



Elk Meadow Nest-box Monitoring—2007

In 2006, we reinvigorated nest-box monitoring at the Elk Meadow Open Space. We made a few trips that year and located 31 boxes placed along a three-and-one-half mile loop.

Because we found many boxes occupied by bluebirds and swallows, we decided to increase our monitoring efforts in 2007.

Between March 11 and Aug. 19, we made 13 visits to monitor productivity in the 31 nest boxes. This period covered the entire breeding cycle of the six species we found nesting in the boxes: Mountain Bluebird, Western Bluebird, Tree Swallow, Violet-green Swallow, Mountain Chickadee and House Wren.

Breeding chronology of Mountain Bluebirds, Western Bluebirds and Tree Swallows, the three most abundant species, is provided in Table 1.

Although Western Bluebirds arrived two weeks later than Mountain Bluebirds, they completed nests and had laid a full clutch of eggs about a week ahead. The heavy snows and cold weather we had in late March and early April appeared to disrupt breeding of Mountain Bluebirds.

Tree Swallows arrived more than six weeks after Mountain Bluebirds and, because of their later breeding season, did not re-nest after raising successful broods.

Overall, 128 young of all species were produced in the nest boxes in 2007, for an average productivity of 4.1 young per box. All boxes, except one, were occupied by a breeding pair at some point in the breeding season.

Although Mountain Bluebirds made more nests and laid more eggs during their first nesting attempt, Western Bluebirds were far more productive (Table 2). Several first clutches of Mountain Bluebirds appeared to be abandoned during cold, snowy weather.

Half of the Mountain and Western Bluebirds that raised successful broods re-nested; productivity for both species was higher during their second nest attempts (Table 2). However, we did find

some dead chicks in second nests, which we did not find in first nesting attempts.

Because our visits were fairly widely spaced, our estimates of productivity might be on the high side.

Relative to both bluebird species, which combined laid 29 clutches, few clutches were produced by the remaining four species (12 clutches). Productivity varied a lot among species; no Violet-green Swallow young were produced from boxes, but three Mountain Chickadee pairs produced 20 young (Table 2).

We plan to continue monitoring efforts in 2008. If you would like to participate, please contact Brad Andres, 303-670-0101, heatherbrad1@yahoo.com or Kay Niyo, 303-679-6646, kay@kayniyo.com.

- Brad Andres, Kay Niyo,
Heather Johnson



Mountain Bluebird on Top of Nest-box. Photo by Kay Niyo

Table 1. Breeding chronology of bluebirds and Tree Swallows using nest boxes in Elk Meadow Open Space, Evergreen, CO – 2007.

	Mountain Bluebird	Western Bluebird	Tree Swallow
Males arrive	11 March	25 March?	29 April
Pairs evident	18 March	1 April	12 May
Nest completed	29 Apr	22 Apr	19 May
Full clutch in nest	15 May	9 May	7 June
Hatchlings in nest	29 May	23 May	21 June
Chicks fledged	18 June	13 June	11 July
Eggs in second nest of successful pair	2 July	24 June	—
Last young of re-nest fledged	6 Aug	12 Aug	—

Table 2. Breeding success of birds using nest boxes in Elk Meadow Open Space, Evergreen, CO – 2007.

	Mountain Bluebird		Western Bluebird		Tree Swallow	Violet-green Swallow	Mountain Chickadee	House Wren
	1 st	2 nd	1 st	2 nd	1 st	1 st	1 st	1 st
Nest attempt	16		11		7	2	3	3
No. pairs	14	3	10	4	6	2	3	3
No. nests with eggs	13	3	9	4	5	2	3	2
No. successful	8	2	6	4	3	0	3	1
Clutch size	4.85	4.67	5.33	4.75	4.20	2.50	7.00	6.00
% hatch	46	50	71	79	71	0	95	50
% fledge	46	50	71	75	71	0	95	50
No. chicks fledged/pair	1.81	2.33	3.09	4.25	2.14	0.00	6.67	2.00
Young produced	29	7	34	17	15	0	20	6



Elk Meadow Nest Box Monitoring—2008

Between March 16 and Aug. 21, we made 11 visits to monitor bluebird and other cavity-nester use of the 31 nest boxes placed in Elk Meadow Park.

Male Mountain Bluebirds were seen in Elk Meadow by Feb. 29, and several pairs were found around boxes during our first visit on March 16. Pairs of Western Bluebirds were first observed on our April 5 visit.

Although swallows were present in Elk Meadow on May 4, we did not find eggs of any species until our May 17 visit. The cool spring may have delayed egg laying by bluebirds.

Similar to use in 2007, nests were constructed in all 31 boxes. Overall, 139 young of six species were produced in the nest boxes in 2008, for an average productivity of 4.5 young per box.

Compared to 2007, nest boxes were occupied by fewer Mountain Bluebirds (-15%) and more Western Bluebirds (+40%) in 2008.

Productivity of bluebirds was higher in 2008 (Table 1), which resulted in an increase in the number of young produced, relative to 2007, by Mountain Bluebirds (+28%) and Western Bluebirds (+35%).

Only five bluebird pairs re-nested, of which four pairs successfully fledged

young. Because our visits only occurred every two weeks, we may have somewhat overestimated productivity.

Relative to both bluebird species, which combined laid 29 clutches, few clutches were produced by the remaining four species (5 clutches).

House Wrens appeared to destroy the nests or eggs of at least 4 pairs of bluebirds, and swallows appeared to displace 2-3 pairs of Mountain Bluebirds.

As the current nest boxes deteriorate, placement of new boxes in more open areas should reduce nest and egg predation by House Wrens.

We plan to continue monitoring efforts in 2009. If you would like to participate, please contact Brad Andres,



A Mountain Bluebird sits atop its nest box. Photo © Kay Niyo

303-670-0101, heatherbrad1@yahoo.com; or Kay Niyo, 303-679-6646, kay@kayniyo.com.

- Brad Andres, Kay Niyo, Heather Johnson

Table 1. Breeding success of birds using nest boxes in Elk Meadow Open Space, Evergreen, CO in 2008.

	Mountain Bluebird		Western Bluebird		Tree Swallow	Violet-green Swallow	Mountain Chickadee	House Wren
	1 st	2 nd	1 st	2 nd	1 st	1 st	1 st	1 st
Nest attempt	13		14		2	1	1	4
No. pairs	13	2	14	3	2	1	1	4
No. nests built	11	2	13	3	2	1	1	1
No. successful nests	9	1	11	3	2	1	1	1
Clutch size	4.91	4.0	4.85	4.33	6.00	5.00	9.00	7.00
% eggs laid that hatch	80	50	89	100	75	40	100	71
% eggs laid that fledge	78	50	89	100	75	40	89	71
No. chicks fledged/pair	3.81	2.0	4.00	4.33	4.50	2.00	8.00	5.00
Number of young produced - 2008	42	4	56	13	9	2	8	5
Young produced - 2007	29	7	34	17	15	0	20	6



Elk Meadow Nest Box Monitoring 2009

Between March 1 and Aug. 10, we made 12 visits to monitor bluebird and other cavity-nester use of the 31 nest boxes placed in Elk Meadow Park.

Male Mountain Bluebirds were seen in Elk Meadow by March 1, but nesting did not get going until mid-May. Pairs of Western Bluebirds were first observed on our April 11 visit.

We did not find Tree Swallows with eggs until June 13. Snow and cold weather seems to have delayed bluebird-nesting activity in Elk Meadow in 2009.

Similar to the past two years, nests were constructed in all 31 boxes in Elk Meadow. Overall, 144 young of six species were produced in the nest boxes in 2009, for an average productivity of 4.6 young per box.

Again in 2009, fewer boxes were used by Mountain Bluebirds, whereas Western Bluebirds increased their use of Elk Meadow boxes. Western Bluebirds produced 80 young in 2009 compared to just 30 young produced by Mountain Bluebirds.

Only 1 pair each of Mountain Bluebirds and Western Bluebirds produced a second clutch, and only the Western

We believe this will be a great opportunity for Evergreen Audubon members to be more involved with a bird science project.

Bluebirds were successful. Because our visits only occurred every two weeks, we may have somewhat overestimated productivity.

Since 2007, Western Bluebirds have been increasing in their use of Elk Meadow nest boxes.

Relative to both bluebird species, which combined laid 28 clutches, few clutches were produced by the remaining four species (7 clutches).

We had our first White-breasted Nuthatch using a box this year.

In three years of monitoring, only two Violet-green Swallows have been produced from the boxes, although we have observed nesting in aspens in Elk Meadow.

House Wrens appeared to destroy the nests or eggs of at least two pairs of Mountain Chickadees, and Western Bluebirds displaced two pairs of Mountain Bluebirds.

As the current nest boxes deteriorate,

placement of new boxes in more open areas should reduce egg predation by House Wrens and attract more bluebird pairs.

We plan to continue monitoring efforts in 2010. In addition, we are developing a project with the University of Colorado-Denver where we will expand the nest boxes in Elk Meadow and begin banding individual bluebirds and track their site fidelity and survival.

We believe this will be a great opportunity for Evergreen Audubon members to be more involved with a bird science project.

If you would like to participate in further monitoring efforts, please contact Brad Andres, 303-670-0101 or heather-brad1@yahoo.com.

This project would not happen without the help of Mike Wilson, Barbara Nabors, Rachel Hutchinson, Kay Niyo and Heather Johnson. Thanks to you all!

- Brad Andres

Table 1. Breeding success of birds using nest boxes in Elk Meadow Open Space, Evergreen, CO – 2009.

	Mountain Bluebird		Western Bluebird		Tree Swallow	White-breasted Nuthatch	Mountain Chickadee	House Wren
Nest attempt	1 st	2 nd	1 st	2 nd	1 st	1 st	1 st	1 st
No. pairs	11	1	14		2	1	3	3
No. nests built	10	1	14	3	2	1	3	3
No. nests with eggs	9	1	13	3	2	1	1	1
No. successful nests	7	0	11	3	2	1	1	1
Clutch size	5.55	5.00	4.85	4.33	6.00	5.00	5.00	7.00
% eggs laid that hatch	60	0	89	100	75	100	100	100
% eggs laid that fledge	60	0	89	100	75	100	100	100
No. chicks fledged/pair	3.33	0	4.00	4.33	4.50	5.00	5.00	7.00
No. young produced - 2009	30	0	75	5	17	5	5	7
No. young produced - 2008	42	4	56	13	9	-	8	5
No. young produced - 2007	29	7	34	17	15	-	20	6

Elk Meadow nest-box system expanded with grant

With funding Evergreen Audubon received through a National Audubon TogetherGreen grant, we purchased materials to build replacement boxes and expand the nest-box trail in Elk Meadow Open Space Park in 2010.

The trail in Elk Meadow now stands at 35 boxes. We also replaced a number of boxes at Three Sisters Open Space Park and established a two-mile loop trail that now contains 25 nest boxes.

We added boxes gradually throughout the summer at Three Sisters, so we did not undertake a full monitoring program there. Through Sean Kluesner, a natural resources specialist, we have developed a good working relationship with Jefferson County Open Space, and they are supportive of our expanded efforts.

In 2010, we made 11 visits to monitor the bluebird, swallow and other cavity-nester use of the 36 nest boxes placed in Elk Meadow. (We left one old box because of bluebird activity but removed it at the end of the season.)

Mountain Bluebirds were almost a week late in returning to Elk Meadow this year. We observed 27 males and two females on the north end of the property on March 6, but only two birds were observed around boxes on March 13. No bluebirds were found in Elk Meadow on a snowy box check on March 27.

Numerous pairs of Mountain Bluebirds were observed around nest boxes on April 11, and a Tree Swallow was first observed on April 25.

Similar to past years, 35 of 36 boxes were occupied by Western and Mountain Bluebirds, Tree Swallows, House Wrens and a White-breasted Nuthatch.

Most of the new nest boxes were taken up by Tree Swallows, and our removing boxes from trees and placing them in more open areas resulted in lower box use by Mountain Chickadees.

Despite arriving almost a month after Mountain Bluebirds, the first egg date of Western Bluebirds was only one day later (May 21) than Mountains (May 20). The first eggs of Tree Swallows were found on June 5.

Overall, 147 young of five species were produced in the nest boxes in 2010, for an average productivity of 4.1 young per box. Again in 2010, more Western

Table 1. Breeding success of birds using nest boxes in Elk Meadow Park, Evergreen, Colorado—2010

	Western Bluebird	Mountain Bluebird	Tree Swallow	House Wren	White-breasted Nuthatch	Mountain Chickadee
Pairs	14	11	10	4	1	-
Nests built	12	9	10	5	2	-
Nests with eggs	12	8	10	4	2	-
Successful nests	12	8	10	3	1	-
Clutch size	5.08	5.13	5.60	5.50	5.00	-
% hatched of eggs laid	87	90	77	65	40	-
% fledged of eggs laid	85	88	75	65	40	-
Chicks fledged/pair	4.33	4.50	4.20	3.75	2.00	-
Young produced - 2010	52	36	42	15	2	-
Young produced - 2009	75	30	17	7	5	5
Young produced - 2008	56	42	9	5	-	8
Young produced - 2007	34	29	15	6	-	20

Bluebirds built nests and laid eggs in boxes than Mountain Bluebirds, although productivity for Western Bluebirds was down by 44% from 2009 (see Table 1).

No bluebirds, or any other species, produced a second clutch after successfully raising a brood.

Increasing the number of boxes in Elk Meadow increased productivity of Tree Swallows by about 150% over 2009, and a total of 42 swallow young fledged in 2010.

Mountain and Western Bluebirds and Tree Swallows contributed 88% of the total nest-box productivity in Elk Meadow; 17 additional young were produced by one pair of White-breasted Nuthatches and four pairs of House Wrens.

The White-breasted Nuthatch pair and one pair of House Wrens had their nests destroyed and re-nested. Hot weather in midsummer likely caused some chick deaths in the boxes.

A few pairs that initially set up territories at a box were subsequently replaced by other species, although the five shifts we observed were not consistent between species and included Tree Swallow to Western Bluebird, Mountain Bluebird to Tree Swal-

low, House Wren to Western Bluebird, House Wren to Mountain Bluebird, and Mountain Bluebird to House Wren.

We plan to continue monitoring efforts in Elk Meadow in 2011 and expand our monitoring efforts to Three Sisters. If you would like to participate in nest-box monitoring efforts in 2011, please contact Brad Andres at birdmon@evergreen-audubon.org.

This project would not happen without the help of Jeffrie Anderson, Judith Bird, Pat Carter, Rachel Hutchinson, Heather Johnson, Barbara Nabors and Kay Niyo. Thanks to you all! We appreciate the support of Jefferson County Open Space.

- Mike Wilson and Brad Andres



Western Bluebird chicks in Elk Meadow Box 27 on June 20, 2010. Photo by Mike Wilson