
1949-1953: Assistant Professor of Zoology, San Jose State College, California.
1953-1965: Associate Professor and Professor of Zoology; Curator of Birds; Cornell University.
1965-1986: Professor of Biology and William Robertson Coe Prof. of Ornithology, Dept of Biology; and Curator of Birds, Peabody Museum of Natural History, Yale University.
1970-1976: Director, Peabody Museum of Natural History, Yale University.
1986: Professor of Biology, Emeritus, Yale University.
1986-1992: Dean's Professor of Science and Prof. of Biology, San Francisco State University.
1993- Adjunct Prof. of Biology, Sonoma State University (by invitation).

Field Experience: United States: all regions and states. Mexico: six trips (1939, 1941 (2), 1946, 1948, 1950. Honduras: 1973. Costa Rica: 1972. South America: 1956, six countries. Europe: 1954, 1958, 1959-60 (sabbatic year), 1966, 1970, 1982, 1984, 1985 - mostly short visits; Africa: 1964, 1974, six countries, short visits. Australia: 1963, 1968, 1974, 1983, short visits. New Guinea: 1945, 1968, 1969. New Zealand: 1964, 1983, 1990. New Hebrides, Solomon Islands, Bismarck Archipelago, Philippines: 1944-1945, 19 months. Japan: Dec. 1992.

Research Experience: Fossil birds, 1939-1942. Geographic variation, speciation, and interspecific hybridization in wild bird populations, 1941-1957. Biochemical and molecular studies of proteins and DNAs of birds and mammals -- phylogeny reconstruction, classification, rates of genomic evolution, etc. 1957-present.

Affiliations and Other Activities: Member of ca. 15 scientific societies, U.S. and foreign; Fellow ,
Honorary, or Corresponding Fellow of seven; officer or council member of five -

1946-present.
Guggenheim Fellow, 1959-1960. Oxford University.
Treasurer, American Ornithologists' Union, 1953-1962.
Secretary-General, 13th International Ornithological Congress, 1958-1962.
Brewster Memorial Medal of the American Ornithologists' Union, 1971.
Editorial Board, *Evolution, (past).*
Editorial Board, *Journal of Molecular Evolution,* 1983-present.
Editorial Board, *Molecular Biology and Evolution,* 1986-present.
Editorial Board, *Molecular Phylogenetics and Evolution, 199* 1 -present.
President, American Ornithologists' Union, 1986-1988.
President, 20th International Ornithological Congress, 1986-1990. New Zealand.
Member, National Academy of Sciences, U.S.A., elected 1986.
Daniel Giraud Elliot Medal, National Academy of Sciences, U.S.A., 1988
Alessandro Ghighi Medal, National Institute of Wildlife Biology, Italy. 1991.

Publications: 1939-present - 132 titles, of which 77 pertain to molecular systematics and evolution.
Three books: "Phylogeny and Classification of Birds" (with Jon Ahlquist). Yale Univ. Press, 1990.
"Distribution and Taxonomy of Birds of the World" (with Burt Monroe). Yale Press, 1990.
"A World Checklist of Birds" (with Burt Monroe). Yale Univ. Press. 1993.

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