The McGraw Dove Symposium

Mission Statement:

"Drive economic efficiencies, innovation and accountability in conservation."

A report by the McGraw Center for Conservation Leadership/March 29, 2016

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Executive summary

The purpose of the McGraw Dove Symposium was to assemble a network of leading dove managers and hunters to address statewide population trends in Illinois and to share best practices for managing dove fields and dove hunting. After a series of erratic years in Northeastern Illinois, leaders of the Max McGraw Wildlife Foundation convened the symposium under the aegis of the McGraw Center for Conservation Leadership in hopes of finding a better way forward.

A wide-ranging discussion on everything from crop rotation to shooting pressure took place over the course of several hours in late March, 2016. While there were plenty of specific tips – outlined in the first part of this report – several themes emerged and re-emerged during the session. Among them:

Population:

- Dove populations in Illinois have varied in the last six years due to weather extremes, but are nowhere near the point where federal authorities would scale back limits
- Dove hunters and dove harvests are declining, though the reasons for that have not been evaluated
- Neighboring states probably do not have any effect on Illinois dove hunting

Dove field management:

- Early planting of sunflowers is crucial, as is harvesting at least two weeks before the season opens
- The basic idea is to build a local flock that uses your field from mid-July forward, using various crops and mowing practices to attract the birds
- Nesting cradles placed in suitable habitat such as conifer trees are a means to help dove nesting success
- Field management efforts should be focused on opening day, September 1 – if doves are not in the habit of using the field by then, prospects for the season are poor
- Too often, sunflowers are late in ripening – they need to be ripe in mid-August for prime dove habitat
- The window for planting is very narrow, and managers must be prepared to hit that window. The same is true for spraying
- Small fields of less than 5 acres are not as effective, and long, rectangular fields are best
- The work of preparing a proper dove field is not cheap, but can be defrayed by harvesting sunflower seeds as a cash crop if there is a local market

- Maintaining good shooting over time is a matter of regulating shooting pressure, as well as continuing to mow and disk during the season to maintain food supplies

Conducting the hunt:

- Time spent in the field is critical – hunter pressure should be regulated either by shell limits or time limits if bag limits are not swiftly achieved
- Overshooting or pressuring a field will cause doves to move on
- It is not recommended to shoot doves in the morning. Afternoon hunts early in the season at least two hours before sunset so the birds can return to feed. As the season advances, hours may be extended
- Spacing of shooters is advised to be at least 50 yards apart and 100 yards across from each other
- It is OK to have late-arriving shooters straggle into a field, but they all must leave at a set time to allow the field to rest
- Decoys can be effective, especially spinning-wing decoys, but it is best to ease into their use as the season progresses. Using dead trees or wire lines in the field to place decoys is a good strategy
- Dogs must be carefully watched in hot, calm weather

Details of all recommendations can be found in the next section of this document.

The next steps for the McGraw Dove Symposium are to begin to implement recommendations as each manager sees fit – and, it is hoped, to reconvene next year to share success stories of the 2016 dove season.

The McGraw Dove Symposium, 3/29/2016

Participants:

- Steve Goulding, *private landowner*
- Mark Hamilton, *private landowner*
- Kerry Luft, *Max McGraw Wildlife Foundation/McGraw Center for Conservation Leadership*
- Stan McTaggart, *Manager, Agricultural and Grasslands Wildlife Program/IDNR*
- Terry L. Musser, *Program Manager, Hunting Preserves, Controlled Pheasant Hunting, Field Trials & Dog Training/IDNR*
- Charlie Potter, *Max McGraw Wildlife Foundation/McGraw Center for Conservation Leadership*
- Roy Raupp, *McGraw*
- Mike Resetich, *Site Superintendent, Donnelly-DePue SF&WA & Green River SWA/IDNR*
- Wayne Schneider, *McGraw*
- Bill Schroeder, *McGraw*
- Dick Schroeder, *McGraw/private landowner*
- Mike Weller, *owner, Schudwell Dove Club/Greenville IL*
- Mike Wickens, *Site Superintendent, Jim Edgar Panther Creek SF&WA/IDNR*
- Ron Willmore, *Site Manager, Helfrich Wildlife Propagation Center & Edward R. Madigan State Park/IDNR*

Charlie Potter opened the meeting with a welcome and a summary of McGraw's recent dove population trends and hunting experiences. The purpose of the Dove Symposium is to have a discussion about various experiences, statewide population trends and to share ideas among people who get their fingers dirty in the business of dove management and dove hunting.

The ultimate goal of the day is to not only build a manual of best dove management practices but also to build a network for sharing ideas about creating the best dove hunting possible.

After a round of introductions, the discussion began. For the purposes of this document, the subject matter has been organized into three sections: Current population/effects on population; Preparation and management of the dove field; and Conducting the hunt.

Current population/effects on population

Stan McTaggart of the IDNR provided an overall view of the dove population and harvest numbers for Illinois. In the Eastern Management Unit of the United States, the population is highly variable but nowhere close to the point where U.S. Fish and Wildlife would curtail the liberal limits now in place.

For the past five or six years, weather extremes have affected various portions of the state, to the point where "we can't get anything close to an average." Public hunting reports are not consistent by regions, and they are variable. That's a reflection of crops, harvest times and are based on the weather, which can affect both planting and harvesting.

One thing is clear. Dove hunters are dwindling, with the numbers falling in half since 2004. Dove harvest has dropped to about 745,000 doves a year from more than 1.8 million in 2004. There are several factors that may be in play in the drop, including the increase in deer and turkey hunting, the aging hunter demographic, and the fact that those who do hunt doves are hunting fewer days during the season. Whether hunter-days are dropping due to poor quality hunting is a question that depends on many variables that change year to year.

Overall, McTaggart said, there aren't many doves shot in Illinois after the first two weekends in September. Most of the doves shot, according to banding surveys, are Illinois birds.

Mike Wickens said that in 17 years, he has seen only one influx of fresh doves that he attributed to migration.

Mike Weller said that at times he gets a buildup of birds, but they leave. "Where do they go? I don't know." Mike Wickens said that doves do not stick around when it's cold and rainy.

Terry Musser said that if he does not hunt his fields for two weeks, he will see a buildup of birds that tend to be larger and fly in big flocks. He suspects these are migratory. But he also believes that local dove populations are peaking before hunting actually begins.

Mike Weller asked whether dove season could open earlier, on Aug. 1. He said that there is precedent for doing so – a teal season was established in Illinois to allow opportunities to hunt teal that were leaving the state, as well as an early goose season. Charlie Potter responded that it would literally take an act of Congress to override international migratory bird policies that prevent hunting of migratory species before Sept. 1, and would be nearly impossible to achieve as well as being potentially divisive.

Effects of neighboring states: Dick Schroeder asked whether the establishment of Wisconsin's dove season had any negative impact on Illinois. The consensus was no, that 75 percent of doves come from within 10 miles of where they are shot.

Disease: One hypothesis about dwindling dove populations: Buffalo gnats (black flies), which are known to affect other birds.

Invasives and other species: A question was asked whether a proliferation of blackbirds, finches and other species were crowding out doves. Blackbirds have been a problem at McGraw. It was suggested that this is primarily a weed issue that causes the sunflower heads to be smaller in size. This in turn makes the field more attractive to small birds that prefer smaller heads.

In a later discussion of Eurasian collared doves, Stan McTaggart and others expressed the view that while their range is expanding, these invasive birds are not displacing mourning doves. They tend to live in towns instead of the country and co-exist with mourning doves. In Illinois, Eurasian doves are not counted against the 15-bird daily limit.

Location: Contrary to the idea that an increase in residential usage will harm dove shooting, Terry Musser believes that it actually is a benefit. In his case, he believes large numbers of doves are coming into his fields from nearby Jacksonville.

- The idea is that if you are near communities, you can pull doves from areas where feed and weather effects are mitigated.
- Fields near communities have been "dynamite" longer than those in strictly agricultural areas. "If your management is optimal, you will pull doves from all around."

Preparing the dove field

Mike Wickens provided an overview of management changes at Panther Creek that have been successful. Before 2003, dove hunters used the same fields daily, and after four days of shooting, the season was over for all intents and purposes. Beginning in 2003, new management practices began.

- 120 acres of sunflowers and 120 acres of wheat are planted
- In August, the wheat is burned (planning to leave only 5 percent of it standing this year, as opposed to 50 percent in past years)
- This starts doves coming to the area and feeding on the wheat in advance of dove season
- Then the sunflowers are harvested – Wickens bids out the crop to a farmer, who sells the seeds and gets them out in a timely fashion
- His goal at Panther Creek is to get the sunflowers harvested five days before the season. He leases the farming and requires the farmer to harvest sunflowers on schedule, regardless of whether the farmer has other crops that are ready to come out
- He rotates his crops to combat weeds. Planting sunflowers in the same field year after year is a recipe for "horrible weeds."
- 2014 was the best year Panther Creek has seen in 7 years
- Weather can be a factor. In 2015 a cold front blew through and the doves moved out, and that was the first time Panther Creek didn't kill limits on opening day.
- In 2006, about 125 hunters shot 10,000 doves in the first 10 days of the season, averaging about 11 or 12 doves each.

Mike Weller offered some tips based on his 30-plus years of managing dove fields at his Schudwell club near St. Louis:

- He plants 40 to 50 acres of sunflowers a year.
- He sprays and shreds to create bare dirt in his fields and harvests sunflowers
- As a result of his management practices he often has more doves on the third or fourth day of shooting
- Small fields of two-three acres don't work. "They need areas to work and fly around."
- He believes that doves will fly over areas with prime feeding opportunities to go to other areas where they know they will be safe. By beginning to provide food sources early, he gets the doves in the habit of coming to his fields even when other fields are nearby.
- After 30 years he has come to believe that however many doves are in the area on opening day, his hunters will kill half that season
- If he doesn't have a good opening day, he will not have a good season
- He believes that migratory doves no longer "hopscotch" down the flyway but instead are largely overflying the state
- His goal is to have his sunflowers planted by April 25. To be ready for a Sept. 1 opening day, he needs to be done on Aug. 1 with spraying/burning
- His goal is to have bigger heads on the sunflowers and fewer plants per acre, which he believes helps to ward off the smaller birds
- After sunflower harvest, he shreds and bush-hogs the stalks to make for easier dove recovery and walking. Harvesting the seeds requires a special head, such as a 653A bean head. You can get about $125-$200/acre in seeds, and that helps cover costs. They also can be insured against loss.
- His club's harvest hasn't gone down, but it all is now occurring in two weeks, not four

Weller then provided an overview of how he plants his fields in winter wheat and sunflower strips. He provided a list of chemicals and procedures, which is included in the Appendix. He uses Clearfield seed, which is tolerant to Raptor or Beyond herbicides.

His procedures kill weeds and "fries" sunflowers. "In six days it looks like it's been dead for a year, and that's what you want." But this work is not cheap – on average, about $62 per acre including planting, spraying and nitrogen treatment. "It's not cost effective – that's why we harvest the sunflowers," Weller said.

Ultimately, Weller's best advice: "Design everything you do for opening day. Then from that point you're good, if you've got birds. If you don't have birds, don't expect them to come. They're not coming. If hunters kill a limit on opening day, that takes the pressure off. But if he doesn't fire a box of shells, you've got problems."

Terry Musser was asked to discuss his experiences dealing with licensed hunting preserves that offer dove hunting.

- In general, preserves use dove hunting to kick off their season, to get people coming back to the preserve

- His overall feeling is that dove management on preserves is done very poorly
- "If you want doves, you have to devote the money, time and effort to get it done right. If your hunters are disappointed, then what have you achieved?"
- In his view, very few preserves handle things correctly
    - Timing is critical
    - Too often, sunflowers are late in ripening – they need to be ripe in mid-August
    - In general, dove field managers are not ready to go when they need to be
        - The window for planting is very narrow, perhaps only three days or even one
        - "That's your opportunity," otherwise you may have to wait two or three weeks
        - Similarly, it's important to spray on time as well

Mike Resetich said that if you see your neighbors out in the field, it's time to get out yourself. At Green River, his team plants early, sprays on schedule. "Spring is important. You have a small window to plant. If it's ready to go, we go."

Stan McTaggart noted that if sunflower crops are the province of tenant farmers, it can be difficult to get them to harvest on time because they are more focused on corn or beans. During the wet years, there is occasionally trouble getting tenants to plant sunflowers on time as well. Mike Wickens said he makes it part of the lease arrangement that the farmer has to plant the sunflowers before other crops are planted. They must be harvested five days before September 1.

More general observations:

- Mike Resetich said that ragweed will re-sprout and come back up, creating his biggest problem
- In general, doves like sandy soil

Terry Musser then kicked off a discussion of dove field management for shooting. He is a consulting biologist for a dove club with properties in several counties. Unlike public shooting areas, which aim to provide a flurry of dove shooting at the beginning of the season, he aims to stretch out quality shooting for as long as possible.

- His club has 5- to 8-acre fields specifically managed for doves
- They are planted in a combination of wheat and sunflowers, in 60 foot alternating strips
- The wheat is not harvested; instead, it's used to get the doves in very early
    - The wheat is manipulated through mowing
    - 1/3 of the wheat is mowed at a time, every week
    - Previously mowed areas are re-mowed when new strips are mowed
- The idea is to build a local flock that uses your fields from mid-July forward.
- He will use Gramoxone if sunflowers are not ripe in time
- Then the sunflowers are manipulated in the same manner as the wheat, mowing strips
    - The last manipulation occurs 3-4 days before the opening

    - The strip is left wide enough to take more off in 10 days after the season is open
        - That mowing is done during midday, when doves are not in the field. It scatters new seed to keep the birds coming
        - A light disking of the wheat is done at the same time
- His hunters hide in sunflower strips 30 to 40 feet wide that are left standing
- In his experience, doves do not leave with a cold front if they have food
    - "We give them a smorgasbord, and there's always fresh seed every week to 10 days"
- The hunting is carefully regulated
    - In the early part of the season, 10 shooters can shoot an 8-acre field, standing 40-50 yards apart
    - 10 days in, only 5 shooters shoot the same field, distributed appropriately
        - They hunt the whole field, not leaving any area as a refuge
    - There is a strict protocol of two hours, two boxes or a limit – then you get out
    - Net result is quality hunting for a long time. In recent years, his shooters were still harvesting limits in late September or early October
        - This is attributed to the dropoff in hunter numbers; while state areas have large numbers of shooters, he very quickly is down to 4-5 shooters per hunt
    - Later in the season, they will draw down a pond to create a mud bank to lure doves
    - Fields are rested for two or three days. Generally one shoot is held on a weekend, one in the middle of the week
- In general, when an area's crop harvest is late he can predict good shooting. Early harvests spread feed all over the area and ends the shooting, because doves no longer have to fly to feed in his dove field.

Nesting cradles: Terry Musser and Mike Weller both promoted the idea of creating dove nesting cradles and putting them in the areas where you wish to hunt, either in evergreens or on the top of fence posts. The cradles are made from hardware cloth and prevent nests from falling apart in bad weather.

Nesting often begins in March, and if nests are destroyed in spring then it's hard to recover.

"If we can mount an effort to get these cages, we could have a significant effect," Musser said.

Thousands would be needed. They are about the size of two hands cupped together and can be stapled to the top of fence posts or wired into trees.

(A copy of plans to make these cradles is included in the Appendix)

Alternative crops/seed selection: Mike Weller discussed the benefits of white proso millet as an alternative dove crop. It matures in 45 days and can be used in situations where wet conditions

have drowned out wheat or other crops. He treats it like wheat – spraying and burning – and "it works."

Others suggested that white proso could even be better than wheat, because it can be planted earlier. It could even be used in succession with wheat – burn and disk the wheat and then plant white proso millet. Proso does have to be manipulated because it can be quite thick. Weller suggested chemically killing it and then bush-hogging the remainder to shred the stalks. "I have the blades in the dirt," he said. Mike Resetich suggested that an old silage chopper could also be effective. Disking proso is not effective because you could have re-sprouting following a rain.

Mike Weller described the seed program offered by Ducks Unlimited in partnership with Mycogen Seeds. Under this program, leftover seed is distributed free. Because it is older, the seed germination rate is lower, perhaps 80 percent. But, he said, this is not an issue because you tend to overplant sunflowers anyway. He gets and distributes a pallet every year.

Mike Wickens and Mike Resetich both praised Clearfield seed for its cold tolerance – it can handle temperatures down to 28 degrees. Resetich said he hopes to plant in April. Weller pointed out that sunflowers do not germinate if soil temperatures are below 55 degrees – a good rule of thumb is if asparagus is sprouting, it's OK to plant. Wickens noted that wet springs change the calculations.

Sunflowers need 10 days to get out of the ground. If they are not out by May 5, you can replant.

Optimum fields: An optimal dove field is a minimum of 5 acres. Any less isn't worth the effort. Optimally it would be at least 525 feet across for shotfall purposes and allow shooters to be placed 40 yards apart. "The bigger the better," Mike Weller said. His field is 80 acres with 30 acres of sunflowers. "More important is what surrounds you," he said.

Weller likes long and rectangular fields, planted with alternating swaths of sunflowers and wheat or millet, which is burned and shredded. About six rows of sunflowers are left unharvested, and 90 feet of bare dirt is left.

Ron Wellmore leaves a strip down the middle of his fields to provide better access for hunters. They shoot back to back.

Conducting the dove hunt

All agree that minimizing the time spent in the field is critical to sustaining shooting for as long as possible. The longer time spent in the field means fewer days of shooting overall due to the harassment factor.

Terry Musser spoke of properties where he is a consulting biologist. At his club, hunters must leave the field after taking a limit, shooting 50 shells, or hunting for two or 2½ hours.

Hunting on opening day is from 2 p.m. to 4 p.m. As the season progresses, they shift later in hour increments but still adhere to two-hour hunts. They hunt different segments of the fields at different times, and by the time only 3-4 hunters are participating the time limit no longer matters.

Mike Weller added that in his experience, shell limits are not as effective as limiting hunter time in the field. At his club, hunting goes from 2-5 p.m. early in the season, then shifts from 3 to 6 p.m. The deadline is not just to quit shooting, but to be out of the field. Nor are his hunters allowed into the field before the appointed starting time.

Weller believes the following factors are critical:

- Putting the hunters in the field pushes birds out. Half of the doves return, but the other half doesn't return until after the shooting is over. "I believe many of them don't even know the field's been shot."
- There is no morning shooting.
- The vast majority of birds he hunts are in the area on opening day. If his fields are pressured, he would expedite their migration.
- Fields are not hunted on consecutive days, and then only for two to 2 ½ hours.

Weller said that he runs out of hunters before he runs out of doves. He said that his hunters average four visits a year, and they want quality opportunities, four limits in four days if at all possible. He controls when the hunts take place – it's not a show up and go setup.

Weller takes his hunters to the field, and if they're not present at 2 p.m., they don't hunt. At 5 p.m., he picks up the hunters who are still in the field. Spots are assigned and hunters cannot move among them. He needs 10 hunters to shoot his field.

Shooters are positioned at 20 posts, five posts per strip of sunflowers. They are stationed 70 yards apart from side to side and 100 yards across from each other. He requires shooting glasses or other eye protection. The bare dirt helps with bird recovery.

Mike Wickers has six areas that he rotates. No more than three areas are hunted at a time. He wants them all to be rectangles. Hunters are placed 50 yards apart and 175 yards across from each other. He mows 50 yards out to allow for game recovery. The ends of the rectangles are not hunted. He will allow doubling up at a stake "People either like buddy stakes or hate them."

Spots are assigned at an 11 a.m. drawing. After the 11th day of the season, hunting is permitted from sunrise to dark.

In general, it was agreed that it was OK to have shooters straggle into a field, but they must pull out in time to give the field time to rest. In response to a question of whether state areas allowed hunting periods to go on for too long, it became clear that state areas and private clubs have different objectives in providing opportunity. Mike Wickens said that if he could change the shooting hours at Panther Creek to 2 to 5 p.m., he would in hopes of creating a higher quality hunt.

Decoys: Charlie Potter mentioned the use of using wires suspended in poles to hang decoys in a field, a phenomenon he has seen in the south.

All agreed that decoys and Mojo Doves can be effective, but Terry Musser suggested that it would be best to ease into the use of decoys.

He does not use them at all for his first three hunts, but as the season goes on, he starts to use mojos, decoys and a flutterer (a dove silhouette attached on a swivel to a pole, used as a long range attractant). Ultimately he adds decoys on his sunflowers and on the ground. “When you can’t kill a half limit of doves (on a hunt), you’re done,” he said.

Dogs: All suggested that if it is over 85 degrees that it’s important to consider whether to use dogs for retrieving. Kiddie pools are excellent ways to ensure dogs have water. Mike Weller doesn’t allow dogs to be used on 90-degree days with no wind.

Appendix

- **Population trends**
  - Illinois Dove Harvest Rates
  - North American Breeding Bird Survey Summary of Population Change
  - 14-Year Harvest Rates at the Max McGraw Wildlife Foundation

- **Management**
  - Mike Weller's Recommended Spraying Regimen
  - Mourning Dove Nesting Basket
  - Dove Field Management Information, Illinois Department of Natural Resources (2005)

- **General**
  - Assessment of Illinois Dove Hunter Satisfaction, Retention and Attitudes Toward Non-Toxic Shot (2013)

Illinois Dove Harvest Rates

(From the 2013-2014 Hunter Harvest Report)

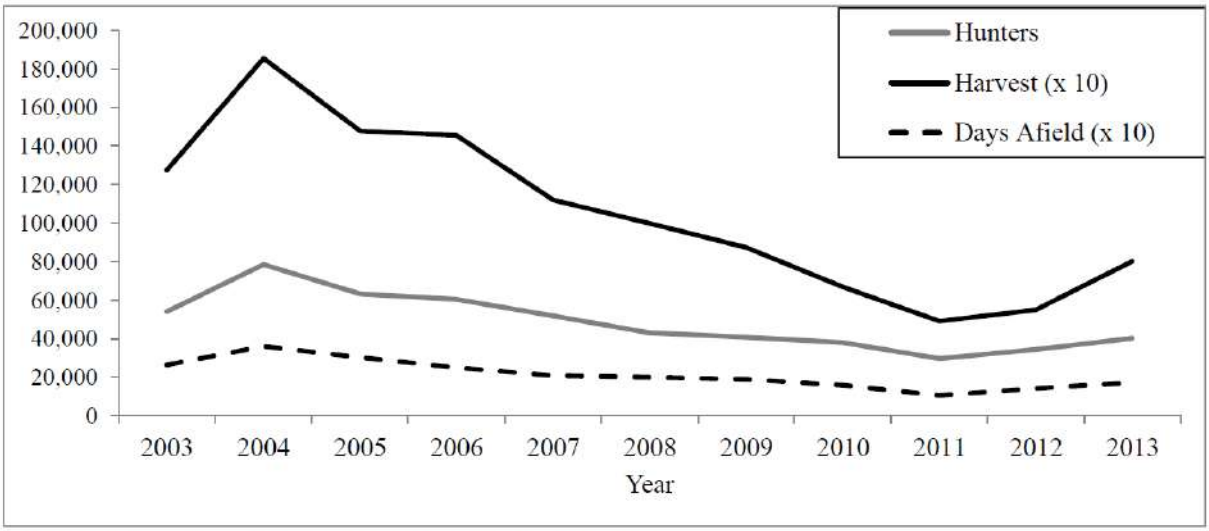


Figure 5. Illinois dove harvest and hunter activity (2003-2013).

Table 47 - continued.

Species and Seasons	Estimated Total Hunters	Average Daily Bag	Average Season Bag	Estimated Total Harvest	Average Days Hunting	Estimated Total Days Hunting
DOVE						
2003	54,172	4.84	23.53	1,274,765	4.86	263,390
2004	78,455	5.13	23.65	1,855,135	4.61	361,989
2005	63,383	4.89	23.35	1,479,709	4.78	302,777
2006	60,514	5.81	24.07	1,456,542	4.14	250,631
2007	51,847	5.38	21.62	1,120,739	4.02	208,437
2008	43,123	4.98	23.14	997,917	4.64	200,225
2009	40,781	4.61	21.41	873,182	4.64	189,254
2010	37,974	4.21	17.61	668,547	4.18	158,688
2011	29,742	4.57	16.57	492,765	3.62	107,769
2012	34,501	3.85	15.97	550,962	4.15	143,109
2013	40,281	4.62	19.94	803,159	4.31	173,794

Table 32. Summary of 2013 hunting effort and success in administrative regions in Illinois for the species listed below.

Doves (213)						
Administrative Region	Estimated Number of Hunters	Percent of Hunters	Average Bag		Estimated Total Harvest	Estimated Days Afield
			Daily	Season		
Region 1	8,888	22.17	3.19	12.77	113,467	35,553
Region 2	4,350	10.85	5.24	18.22	79,238	15,129
Region 3	8,132	20.28	5.61	21.53	175,118	31,203
Region 4	12,671	31.46	5.33	23.85	302,201	56,734
Region 5	6,241	15.57	3.78	21.33	133,135	35,175
Statewide	**40,281**	**100.00**	**4.62**	**19.94**	**803,159**	**173,794**

Table 11. Summary of 2013 hunting effort and harvest in Wildlife Management Units in Illinois for the species listed below.

Dove (213)						
Wildlife Management Units	Estimated Number of Hunters	Percent of Hunters	Average Bag		Estimated Total Harvest	Estimated Days Afield
			Daily	Season		
Northwest Hills	1,702	4.25	2.19	10.22	17,398	7,943
Northeast Moraine	1,324	3.30	5.23	19.43	25,719	4,917
Mississippi Border-North	1,135	2.83	4.00	28.00	31,771	7,943
Mississippi Border-South	5,484	13.62	5.68	22.72	124,625	21,937
Western Prairie/Forest	5,295	13.21	4.25	17.61	93,232	21,937
Central Sand Prairie	2,269	5.66	2.88	11.75	26,665	9,266
Grand Prairie	13,805	34.43	5.27	19.99	275,914	52,384
Southern Plain	8,321	20.75	4.25	21.91	182,304	42,928
Wabash Border	567	1.42	4.00	10.67	6,052	1,513
Shawnee Hills	378	0.94	6.44	51.50	19,479	3,026
Statewide	**40,281**	**100.00**	**4.62**	**19.94**	**803,159**	**173,794**

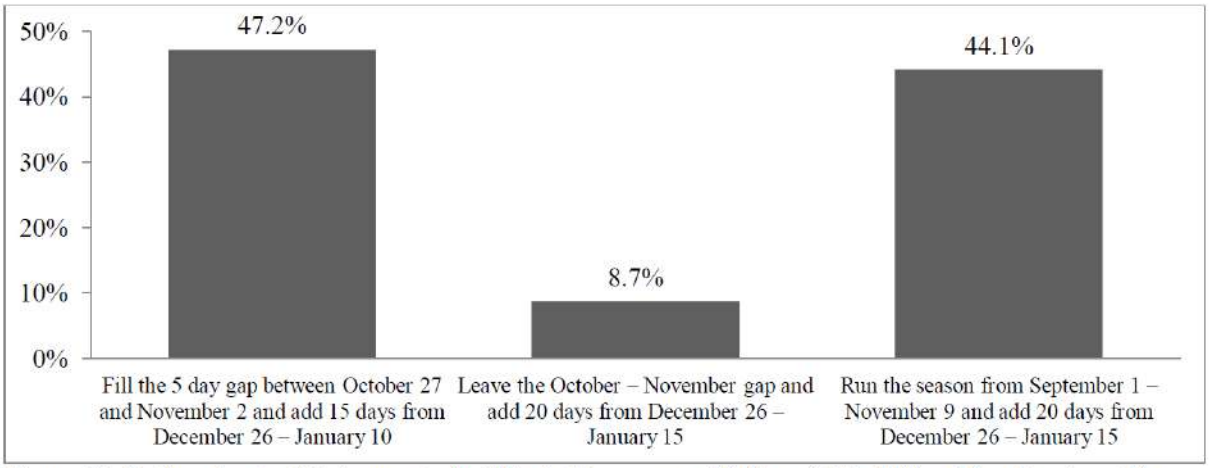


Figure 19. Preferred potential changes to the Illinois Dove season if allowed 20 additional hunting days. The current Illinois Dove Season is open September 1-October 27 and November 2-November 14 (n=195).

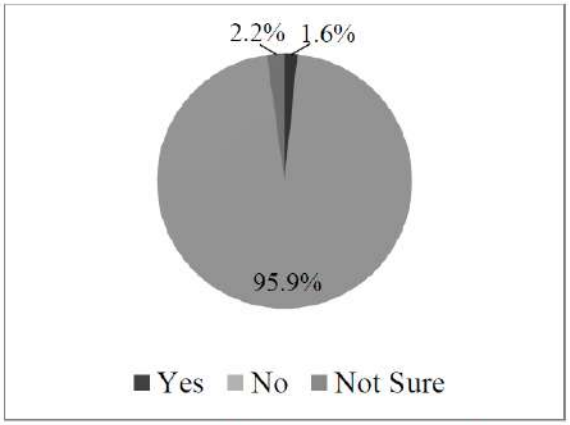


Figure 17. Percent of hunters who harvested Eurasian collared-doves in Illinois during the 2013 season (n=1077).

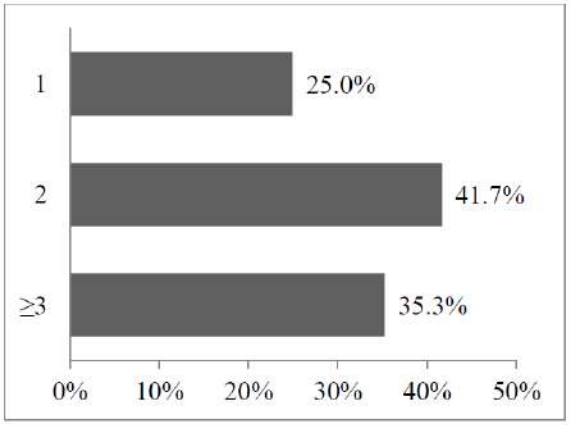


Figure 18. The number of Eurasian collared-doves harvested by hunters in Illinois during the 2013 season (n=23).

North American Breeding Bird Survey

Summary of Population Change

Mourning Dove *Zenaida macroura*

ILL trend results

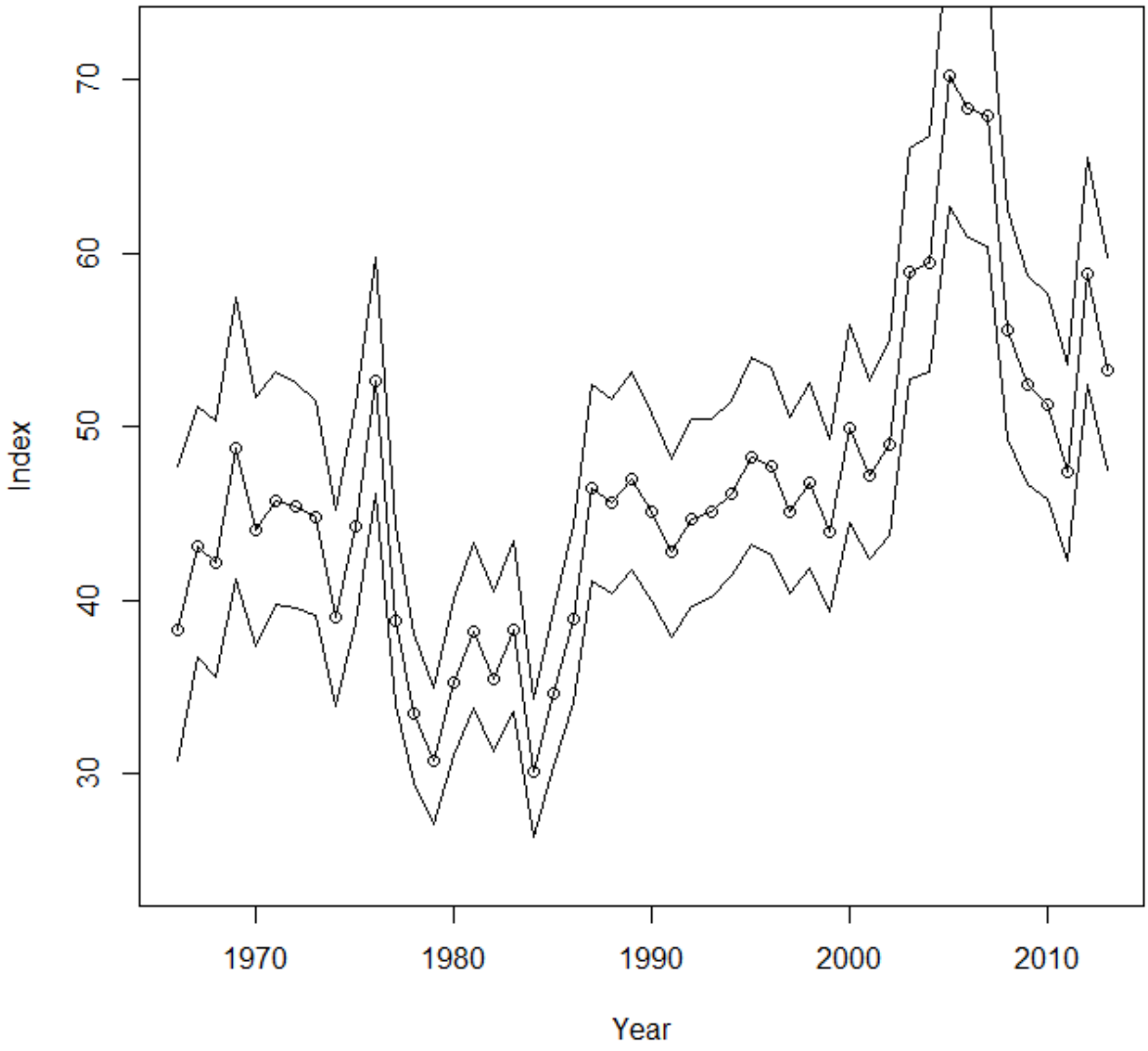
Hierarchical Model Results

Region	Trend Estimate	2.5% CI	97.5% CI
Trend period	1966 to 2013		
ILL	0.70	0.21	1.20

Region	Trend Estimate	5% CI	95% CI
Trend period	1966 to 2013		
ILL	0.70	0.28	1.11

Annual Indices for Years: 1966 to 2013

Year	Annual Index	2.5% CI	97.5% CI
1966	38.34	30.80	47.76
1967	43.11	36.75	51.12
1968	42.14	35.56	50.30
1969	48.73	41.20	57.46
1970	44.03	37.33	51.66
1971	45.77	39.82	53.12
1972	45.40	39.56	52.51
1973	44.79	39.17	51.46
1974	39.05	33.96	45.17
1975	44.28	38.77	51.23
1976	52.68	46.19	59.76
1977	38.78	34.02	44.29
1978	33.53	29.49	38.15
1979	30.74	27.09	34.95
1980	35.23	31.07	40.04
1981	38.19	33.83	43.30
1982	35.52	31.32	40.55
1983	38.34	33.61	43.43
1984	30.13	26.37	34.33
1985	34.64	30.44	39.42
1986	38.91	34.13	44.35
1987	46.44	41.09	52.40
1988	45.60	40.39	51.58
1989	46.96	41.71	53.19
1990	45.10	39.94	50.80
1991	42.76	37.87	48.10
1992	44.67	39.63	50.45
1993	45.08	40.16	50.45
1994	46.12	41.40	51.51
1995	48.27	43.19	53.98
1996	47.69	42.62	53.32
1997	45.05	40.43	50.51
1998	46.73	41.82	52.54
1999	43.97	39.34	49.33
2000	49.94	44.49	55.83
2001	47.15	42.41	52.62
2002	49.00	43.76	54.99
2003	58.88	52.79	66.04
2004	59.39	53.14	66.76
2005	70.24	62.69	78.73
2006	68.31	60.85	76.44
2007	67.86	60.43	75.94
2008	55.58	49.29	62.46
2009	52.40	46.70	58.74
2010	51.25	45.86	57.65
2011	47.45	42.31	53.53
2012	58.80	52.43	65.55
2013	53.25	47.53	59.79



Source: USGS/Patuxent Wildlife Research Center

Dove Harvest History at Max McGraw

	SEASON TOTALS		
	NUMBER OF HUNTER TRIPS	NUMBER OF DOVES HARVESTED	AVERAGE HARVEST PER HUNTER
2002	139	1093	7.9
2003	127	705	5.6
2004	107	788	7.4
2005	98	1009	10.3
2006	127	1434	11.3
2007	157	1271	8.1
2008	118	685	5.8
2009	55	162	2.9
2010	86	352	4.1
2011	74	565	7.6
2012	133	905	6.8
2013	174	1436	8.3
2014	101	282	2.8
2015	30	90	3.0

Notes: The Foundation limit has always been 12 doves per hunter.

We have four fields, averaging 2.5 acres each.

Roughly ½ of each field is planted in winter wheat and ½ in sunflowers. Six rows of corn are planted down the middle to hide from six to eight hunters.

Sunflowers are a Peridovic dove blend, planted 26,000 seeds per acre. The ground is sprayed Preplant Incorporated with Prowl at three pints per acre.

Sunflowers are planted with a corn planter and cultivated to control weeds.

Hunting begins at 1 p.m. and ends at 5 p.m. the first three days of the season, and 90 minutes before sundown the balance of the season.

Mike Weller's Recommended Spraying Regimen:

Pre-plant

- 2.5 pints Prowl H20
- Nitrogen 100-150 units per acre

Post emerge (when plants are beer-can tall)

- Raptor or Beyond – 5 ounces per acre (broadleaves and grass)
- Select Max – 10 ounces per acre (grass)
- COC Supreme (crop oil concentrate – surfactant) 1 quart per 100 gallons of water
- AMS Plus (liquid) 2.5 gallons per 100 gallons of water
- Use no less than 15 gallons applied per acre

When Plants are Physiologically Mature:

- We use Gramoxone and 2-4D to finish off the plant and kill all weeds

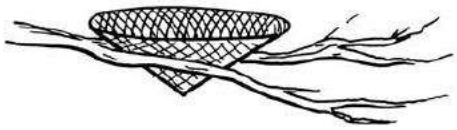
Dove Nesting Basket

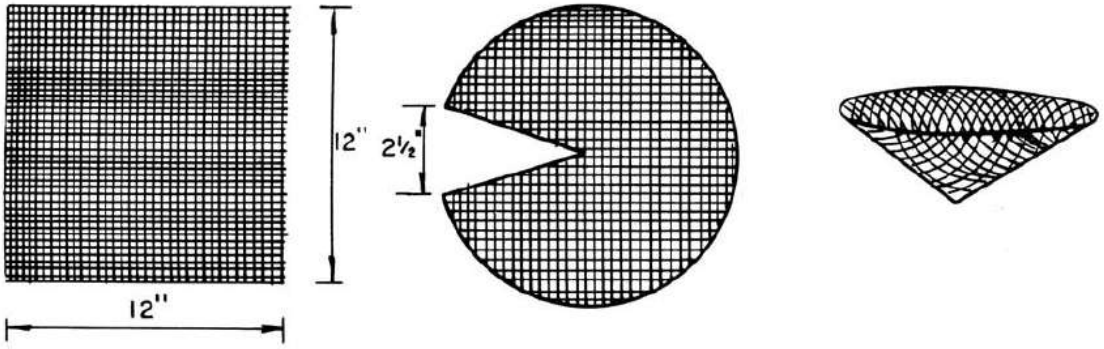
Supplies needed

One 12x12” piece of hardware cloth

Instructions

Cut with tin snips to form a circle. Cut out a narrow pie shape and wire edges together to form a cone. Wire and/or staple cone into the crotch of a tree limb.





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TheCornellLab NestWatch

Dove Field Management Information

Guidelines and Recommendations
March 2005

Proper and effective dove field management is critical to the success of the dove hunting program on Illinois Department of Natural Resources (IDNR) managed public lands. It is essential that IDNR staff be informed and trained to properly prepare dove management fields. This is necessary to provide for quality wildlife management and provide hunting opportunity for site users. The purpose of this document is to identify what is currently being conducted on 67 Illinois public land sites and to provide information through guidelines and recommendations for future use by IDNR district wildlife biologists, site managers and their staff.

1. Inventory of current planting practices

- As an ag lease requirement w/ no money exchanged - Nine (9) biologists reported that their sites operate in this fashion. All components required to install an established number of acres of sunflowers is considered in the cost per acre provided by the tenant.

- W-76-D assistance and bartering or using farm lease revenues - Seven (7) biologists reported that their sites use a combination of funding from ag lease program revenues, the W-76-D Project, site budgets and bartering with the tenant to accomplish sunflower/ wheat field installations.

- W-76-D Project exclusively paying for installation etc. - Eight (8) biologists reported that funding resulting exclusively from the W-76-D Project for seed, chemical, fertilizer and contractual farming costs fund sunflower field site operations in their districts.

- Site operating budget & staff exclusively - Two (2) biologists report that their sites do all preparation work and funding to complete the sunflower management field installations entirely through site budgets.

- Jim Edgar Panther Creek SFWA (JEPCSFWA) - (current program used)

  JEPCSFWA has a specific sunflower lease and this method for providing dove management field units is very cost effective, especially for sites that have large agricultural lease acreage available. The specific lease at JEPCSFWA includes three crops; sunflowers, wheat and soybeans. The site has six units in the lease with approximately six fields of about 11.5 acres each for a total of 438 acres. Two of the fields are sunflowers, two wheat and two are in soybeans annually. The six fields are rotated through the three crops in each of the six areas. Granted, this is significant acreage, but the program could be implemented with 60 acres without rotating fields. Another option could be done with two units

hunting fields within a given unit could occur every other day. This would require120 acres for the dove field management effort. JEPCSFWA bids this lease and most recently it was awarded for $ 27.20 per acre. Payment varies with the crop. They are presented separately as follows:

Sunflowers- The tenant harvests 50-80% of the Sunflowers and leaves 20% of the Sunflowers in the field. It is the tenants choice. He pays the $ 27.20 cash rent per acre on what ever he harvests, with a minimum of 50 and maximum of 80% of the acres harvested.

Soybeans - The tenant pays $ 27.20 on all the acres in soybeans. The average cash rent at this site is $ 119 per acre.

Wheat - The tenant leaves 50% of the wheat standing and harvests the remaining 50%. No cash rent is paid but the tenant is required to pay real estate taxes on the crops harvested as all are tenants leasing farm land at JEPCSFWA.

This program has worked extremely well for this site and also the tenant. The tenant gets his bean ground cheap and we make money on the sunflowers instead of leaving the crop in the field. The wheat is a break even situation. It is highly suggested that other sites look at this option, especially with the current fiscal situation.

2. Planting site preparation - equipment and rental rates

Reference: ***Table 1. Tillage methods and approximate costs.***

Table 2. Equipment custom rental rates. ***(includes tractor overhead cost)***

3. Sunflower field management specifics.

Reference: ***Table 3. Sunflower seed information.***

Descriptions of various activities and practices from Table 3 are provided below:

- Seed varieties - five seed varieties offer a diversified spectrum of sunflowers that have proven track records on many Illinois public land sites. They offer variety in planting dates, seed maturity, chemical application, installation options and costs.

- Seed packaging - current standards for seed packaging runs approximately 200,000 sunflower seeds per bag. This usually results in about 1 bag of seed planting 10 acres.

- Days to maturation - as an example, 98 days to physiological maturity results in average height, flower head semi-drooping, center seed fill outstanding and kernel retention outstanding. Basically the seed head is made.

- Preferred planting date - it is preferred for seed dry-down purposes that the seed be planted on or before the listed date to ensure seed is dried for management purposes whether mowed, disced or other-wise manipulated.

- Seeds per acre (P- planted or D -drilled) **-** Plant population for the typical "less than ideal" fertility situation on many public land sites suggests a reduced population of approximately 20,000 seeds planted per acre, except the drilled rate of 25,000 -27,000 for Pioneer 6150.

- Tillage & planting methods - all sunflower varieties listed can be planted using no-till methods or through conventional farming practices. No-till methodology typically involves "burning down" existing vegetation with a quart of either the chemical TOUCHDOWN (preferred), ROUNDUP or GLYSTAR PLUS - combined with 1 gallon/acre of ammonium sulfate (8-0-0 -10S) in 15 -18 gallons of water per acre. This solution is then sprayed approximately 7 days prior to no-till planting. (*Conventional farming involves chisel plowing or moldboard plowing, discing, field cultivating, harrowing, spraying and planting*).

Chemicals and application rates -

Reference: ***Table 4 - Sunflower chemical , application rates and costs.*** Listed below are narrative descriptions for sunflower approved chemicals.

- PROWL *(pendimethalin)*, SONOLAN *(ethalfluralin)*and TREFLAN *(trifluralin)* are approved (labeled) for sunflower use in Illinois and control annual grasses, pigweed and lambs quarter. These chemicals are applied and incorporated as (pre-plant) pre-emergent chemicals. Prowl and Sonolan can be applied and immediately incorporated, then re-incorporated 4-5 days later working the soil the opposite direction for dual control if time is available. These herbicides will effect various broadleaf weeds, but will not control them. Dependent on soil type, application per acre is approximately 1 to 11/2 quart in 15 -18 gallons of water per acre.

- SPARTAN DF *(sulfentrazone)* is approved (labeled) for sunflower use in Illinois and is applied at a rate of 2-3 ounces per acre on medium to fine textured soils with organic matter above 3%. This product should not be used on course textured soils with less than 1% organic matter. This product is used as a pre-emergent and should be sprayed on top the soil prior to planting or immediately post plant. Weeds controlled include most annual small-seeded broadleaf weeds, such as kochia, pigweed species,

lambs quarter, nightshade, smartweed, Russian thistle and biennial wormwood and may suppress buckwheat, mustard and ragweed. SPARTAN may provide some grass control.

- BEYOND *(imazamox)* is approved (labeled) for sunflower use in Illinois and is specifically used in combination with "Clearfield sunflowers" commercially produced and marketed by Mycogen Seeds. It is normally applied at a rate of 4 ounces per acre, however since many of Illinois public land site sunflower fields experience a severe ragweed infestation condition, specialists have advised that BEYOND be applied at a rate of 6 ounces in 15-18 gallons of water per acre, post emergent. Approximately, within two weeks of planting before weed height reaches three (3) inches. It is advised that a (adjuvant) surfactant be used. A nonionic surfactant containing at least 80% active ingredient applied at a rate of 1 quart per 100 gallons of spray solution. When adequate soil moisture is present, BEYOND chemical will provide residual activity on susceptible germinating weeds; activity on establish weeds will depend on the weed species and the location of the root system in the soil.

- SELECT *(Clethodim)* - is approved (labeled) for sunflower use in Illinois and is applied as a post emergent at a rate of 8 ounces of SELECT, one quart of a crop oil (surfactant) and in 15 -18 gallons of water per acre solution. This product provides excellent grass control including crabgrass, quackgrass, Rhizome, johnsongrass. red rice, wild oats and volunteer cereal grasses. This chemical currently provides a wide spectrum of control and is especially effective on crabgrass.

Field Management Options:

- Timing (i.e., planting, mowing, spraying, burning, discing) - Sunflowers should be planted based on a variety of conditions. Ideally, it is preferred that sunflower seed are dried down by the 10th to 15th of August. This allows mourning doves time to utilize the field several days before 01 September. Planting dates should be determined based on seed maturation periods and the preferred dry-down date. Mowing is generally accepted as the primary method for preparing managed fields for mourning dove season. It is recommended that limited strip mowing be initiated the first week of August. Phasing the mowing once per week until dove season begins is recommended to provide an enhanced food source and grit/dusting area for the birds throughout August.

  Wheat field management, in coordination with sunflower fields provide an excellent food source and grit/dusting area. Wheat fields can be managed in three ways to prepare them for optimal use by doves. 1. In late July, the fields can be sprayed with one quart of Roundup or Gly Star Plus per acre in 15 gallons of water to "burn-down" existing green vegetation. In early August the field can then be prescribed burned to remove all vegetation and provide bare ground and food for dove use, 2. another method is to sickle bar or rotary mow the wheat strip and then allow 5 -7 days to dry before prescribe

burning the residue and 3. last, standing wheat can be burned, starting in late July and this practice will often do a slow burn that allows upland wildlife escape areas and results in a mosaic burn that allows for additional burns to be conducted in the same field. This provides a new food source throughout the month of August and September.

Light discing can be used in concert with mowing and burning to enhance dove use in a management field. It provides a bare ground situation that mourning dove prefer. It is suggested that light discing be done on a limited basis to not cover and subsequently lose large amount of sunflower or wheat seed. Light discing should be initiated approximately August 15th.

All of the recommended practices for timely planting, mowing, spraying, burning and discing are methods used for mourning dove field management. Site specific needs dictate what practice is best for the site based on weather, staffing, equipment and other factors.

- Field rotation needs - most literature concerning planting agricultural crops indicates that rotating crops every two years is good for plant seed production, weed control, soil compaction, weed/chemical adaptation and fertility levels in continuous farmed fields. The new Mycogen "Clearfield" sunflower uses the chemical Beyond, which is an ALS (inhibitor) herbicide. It is recommended that Beyond be used no more than 2 out of 4 years in the same field. Crop rotation is essential for providing quality and quantity in sunflower field management.

- Wildlife depredation problems - Sunflowers are a preferred food of white-tailed deer during development of stalk and seed head. Rabbits and wood chuck also feed on the tender plants during early development. Most Illinois public land sites consider this of minor annoyance, but substantial damage can occur, especially from deer depredation. If damage persists, refer to methods used in the Prevention and Control of Wildlife Damage - Volumes I & II which each district wildlife biologist is issued.

- *Reference:* **Table 5. Approximate total cost for sunflower field installation (personnel services costs are not included).**

4. Alternative crops for dove field management -

- Winter Wheat - wheat has been used as a dove attractant crop for many years, even prior to sunflower usage on Illinois public lands sites. Wheat is easily grown and relatively inexpensive to install. Many public land sites use wheat as a compliment component to sunflower fields or in the event of a sunflower crop failure, would be the primary food supply for mourning doves. Winter wheat is also easily manipulated

through mowing, burning or light discing. This seed crop is planted in the fall of the year (months of September and October) and requires minimal fertilization for establishment. It is planted at a rate of approximately 60 -90 pounds seed wheat per acre with 100 pounds of 18-46-0 fertilizer and can be installed for about $50 per acre total cost.

Wheat is often used as strips around sunflower fields and since it matures in July, can be mowed and/or burned early in the summer to encourage dove use in the sunflower field. Many sites have used the mowed wheat strips as a drop or retrieval zone for harvested doves. It is a good dove field management crop if properly manipulated and done in a timely manner.

- Browntop, proso, pearl millets - millet(s) have been used as a dove attractant crop for many years, also prior to sunflower usage on Illinois public lands sites. Millet(s) are easily grown and relatively inexpensive to install. Many public land sites use millets as a compliment component to sunflower fields or in the event of a sunflower crop failure, would be the primary food supply for mourning doves. Millet(s) are also easily manipulated through primarily mowing or very light discing. Installation costs hover around the $75 per acre figure. Seeds are usually drilled at a rate of approximately 20 pounds per acre. Fertilization is suggested about 150 pounds per acre of 18-18-18 or dependent on soil test needs.

  Millet, like wheat is often used in strips around the sunflower fields and since it matures in approximately 55-60 days, can be mowed and/or disced in mid summer to encourage dove use in the sunflower field. Many sites have used the mowed millet strips as a drop or retrieval zone for harvested doves. It is a good dove field management crop if properly manipulated and done in a timely manner.

- Corn (chopped/silage) - corn, chopped for silage, has been used on some public land sites with limited success. Usually, a silage chopper is used to spread the stalk, leaf and grain on the ground behind the equipment. This is best done near the end of the "milk stage" of kernal development. Most dove hunting was done over silage chopped fields on privately owned dairy and beef farms 30 -50 years ago. Less livestock, fewer silage fields, other dove field management and efficient farming practices have limited the number of silage field hunts in more recent times. Rural farms have decreased significantly as well. Corn fields can be installed for approximately $175 per acre.

- Managed common ragweed, yellow foxtail, wild hemp and dove weed as annual weeds - Mourning dove have a high preference for a variety of weed seeds including common ragweed and yellow foxtail seeds. Wild hemp found in the northern and western portions of Illinois is also known as a highly preferred dove food. In times past, when livestock pastures were more common on Illinois' landscape, a plant referred to as "dove weed" *Eremocarpus setigerus,* or Turkey Mullein was a preferred food source for mourning dove also. Natural weed seed production can be accomplished through prescribed burning, mowing, discing and livestock pasturing.

  Managed weed fields are also be valuable food, cover and nesting areas for upland

wildlife species such as quail, rabbit and pheasant.

- Gob pits (former mine lands) for grit areas - Mourning doves have been observed ingesting grit at these sites and they may offer some management potential. Management potential may be minimal and over time succession will result in ground conditions less desirable for "gritting" purposes unless sites are disturbed.

- Water holes, ponds, wetlands and sand beaches - Mourning doves use watering areas after feeding, usually in morning and evening. Many public land sites have lakes, ponds, permanent and temporal wetlands and sand beaches that are used for watering purposes. Doves will also use these areas for obtaining grit, if available. Management of these structures entails spraying shorelines with chemicals for the control of weeds and grasses, discing the perimeter of the site, mowing and burning. An evaluation of this kind of management impact(s) should be completed to measure positive or negative effects on other wildlife species prior to initiation.

5. Field layout and establishment -

Current sunflower field layout on Illinois public land - DNR sites plant dove management fields in a variety ways. We will discuss the general field layouts currently used.

- Square or rectangular fields - Probably the primary "standard" for sunflower fields is a 5,10, 15, 20, 30, or 40 acre field laid out in a square of rectangular fashion. These fields typically are planted either exclusively to sunflowers or have wheat or some type of millet on the peripheral for early mowing, encouraging dove use and providing a drop zone for harvested birds.

- Long lineal fields - Terrain or limited open-land sometimes results in fields running along ridge-tops or in areas that are thin long strips providing dove hunting management units. This approach is also used to provide hunter placement, all along one side, for safety concerns.

- Odd areas & triangular fields - Limited open - land often dictates that IDNR staff utilize these types of fields for dove field management purposes. These fields may only accommodate a limited number of hunters, but they help optimize dove hunting opportunity.

- *Reference:* ***Table 6. General recommendations for dove field management.***

6. Litter and trash concerns in dove management fields

- **Litter problems** - Illinois public lands are starting to experience increased trash including shell casings, shell boxes, cans/bottles and paper products left by hunters at dove management fields. This is especially noticeable on dove management fields due to consolidation of the hunters in a finite area. In a recent survey of 23 responding district wildlife biologists, 13 DWB's indicated that litter is becoming a real problem and site users should be counseled to reduce or eliminate the problem. On some state facilities where hunters are assigned stakes to hunt by, site staff have even done stake checks to ensure the anti-litter policy is complied with. One site utilized community service - probation participants to pick up litter in a dove field and accumulated two (2) 55 gallon barrels of various kinds of litter, including one barrel of just shell casings. Not only is it against the law to litter on state property (or anywhere for that matter), but items such as shell casings will not decompose for 75 to 100 years. Although it is realized that an occasional expended cartridge may be ejected and not found at all, it is suggested that site users adhere to the ethical aspects of anti-littering. This is something that should be stressed before every organized dove hunt and enforced by law enforcement personnel.

Table 1. Tillage methods and approximate costs.

Method	Approximate cost per acre
1. Conventional - Plow/chisel plow, disk, field cultivate, spray, drill or plant, cultivate	$53.00
2. Conventional - Disk (x2), field cultivate, spray, drill or plant, spray	$33.00
3. No -till - spray, no-till plant or drill, spray	no-till plant and spray twice - $ 14.00 no-till drill and spray twice - $ 20.00

Table 2. Equipment custom rental rates. **(includes tractor overhead cost)**

Type equipment	2003 custom rental rates per acre
Tillage	
Combination tool	$9.70
Coulter chisel plow	$9.60
Disk Subsoiler	$16.50
Field cultivator	$5.30
Moldboard plow	$21.00
Tandem disk	$6.80
Planting and row-crop cultivation	
Conventional planter	$8.10
No-till planter	$8.80
Grain drill	$10.20
No-till drilling	$14.90
Rotary hoe	$3.70
Row-crop cultivator	$8.40
Additional operations	
Field sprayer	$2.50
Rotary mower	$8.90
Flail mower	$9.10

Source: University of Illinois U-C, College of Agriculture - June 2003

Table 3. Sunflower seed information.

Sunflower Seed variety	Seeds per bag	Days to maturation	Preferred planting date	Seeds per acre P- planted D -drilled	Tillage & planting methods	Chemicals and rates	Seed size	Approx. cost per bag	Special notes or needs
Pioneer 6150	200,000	72	by June 05 th	22,000 P 27,000 D	conventional or no-till	Prowl - 1qt/.ac or Spartan DF 2-3 oz. Per acre	3	$100	Shorter stalk h.
Mycogen 8242NS	200,000	90	by May 20 th	20,000 P	conventional or no-till	Prowl - 1qt/.ac or Spartan DF 2-3 oz. per acre	3	$ 130	
Mycogen Clearfield	200,000	98	by May 15th	20,000 P	conventional or no-till	Prowl - 1 qt./ acre and 6 oz. Beyond / acre	3	$ 150	Rotate field every two years
Peredovic or variety not stated (VNS)	250,000 or 50 lb. bag	105	by May 10th	20,000 P	conventional or no-till	Prowl - 1qt/.ac or Spartan DF 2-3 oz. per acre	3/4	$ 30	
FS dove blend	125,000 or in 25 lb. bags	100	by May 10th	20,000 P	conventional or no-till	Prowl - 1qt/.ac or Spartan DF 2-3 oz. per acre	2	$ 50	

Table 4. Sunflower chemical, application rate and cost.

Chemical	Rate/ acre	Cost / unit	Cost / acre	Surfactant (Y/N)	Ammonium Sulfate 8-0-0-10S
Prowl	2 pints/ acre	$2.75	$5.50/ acre	N	N
Sonolan	2 pints/ acre	$3.25	$6.50/ acre	N	N
Treflan	2pints/ acre	$2.50	$5.00/ acre	N	N
Touchdown	2 pints/ acre	$3.48	$6.96/ acre	N	$1 /gal./acre
Roundup WM	22oz./ acre	$.58	$12.75/ acre	N	$1 /gal./acre
Glystar Plus	2pints/ acre	$2.00	$4 .00/ acre	N	$1 /gal./acre
Spartan DF	2.5 oz./ acre	$2.85	$7.13/ acre	N	N
Beyond	6 oz./ acre	$4.38	$26.28/acre	Y	N
Select	8 oz./ acre	$1.70	$13.60/ acre	Y	N

Table 5. Approximate total cost for sunflower field installation - (personnel services costs are not included).

Seed type	Tillage method	Tillage	Seed	Chemical a./	Fertilizer b./	Grand totals
Pioneer 6150	Conventional (drilled) (plowing)	$53	$13.33	$12.63	$24.15 (175#/ac.)	$103.11
Pioneer 6150	No-till (drilled)	$14	$13.33	$19.34	$24.15 (175#/ac.)	$ 70.82
Mycogen 8242NS	Conventional (planted / disc only)	$33	$ 9.00	$ 12.63	$24.15 (175#/ac.)	$ 78.78
Mycogen 8242NS	No-till (planted)	$14	$ 9.00	$ 19.34	$24.15 (175#/ac.)	$66.49
Mycogen *Clearfield*	Conventional (planted / disc only)	$33	$15.00	$ 31.78	$24.15 (175#/ac.)	$103.93
Mycogen *Clearfield*	No-till (planted)	$ 14	$ 15.00	$ 38.74	$24.15 (175#/ac.)	$91 .89
Peredovic or VNS	Conventional (planted / disc only)	$ 33	$ 2.40	$ 12.63	$24.15 (175#/ac.)	$72.18
Peredovic or VNS	No-till (planted	$ 14	$ 2.40	$ 19.34	$24.15 (175#/ac.)	$ 59.89
FS Dove Blend	Conventional (planted / disc only)	$ 33	$ 6.66	$ 12.63	$24.15 (175#/ac.)	$ 76.44
FS Dove Blend	No-till (planted)	$ 14	$ 6.66	$ 19.34	$24.15 (175#/ac.)	$ 64.15

a./based on prowl, treflan and sonolan being applied @ the rate of 2 pints per acre - average cost $3/pint.

b./ based on starter fertilizer required per soil test of management crop field.

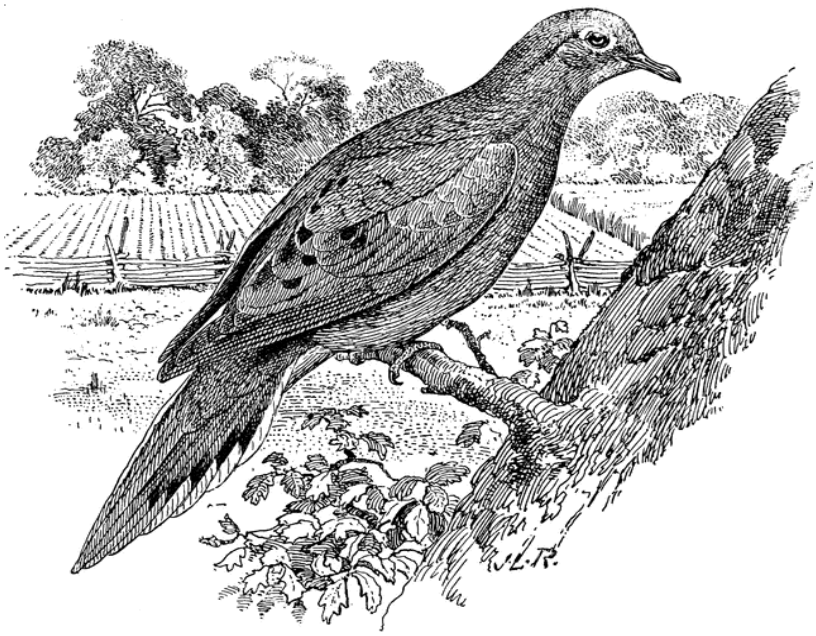
Table 6. General recommendations for dove field management.

Recommendations to do	Recommendations not to do
1. If using 2 crops (i.e. wheat and sunflowers) consider placement and distance	1. Avoid dense vegetation in drop zone
2. Always consider field peripheral habitat (i.e., snag perch trees, grit areas, water sites) in field placement decisions	2. Don't position fields in direct proximity to warm season grasses *(unless the wildlife plan calls for drop zone mowing - min. 40 yards)*, brush or woodlands due to drop zones
3. Fields should be rotated every year if possible	3. Don't position fields along roadsides or near private buildings or dwellings
4. create established drop zones	4. Consider field placement next to soybean fields (e.g., difficult dove retrieval) or other crops unless a 40 yard drop zone is established.
5. Sunflowers seed heads should be ripe by Aug. 5th.	5. Avoid large block planting's if only hunting field exterior.
6. Start trickle (phased) mowing fields Aug. 1st	
7. Start trickle (phased) burning fields Aug. 1st	
8. Rotate hunting fields daily if possible	

*Human*Dimensions
Research Program

Illinois Natural History Survey
Prairie Research Institute
University of Illinois at
Urbana-Champaign

Assessment of Illinois Dove Hunter Satisfaction, Retention, and Attitudes Toward Non-Toxic Shot



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ASSESSMENT OF ILLINOIS DOVE HUNTER SATISFACTION, RETENTION, AND ATTITUDES TOWARD NON-TOXIC SHOT

JOB COMPLETION REPORT

WILDLIFE HARVEST AND
HUMAN DIMENSIONS RESEARCH PROGRAM

STATE OF ILLINOIS

PROJECT NUMBER: W-112-R-22
STUDY 101
JOB NO. 101.4

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Introduction

Recent assessments of trends in hunter activity in Illinois suggest participation in mourning dove (*Zenaida macroura*) hunting is declining in the state (see, for example Alessi, Miller, and Campbell 2012). Little is known about dove hunters and dove hunting in Illinois, and questions surrounding factors contributing to declining dove hunter involvement remain. Factors such as lack of access, poor habitat conditions (due in part to recent drought), and lower dove populations have been proposed as contributing to the decline.

Illinois is one of 27 states that comprise the Eastern Management Unit (EMU) for mourning dove management by the U.S. Fish and Wildlife Service (USFWS) (Seamans, Parker, and Sanders, 2011). The EMU covers 30% of the contiguous United States, and the 19 states in this unit that permit dove hunting comprise 80% of the total unit. Nationally, dove harvest is estimated to consist of 5% to 10% of the total populations. Annual population indices conducted by the states and compiled by the USFWS consist of call-count surveys and breeding bird surveys. In addition, harvest estimates provided by the Migratory Bird Harvest Information Program (HIP) are used to further monitor dove populations, among other migratory species. Recovered leg bands from harvested birds are also used to model survival and harvest rates (Seamans, Rau, and Sanders, 2013). USFWS population indices for both 2- and 10-year trends do not show a decline in dove populations for the EMU; however, 48-year trends do support decreased dove populations in both the total EMU and EMU states where doves are hunted, and evidence suggests dove populations have increased in states with no dove hunting during this same period (Seamans, Rau, and Sanders, 2013). Estimates based on analysis of 2-year call-count surveys suggest dove populations in Illinois had 20-30 doves per call-count route (Seamans, Rau, and Sanders, 2013).

Given the relatively high amount of shot expended during the average dove hunting season nationwide (at 12-18 million birds harvested annually and the number of shells per bird harvested, estimates exceed more than 50 million shot shells annually) (Raftovich, et al., 2012). Some researchers have proposed lead shot ingestion as a mortality factor among dove populations (see for example, Locke and Bagley, 1967; Beurger, Mirarchi, and Lisano, 1986, Kendall. et al. 1996; Fisher, et al. 2006). In a study designed to determine lead shot availability in Indiana fields managed for dove hunting, Castrale (1989) found densities of lead shot had significantly increased in fields used for dove hunting following the hunting season compared with pre-season samples of the same fields. Discing and other tillage practices reduced shot densities by an average of 73%. Results of this study supported those found by Anderson (1986); he found significantly greater amounts of spent lead shot in fields where dove hunting occurred. Schultz et al. (2002) collected soil samples from 2 dove fields in Missouri, one field hunted using non-toxic shot and the other with lead shot. Although post-season shot density for the non-toxic shot site was approximately 65% of that for the site allowing lead shot, doves retrieved from the non-toxic shot site contained significantly more ingested shot than those from the lead shot site. This led the authors to hypothesize that doves from the latter site that ingested shot died of lead shot toxicosis, although this hypothesis was not followed with testing to determine if that was true. Hunter reactions to regulatory prohibition on lead shot use in waterfowl hunting in the early 1980s has prompted state wildlife agencies to gather data on hunter attitudes before imposing further restrictions on or banning of lead shot for dove hunting.

Problem Statement

The purpose of this study was to:

- Describe characteristics of dove hunting and dove hunters in Illinois
- Identify factors related to decline of hunter participation in dove hunting in Illinois

- Examine hunter attitudes and beliefs toward use of steel shot for dove hunting in Illinois

Methods

We conducted a mail survey of dove hunters in Illinois beginning 29 November 2012 and ending 5 April 2013. Samples of 3,000 hunters who reported they had hunted doves were selected from HIP registrants for each of the years 2009, 2010, and 2011, for a total sample of 9,000. The survey instrument was developed in cooperation with wildlife program managers with the Illinois Department of Natural Resources, and measured hunter participation and effort, satisfaction with seasons and harvest, and use and attitude toward non-toxic shot. Survey participants were mailed a cover letter explaining the purpose of the study, an 8-page questionnaire, and a first-class stamped return envelope (questionnaire packet). Non-respondents were mailed a postcard reminder/thank you 14 days following the first questionnaire packet, with a second questionnaire packet following 14 days after the postcard to non-respondents. A second postcard reminder/thank you was mailed 14 days after the second questionnaire packet, followed by a third questionnaire pack on 20 February 2013 to the remaining non-respondents; a total of 3 waves of questionnaire packets and 2 follow-up postcard reminders were mailed to survey nonrespondents. We removed 229 addresses from our list as undeliverable and received 5,151 completed questionnaires for a response rate of 59%.

Data Analysis

Data were entered into SPSS v21.0 for analysis. Analyses consisted of simple frequencies, Pearson's Chi-square with Cramer's *V* measuring effect size, and One-way Analysis of Variance (ANOVA) models.

Results

Dove Hunter Participation in Illinois

When asked whether they had ever hunted doves in Illinois, 89.2% of survey participants responded "Yes" (Figure 1).

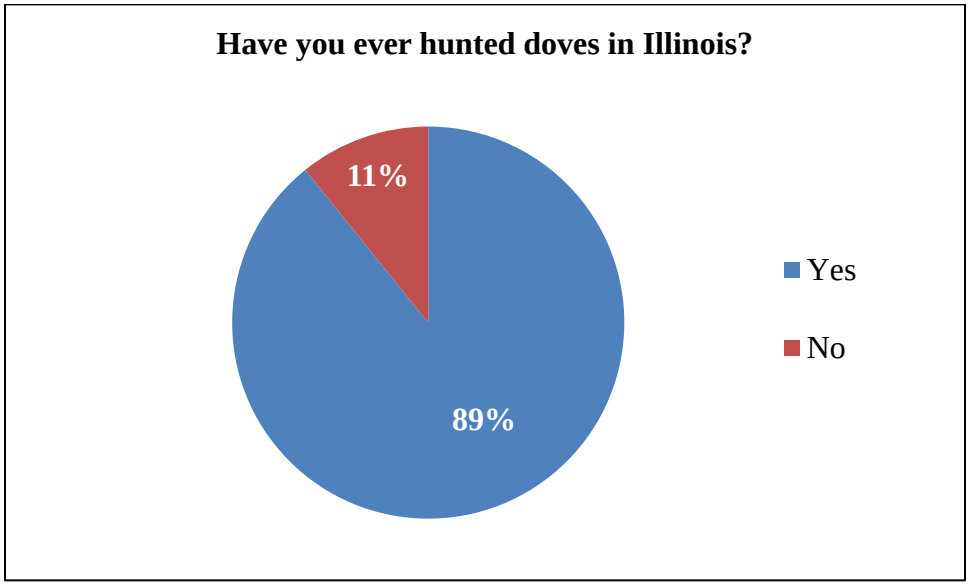

Figure 1. Percentage of survey participants who have hunted doves in Illinois. *n*=4852

Of respondents who reported they hunted doves in Illinois, 98.4% reported the 2012 dove hunting season was not their first time hunting doves in Illinois; 1.4% identified themselves as new nonresident dove hunters and 0.2% as new resident dove hunters. Participants were asked which years (2011, 2012, both, or neither) they hunted doves in Illinois. Similar percentages of respondents, across all HIP registration year subgroups (2009, 2010, 2011), responded that they either hunted during both 2011 and 2012 or they did not hunt during either year; 45.8%, 41.3%, and 38.3% from the 2009, 2010, and 2011 subgroups, respectively, responded "No"; 37.1%, 39.2%, and 42.2% from the 2009, 2010, and 2011 subgroups, respectively, indicated they hunted

both years (Table 1). Of resident hunters from the 2009, 2010, and 2011 strata, 43.2%, 44.7%, and 47.6%, respectively, stated they hunted doves during 2012. A similar percentage of nonresidents from the 2009 (40.0%) strata indicated hunting doves during 2012, whereas 2010 (30.0%) showed less participation, and the 2011 strata (63.0%) showed greater participation by nonresidents than residents during 2012 (Table 2).

Table 1. Frequency of Illinois dove hunters during 2011 and/or 2012.

	2009 % *n*=1378	2010 % *n*=1471	2011 % *n*=1481	Total *n*=4852
Yes, only in 2012	5.6	5.2	5.6	5.5
Yes, only in 2011	11.5	14.3	13.9	13.4
Yes, both years	37.1	39.2	42.2	39.7
No	45.8	41.3	38.3	41.4

Table 2. Resident and Nonresident participation in Illinois dove hunting during 2012.

	2009 % *n*=590	2010 % *n*=654	2011 % *n*=710
Resident	43.2	44.7	47.6
Nonresident	40.0	30.0	63.0

Reported Illinois Dove Hunter Harvest for 2011 and 2012 Illinois Dove Seasons

Illinois dove hunters were asked to report their personal hunting effort and harvest during 2011 and 2012 including counties in which they hunted, number of days hunted, number of doves harvested, and number of doves downed but not retrieved. Participants from the 2011 HIP registration strata reported higher frequencies than either the 2010 or 2009 strata for all factors

(days, birds harvested, downed but not retrieved) during both 2011 and 2012. Between 1 September 2012 and 14 November 2012, hunters in the 2011 group hunted a total of 3,184 days, harvested 16,182 birds, and downed 1,595 birds that they did not retrieve; hunters in the 2010 group reported less of each factor (3,126 days, 15,869 harvested, and 1,506 not retrieved), and hunters in the 2009 sample reported even fewer (2,652 days, 14,102 harvested, and 1,322 not retrieved) (Table 3). Between 1 September 2011 and 13 November 2011, hunters in the 2011 group hunted a total of 3,772 days, harvested 19,079 birds, and downed 1,653 birds they did not retrieve; similar to the 2012 data, hunters in the 2010 group reported less of each factor (3,467 days, 17,498 harvested, and 1,567 not retrieved), and hunters in the 2009 group reported the least (3,047 days, 16,192 harvested, and 1,513 not retrieved). Compared to the 2011 data from all strata combined, hunters active during 2012 reported a 12.9% decrease in the number of days hunted, a 12.5% decrease in the number of birds harvested, and a 6.6% decrease in doves downed but not retrieved.

Table 3. Harvest data by HIP registration year.

	2009 *n*	2010 *n*	2011 *n*
Number of days hunted			
2012	2652	3126	3184
2011	3047	3467	3772
Number of birds harvested			
2012	14102	15869	16182
2011	16192	17498	19079
Downed but not retrieved			
2012	1322	1506	1595
2011	1513	1567	1653

Use of Spinning-Wing Decoys for Illinois Dove Hunting

Approximately half (52.6%) of dove hunters in Illinois surveyed reported using a spinning-wing decoy during the 2012 season (Figure 2).

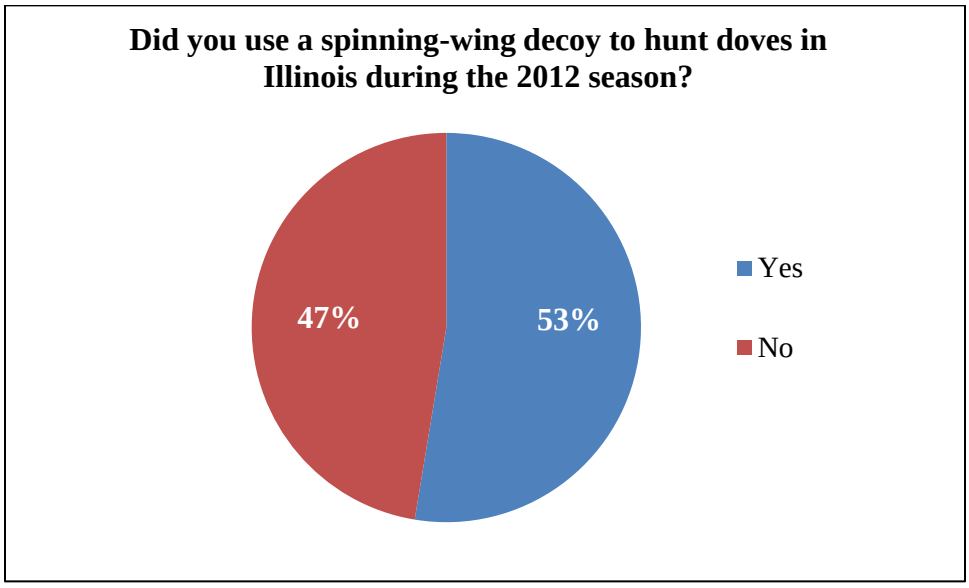

Figure 2. Hunter use of spinning-wing decoys to hunt doves in Illinois during the 2012 season. (Hunters who hunted during 2012 season or both 2011 and 2012 seasons. *n*=1941)

Participants were asked how often they used a spinning-wing decoy to hunt doves during the 2012 season on a four-point scale: 1="Rarely," 2="Sometimes," 3="Often," and 4="Always." Half of respondents (51.6%) reported they "Always" use a spinning-wing decoy; this response was followed by 22.5% reporting "Often" and 18.9% reporting "Sometimes" (Figure 3).

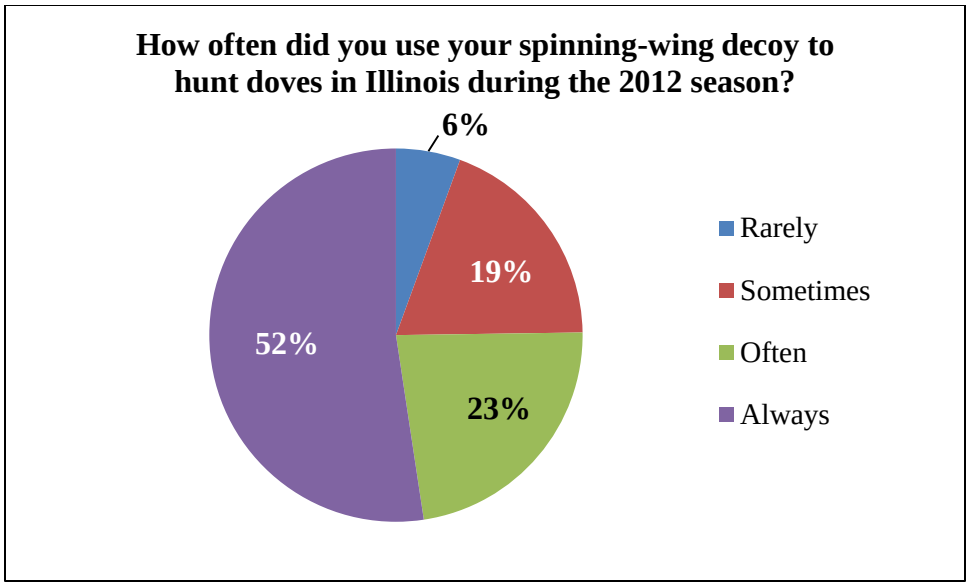

Figure 3. Frequency of hunter use of spinning-wing decoys to hunt doves in Illinois in 2012. (Hunters who hunted during 2012 season or both 2011 and 2012 seasons. used a spinning-wing decoy during 2012 season. *n*=1006)

Types of lands used to hunt doves during 2012

A majority of dove hunters (78.8%) spent most of their time hunting on private land during 2012; fewer hunters used public land (14.0%) or public and private land equally (7.2%) (Figure 4).

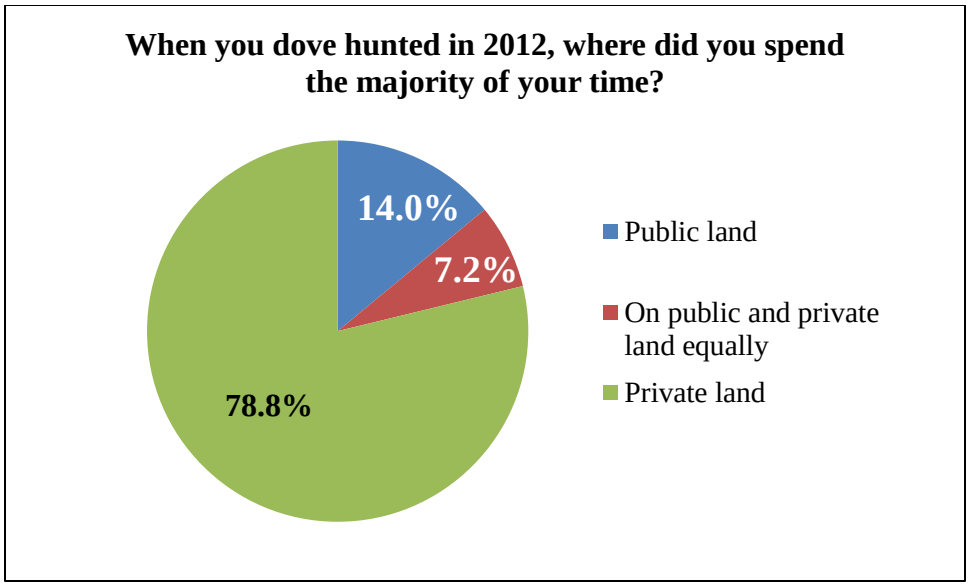

Figure 4. Types of land hunted most often by dove hunters in Illinois (2012 season). (Hunters who hunted during 2012 season or both 2011 and 2012 seasons. *n*=1940)

Frequency of Dove Hunting in Illinois

Survey participants were asked to indicate how often they hunted doves in Illinois on a five-point scale from 1="Never" to 5="Every year." No majority was identified in any group; hunters in each group responded with a similar frequency for "Occasional years" (28.2% for the 2009 group, 27.7% for the 2010 group, 26.6% for the 2011 group) "Most years" (27.6%, 28.2%, 27.4%) and "Every year" (24.3%, 25.3% 27.4%) (Figure 5). Participants who did not hunt doves during 2011 or 2012 were asked to specify the last year in which they hunted doves. Responses from 1958 to 2010 were received, with the most frequent year reported for each group being "2006-2010"; 74.8% of the 2009 group, 75.4% of the 2010 group, and 73.8% of the 2011 group answered "2006-2010." Least frequent response for all strata fell within "1991-1995" (3.3% from 2009, 2.2% from 2010, 2.7% from 2011) (Figure 6).

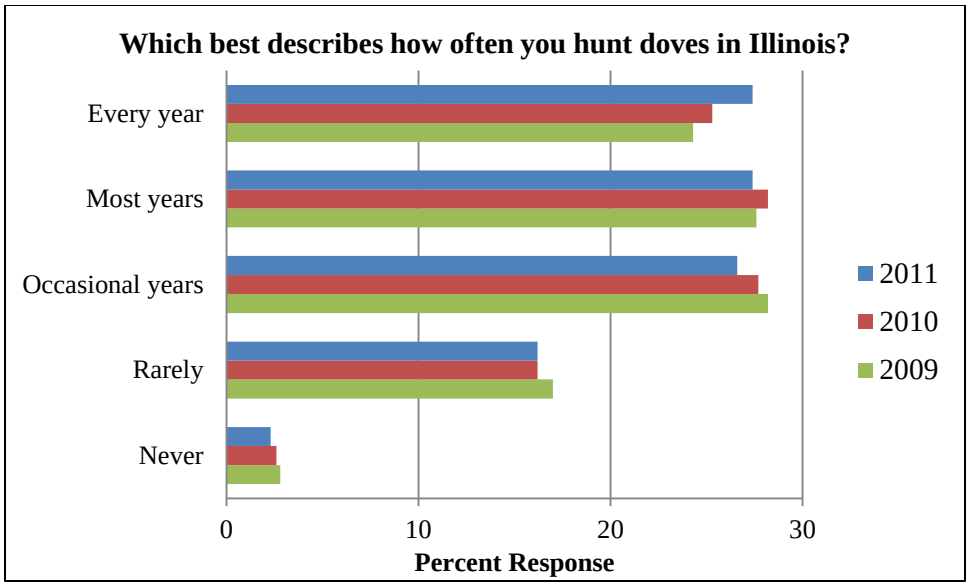

Figure 5. Frequency of dove hunting in Illinois. *n*=4301

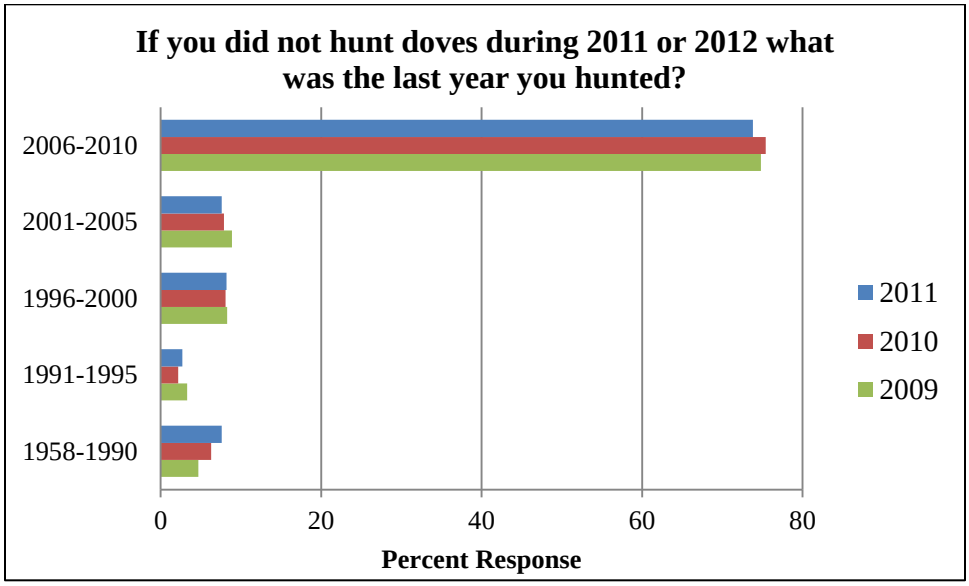

Figure 6. Participant write-in indicating their last year dove hunting if they did not hunt doves in 2011 or 2012. *n*=1759

The “2006-2010” category for last year hunted was broken down to further analyze hunter trends during that period. For each stratum, greatest frequencies occurred closest to the year this study was conducted (2013); “2010” received approximately half the responses in this

category (49.2% from 2009, 51.4% from 2010, 50.7% from 2011), and "2009" received approximately one quarter (29.3%, 26.0%, 25.5%) (Figure 7).

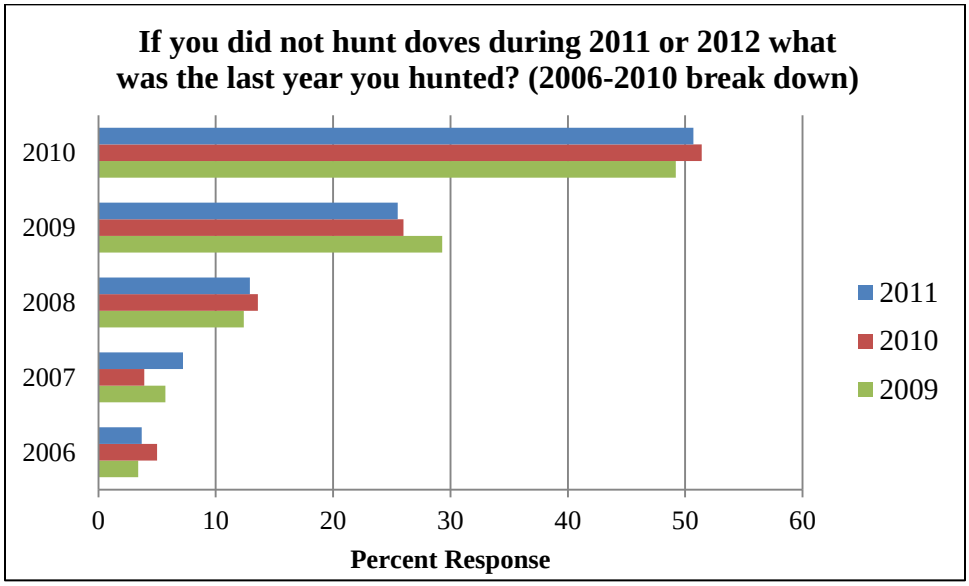

Figure 7. Year breakdown from 2006-2010 of the last time participants hunted doves if they did not hunt in 2012 or 2011. *n*=1372

Reasons for Dove Hunting Decline during the 2012 or 2011 Seasons

Hunters who did not hunt doves during 2011 or 2012 were asked to select the reason(s) why they did not hunt from a list of 11 factors, or to write in another reason that was not included in the list. The most frequent reasons selected were "Normally do not hunt doves every year" (35.6%-2009 strata, 37.1%-2010 strata, 38.5%-2011 strata) and "Could not find time to hunt" (40.0%, 43.7%, 36.7%). Factors such as "Could not secure a place to hunt" (14.7%, 14.3%, 16.0%), "Doves were not available where I hunt" (15.1%, 12.6%, 15.0%), and "Did not have access to dove hunting areas" (17.1%, 14.6%, 13.7%) showed the next highest response frequencies (Table 4).

Table 4. Reasons for not hunting doves in Illinois during the 2011 or 2012 season by HIP registration year.

	2009 *n*=750	2010 *n*=741	2011 *n*=738
Could not find time to hunt	40.0	43.7	36.7
Normally do not hunt doves every year	35.6	37.1	38.5
Did not have access to dove hunting areas	17.1	14.6	13.7
Doves were not available where I hunt	15.1	12.6	15.0
Could not secure a place to hunt	14.7	14.3	16.0
Health reasons	8.9	7.3	6.8
Did not want to shoot steel shot at a state site	6.1	5.7	5.4
Did not get a permit to a state site	4.7	6.7	6.0
Financial reasons	7.9	4.3	2.8
Drought damaged the crop planted for doves	3.3	4.3	3.4
Did not get drawn for a daily hunt	2.5	2.4	2.0
Other	12.5	10.7	13.6

Dove Hunting Effort

Hunters ranked change in dove hunting effort over the five-year period prior to the study on a seven point scale where 1="Decreased considerably" to 7="Increased considerably." The most frequent response was "No change" (33.2% from 2009, 31.4% from 2010, 34.8% from 2011); "Decreased considerably" (22.7%, 22.1%, 21.4%); "Decreased moderately" (17.3%, 17.6%, 14.8%) and "Decreased slightly" (17.7%, 19.1%, 19.1%) received slightly fewer responses (Table 5). Hunters whose hunting effort had decreased were asked to select from a list of 13 factors for the decline or provide a write-in response. Greater frequencies of hunters indicated "Lack of free time" (47.9%-2009, 46.7%-2010, 46.5%-2011) and "Not enough doves around" (44.4%, 46.9%, 48.9%); hunters also responded with "Difficulty finding a place to hunt

close to home" (30.4%, 29.1%, 27.3%) (Table 6). Among other reasons provided "Poor Habitat" was cited most often, (Table 7).

Table 5. Reported change in dove hunting effort 2008-2013, by HIP registration year.

	Decreased considerably %	Decreased moderately %	Decreased slightly %	No change %	Increased slightly %	Increased moderately %	Increased considerably %
2009 (*n*=1472)	22.7	17.3	17.7	33.2	5.4	2.4	1.2
2010 (*n*=1559)	22.1	17.6	19.1	31.4	5.3	3.0	1.4
2011 (*n*=1599)	21.4	14.8	19.1	34.8	5.5	3.1	1.4

$F = 2.01$, $p = .134$, $\eta = .029$

Table 6. Reasons for decreased dove hunting effort.

	2009 % (*n*=850)	2010 % (*n*=918)	2011 % (*n*=883)
Lack of free time	47.9	46.7	46.5
Not enough doves around	44.4	46.9	48.9
Difficulty finding a place to hunt close to home	30.4	29.1	27.3
Dove fields at state site were bad	14.2	13.8	14.7
Lack of interest	10.5	11.4	15.9
Dove season does not match migration	9.2	11.5	10.2
Lack of hunting partners	9.4	9.2	8.2
Health problems	8.1	8.2	7.0
Did not get permit for public site	7.9	8.6	6.2
Lack of financial resources	5.4	6.2	6.1
Too many regulations	5.5	4.8	7.0
Too much equipment needed	0.5	0.2	0.2
Other*	5.5	4.7	6.2

Table 7. Write-in responses for decreased dove hunting effort.

	2009 *n*	2010 *n*	2011 *n*
Poor Habitat	14	10	22
Season dates/times/migration	9	5	2
Weather/migration	5	6	6
No place to hunt/difficult to find place to hunt	4	4	4
Steel shot requirements	2	1	1
Family issues/other priorities	2	4	1
Too crowded	1	2	8
Dog issues	1	0	0
Farming issues	1	2	0
Morning hunting	1	0	1
No FOID	1	1	0
Hunted out of state	0	3	0
College	0	0	1
Moved	0	0	1
Game warden's attitude	0	0	1

Hunters who reported dove hunting effort decreased over the past 5 years.

Hunter Beliefs About Steel and Lead Shot

Participants were given a series of statements about steel shot and lead shot and were asked to indicate how much they disagreed or agreed on a scale from 1="Strongly Disagree" to 7="Strongly Agree" (4="Unsure"). The first statement, "Steel shot kills doves as effectively as lead shot," had a greater frequency of "Unsure" responses (31.2%), although almost half of all respondents indicated some level of disagreement with the statement (47.1%) (Table 8). Greater

than 60% of participants agreed to some extent that “Non-lead shot is too expensive for [them] to use for doves” (62.7%). A majority of respondents agreed with the statement “I am not convinced that lead shot causes as much harm as people say,” whereas a quarter of respondents were “Unsure” (28.9%). Approximately 40% of survey participants were “Unsure” (38.9%) whether they “would cripple more doves if [they] used non-lead shot”; another 40% expressed some agreement with the statement. The most frequent response participants gave to “I would rather spend the money I would spend on non-lead shot on something else” was “Unsure” (27.5%), although over half of all respondents indicated some level of agreement with this statement (51.6%). Forty-two percent of responding dove hunters were “Unsure” whether “Too much lead shot is ingested by wildlife”; however, 34% disagreed or strongly disagreed with this statement. Nearly 60% of survey participants responded with agreement that “It is [their] right to decide what kind of ammunition [they] want to shoot at doves.” Half of respondents did not believe “Steel shot can kill doves at the same distance as lead shot” - 51% responded “Slightly Disagree,” “Disagree,” or “Strongly Disagree”; whereas one-third (33.2%) of participants remain “Unsure.” Approximately 44% of hunter participants, those indicating “Slightly Agree,” “Agree,” or “Strongly Agree,” believe that “Animal rights groups are responsible for the push to use non-lead shot”; 41.7% indicated they were “Unsure” of this statement. Similarly, a majority (66.0%) of respondents designated they were “Unsure” of the statement “Doves that eat lead don’t get as sick as people think.”

Table 8. Beliefs about steel and lead shot.

		Strongly Disagree (%)	Disagree (%)	Slightly Disagree (%)	Unsure (%)	Slightly Agree (%)	Agree (%)	Strongly Agree (%)
Steel shot kills doves as effectively as lead shot	Waterfowl Hunters (*n*=3466)	22.4	22.5	8.7	25.5	4.5	12.7	3.8
	Non-Waterfowl Hunters (*n*=1054)	8.3	12.0	5.2	50.3	2.9	15.5	5.8
	Total (*n*=4602) ($\bar{X}$=3.38)	**19.1**	**20.0**	**8.0**	**31.2**	**4.2**	**13.2**	**4.3**
Non-lead shot is too expensive for me to use for doves	Waterfowl Hunters (*n*=3443)	4.9	10.9	7.0	13.5	15.3	25.1	23.2
	Non-Waterfowl Hunters (*n*=1050)	2.3	7.5	4.9	26.0	15.2	25.3	18.8
	Total (*n*=4572) ($\bar{X}$=4.93)	**4.4**	**10.1**	**6.5**	**16.4**	**15.4**	**25.0**	**22.3**
I would rather spend the money I would spend on non-lead shot on something else	Waterfowl Hunters (*n*=3423)	5.2	12.2	4.9	25.4	12.5	22.5	17.2
	Non-Waterfowl Hunters (*n*=1044)	3.0	8.9	3.7	34.3	13.1	24.0	12.9
	Total (*n*=4541) ($\bar{X}$=4.65)	**4.7**	**11.5**	**4.6**	**27.5**	**12.6**	**22.8**	**16.2**
Steel shot can kill doves at the same distance as lead shot	Waterfowl Hunters (*n*=3452)	22.9	22.6	12.1	26.4	5.2	8.0	2.7
	Non-Waterfowl Hunters (*n*=1051)	8.5	11.2	7.1	55.9	5.1	8.6	3.5
	Total (*n*=4582) ($\bar{X}$=3.20)	**19.6**	**20.0**	**10.9**	**33.2**	**5.2**	**8.1**	**2.9**
It is my right to decide what kind of ammunition I want to shoot at doves	Waterfowl Hunters (*n*=3447)	4.9	11.5	8.4	16.8	14.3	23.5	20.6
	Non-Waterfowl Hunters (*n*=1049)	3.0	6.0	6.8	20.3	15.3	27.2	21.5
	Total (*n*=4573) ($\bar{X}$=4.84)	**4.5**	**10.2**	**8.0**	**17.5**	**14.5**	**24.3**	**20.9**

Table 8 (Continued). Beliefs about steel and lead shot.

		Strongly Disagree (%)	Disagree (%)	Slightly Disagree (%)	Unsure (%)	Slightly Agree (%)	Agree (%)	Strongly Agree (%)
I am not convinced that lead shot causes as much harm as people say	Waterfowl Hunters (*n*=3455)	5.9	9.1	3.6	26.8	10.1	25.8	18.6
	Non-Waterfowl Hunters (*n*=1051)	3.4	7.3	3.3	36.1	9.9	25.5	14.5
	Total (*n*=4584) ($\bar{X}$=4.78)	**5.3**	**8.7**	**3.6**	**28.9**	**10.1**	**25.6**	**17.8**
Too much lead shot is ingested by wildlife	Waterfowl Hunters (*n*=3439)	15.2	20.0	8.2	39.5	6.5	7.6	3.1
	Non-Waterfowl Hunters (*n*=1046)	10.7	17.1	8.4	51.3	4.8	5.0	2.7
	Total (*n*=4560) ($\bar{X}$=3.39)	**14.3**	**19.3**	**8.2**	**42.1**	**6.1**	**7.0**	**3.0**
Animal rights groups are responsible for the push to use non-lead shot	Waterfowl Hunters (*n*=3442)	3.7	8.2	4.4	40.6	9.4	16.6	17.1
	Non-Waterfowl Hunters (*n*=1047)	1.8	3.9	2.6	45.5	11.4	17.7	17.2
	Total (*n*=4566) ($\bar{X}$=4.67)	**3.3**	**7.2**	**4.0**	**41.7**	**9.9**	**16.8**	**17.1**
Doves that eat lead don't get as sick as people think	Waterfowl Hunters (*n*=3438)	4.0	8.6	4.2	65.3	3.9	8.3	5.6
	Non-Waterfowl Hunters (*n*=1047)	2.2	4.9	2.9	68.9	5.7	10.0	5.4
	Total (*n*=4562) ($\bar{X}$=4.08)	**3.6**	**7.8**	**3.9**	**66.0**	**4.3**	**8.7**	**5.6**
I would cripple more doves if I used non-lead shot	Waterfowl Hunters (*n*=3457)	5.8	10.9	4.7	33.1	11.7	18.5	15.2
	Non-Waterfowl Hunters (*n*=1052)	4.8	10.9	3.0	58.5	6.6	9.2	7.0
	Total (*n*=4587) ($\bar{X}$=4.40)	**5.7**	**10.9**	**4.4**	**38.9**	**10.6**	**16.3**	**13.3**

Hunters were asked how often they used steel during the last year they hunted doves; 59.2% of survey participants answered “Never” (Figure 8).

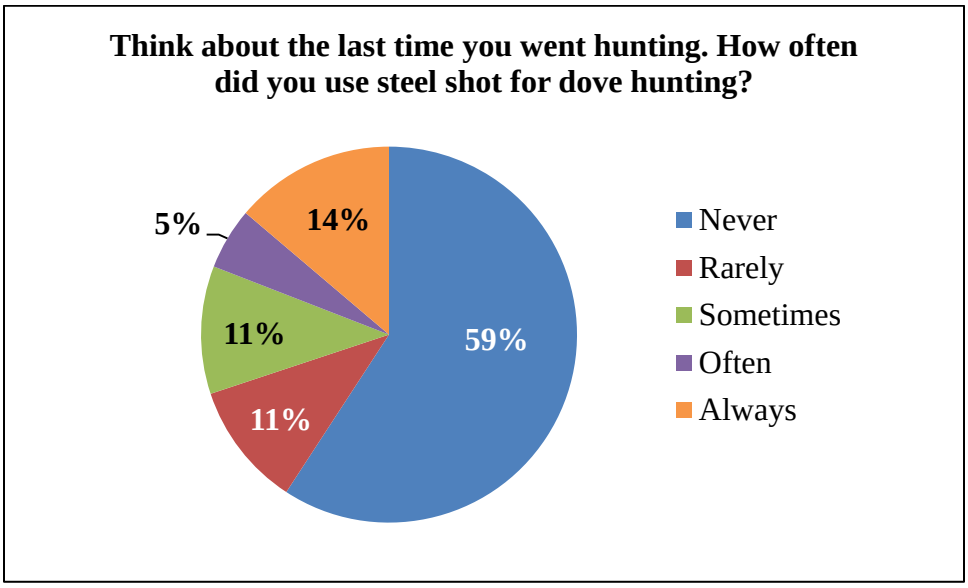

Figure 8. Hunter use of steel shot for dove hunting.

A majority (57%) of participants indicated that they “didn’t use steel shot the last year [they] hunted”, however 16% reported they used steel shot because they wanted to, whereas an additional 27% were required to use steel shot by a landowner or at a public hunting site where it was required (Figure 9).

A majority of hunters (63.5%) did not support banning lead shot for dove hunting; however, fewer hunters (51.1%) disagreed with banning its use on public hunting grounds and over two-thirds (67.2%) of hunters agreed that the IDNR should do more research on the effects of lead on our environment and on wildlife (Table 9). No significant difference was found between waterfowl hunters and non-waterfowl hunters.

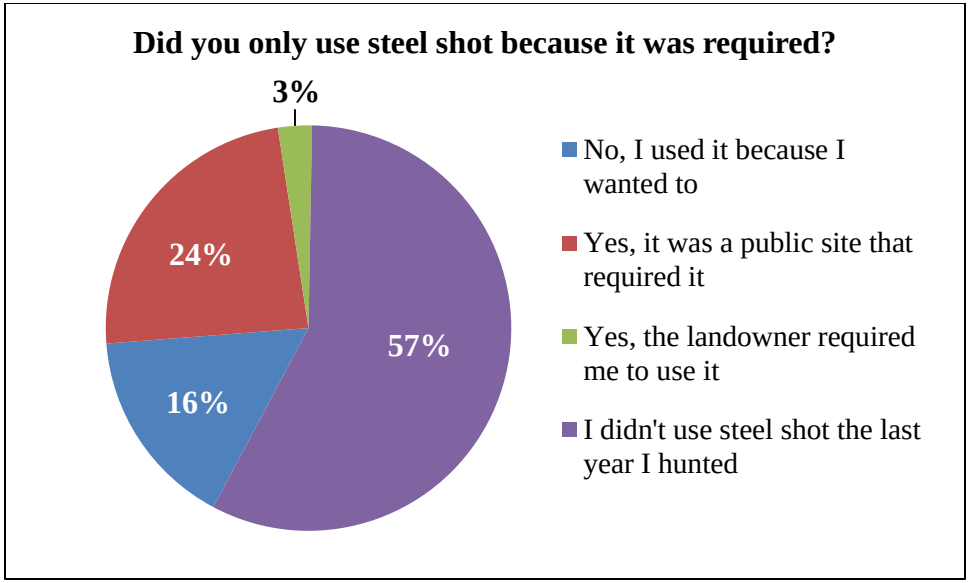

Figure 9. Dove hunter use of steel shot based on requirement of steel shot.

Table 9. Support for management options regarding non-lead shot in Illinois, by waterfowl hunting participation.

		Strongly Disagree (%)	Disagree (%)	Slightly Disagree (%)	Unsure (%)	Slightly Agree (%)	Agree (%)	Strongly Agree (%)
I support the ban of lead shot when dove hunting	Waterfowl Hunters (*n*=3448)	33.0	23.9	8.1	17.7	6.4	7.5	3.4
	Non-Waterfowl Hunters (*n*=1046)	24.9	25.1	8.8	28.7	4.5	5.8	2.2
	Total (*n*=4570) ($\bar{X}$=2.79)	**31.3**	**24.0**	**8.2**	**20.3**	**5.9**	**7.1**	**3.2**
I support banning the use of lead shot on public hunting grounds	Waterfowl Hunters (*n*=3446)	25.1	19.1	7.5	19.9	9.8	13.8	4.8
	Non-Waterfowl Hunters (*n*=1045)	22.6	19.3	8.0	29.8	7.8	9.3	3.2
	Total (*n*=4567) ($\bar{X}$=3.29)	**24.6**	**18.9**	**7.6**	**22.2**	**9.3**	**12.8**	**4.5**
IDNR should do more research on the effects of lead on our environment and on wildlife	Waterfowl Hunters (*n*=3458)	4.8	4.7	3.2	18.9	13.5	31.8	23.2
	Non-Waterfowl Hunters (*n*=1047)	5.6	3.6	3.3	24.5	14.8	30.1	18.0
	Total (*n*=4580) ($\bar{X}$=5.15)	**5.1**	**4.4**	**3.2**	**20.2**	**13.8**	**31.4**	**22.0**

When comparing hunters' use of steel shot with the type of land on which they hunted, steel shot was used less frequently on private land and was most frequently "Always" used on public land (Figure 10).

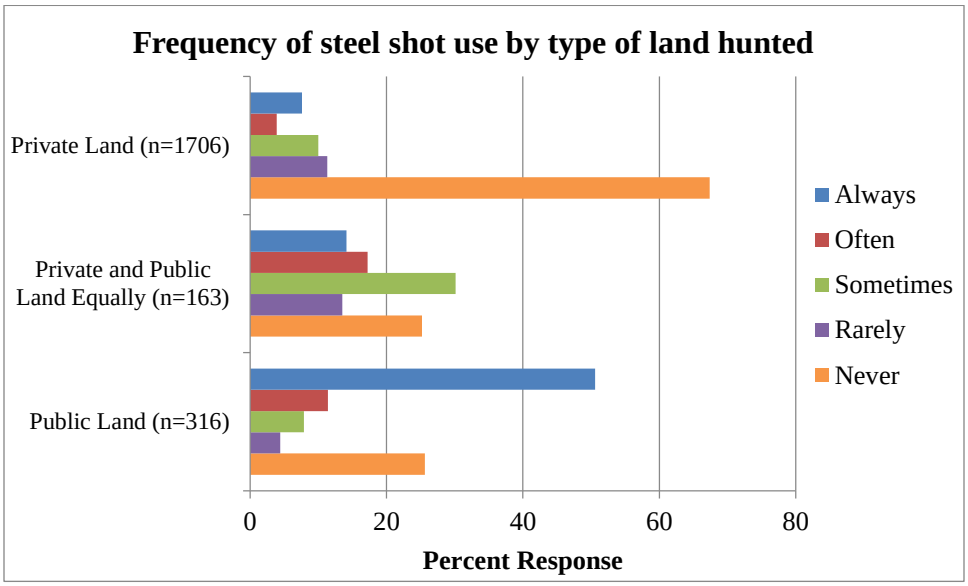

Figure 10. Crosstabs analysis of "How often did you use steel shot for dove hunting?" and "Where did you spend the majority of time hunting?"
$\chi^2 = 592.65$, $p < 0.001$, Cramer's $V = 0.368$

Hunters who spent the majority of their time hunting public land agreed slightly more frequently that steel shot kills doves as effectively as lead shot than did hunters using private lands (Figure 11). Moreover, more public land hunters had greater disagreement with the statement "I would cripple more doves if I used non-lead shot" (Figure 12). Private land hunters most frequently indicated "Unsure" when given the statement "Steel shot can kill doves at the same distance as lead shot"; this was the least frequent response category for public land hunters (Figure 13). Those who hunted on public lands most often tended to agree with supporting the ban of lead shot while dove hunting (Figure 14).

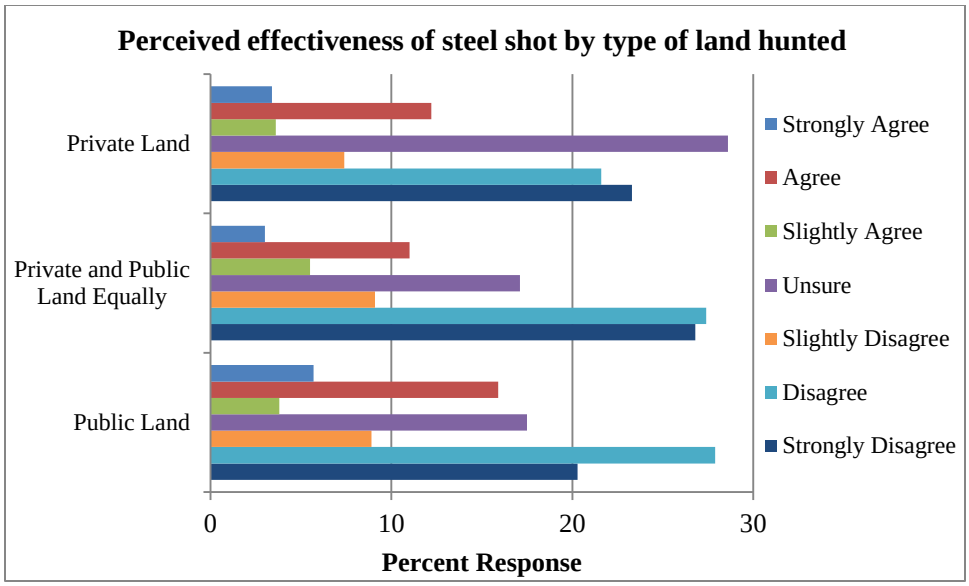

Figure 11. Crosstabs analysis of "Steel shot kills doves as effectively as lead shot" and "Where did you spend the majority of your time hunting?" $\chi^2 = 36.28$, $p < 0.001$, Cramer's $V = 0.091$

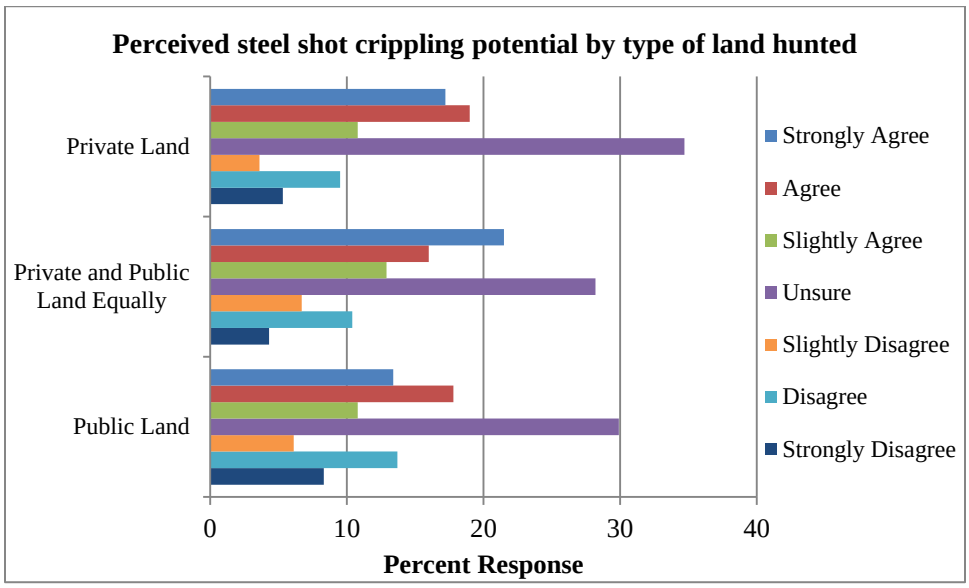

Figure 12. Crosstabs analysis of "I would cripple more doves if I used non-lead shot" and "Where did you spend the majority of your time hunting?" $\chi^2 = 25.53$, $p < 0.1$, Cramer's $V = 0.076$

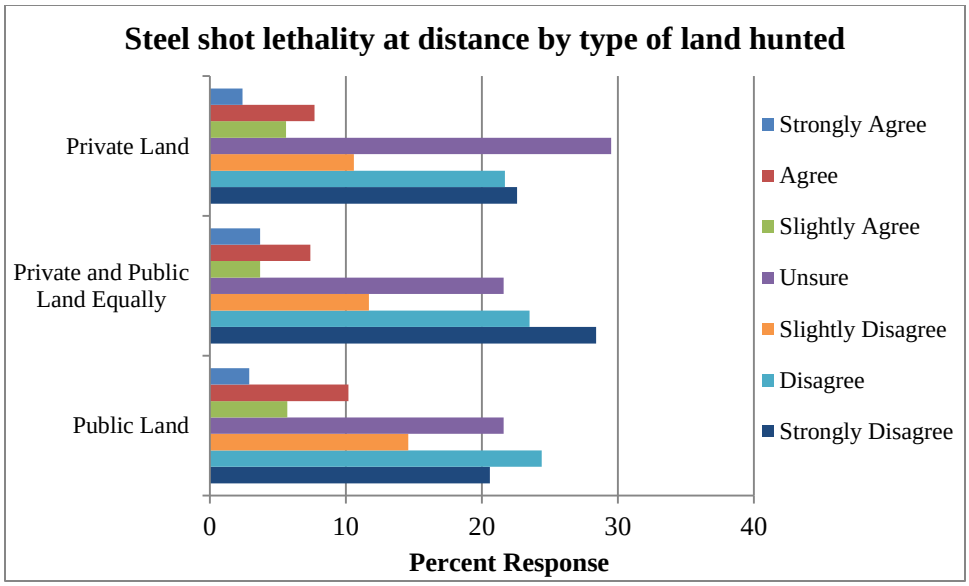

Figure 13. Crosstabs analysis of "Steel shot kills at the same distance as lead shot" and "Where did you spend the majority of your time hunting?"
$\chi^2 = 20.21$, $p < 0.1$, Cramer's $V = 0.068$

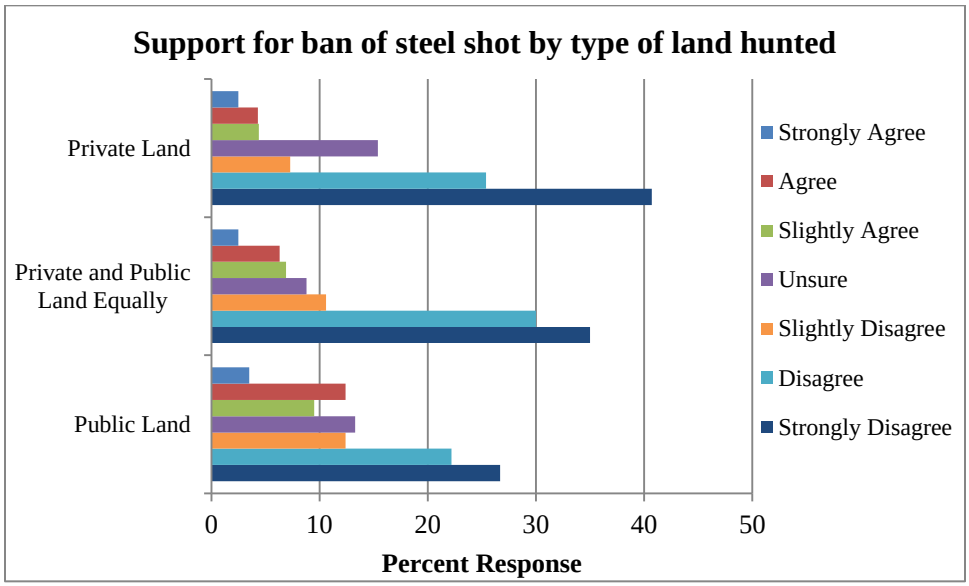

Figure 14. Crosstabs analysis of "I support the ban of lead shot when dove hunting" and "Where did you spend the majority of your time hunting?"
$\chi^2 = 76.66$, $p < 0.001$, Cramer's $V = 0.132$

Hunters who indicated they “Never” use steel shot had more negative views toward effectiveness of steel shot; >50% of these hunters disagreed with the statements “Steel shot kills doves as effectively as lead shot” and “Steel shot can kill doves at the same distance as lead shot” and >43% believed they would “cripple more doves if [they] used non-lead shot.” Moreover, this group of hunters showed more uncertainty with respect to these statements than did hunters who used steel shot, even if only rarely (Table 10). Hunters who never used steel shot had strongest disagreement with banning lead shot.

When stratified by hunting during 2011 or 2012, those who did not hunt during either year had a greater tendency to be “Unsure” of whether steel shot kills doves as effectively as lead shot (Table 11). Respondents who hunted during both seasons believed more strongly they would cripple more doves if they used non-lead shot. Similarly, that same group most frequently disagreed with the statement “Steel shot can kill doves at the same distance as lead shot.” These hunters also disagreed with greater frequency with the statement “I support the ban of lead shot when dove hunting” than did hunters who did not hunt both seasons.

Table 10. Crosstabs analyses of "How often did you use steel shot for dove hunting?"

Frequency of steel shot use	Strongly Disagree %	Disagree %	Slightly Disagree %	Unsure %	Slightly Agree %	Agree %	Strongly Agree %	F	η
	Steel shot kills doves as effectively as lead shot.							21.8*	0.138
Never (*n*=2640)	20.8	20.3	6.9	36.9	2.8	9.5	2.7		
Rarely (*n*=482)	18.3	22.8	8.5	25.5	6.6	14.5	3.7		
Sometimes (*n*=498)	17.5	21.1	10.6	22.7	6.2	17.1	4.8		
Often (*n*=238)	18.1	21.0	7.6	16.4	5.5	25.6	5.9		
Always (*n*=622)	15.0	17.8	10.5	19.6	5.6	21.2	10.3		
	I would cripple more doves if I used non-lead shot.							33.4*	0.171
Never (*n*=2633)	4.0	8.6	3.3	40.9	9.6	18.0	15.6		
Rarely (*n*=482)	5.2	8.1	6.2	38.4	12.7	17.2	12.2		
Sometimes (*n*=497)	6.8	12.9	6.2	33.6	13.3	15.7	11.5		
Often (*n*=237)	9.7	16.0	8.0	32.1	11.4	11.8	11.0		
Always (*n*=618)	10.7	20.2	4.7	33.0	11.0	13.1	7.3		
	Steel shot can kill doves at the same distance as lead shot.							11.0*	0.099
Never (*n*=2635)	21.3	20.4	9.3	37.6	3.4	6.0	2.0		
Rarely (*n*=480)	18.1	21.3	12.9	28.1	8.3	7.3	4.0		
Sometimes (*n*=493)	18.1	21.3	13.4	24.9	8.1	12.0	2.2		
Often (*n*=237)	18.1	21.5	13.9	22.4	9.3	11.8	3.0		
Always (*n*=620)	16.8	17.6	14.4	24.5	6.8	13.9	6.1		
	I support the ban of lead shot when dove hunting.							128.4*	0.322
Never (*n*=2636)	39.4	25.2	6.4	20.2	3.3	3.9	1.6		
Rarely (*n*=478)	27.4	30.1	9.4	17.4	7.1	5.6	2.9		
Sometimes (*n*=493)	24.7	24.1	12.8	21.3	8.3	6.7	2.0		
Often (*n*=234)	15.8	22.6	12.0	17.1	12.4	16.2	3.8		
Always (*n*=617)	12.6	16.0	10.4	20.7	11.3	19.0	9.9		

*p <0.001

Table 11. Crosstabs analyses of "Did you hunt doves in Illinois during the 2012 and/or 2011 dove season?"

2011/2012 dove season participation	Strongly Disagree %	Disagree %	Slightly Disagree %	Unsure %	Slightly Agree %	Agree %	Strongly Agree %	F	η
	Steel shot kills doves as effectively as lead shot.							15.6*	0.105
I did not hunt during 2011/2012 (*n*=1701)	15.8	17.6	8.2	35.2	4.6	13.9	4.7		
I only hunted during the 2011 season (*n*=234)	21.4	23.1	7.7	27.4	4.3	12.0	4.3		
I only hunted during the 2012 season (*n*=565)	18.4	19.3	9.9	30.1	4.6	14.0	3.7		
I hunted during both seasons (*n*=1684)	23.4	23.5	7.7	25.8	3.6	12.4	3.7		
	I would cripple more doves if I used non-lead shot.							17.77*	0.112
I did not hunt during 2011/2012 (*n*=1695)	6.0	12.0	4.7	42.5	10.2	14.6	10.0		
I only hunted during the 2011 season (*n*=232)	7.3	9.1	5.6	34.9	10.8	15.5	16.8		
I only hunted during the 2012 season (*n*=564)	5.7	10.8	5.3	39.4	14.2	14.4	10.3		
I hunted during both seasons (*n*=1686)	5.2	10.0	3.9	33.0	10.6	20.0	17.4		
	Steel shot can kill doves at the same distance as lead shot.							10.2*	0.086
I did not hunt during 2011/2012 (*n*=1690)	17.7	17.9	11.0	37.5	4.6	8.3	3.1		
I only hunted during the 2011 season (*n*=234)	18.8	24.8	10.3	26.9	6.0	11.1	2.1		
I only hunted during the 2012 season (*n*=562)	16.9	19.2	11.9	34.7	6.9	7.7	2.7		
I hunted during both seasons (*n*=1683)	23.6	22.5	11.4	27.0	5.2	7.7	2.6		
	I support the ban of lead shot when dove hunting.							32.2*	0.151
I did not hunt during 2011/2012 (*n*=1686)	24.8	23.9	8.5	24.5	7.1	8.1	3.1		
I only hunted during the 2011 season (*n*=232)	31.5	24.6	9.9	16.8	6.9	6.0	4.3		
I only hunted during the 2012 season (*n*=557)	28.9	26.6	9.7	20.6	4.8	5.6	3.8		
I hunted during both seasons (*n*=1682)	40.4	24.7	8.1	13.6	5.3	5.5	2.3		

* $p < 0.001$

Dove Hunter Satisfaction

Survey participants were provided a list of factors and asked to express their level of satisfaction or dissatisfaction with the last dove season in which they participated. When asked about the "number of doves [they] saw," similar proportions of participants were satisfied (44.7% from 2009, 42.9% from 2010, 42.6% from 2011) and dissatisfied (45.8%, 45.2%, 47.8%) (Figure 15).

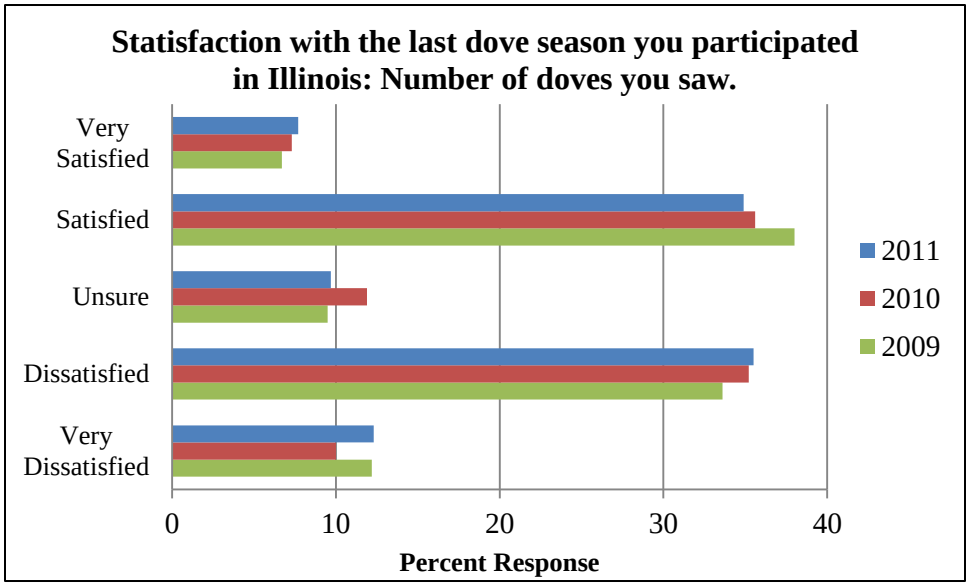

Figure 15. Hunter satisfaction with their last dove season in Illinois.

Respondents indicated comparable levels of satisfaction (43.2%-2009, 43.0%-2010, 41.0%-2011) and dissatisfaction (47.5%-2009, 46.5%-2010, 49.6%-2011) with the "amount of shooting [they] got in" (Figure 16).

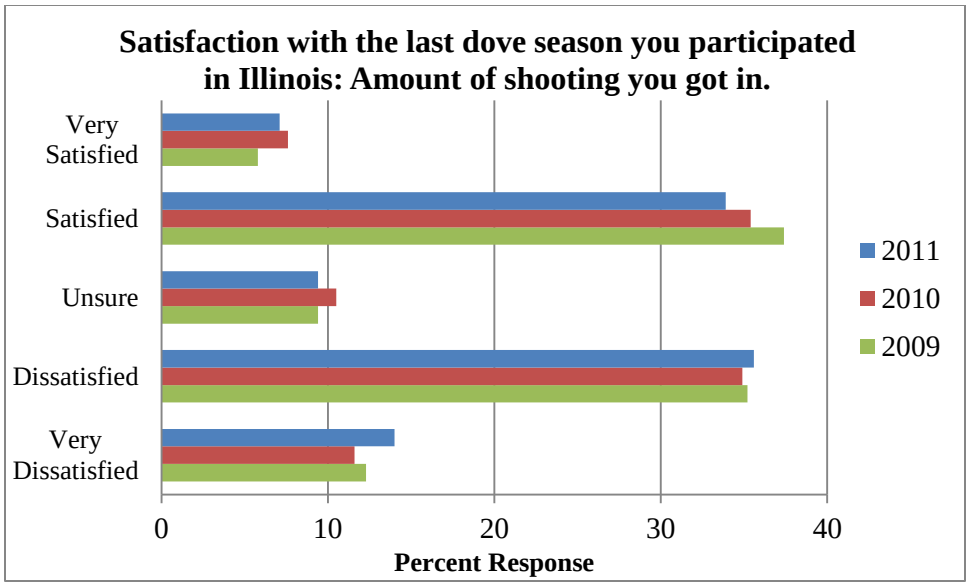

Figure 16. Hunter satisfaction with their last dove season in Illinois.

Corresponding to the previous two factors, participants were similarly satisfied (42.3% from 2009, 40.3% from 2010, 42.8% from 2011) and dissatisfied (43.8%, 43.9%, 43.3%) with the "amount of time [they] spent dove hunting" (Figure 17).

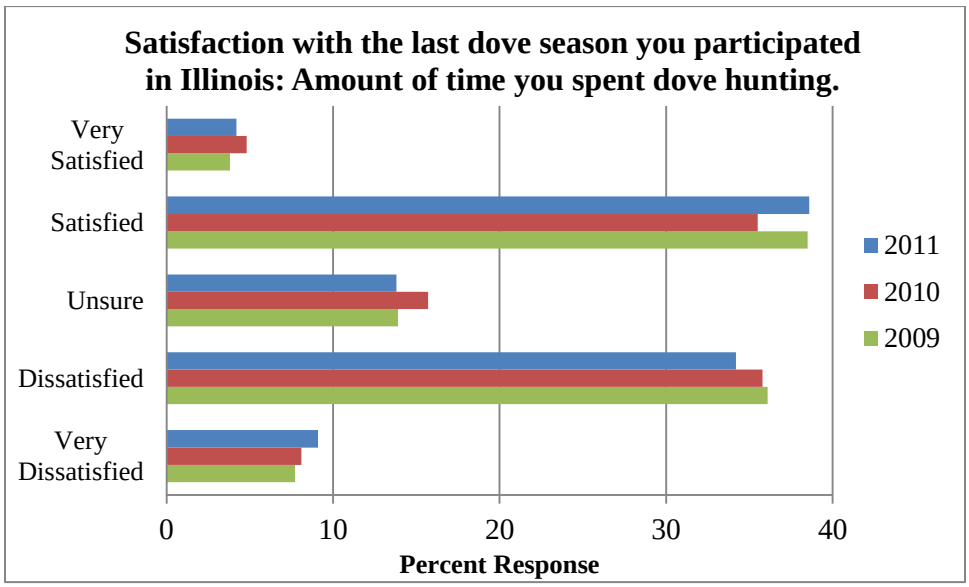

Figure 17. Hunter satisfaction with their last dove season in Illinois.

A majority of hunters from all three subgroups indicated that they were satisfied with the fourth factor, “Conflicts with other hunters for dove hunting spots,” (54.1% from 2009, 54.8% from 2010, 55.4% from 2011); the following most frequent response was “Unsure” (30.0%, 29.3%, 29.8%) (Figure 18).

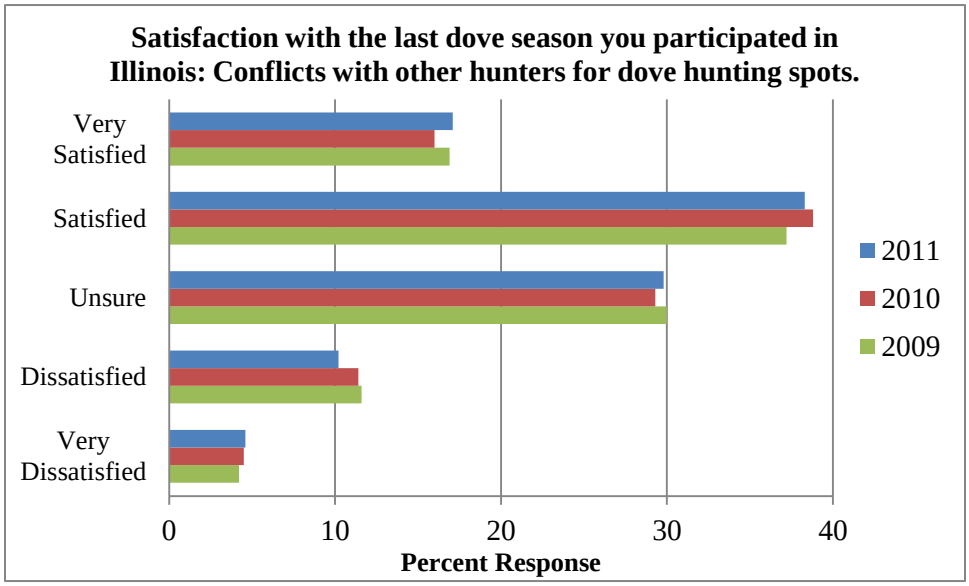

Figure 18. Hunter satisfaction with their last dove season in Illinois.

Hunters’ satisfaction with the “Number of doves [they] harvested” reflected their reported satisfaction with the first three factors: 43.5%-2009, 41.0%-2010, 39.7%-2011 reported being “Satisfied” or “Very Satisfied” and 47.3%, 47.3%, 49.8% reported being “Dissatisfied” or “Very Dissatisfied” in 2009, 2010, and 2011, respectively (Figure 19). Of hunters who were dissatisfied with the number of doves they saw in the last season they hunted in Illinois, factors identified as contributing most to the lack of doves were: “Warm weather/poor dove migration” (60.9% from 2009, 60.4% from 2010, 61.5% from 2011) followed by “Drought affected the food sources” (50.0%, 50.1%, 50.0%) (Figure 20).

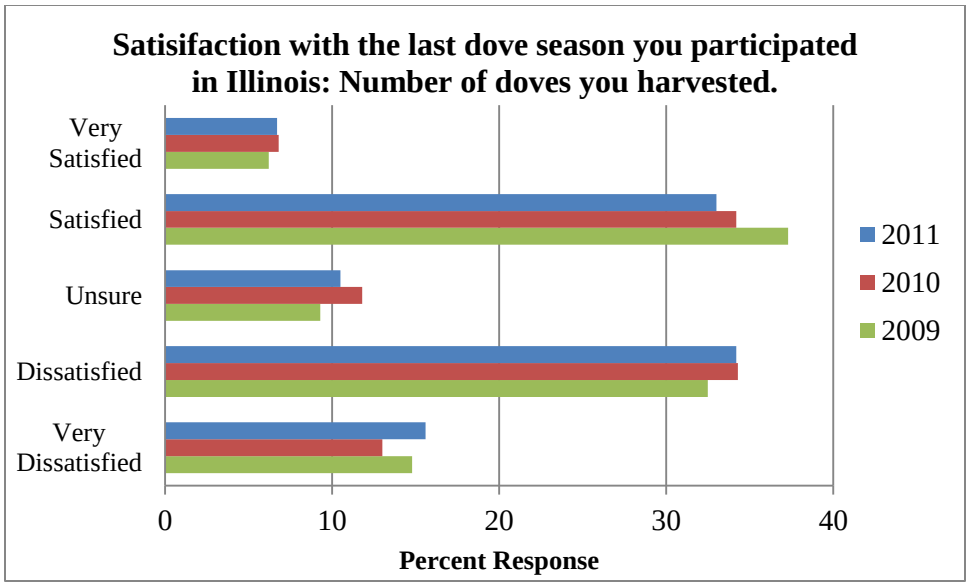

Figure 19. Hunter satisfaction with their last dove season in Illinois.

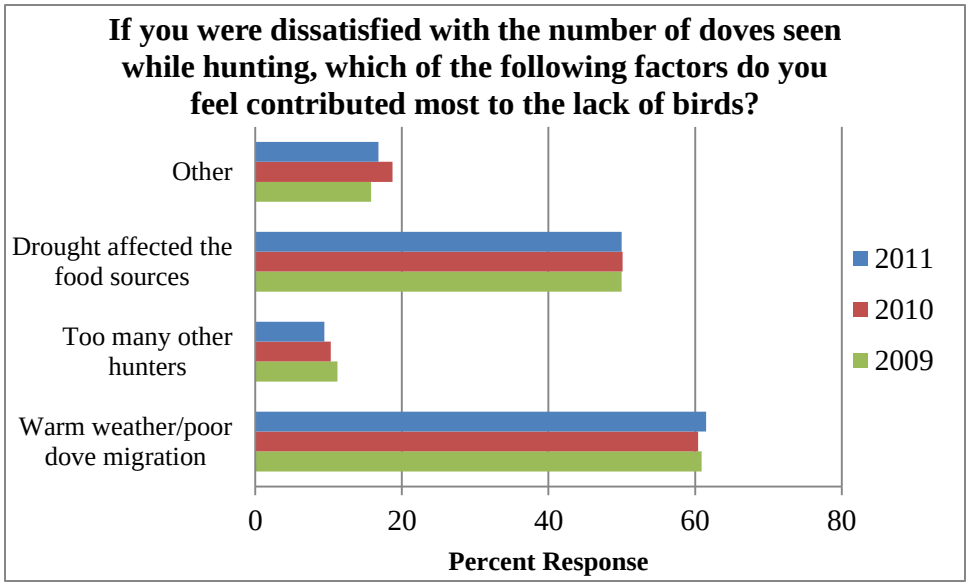

Figure 20. Hunter perceptions for lack of birds.

Write-in responses for this question included “Poor habitat” (58 responses from 2009, 79 from 2010, 71 from 2011), “Weather” (13 responses from 2009, 23 from 2010, 18 from 2011) and “Season dates/time/migration” (18 responses from 2009, 15 from 2010, 16 from 2011) (Table 12).

Table 12. Write in responses for dove hunting effort decrease.

	2009	2010	2011
	n	*n*	*n*
Poor habitat	58	79	71
Weather	13	23	18
Season dates/time/migration	18	15	16
Opening day only good day to hunt/did not hunt opening day	2	1	3
Farmer in the field early scared birds away	1	1	6
Poor/small hatches	1	1	2
Too many red-tailed hawks/predators	1	1	0
Climate change	1	0	1
Banner poor	1	0	0
Doves are spread out due to abundance of food and water	1	0	0
All day hunts	1	0	0
Farmer restrictions	1	0	1
State sites lure away from private lands	0	1	1
Not allowed to plant sunflower seeds	0	3	0
Moved the feeding field	0	1	0
No cattle in pasture	0	1	0
Too many regulations	0	0	1

Cases selected for those that indicated they were very dissatisfied or dissatisfied with the number of doves they saw in the last season hunted in Illinois.

Youth Dove Hunting

Survey participants were asked about the last year they hunted doves, and 27.1% indicated they took a youth hunting with them (Figure 21).

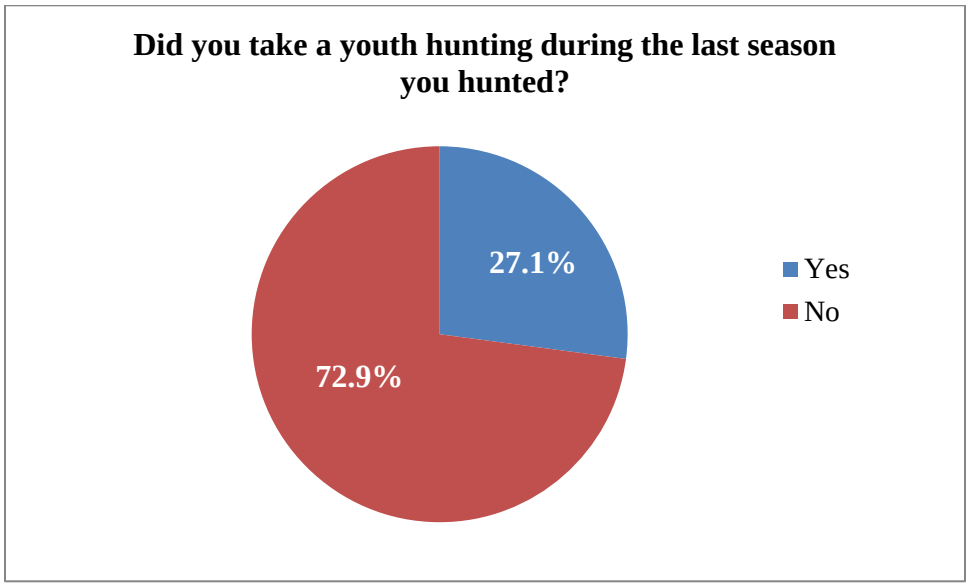

Figure 21. Percentage of hunters who took a youth with them the last season they hunted.

If participants did not take a youth hunting with them the last year they hunted doves, they were asked to indicate from seven reasons or a write-in why they did not do so. The most frequent response was that they did not have kids to take hunting (58.1%) followed by "My kids are too young to go" (11.6%) and "My kids do not have the interest" (8.1%) (Table 13). The most frequent write-in responses were: "I am a youth" (43 responses), "Only 17" (14), and "Don't want to/I hunt alone" (11) (Table 14).

Table 13. Reasons for not taking a youth dove hunting last year.

	%
I do not have kids to take with	58.1
My kids are too young to go	11.6
My kids do not have the interest	8.1
Another person's kids could not go	4.7
My kids could not find the time	4.0
No good spots to take a youth	3.9
Other*	3.1

n=3262, *Other responses in Table 14.

Table 14. "Other" write-in responses for reasons for not taking a youth dove hunting last year. (*n*=102)

	n
I am a youth	43
Only 17	14
Don't want to/ I hunt alone	11
Not allowed	8
Lack of doves	7
Did not attend hunter safety	6
Youth in my area have lack of interest	3
Weather	2
General safety	2
Financial reasons	2
Poor habitat	1
Private group	1
I was invited to a hunt, did not feel right to bring a kid	1
My kids took me	1

Beliefs About Dove Hunting

Participants were given a series of seven belief statements about dove hunting and were asked to indicate their agreement or disagreement with the statements on a 7-point scale with 1="Strongly Disagree" to 7="Strongly Agree" (4="Unsure"). Though the first factor, "Shooting a limit of doves is important to me," showed a split among hunters with 47.7% of respondents agreeing and 43.8% disagreeing with the statement, a majority of hunters' (92.8%) agree that "Seeing doves while dove hunting is more important than harvesting doves" (Table 15). Dove hunters were split in their agreement with the statement "Seeing other wildlife while dove hunting is more important than harvesting doves," with 42.2% agreeing, 42.8% disagreeing, and 15% "Unsure." Over two-thirds of participants "Slightly Agree," "Agree," or "Strongly Agree" (67%) with the statement "I hunt doves to kick off the hunting seasons." The fifth statement, "Dove hunting is a tradition in my family" showed no majority among participants with 39.4% indicating disagreement and 47.6% agreement. A majority of hunters (86%) agree that "Fellowship with other hunters is an important part of dove hunting." Similarly, hunters responded the same way to "I enjoy testing my hunting skills against doves," with 89% indicating "Slightly Agree," "Agree," or "Strongly Agree."

Table 15. Hunter beliefs about dove hunting.

	Strongly Disagree %	Disagree %	Slightly Disagree %	Unsure %	Slightly Agree %	Agree %	Strongly Agree %
Shooting a limit of doves is important to me (*n*=4531) ($\bar{X}$=4.03)	5.1	25.2	13.5	8.5	20.9	19.5	7.3
Seeing doves while dove hunting is more important than harvesting doves (*n*=4532) ($\bar{X}$=5.97)	0.6	1.7	1.7	3.1	11.7	50.6	30.5
Seeing other wildlife while dove hunting is more important than harvesting doves (*n*= 4526) ($\bar{X}$=3.95)	5.2	18.4	19.2	15.0	22.2	15.7	4.3
I hunt doves to kick off the hunting seasons (*n*=4488) ($\bar{X}$=4.85)	3.6	11.3	7.2	10.6	21.8	32.6	12.9
Dove hunting is a tradition in my family (*n*= 4501) ($\bar{X}$=4.13)	8.6	21.4	9.4	13.0	15.2	21.0	11.4
Fellowship with other hunters is an important part of dove hunting. (*n*= 4517) ($\bar{X}$=5.71)	1.2	3.2	2.1	7.4	15.9	43.8	26.4
I enjoy testing my hunting skills against doves. (*n*= 4523) ($\bar{X}$=5.83)	1.4	2.2	1.0	6.4	12.8	48.6	27.6

Hunter Motivations Towards Dove Hunting

Hunters were given 18 motives as to why they hunt doves and were asked to indicate how much they agree or disagree with each; participants chose a number from 1="Strongly Disagree" to 7="Strongly Agree" (4="Unsure"). A majority of hunters (60.4%) agreed with the first motive, "…to give my mind a rest," (Table 16). Over 85% of respondents agreed with the statements: "to develop my hunting skills and abilities," "to be close to nature," to be with friends/family," to test my hunting abilities," "to be where things are natural," to be with people having similar values," "to enjoy the smells and sounds of nature," "to have a chance to shoot doves," "to experience the fast-paced nature of dove hunting," and "to be with others who enjoy the same things as me." Over two-thirds of respondents also agreed with the motive statements "to develop my knowledge of dove hunting," "to experience the open space," "to shoot doves to eat," "to learn more about nature," "to get away from the clatter and racket back home," and "to gain a better appreciation of nature." More hunters disagreed than agreed with the statement "to try to harvest a banded dove;" as compared to the other motives, this statement had the highest percent of "Unsure" responses (21.1%).

Table 16. Participant motivations for dove hunting.

I hunt doves…	Strongly Disagree (%)	Disagree (%)	Slightly Disagree (%)	Unsure (%)	Slightly Agree (%)	Agree (%)	Strongly Agree (%)
…to give my mind a rest. (*n*=4440) ($\bar{X}$=4.55)	4.5	14.4	6.0	14.7	24.6	28.6	7.2
…to develop my hunting skills and abilities. (*n*=4460) ($\bar{X}$=5.48)	1.5	4.2	2.4	6.8	22.6	47.2	15.3
…to develop my knowledge of dove hunting. (*n*= 4444) ($\bar{X}$=4.84)	2.2	8.6	7.0	15.4	27.1	31.4	8.3
…to be close to nature. (*n*=4462) ($\bar{X}$=5.62)	1.2	2.9	2.1	7.4	19.8	46.1	20.6
…to experience the open space. (*n*=4459) ($\bar{X}$=5.58)	1.4	3.4	2.0	8.7	19.1	44.8	20.7
…to be with friends/family. (*n*=4455) ($\bar{X}$=5.75)	1.1	2.8	2.2	6.2	16.0	44.5	27.2
…to test my hunting abilities. (*n*=4456) ($\bar{X}$=5.57)	1.3	3.2	2.7	6.8	20.3	47.0	18.6
…to be where things are natural. (*n*=4449) ($\bar{X}$=5.59)	1.1	2.5	1.8	9.0	21.1	45.3	19.2
…to shoot doves to eat. (*n*=4462) ($\bar{X}$=5.66)	1.5	2.8	3.4	5.9	15.8	26.3	31.9
…to be with people having similar values. (*n*=4462) ($\bar{X}$=5.68)	1.1	2.3	2.1	8.4	16.8	46.8	22.6
…to learn more about nature. (*n*=4438) ($\bar{X}$=5.06)	1.9	5.3	5.9	15.8	26.3	31.9	12.8
…to get away from the clatter and racket back home. (*n*=4429) ($\bar{X}$=5.11)	3.1	8.1	6.5	11.0	19.7	32.6	19.1
…to enjoy the smells and sounds of nature. (*n*=4449) ($\bar{X}$=5.63)	1.2	2.6	2.0	8.5	19.9	44.0	21.8
…to have a chance to shoot doves. (*n*=4464) ($\bar{X}$=5.83)	0.7	1.2	1.5	5.2	17.9	49.4	24.0
…to gain a better appreciation of nature. (*n*=4437) ($\bar{X}$=5.38)	1.5	3.5	3.4	11.6	24.7	38.7	16.8
…to experience the fast-paced nature of dove hunting. (*n*=4450) ($\bar{X}$=5.61)	1.3	2.5	2.5	8.4	19.3	45.0	21.0
…to be with others who enjoy the same things as me. (*n*=4455) ($\bar{X}$=5.76)	1.1	1.9	2.0	6.7	16.2	47.3	24.8
…to try to harvest a banded dove. (*n*=4434) ($\bar{X}$=3.65)	12.4	23.4	10.2	21.1	14.6	10.9	7.5

Hunter Characteristics

The majority of survey respondents were male: 97.1% from the 2009 strata, 97.8% from the 2010 strata, and 96.9% from the 2011 strata. Greater than 40% of hunters who responded indicated they were between 11 and 16 years old when they went on their first dove hunt (44.7%-2009, 45.5%-2010, 43.2%-2011); beginning dove hunting at <10 was the next most frequent age group (18.0%, 17.3%, 19.5%) followed by 17-21 and 22-30 years of age (14.3%, 12.7%, 13.2%; 12.7%, 14.1%, 14.0%, respectively) (Figure 22).

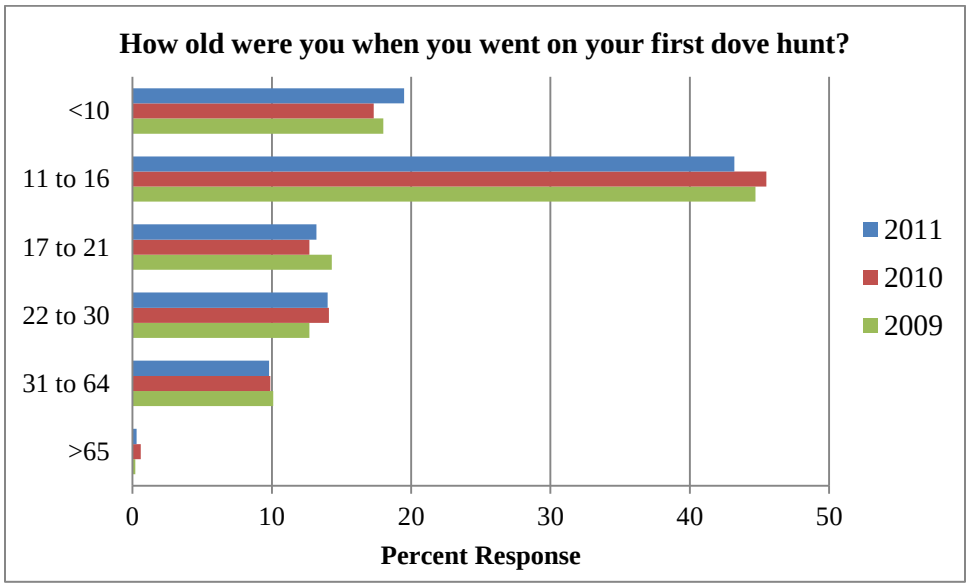

Figure 22. Hunter age demographics of first dove hunt for participants from 2009, 2010, and 2011.

Respondents were most frequently introduced to dove hunting by their fathers (38.1% from 2009, 39.9% from 2010, 41.5% from 2011) or friends (40.8%, 41.6%, 39.2%) (Table 17). Most frequent write-in response to the previous question was “Myself”; 56.0% of respondents from 2009, 53.3% from 2010, and 63.9% from 2011 answered this way (Table 18). When asked “How many years have you hunted doves in Illinois?” hunters most frequently responded >25 years (40.8%-2009, 39.0%-2010, 39.7%-2011)(Figure 23).

Table 17. Person responsible for introduction to dove hunting.

	2009 % *n*=1328	2010 % *n*=1458	2011 % *n*=1471
Friend	40.8	41.6	39.2
Father	38.1	39.9	41.5
Brother/Sister	6.5	5.6	5.2
Uncle/Aunt	3.8	4.1	3.6
Grandparent	3.8	2.5	3.9
Mother	0.2	-	-
Other	6.9	6.4	6.6

Table 18. “Other” write-in response to person who introduced you to dove hunting.

	2009 % *n*=85	2010 % *n*=80	2011 % *n*=95
Myself	56.0	53.3	63.9
Spouse	20.9	13.0	18.6
Cousin	13.2	14.1	8.2
Manager/Co-worker	1.1	2.2	3.1
Nephew	1.1	-	-
Private club	1.1	-	-
Neighbor	-	1.1	2.1
Media	-	2.2	2.1
Non-profit	-	1.1	-

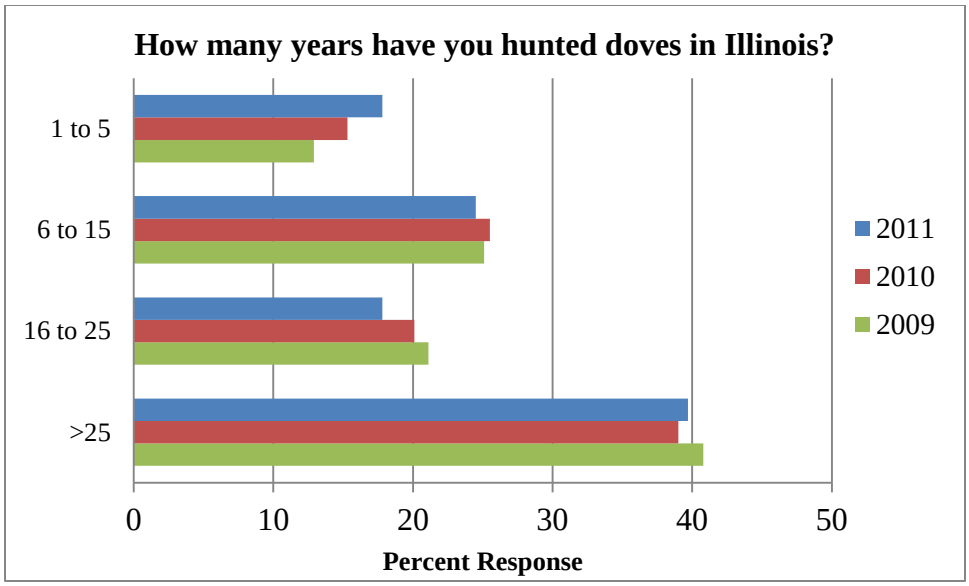

Figure 23. Number of years spent hunting doves for participants from 2009 (*n*=1361), 2010 (*n*=1501), and 2011 (*n*=1528).

When asked about their current age, the majority of respondents were grouped into the "41 through 50" (22.7%-2009, 19.5%-2010, 21.3%-2011) and "51-60" (23.5%, 22.5%, 22.2%) age ranges; the following most-frequent age ranges were "61 through 70" (15.2%, 16.9%, 16.1%), "31 through 40" (15.0%, 16.0%, 15.7%), and "21 through 30" (11.6%, 12.7%, 10.9%) (Figure 24). Three-quarters of survey respondents indicated they had hunted waterfowl; 74.7% from the 2009 strata, 77.9% from 2010, and 76.2% from 2011 (Figure 25).

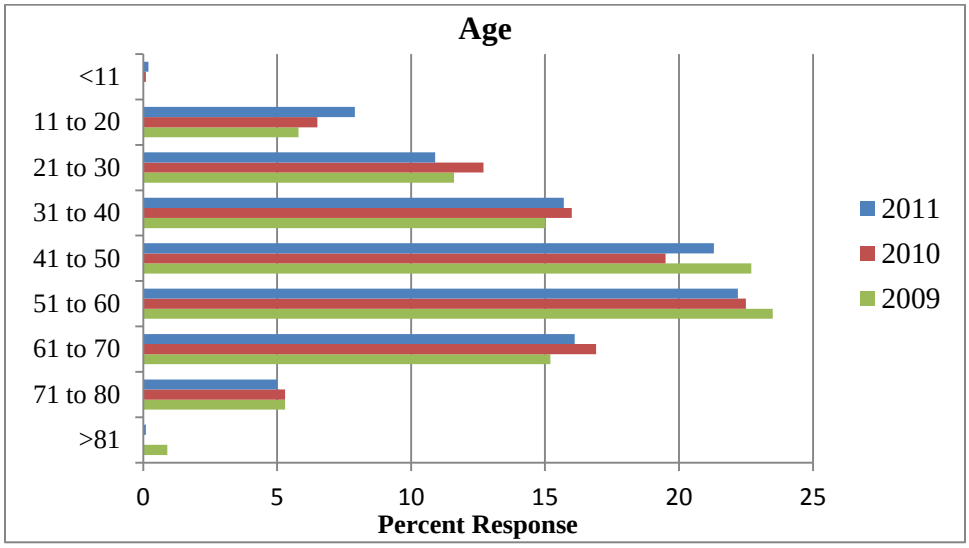

Figure 24. Participant age demographics.

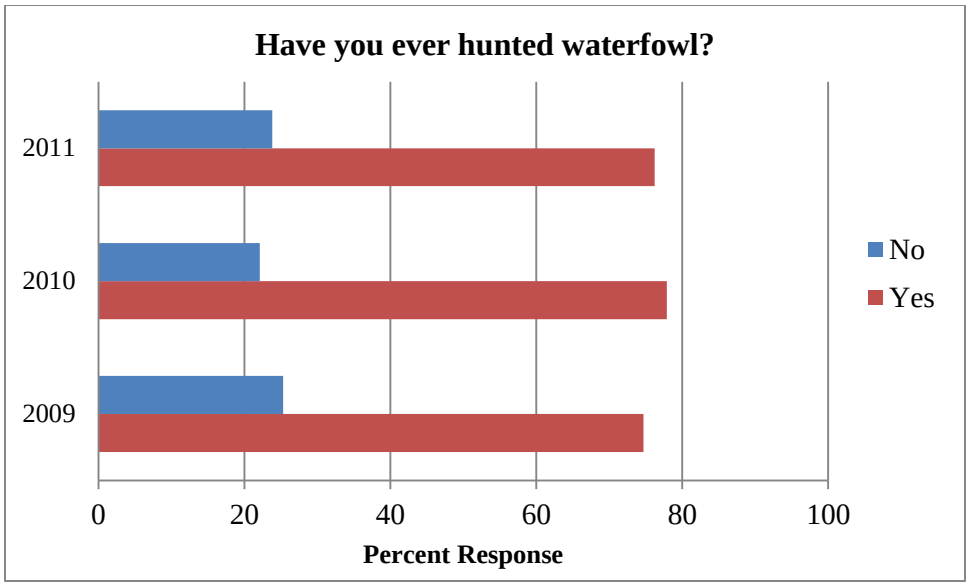

Figure 25. Dove hunters with waterfowl hunting experience.

When asked "How often do you hunt waterfowl?" approximately 40% of hunters responded "Every year" (38.3%-2009, 40.4%-2010, 41.8%-2011); subsequent responses were "Rarely" (24.5%, 22.6%, 20.9%), "Occasional years" (18,2%, 17.6%, 19.3%), "Most years" (17.1%, 18.0%, 16.5%), and "Never" (1.9%, 1.4%, 1.5%) (Figure 26).

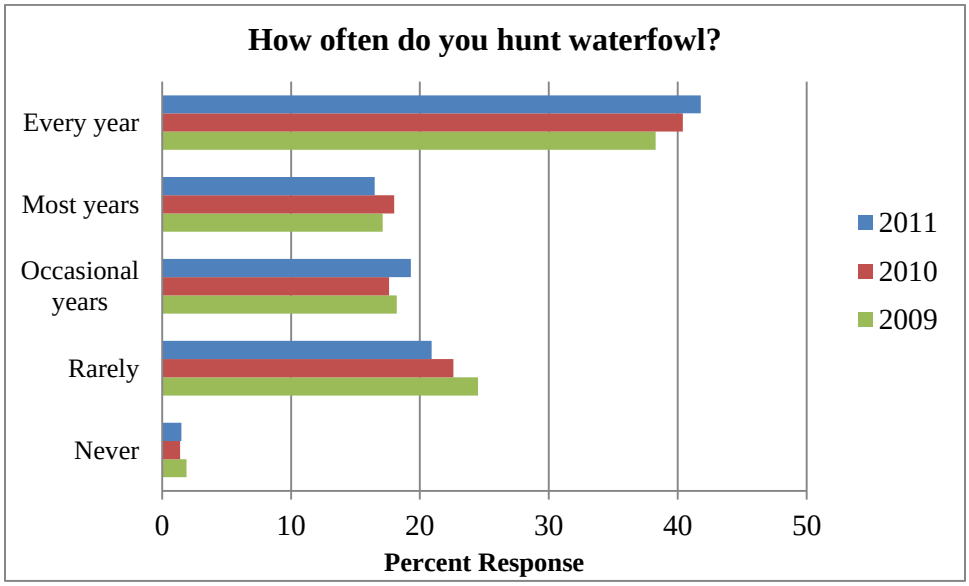

Figure 26. Frequency of dove hunters participating in waterfowl seasons.

Hunters were raised most often in “Rural, farm” (31.2%), “Small town, under 10,000 people” (29.2%), and “Small city, 10,000 to 100,000 people” (22.5%) communities (Figure 27). At the time of this study they resided in similar areas: 29.4% in “Rural, farm”, 26.4% in “Small town, under 10,000 people”, and 21.0% in “Small city, 10,000 to 100,000 people” (Figure 28).

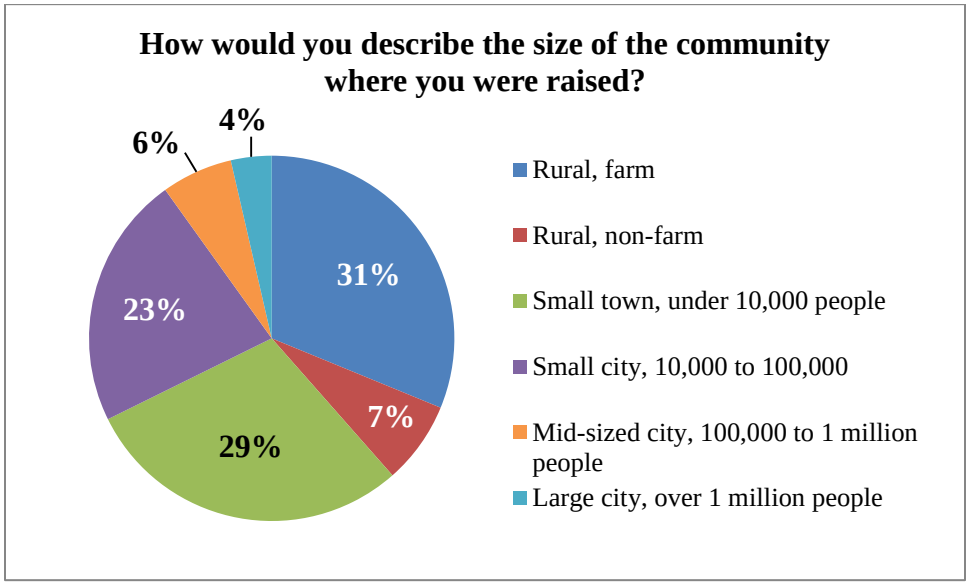

Figure 27. Dove hunter residency demographics.

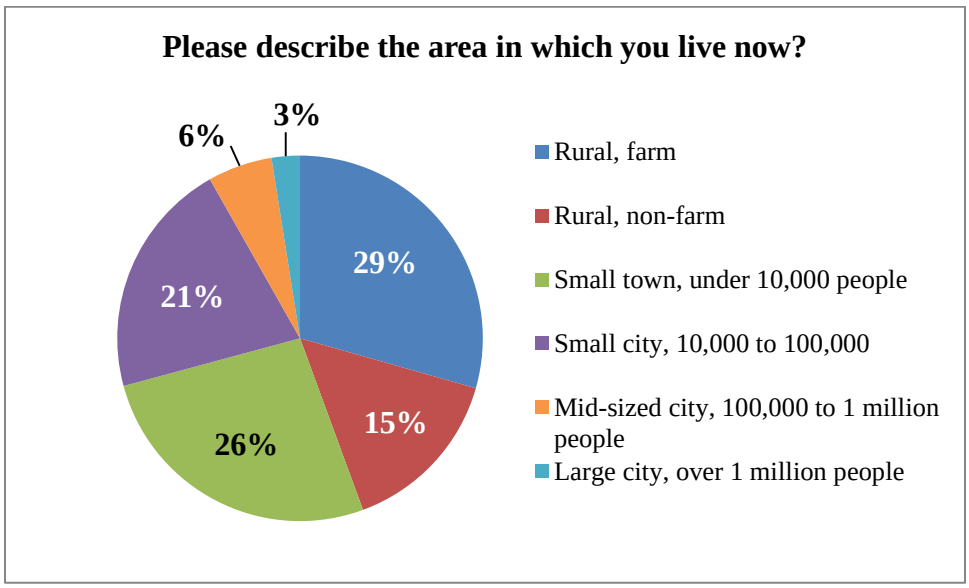

Figure 28. Dove hunter residency demographics.

When forced to choose a single type of game to hunt this year, survey participants most frequently indicated “Deer (archery)” (26.4%) followed by “Deer (firearm)” (23.1%) and “Ducks” (18.3%) (Figure 29).

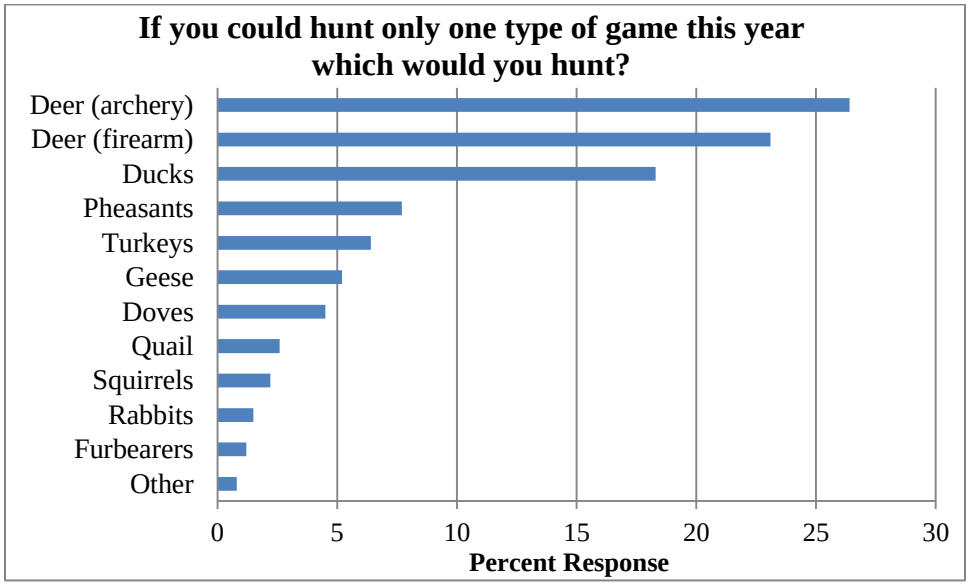

Figure 29. Participant hunting preferences for the current year.

Discussion

Dove Hunter Participation, Recruitment, and Retention

Although a majority of hunters surveyed reported they hunted doves in Illinois at some point, less than half of all respondents reported participating in both the 2011-12 and 2012-13 seasons. The percentage of hunters active in both seasons was higher among the 2011 HIP registrants. The 2009 and 2010 HIP subgroups had the greatest number of respondents indicate they did not hunt in either season. Primary reasons for not hunting every year were: "Normally do not hunt doves every year" and they "Could not find time to hunt." Combined, these 2 reasons accounted for more than 70% of reasons provided. Although the period examined here is limited to 3 years, it may suggest low retention among dove hunters over time and warrants further study. Furthermore, active hunters reported 15% fewer days afield and 14% fewer doves harvested during the 2012 season compared with the 2011 season.

Depending on the year sampled, between 55% and 59% of hunters reported decreased participation in dove hunting during the 5-year period prior to this study. Reasons for the decrease cited most often were "Lack of free time," "Not enough doves around," and "Difficulty finding a place to hunt." The percentage of hunters choosing "Not enough doves around" increased each year across the 2009 to 2011 group, and may correspond to extended drought conditions in Illinois during these years leading to poor habitat and low food availability. This self-reported decline in hunting effort may be indicative of declining interest in or commitment to dove hunting in Illinois and when coupled with the attrition of hunters over time, supports the trend of declining participation noted over time in the Illinois Hunter Harvest Surveys (see, for example Alessi, Miller, and Campbell 2012).

If we view dove hunting from the perspective of a rural cultural activity, declining participation may be a function of declining rural populations. More than two-thirds (67%) of

Illinois dove hunters were raised in rural farm/non-farm regions or small towns, and 70% resided in these areas at the time of this study. These regions account for less than 30% of the population of Illinois, and many have been experiencing population declines for decades (Walzer and Harger 2011). Another consideration for participation is age: slightly less than half of Illinois dove hunters were in the 41-60 age bracket, whereas approximately 6-8% of hunters were in the 11 to 20 age cohort. It may be that hunters become more involved with dove hunting as they age, but this distribution reflects low recruitment of younger dove hunters. Approximately one-third of hunters have 10 or fewer years of experience hunting doves. This distribution, when viewed with that of age, further suggests both recruitment and retention of dove hunters may be low.

Competition with other hunting activities for both time and resources may contribute to decreased participation in dove hunting. More than half of dove hunters in this study favored hunting white-tailed deer more than any other species. Increased opportunities (additional seasons such as late winter and CWD seasons), increased popularity of archery hunting, and greater attention given to trophy deer may account for greater focus on deer hunting in Illinois. This same preference was noted among waterfowl hunters (C. Miller, unpublished data 2012), in which 40% of hunters reported that, if they could choose just one type of game to hunt, they would hunt deer over other game. Combined with preference for deer hunting (deer seasons do not overlap with prime dove hunting in Illinois), approximately 40% of dove hunters reported they hunt waterfowl every year. Early waterfowl seasons are in direct competition with dove hunting: early (September) Canada goose season typically begins the same day as dove season, whereas early teal season starts approximately one week later. For many hunters, they are left to choose either geese, teal, or doves. This choice (coupled with recent high populations of waterfowl) may be contributing to decreased participation in dove hunting. Trends in dove

hunter numbers need to be compared to those for early teal and September Canada goose seasons to provide a better sense of whether these seasons compete for available hunters.

Finally, access to places to hunt doves was cited by more than one-quarter of hunters and was the third-most frequent reason given for decreased participation. Lack of access was given as a constraint to hunting participation in several other studies (Miller and Vaske 2003), and findings here suggest the same is true among Illinois dove hunters. Perceived low quality of state dove fields (the fourth most-frequent reason provided) may also be contributing to decreased dove hunting participation, especially when combined with lack of access. Lack of access may also be a factor in hunters who cite "Could not find time to hunt," "Lack of free time," or "Difficult finding places to hunt." When we consider these responses together, it provides a different picture of dove hunting in particular, and hunting in general. Finding places to hunt requires time, and if a hunter has limited time such efforts become burdensome. Furthermore, if time is a limiting factor getting access to property far from one's home takes travel time. Therefore it may not be that a hunter lacks time to hunt *per se*. What this may suggest is that doing research on who owns particular parcels of land, contacting landowners, and driving to private lands or public hunting sites that may be far from one's home takes time. Therefore, citing not enough time may not be indicative of the time to actually hunt, but may also include time to find places to hunt.

Hunter Satisfaction with Dove Hunting in Illinois

Hunters were clearly divided in their satisfaction with hunting doves in Illinois. To gauge satisfaction, hunters responded to 5 statements on a uni-polar 5-point scale that investigated satisfaction with the past season's dove hunting. Three of these statements addressed experiences with the hunt (number of doves seen, amount of shooting experienced, number of doves

harvested), one for a subjective determinant (amount of time spent dove hunting), and one addressed crowding conflict (conflicts with other hunters over hunting spots). Responses for 4 of the 5 statements generated a bi-modal distribution across each year sampled, with peaks at "Satisfied" and "Dissatisfied." The exception to this distribution was the statement on conflict, for which a majority of hunters reported they were "Satisfied" or "Very Satisfied." Though a significant portion of respondents were unsatisfied with the "Number of doves [they] harvested," over 90% indicated that seeing doves while hunting is more important than harvesting doves. Reasons provided most often for dissatisfaction with number of doves seen were "Warm weather/poor migration" and "Drought affected the food sources." Further analyses will be conducted to determine typologies for satisfaction among dove hunters in the study.

Doves Hunter Beliefs and Attitudes Toward Steel and Lead Shot

We examined attitudes by waterfowl hunting experience and found that hunters with experience hunting waterfowl had stronger negative beliefs toward steel shot than hunters without waterfowl hunting experience. As lead shot has been banned from waterfowl hunting for over 3 decades, we expected greater acceptance of steel shot for dove hunting among this group of hunters, however results suggest the opposite may be true. These findings also suggest that, although hunters have been using steel shot for waterfowl for more than 30 years, it remains unpopular with them. We asked hunters to respond to three statements examining beliefs about effectiveness of steel compared to lead shot (effective range, killing power, and crippling). We compared these results to frequency of use of steel shot for dove hunting using One-way ANOVA models. Although results were significant, low effect sizes for eta suggest significance was minimal. One question, however, did produce meaningful significance: Support for banning

lead shot to hunt doves. The more frequently individuals used steel shot for dove hunting the greater support was reported for banning lead shot's use.

Attitudes toward banning lead shot followed the same patterns as beliefs. Hunters with no waterfowl hunting experience were more likely to be unsure (however, the degree of separation among categories was closer than with beliefs), and although waterfowl hunters reported greater disagreement to banning lead shot for doves the difference was not statistically significant. Hunters were presented with 10 statements regarding their beliefs about steel shot and dove hunting. The most frequent single response for 8 of the 10 statements was "Unsure,": personal right to choose what ammunition they use and expense of non-lead shot were the exceptions. Hunters were most unsure about lead shot ingestion, effectiveness and killing power of steel shot, and crippling more doves with steel shot. These findings suggest opportunities for educating hunters on the ballistics and effective power of steel shot compared to lead.

In conclusion, little support exists for banning lead shot for dove hunting in Illinois. Although similar opposition existed prior to the lead shot ban was imposed for waterfowl hunting, support appears to be low among waterfowl hunters – presumably a group that would not oppose a ban. Further, results suggest widespread opposition to steel shot among waterfowl hunters. Findings further suggest concerted effort will be necessary to gain support among Illinois hunters in order to effectively ban lead shot for dove hunting.

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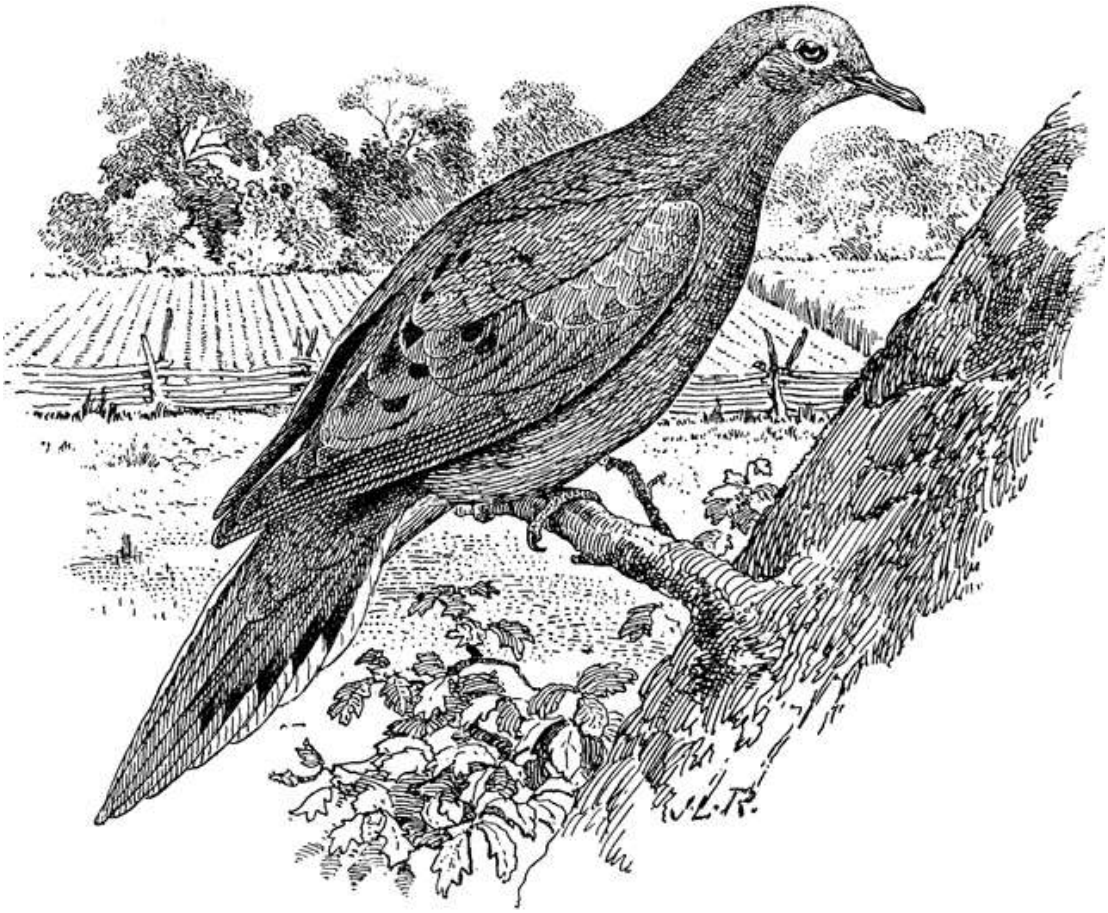
Appendix A

Illinois Dove Hunter Survey



Illinois Department of Natural Resources

Division of Wildlife Resources
and
Illinois Natural History Survey

The Department of Natural Resources is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under the Illinois Compiled Statutes, The Wildlife Code, Chapter 520. Disclosure of information is voluntary. This study is funded by the federal Wildlife Restoration Fund through your purchase of sporting arms and ammunition.

THANK YOU FOR YOUR COOPERATION!
All of your responses will be kept confidential.
Please return this survey in the postage-paid return envelope provided.

Section 1. Dove Hunting Effort and Harvest in Illinois. Please provide the following information so that Illinois Department of Natural Resources (IDNR) migratory bird biologists may estimate hunter participation and harvest of doves in Illinois.

1. Have you **ever** hunted doves in Illinois? (Please check one.)

_____ Yes _____ No (Please go to **question 11**)

2. Did you hunt doves in Illinois during the 2012 and/or 2011 dove season? (Please check one.)

_____ Yes, I only hunted during the 2012 season

_____ Yes, I only hunted during the 2011 season (Please go to **question 4**)

_____ Yes, I hunted during both seasons (Please go to **question 3 & 4**)

_____ No (Please go to **question 9**)

3. Please report your dove hunting effort and harvest in Illinois between September 1, **2012** and November 14, **2012** in the following table.

- Include only **your** personal effort and harvest (**DO NOT** include harvests for party).
- Count part of 1 day as 1 whole day

County hunted	Number of days hunted	Number of doves harvested	Doves downed but not retrieved

4. Please report your dove hunting effort and harvest in Illinois between September 1, **2011** and November 13, **2011** in the following table.

- Include only **your** personal effort and harvest (**DO NOT** include harvests for party).
- Count part of 1 day as 1 whole day

County hunted	Number of days hunted	Number of doves harvested	Doves downed but not retrieved

5. Did you use a spinning-wing decoy to hunt doves in Illinois during the 2012 season? (Please check one.)

_____Yes _____No (Please go to **question 7**)

6. How often did you use your spinning-wing decoy to hunt doves in Illinois during the 2012 season?

Rarely	Sometimes	Often	Always
1	2	3	4

7. Was the 2012 Illinois dove season your first time hunting doves in Illinois? (Please check one.)

_____ Yes, I'm a new Illinois resident dove hunter

_____ Yes, I'm a new nonresident dove hunter

_____ No, I've hunted doves before in Illinois

8. When you dove hunted in 2012, where did you spend the majority of your time hunting? (Please check one.)

_____ Public land _____ On public and private land equally _____ Private land

9. Which of the following best describes how often you hunt doves in Illinois? (Please check one.)

_____ Never _____ Rarely _____ Occasional years _____ Most years _____Every year

10. If you did not hunt doves during the 2012 or 2011 dove season, what year was the last time you hunted doves in Illinois?

_____ year

11. If you **did not hunt doves** in Illinois during the 2012 or 2011 season, please give the reason(s) why not. Please *select all that apply*.

_____ I normally do not hunt doves every year

_____ I could not find the time to hunt

_____ I could not find the time to secure a place to hunt

_____ Health reasons

_____ Financial reasons

_____ Doves were not available where I hunt when I could hunt them

_____ I did not want to shoot steel shot at a state site

_____ I did not get a permit to a state site

_____ I did not get drawn for a daily hunt

_____ I did not have access to dove hunting areas

_____ The drought damaged the crop I/we planted for doves

_____ Other (please identify) : _____

12. How has your dove hunting effort changed over the past 5 years? Please circle the number that matches your response?

Decreased Considerably	Decreased Moderately	Decreased Slightly	No Change	Increased Slightly	Increased Moderately	Increased Considerably
1	2	3	4	5	6	7

13. If your dove hunting effort has decreased, has it been due to: (Please check **all that apply**).

____ lack of free time
____ lack of financial resources
____ too many regulations
____ health problems
____ too much equipment needed
____ did not get permit for public site
____ dove fields at state sites were bad
____ not enough doves around
____ lack of hunting partners
____ difficulty finding a place to hunt close to home
____ lack of interest
____ dove season does not match the dove migration where I hunt
____ regulations too complicated
____ other (please explain):_____

Section 2. Lead and Steel Shot. Please answer the following questions about lead and steel shot for dove hunting.

1. Please state if you disagree or agree with each of the following statements by circling the number that matches your response.

	Strongly Disagree	Disagree	Slightly Disagree	Unsure	Slightly Agree	Agree	Strongly Agree
Steel shot kills doves as effectively as lead shot.	1	2	3	4	5	6	7
Non-lead shot is too expensive for me to use for doves.	1	2	3	4	5	6	7
I am not convinced that lead shot causes as much harm as people say.	1	2	3	4	5	6	7
I would cripple more doves if I used non-lead shot.	1	2	3	4	5	6	7
I would rather spend the money I would spend on non-lead shot on something else.	1	2	3	4	5	6	7
Too much lead shot is ingested by wildlife.	1	2	3	4	5	6	7
It is my right to decide what kind of ammunition I want to shoot at doves.	1	2	3	4	5	6	7
Steel shot can kill doves at the same distance as lead shot.	1	2	3	4	5	6	7
Animal rights groups are responsible for the push to use non-lead shot.	1	2	3	4	5	6	7
Doves that eat lead don't get as sick as people think.	1	2	3	4	5	6	7

2. Think about the last year you hunted doves. How often did you use steel shot for dove hunting? (Please circle one)

Never	Rarely	Sometimes	Often	Always
1	2	3	4	5

3. If you used steel shot the last year you hunted doves, did you only use it because it was required? (Please check one.)

_____ Yes, it was a public site that required it

_____ Yes, the landowner required me to use it

_____ No, I used it because I wanted to

_____ I didn't use steel shot the last year I hunted

4. Please give your opinion about the possible management options regarding non-lead shot in Illinois.

	Strongly Disagree	Disagree	Slightly Disagree	Unsure	Slightly Agree	Agree	Strongly Agree
I support the ban of lead shot when dove hunting.	1	2	3	4	5	6	7
I support banning the use of lead shot on public hunting ground.	1	2	3	4	5	6	7
IDNR should do more research on the effects of lead on our environment and on wildlife.	1	2	3	4	5	6	7

Section 3. Satisfaction and Youth Hunting. Please tell us about your satisfaction with the last dove season you participated in and whether you took any youths hunting.

1. Please rate your **SATISFACTION with the last dove season you participated in Illinois** for each of the following by circling the number that matches your response.

	Very Dissatisfied	Dissatisfied	Unsure	Satisfied	Very Satisfied
Number of doves you saw.	1	2	3	4	5
Amount of shooting you got in.	1	2	3	4	5
Amount of time you spent dove hunting.	1	2	3	4	5
Conflicts with other hunters for dove hunting spots.	1	2	3	4	5
Number of doves you harvested.	1	2	3	4	5

2. If you were dissatisfied with number of **doves seen while hunting**, which of the following factors do you feel contributed most to the lack of birds? Please check *all that apply*.

____ Warm weather/poor dove migrations

____ Too many other hunters where I hunt

____ Drought affected the food source

____ Other (Please identify): _____

3. Think about the last year you hunted doves, did you take a youth (less than 16 years old) hunting during that dove season?

_____ Yes _____ No

3a. If you did not take a youth (less than 16 years old) dove hunting the last year you hunted doves, please indicate why you did not. (Please check all that apply.)

_____ I do not have kids to take with _____ My kids could not find the time

_____ My kids do not have the interest _____ My kids are too young to go

_____ No good spots to take a youth _____ Another person's kids could not go

_____ Other (_____)

4. Think about the last year you hunted doves, did you take someone older than 15 years old hunting during that dove season?

_____ Yes _____ No

5. Please state if you disagree or agree with the following statements by circling the number that matches your response.

	Strongly Disagree	Disagree	Slightly Disagree	Unsure	Slightly Agree	Agree	Strongly Agree
Shooting a limit of doves is important to me.	1	2	3	4	5	6	7
Seeing doves while dove hunting is important to have a satisfying dove hunt.	1	2	3	4	5	6	7
Seeing other wildlife while dove hunting is more important than harvesting doves.	1	2	3	4	5	6	7
I hunt doves to kick off the hunting seasons.	1	2	3	4	5	6	7
Dove hunting is a tradition in my family.	1	2	3	4	5	6	7
Fellowship with other hunters is an important part of dove hunting.	1	2	3	4	5	6	7
I enjoy testing my hunting skills against doves.	1	2	3	4	5	6	7

Section 4. Motivations Toward Dove Hunting. Please state if you agree or disagree with the following statements by circling the number that matches your response about why you dove hunt.

I hunt doves…….	Strongly Disagree	Disagree	Slightly Disagree	Unsure	Slightly Agree	Agree	Strongly Agree
… to give my mind a rest.	1	2	3	4	5	6	7
…to develop my hunting skills and abilities.	1	2	3	4	5	6	7
… to develop my knowledge of dove hunting.	1	2	3	4	5	6	7
… to be close to nature.	1	2	3	4	5	6	7
… to experience the open space.	1	2	3	4	5	6	7
…to be with friends/family.	1	2	3	4	5	6	7
… to test my hunting abilities.	1	2	3	4	5	6	7
…to be where things are natural.	1	2	3	4	5	6	7
…to shoot doves to eat.	1	2	3	4	5	6	7
…to be with people having similar values.	1	2	3	4	5	6	7
… to learn more about nature.	1	2	3	4	5	6	7
… to get away from the clatter and racket back home.	1	2	3	4	5	6	7
…to enjoy the smells and sounds of nature.	1	2	3	4	5	6	7
…to have a chance to shoot doves.	1	2	3	4	5	6	7
…to gain a better appreciation of nature.	1	2	3	4	5	6	7
…to experience the fast-paced nature of dove hunting.	1	2	3	4	5	6	7
… to be with others who enjoy the same things as me.	1	2	3	4	5	6	7
…to try to harvest a banded dove.	1	2	3	4	5	6	7

Section 5. Background Information. The following questions allow us to understand more about the people involved in dove hunting in Illinois. All responses are kept confidential.

1. What is your gender? _____ Male _____ Female

2. How old were you when you went on your *first* dove hunt? _____ years

3. Who introduced you to dove hunting? (Please check one.)

____ Father ____ Mother ____ Brother/Sister

____ Uncle/Aunt ____ Friend ____ Grandparent

____ Other: _____

4. How many years have you hunted doves in Illinois? _____ years

5. What is your county of residence? _____ County

6. Please give your age. _____ years

7. Have you ever hunted waterfowl (ducks or geese)?

_____ Yes _____ No (Please go **to question 9**)

8. If you have hunted waterfowl, how often do you hunt waterfowl?

_____ Never _____ Rarely _____ Occasional years _____ Most years _____Every year

9. How would you describe the size of the community where you were raised? (Please check one)

_____ Rural, farm
_____ Rural non-farm
_____ Small town, under 10,000 people
_____ Small city, 10,000 to 100,000 people
_____ Mid-sized city, 100,000 to 1 million people
_____ Large city, over 1 million people

10. Please describe the area in which you live now. (Please check one)

_____ Rural, farm
_____ Rural non-farm
_____ Small town, under 10,000 people
_____ Small city, 10,000 to 100,000 people
_____ Mid-sized city, 100,000 to 1 million people
_____ Large city, over 1 million people

11. If you could hunt only <u>one type of game this year</u>, which of the following would you hunt? **Please check ONE response.**

____ ducks ____ geese ____ deer (archery) ____ deer (firearm)

____ furbearers ____ pheasants ____ quail ____ squirrels

____ rabbits ____ doves ____ turkeys

____ others (please identify): _____

<u>Comments</u>

THANK YOU FOR YOUR TIME AND ASSISTANCE!
Please return this survey in the postage-paid envelope provided.

Appendix B

ILLINOIS NATURAL HISTORY SURVEY

Prairie Research Institute
University of Illinois at Urbana-Champaign

Nov. 19, 2012

Dear Illinois Hunter,

As one of a select group of Illinois hunters asked to provide information about your dove hunting activities during the 2011 and/or 2012 dove hunting season. Please complete the enclosed questionnaire and return it to us as soon as possible. The information you and other selected hunters furnish our biologists is vital for proper wildlife management and allows us to maximize hunting opportunities while safeguarding wildlife populations.

This survey is limited to those hunters selected. Please take 15 minutes to complete the enclosed questionnaire **even if you were not successful or did not hunt doves**. A postage paid envelope is provided for returning the questionnaire to us.

You may access the results of this and other studies of hunters and hunting in Illinois at http://www.inhs.illinois.edu/programs/hd/. You may also find information about Illinois Department of Natural Resources wildlife management programs and wildlife in Illinois at http://dnr.state.il.us/orc/wildliferesources/.

Thank you for your time and assistance.

Sincerely,

Craig A. Miller
Human Dimensions Research Program

1816 South Oak Street,
Champaign, Illinois 61820 USA

Appendix C

ILLINOIS NATURAL HISTORY SURVEY

Prairie Research Institute
University of Illinois at Urbana-Champaign

January 11, 2013

Dear Illinois Hunter,

You recently received a survey questionnaire regarding your dove hunting activities during the 2011 and/or 2012 dove hunting seasons. We have not received your completed questionnaire at this time. If you have recently returned your questionnaire, we thank you. If not, we have enclosed a second one for you. Please take a few moments of your time to complete this questionnaire and return it in the envelope provided **even if you did not hunt during the 2011 or 2012 Illinois dove seasons.**

The information you and other selected hunters furnish will enable the Illinois Department of Natural Resources to maximize dove hunting opportunities and safeguard the dove population.

Please take 15 minutes to complete the enclosed questionnaire and return it in the envelope provided.

Thank you for your time and assistance.

Sincerely,

Craig A. Miller
Human Dimensions Research Program

1816 South Oak Street,
Champaign, Illinois 61820 USA

Appendix D

ILLINOIS NATURAL HISTORY SURVEY

Prairie Research Institute
University of Illinois at Urbana-Champaign

February 21, 2013

Dear Illinois Hunter,

You recently received a survey questionnaire regarding your dove hunting activities during the 2011 and/or 2012 dove hunting seasons. We have not received your completed questionnaire at this time. If you have recently returned your questionnaire, we thank you. If not, we have enclosed a second one for you. Please take a few moments of your time to complete this questionnaire and return it in the envelope provided **even if you did not hunt during the 2011 or 2012 Illinois dove seasons.**

The information you and other selected hunters furnish will enable the Illinois Department of Natural Resources to maximize dove hunting opportunities and safeguard the dove population.

Please take 15 minutes to complete the enclosed questionnaire and return it in the envelope provided.

Thank you for your time and assistance.

Sincerely,

Craig A. Miller
Human Dimensions Research Program

1816 South Oak Street,
Champaign, Illinois 61820 USA

Appendix E

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

Dear Illinois Hunter,

Recently you were mailed a questionnaire about your dove hunting activities in Illinois. We have not yet received your response. **If you have already returned the questionnaire, we thank you. If you have not returned the questionnaire, please do so as soon as possible. Your input is very important!**

Your name and address will be deleted from our mailing list when your questionnaire is received. Thank you for your cooperation.