OREGON DEPARTMENT OF FISH AND WILDLIFE

# Hunter Orange Report to the Commission

June 4, 2010

# Introduction

In December 2009, the Oregon Fish and Wildlife Commission requested the department review the issue of whether or not the wearing of hunter orange should be made mandatory while hunting in Oregon. The department already strongly encourages hunters to wear hunter orange during big game rifle seasons and upland game bird seasons, however doing so is voluntary.

In response to the Commission's request, an internal hunter orange working group was created to compile a report on hunting incident statistics, effect of hunter orange on hunting incidents and hunter success, enforcement issues associated with mandatory hunter orange requirements, and to develop a range of mandatory hunter orange options (page 16) for the Commission's consideration. In preparing the report, all 19 member states of the Western Association of Fish and Wildlife Association (WAFWA) were asked to provide information on hunting-related incidents in their states.

***B A C K G R O U N D***

The International Hunter Education Association's (IHEA) definition of a hunting incident is "an occurrence or an event that results in the physical injury or death of a person or persons which involves the discharge or use of a hunting implement while engaged in hunting activity." Hunting is defined as "to pursue, take, attempt to take, search for, stalk or lie in wait for any animal."

There are four main causes of hunting incidents according to the IHEA:

- **Vision-related**, such as mistaking another person for game, not checking the foreground or background before firing, or covering another hunter while swinging on game.
- **Safety rule violations**, including pointing the muzzle in an unsafe direction and ignoring proper procedures for crossing a fence, obstacle, or difficult terrain.
- **Lack of control and practice** that can lead to accidental discharges and stray shots.
- **Mechanical failure**, such as an obstructed barrel, improper ammunition, or malfunctioning safety.

Hunter orange requirements are aimed solely at reducing the number of vision-related incidents; other causes of hunting related incidents would not be affected. As a measure designed to reduce vision-related hunting incidents, forty states have passed laws that require of the hunter orange while hunting

The department's Hunter Education Program has placed heavy emphasis into encouraging the voluntary use of hunter orange. The practical safety benefits of wearing hunter orange are covered in all hunter education course materials, discussed extensively in the classroom, and promoted through the media prior to each hunting season.

Despite significant effort to encourage the voluntary wearing of hunter orange, a survey of Oregon State Police (OSP) Fish and Wildlife Division Troopers estimated that only 15% - 25% of Oregon hunters they encounter in the field wear hunter orange during big game rifle and upland game bird seasons.

In recent history three bills have been introduced to the Oregon State Legislature relating to hunter orange; two bills in 1991 and one in 2001. One of the 1991 bills, HB 2763, received a hearing in front of the House Committee on Agriculture, Forestry and Natural Resources, but did not advance.

# Hunting Related Incidents

***HUNTING IS A SAFE ACTIVITY***

According to a 2009 Industry Intelligence Report released by the National Shooting Sports Foundation (NSSF), hunting is one of the safest forms of recreation in the United States with an estimated 5 injuries per 100,000 participants. This is very low, especially when compared to other common forms of recreation. For example, bicycle riding can expect 1,351 injuries per 100,000 participants; soccer can expect 1,440 injuries per 100,000 participants; and Football can expect 2,557 injuries per 100,000 participants.

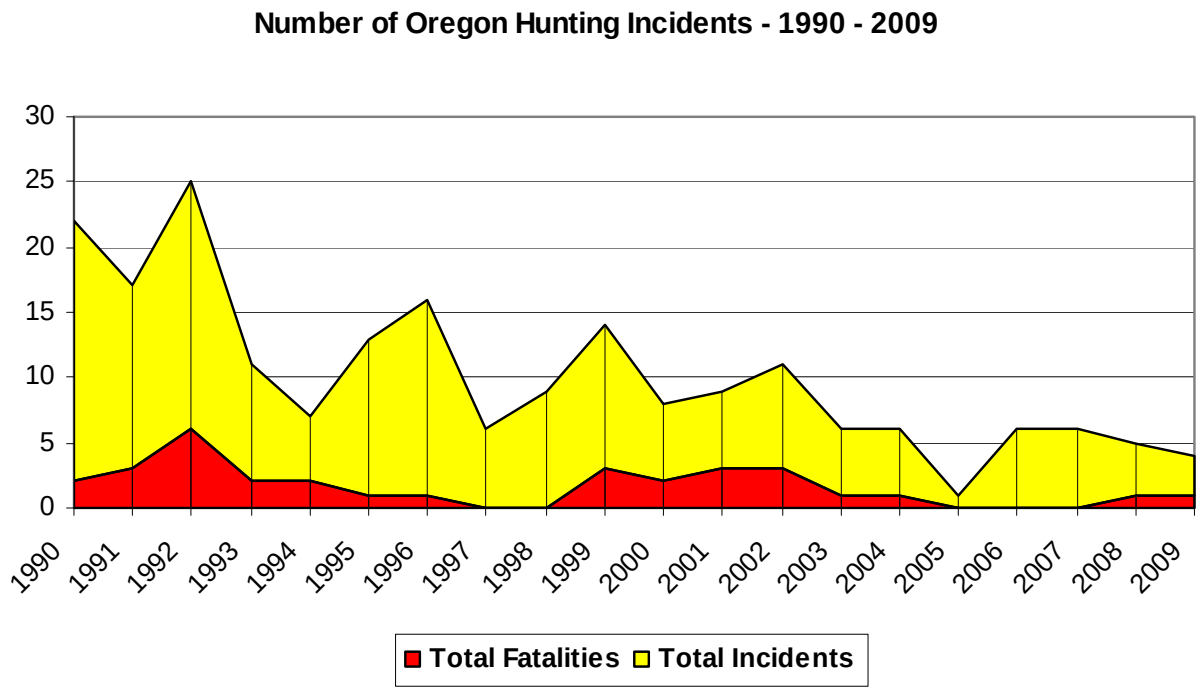
| Activity | Estimated Participants | Estimated Injuries | Estimated Injuries per 100,000 Participants |
|---|---|---|---|
| Football | 17,800,000 | 455,193 | 2,557 |
| Basketball | 24,100,000 | 481,011 | 1,996 |
| Boxing | 794,000 | 14,844 | 1,870 |
| Wrestling | 2,100,000 | 37,320 | 1,777 |
| Soccer | 13,800,000 | 198,679 | 1,440 |
| Skateboarding | 10,100,000 | 143,682 | 1,423 |
| Bicycle Riding | 37,400,000 | 505,413 | 1,351 |
| Baseball | 14,000,000 | 167,661 | 1,198 |
| Snowboarding | 5,100,000 | 57,792 | 1,133 |
| Softball | 10,000,000 | 110,086 | 1,101 |
| Ice Hockey | 2,100,000 | 18,679 | 889 |
| Cheerleading | 3,800,000 | 26,786 | 705 |
| Martial Arts | 4,700,000 | 26,655 | 567 |
| Volleyball | 12,000,000 | 57,039 | 475 |
| Swimming | 52,300,000 | 171,704 | 328 |
| Weight Lifting | 33,200,000 | 72,369 | 218 |
| Fishing | 35,300,000 | 71,615 | 203 |
| Water Skiing | 5,300,000 | 9,652 | 182 |
| Tennis | 12,300,000 | 21,775 | 177 |
| Golf | 22,700,000 | 36,886 | 162 |
| Mountain Biking | 7,400,000 | 10,458 | 141 |
| Mountain Climbing | 4,600,000 | 3,875 | 84 |
| Archery | 6,600,000 | 4,393 | 67 |
| Bowling | 43,500,000 | 21,819 | 50 |
| Billiards | 29,500,000 | 5,045 | 17 |
| **Hunting** | **19,400,000** | **916** | **5** |

## Hunting Incidents in Oregon

The department tracks and reports statistics of hunting-related incidents that occur throughout the state. Such data is extremely valuable to the department and can be used to determine ways to decrease hunting incidents in the future. The department distributes its "Oregon Hunting and Hunting-Related Accident Report" form to law enforcement agencies throughout the state and requests that their officers complete the form when an incident occurs within their jurisdiction. Information from these reports is the department's only source of hunting incident data and do not include hunting incidents which occur but are not reported. When made aware of incidents that have not been reported, the department contacts the investigating agency and requests that reports be submitted. While chances are that some hunting incidents go unreported, those that involve fatalities generally attract significant media coverage and public attention that captures the agency's attention.

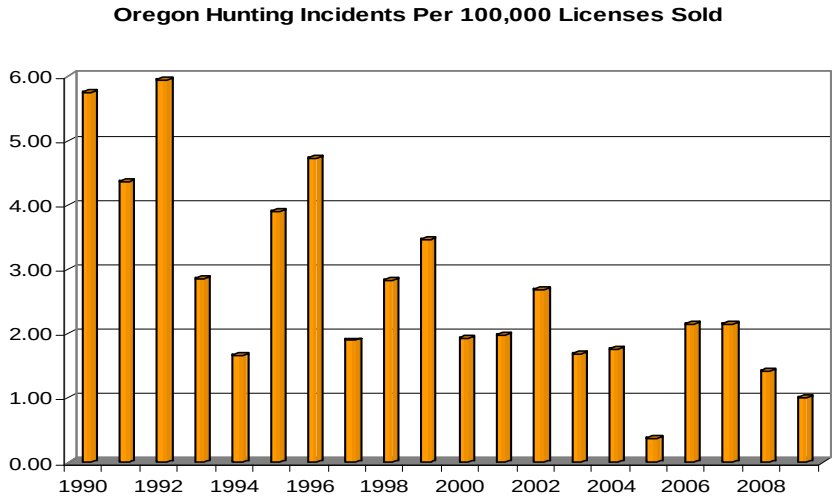
### *20 YEAR SUMMARY OF HUNTING INCIDENTS IN OREGON*

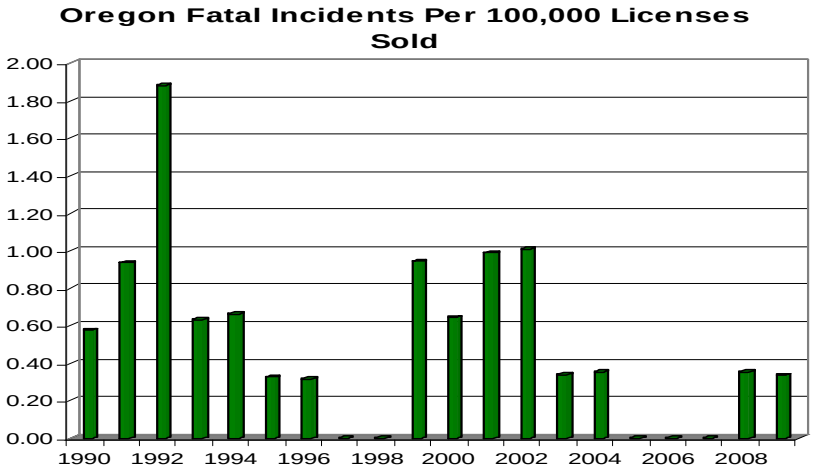
From 1990 – 2009, the department received reports on 170 hunting related firearms incidents of which 32 resulted in fatalities. Over the past 20 years, Oregon has averaged 8.5 incidents per year and 1.6 fatalities per year. As seen in the chart below, yearly hunting incidents and fatalities have trended down over the past twenty years. From 1990 – 1994 there was an average of 13.4 incidents and 3 fatalities per year. From 2005 – 2009 there was an average of 4 incidents and 0.4 fatalities per year.




To compensate for fluctuating hunting license sales, incident rates were adjusted to reflect the number of incidents per 100,000 hunting licenses sold. The results reflected those discussed above. Over the past twenty years, Oregon has averaged 2.79 incidents per 100,000 hunters and 0.52 fatalities per 100,000 hunters per year. As seen in the charts below, the hunter incident rate and fatality rate per 100,000 hunters have trended down over the past twenty years; from an average rate of 4.11 incidents

and 0.94 fatalities per 100,000 hunters for the five year period from 1990 – 1994 to an average rate of 1.41 incidents and 0.14 fatalities per 100,000 hunters for the five year period from 2005 – 2009.

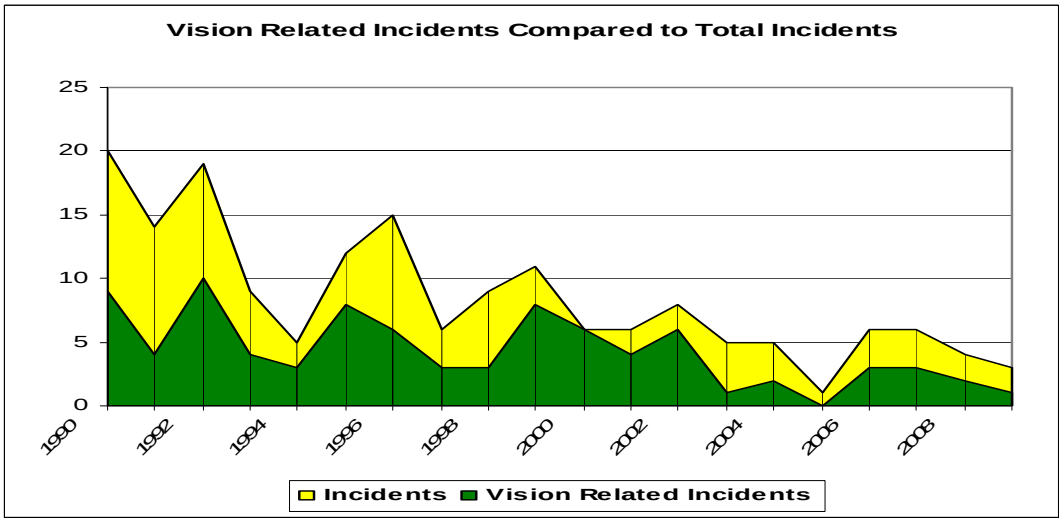



While it is clear that both hunting-related incidents and fatalities have declined in Oregon over the past twenty years, it is not possible to attribute the decline to any specific reason. However, there are several possible explanations. The decline in hunter numbers we have seen over the past 20 years likely consisted of more marginal, less dedicated hunters that were less safety conscience than their more dedicated counterparts. Additionally, mandatory hunter education for youth under 18 was enacted in 1973. People exposed to hunting as youth are more likely to continue in the sport as an adult. Thus our core, dedicated hunters may have also had the benefit of hunter education as a youth. Finally, improvements in hunting equipment technology, particularly improved optics, may play a role.

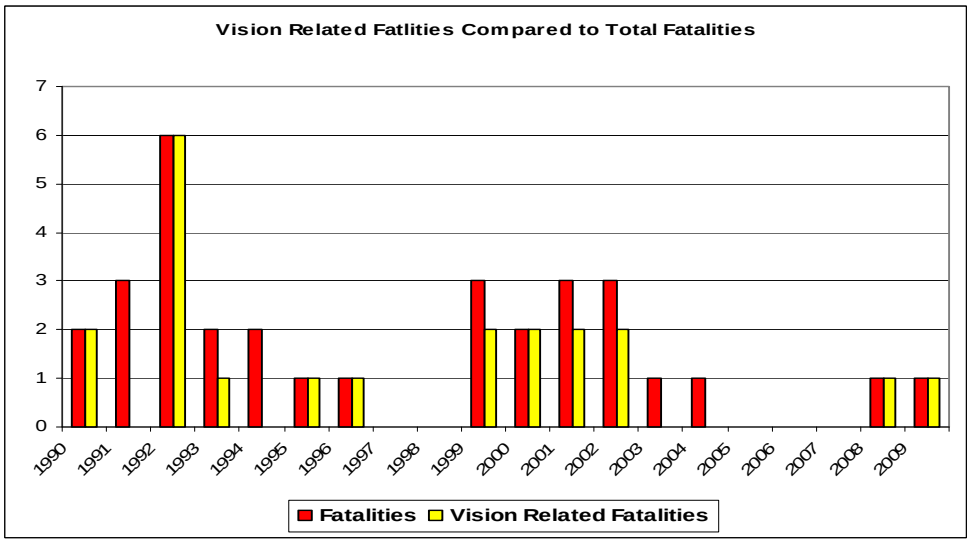
***MAJOR CAUSES OF OREGON HUNTING INCIDENTS***

Vision-related incidents are the single biggest cause of hunting-related incidents in Oregon. Of the 170 hunting related incidents that were reported during the twenty year period from 1990 – 2009, 86 (50.5%) were vision-related. Careless handling of firearms (39 reported incidents, 23%) was the next highest cause of hunting related incidents.




Fourteen (16%) of the 86 victims of all (fatal and non-fatal) vision-related hunting incidents were reported to be wearing hunter orange at the time of the incident. This is close to the proportion of hunters OSP estimated to be wearing hunter orange in the field.

Vision-related incidents are also the single biggest cause of hunting-related fatalities in Oregon. Of the 32 hunting-related fatalities that were reported during the twenty year period from 1990- 2009, 21 (66%) were vision-related.

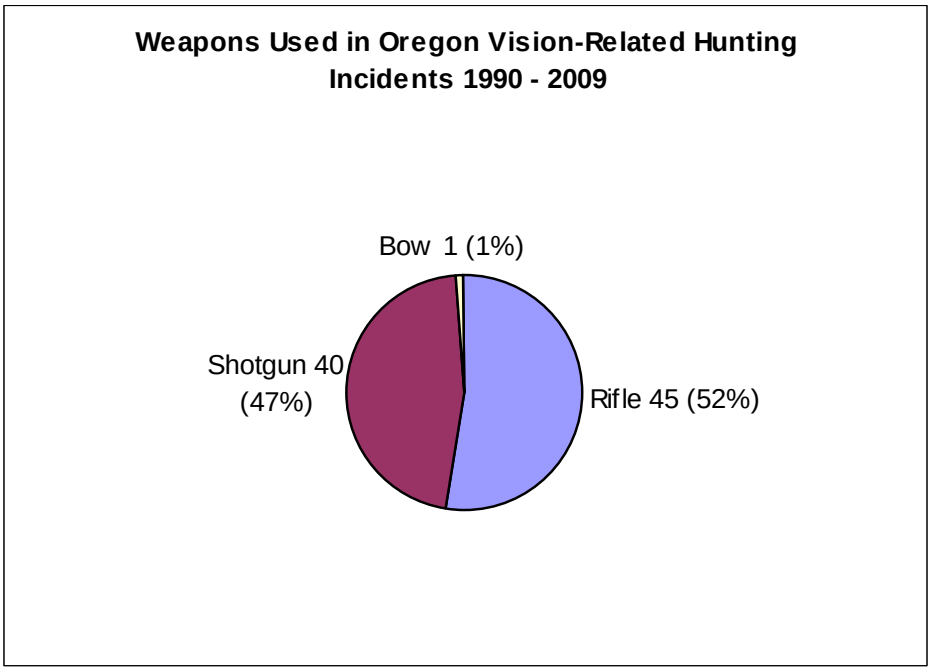



Whereas 19% of the victims of all vision-related hunting incidents were reported to be wearing hunter orange, none of the victims in fatal incidents were wearing hunter orange at the time they were shot.

### *WEAPONS INVOLVED IN OREGON HUNTING RELATED INCIDENTS*

Of the numerous types of weapons that are used to hunt game animals in Oregon, rifles (55% of all incidents) and shotguns (32% of all incidents) were involved in the overwhelming majority of hunting related incidents during the twenty year period from 1990 – 2009. Handguns were involved in 11% of hunting-related incidents during this time period; however there has not been a hunting-related incident involving a pistol reported since 2003. During this period there has been one incident involving a bow, one incident involving a muzzleloader, and one incident involving a weapon that was not identified in the report.

Rifles (52%) and shotguns (47%) were being used in 99% of all vision-related incidents in Oregon during the twenty year period from 1990 - 2009. The only other type of weapon used in a vision-related incident was a bow, in which one archery elk hunter shot and wounded another archery elk hunter.



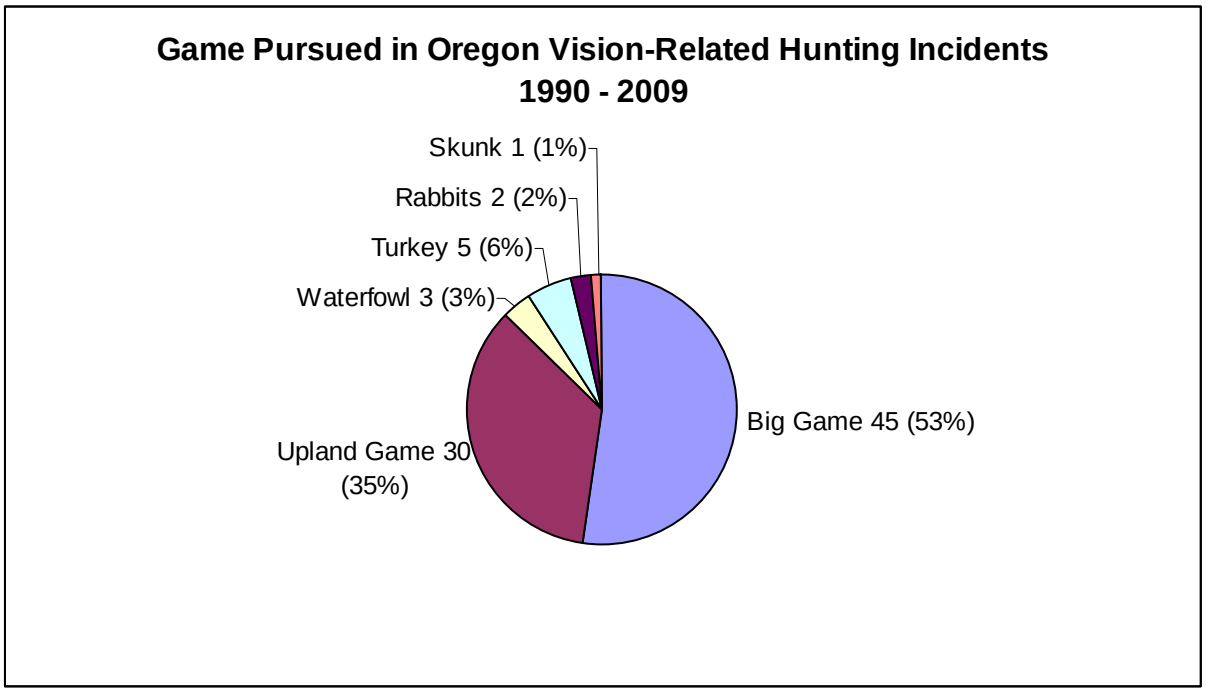

### *GAME PURSUED IN OREGON HUNTING RELATED INCIDENTS*

Most of the incidents over the past twenty years have occurred while hunters are pursuing big game animals or upland game birds (not including turkey). Of the 170 total incidents, 90 (53%) have involved people hunting big game and 37 (22%) have involve people hunting upland game birds. Other species that were pursued while incidents have happened include waterfowl (8), rabbits (7), turkey (5), predators (4), squirrels (2), nutria (2), skunks (1), badger (1) and sage rats (1). The game being pursued for the remaining incidents (12) was unknown or unreported.

Big Game hunters have been involved in 30 (94%) of Oregon hunting-related fatalities over the past twenty years. The other two fatalities occurring over this period involved hunters pursuing waterfowl and rabbits.

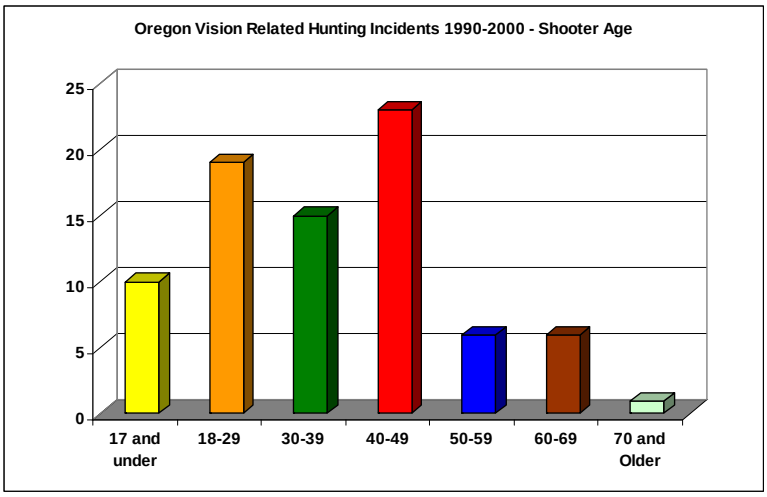
Big game (53%) and upland game bird (35%) hunters were involved in the majority of vision-related hunting incidents. Other species that were pursued while vision-related incidents happened include turkey (6%), waterfowl (3%), rabbits (2%) and skunk (1%).

All 21 of the vision-related hunting fatalities have involved big game hunters.

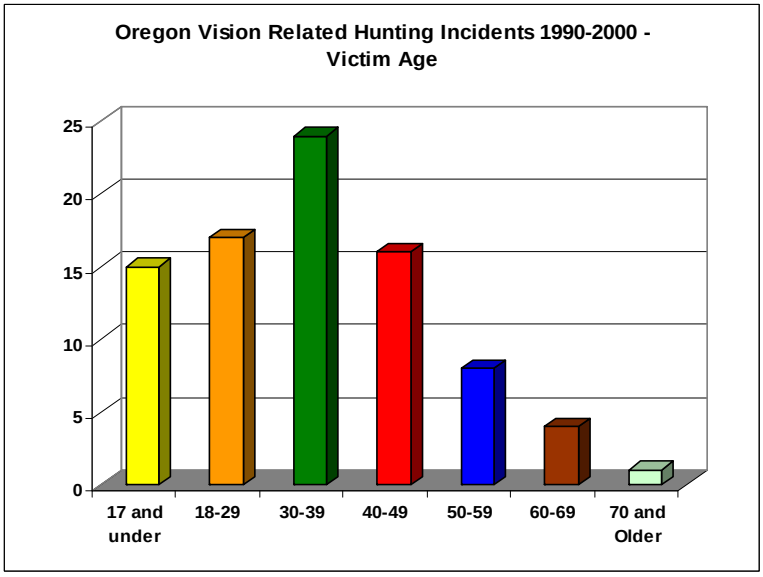


## *AGE OF PARTIES INVOLVED IN OREGON VISION-RELATED HUNTING INCIDENTS*

The average age of the shooters involved in vision-related incidents is 36 years old and the average age of victims of vision-related incidents is 34 years old. Shooters between the ages of 40-49 are involved in the most vision-related hunting incidents, followed by those between the ages of 18-29, 30-39, and 17 years of age and under.




The average age of the victims involved in vision-related incidents is 34 years old. Victims between the ages of 30-39 are involved in the most vision-related hunting incidents, followed by those between the ages of 18-29, 40-49, and 17 years of age and under.




## *ROLE OF HUNTERS 17 YEARS OF AGE AND UNDER IN VISION-RELATED INCIDENTS*

Hunters 17 years of age and under account for 12% of all vision-related hunting incident shooters and 17% of all vision-related hunting incident victims. Of the 21 vision-related fatalities in Oregon over the past twenty years, one shooter and four victims were 17 years of age and under. The percentage of hunters 17 years of age and under who are involved in vision-related hunting incidents is proportionate to the percentage of licensed hunters in that same age group.

## Hunting Safety in Oregon Compared to Other States

Oregon is amongst the safest states to hunt in when compared to 10 other Western Association of Fish and Wildlife Agencies (WAFWA) states that responded to our requests for hunting related incident statistics. Oregon ranked second, trailing only Nevada, in terms of least total hunting related incidents and fatalities per 100,000 hunting licenses sold.

Hunting Incidents and Fatalities per 100,000 Licenses Sold

WAFWA States 2004 - 2009

| RANKED BY INCIDENTS | | | RANKED BY FATALITIES | | |
|---|---|---|---|---|---|
| STATE | HUNTER ORANGE REQUIRED? | INCIDENTS PER 100,000 LICESNE SALES | STATE | HUNTER ORANGE REQUIRED | FATALITIES PER 100,000 LICESNE SALES? |
| Nevada | No | 0.63 | Nevada | No | 0.00 |
| Oregon | No | 1.56 | Oregon | No | 0.14 |
| Idaho | No | 1.56 | South Dakota | Yes | 0.22 |
| New Mexico | No | 1.79 | Utah | Yes | 0.29 |
| Utah | Yes | 2.16 | Alaska | No | 0.31 |
| Alaska | No | 2.43 | Texas | Yes | 0.37 |
| Texas | Yes | 2.74 | Idaho | No | 0.47 |
| Washington | Yes | 4.65 | Washington | Yes | 0.48 |
| California | No | 5.97 | Nebraska | Yes | 0.58 |
| Nebraska | Yes | 6.08 | New Mexico | No | 0.81 |
| South Dakota | Yes | 13.91 | California | No | 0.87 |

States not yet responding or who do not track hunting related incident statistics: Colorado, Wyoming, North Dakota, Kansas, Oklahoma, Hawaii, Arizona, Montana

## Effectiveness of Hunter Orange in Other States

It is universally accepted amongst hunter education experts that the use of hunter orange reduces vision-related hunting incidents and fatalities; however accurate statistics that provide specific hunting related incident information are hard to come by.

### *EXISTING LITERATURE*

Studies conducted in New York, Maine and North Carolina all concluded that there was a reduction in vision-related hunting incidents as a result of the use of hunter orange clothing (New York) or after hunter orange requirements were enacted (Maine, North Carolina). New York, a state without mandatory hunter orange requirements, found that of the 125 injured hunters mistaken for game between 1989 and 1995, 117 (94%) were not wearing hunter orange (Jones 1993). Beginning in 1967 Maine began requiring hunters in York County to wear hunter orange clothing. In the five years prior to the one-county requirement York County accounted for 41% of the state's vision-related hunting incidents, but only 23% in the five years after (Jones 1993). Finally, a study conducted in North Carolina found that in the four years prior to that state's hunter orange requirement there were 12 vision-related fatalities, but only 2 vision-related fatalities in the four years after the requirement (Cina, Lariscy 1996).

### *SURVEY OF WAFWA STATES*

We asked all WAFWA states that require hunter orange to provide us with incident statistics five years prior to and five years after their hunter orange requirement. North Dakota, Texas, Utah and Washington were able to provide us the requested information. These four states saw a combined decrease of 22% in total hunting incidents per 100,000 hunters and 40% in total hunting fatalities per 100,000 hunters. Of these four states, Texas' results were the least successful. While their rate of hunting incidents per 100,000 hunters dropped slightly, their rate of fatalities per 100,000 hunters actually increased. It was not clear what may have contributed to such an unexpected increase in fatalities following hunter orange regulations.

**Comparison of Hunting Related Incidents and Fatalities**

**Five Year Totals Before and After Hunter Orange Requirement**

| **State** | **Incidents per 100,000 Hunters** | **Fatalities per 100,000 Hunters** |
|---|---|---|
| North Dakota | -4% | -82% |
| Texas | -1% | +6% (fatalities increased) |
| Utah | -47% | -38% |
| Washington | -37% | -47% |
| **Average** | **-22%** | **-40%** |

Washington State enacted a hunter orange regulation in 1991. According to Mik Mikitik, Washington's Hunter Education Coordinator, hunter surveys conducted at three points during the

1980s showed a consistent low level of support for a hunter orange requirement. As a consequence of the low support levels among hunters, the Washington Fish and Wildlife Commission directed hunter education staff to undertake an aggressive public relations campaign to increase hunter support for voluntary use of hunter orange.

According to Mikitk, the campaign was not effective in terms of behavioral change in the field. It was not until six vision-related fatalities in one hunting season that the Washington Commission decided to act and created regulations requiring the use of hunter orange. Compliance to the regulation has been high and statistics have shown that the regulation reduces hunting-related injury and fatality incidents.

# Effects of Wearing Hunter Orange on Hunting Success

***INTRODUCTION***

For hunters, success often depends on their ability to get within effective range of their quarry. The effective range varies with the type of hunting method (e.g. centerfire rifle, muzzleloader, archery, etc.). Wildlife can use a wide range of senses to detect danger, including vision, hearing, and smell. There is little doubt close proximity increases the chance odor, sound, movement, or detectable color and patterns will cause alarm. This report will examine only one of these senses; vision. Specifically, how different species of wildlife are believed to use vision to detect their environment.

Hunter orange clothing increases the visibility of the wearer to other hunters, but does it also make hunters more visible to the wildlife they are pursuing? If wearing hunter orange increases visibility to wildlife, will wearing hunter orange reduce hunter success?

It may never be possible to completely understand how wildlife interprets colors. However, by using what science has discovered about eye anatomy and function as well as scientific experiments that measured wildlife response to different colors, it has been possible to make some educated assumptions about how wildlife may respond to hunter orange.

***ABOUT THE EYE***

Animals typically have two types of receptors in the eye; rods and cones. Cone receptors are better at detecting color, while rods generally allow vision in low light, but in shades of gray. Different types of cones are most sensitive to certain segments of the color spectrum. Animals generally have one, two, three, or even more types of cones. The more types of cones an animal possesses, the broader the spectrum of colors they can detect. However, vision is very complex with many other factors determining the perception of color such as hue, reflectivity, brightness, ability of animal to focus the lens, and presence or absence of tapetum lucidum.

Deer and other cervids are considered to have dichromatic vision, (Jacobs et al. 1994, VerCauteren and Pipas 2003, D'Angelo et al. 2008) which means they have two types of cone receptors, each with pigments that allow them to see the higher wavelengths of yellow through violet and likely even higher such as ultra-violet. Humans have trichromatic vision with three types of cone receptors which allow us to see the typical rainbow colors from red through violet. Most birds are tetrachromats (4 types of cones), or even pentachromats (5 types of cones) allowing them to perceive color at a much broader spectrum which likely includes infrared and ultraviolet (Chen and Goldsmith 1986, Kelber et al. 2003).

Having dichromatic vision does not preclude an animal from discerning the lower wavelengths of red and orange, including hunter orange (Scott 1981, VerCauteren and Pipas 2003). These animals probably can distinguish the "color" from other objects, but the "color" likely does not stand out in a way that it would for animal with trichromatic or tetrachromatic vision. In close proximity there could

be an increased chance of detection when these colors, or any other color, are different from the background, such as solid unbroken patterns.

### *DEER, ELK AND OTHER UNGULATES*

From the research conducted to date, all ungulates appear to be dichromats (Jacobs et al. 1994, Jacobs et al. 1998, D'Angelo et al. 2008), with their best color perception at the shorter wavelengths of yellow, green, blue, violet and even ultraviolet (VerCauteren and Pipas 2003). This does not mean they can't see red and orange color (Scott 1981), but they likely perceive it differently than humans and are limited in their ability to distinguish colors like hunter orange and red from other colors like green.

With a wide field of view and eyesight that is adapted for lower light levels (D'Angelo et al. 2008), (e.g. high numbers of rods and reflective membrane at the back of the eye) ungulates are generally considered to be very adept at detecting movement. Most ungulates also have a keen sense of smell. The ability to detect movement, coupled with their sense of smell and hearing, are the primary senses ungulates use to identify potential predators (VerCauteren and Pipas 2003, Jacobs et al. 1994).

The wearing of hunter orange is expected to have little effect on the ability of hunters, particularly those using a gun, to harvest deer. In North Carolina, which made the wearing of hunter orange mandatory in 1987, deer harvest has continued to increase since requiring hunter orange (North Carolina Wildlife Resources Commission). It is important to note that during the same time period, deer populations have also increased and harvest regulations have been liberalized in attempt to slow deer population growth.

Washington adopted hunter orange requirements in 1991. Hunter success in Washington did not appear to be affected by the mandatory use of hunter orange. Average hunter success rates for the center-fire rifle deer seasons for the 3 years prior to, and for the 3 years after adoption, of mandatory orange hunter were the same: 1988-90 hunter success was 24.99%; 1991-1993 hunter success was 25.01%(Washington Department of Fish and Wildlife).

### *BEARS*

There has been little research into the color vision of black bears. Though black bears have the reputation by many as having poor eyesight, bears actually have good vision and are able to distinguish between some color hues suggesting they are not monochromatic (Bacon and Burghardt 1976). The reputation for poor eyesight likely comes from the bear's reliance on their highly developed sense of smell and acute hearing to sense the world at a distance. Bears are thought to benefit from their vision at close range during feeding activities when detecting small berries and insects is important (Bacon and Burghardt 1976). Because of their dependence on smell and hearing, the wearing of hunter orange should not affect the success of bear hunters.

### *COYOTES AND COUGARS*

Little information exists on the visual abilities of coyotes and cougars, but there have been investigations into the color vision abilities of domestic dogs and cats. Both dogs and cats are limited in their ability to detect colors as compared to humans. However, both have a greater ability to "see" in low light conditions, and dogs probably have greater ability than humans to distinguish shades of gray and detect movement (Miller and Murphy 1995). Dogs are dichromats and have a very limited ability to distinguish the longer wavelengths of reds and oranges (Neitz et al., 1989).

Cats are either dichromats (Loop and Bruce 1978) or weak trichromats (Schneider and Beller 1993). As weak trichromats cats probably see colors as rather pale and washed out, much as humans might perceive pastels. It has been well established that cats in general have vision that is highly adapted to low light conditions (exception might be the cheetah, Ahnelt et al. 2005) and are sensitive to detecting movement. The research suggests that canids and felids do not detect hunter orange in the same way as humans.

***B I R D S***

The ability of birds to distinguish color is highly developed (Blackwell 2002). Wearing hunter orange will make hunters more visible to birds. For upland game bird hunting, where hunters are actively pursuing birds on the ground, the wearing of hunter orange is not expected to greatly affect hunter success. However, where hunters are trying to conceal themselves and attract birds within range, such as for waterfowl and turkey hunting, the wearing of hunter orange would likely reduce hunter success.

Waterfowl, turkey and other gallinaceous birds are tetrachromats and have the ability to detect colors over a broad spectrum (Jane and Bowmaker 1988, Barber et al. 2006, Saunders et al. 2008), even at higher wavelengths than humans (Parrish et al. 1981). There has been little research specifically on the effect of wearing hunter orange on hunting success, but at least one study concluded that use of blaze orange reduced spring turkey hunter success (Eriksen et al. 1985). It is commonly accepted among waterfowl hunters and waterfowl managers that bright colors will discourage birds from coming within in range of hunters.

Due to the keen eyesight and color detection abilities of birds, most states with mandatory hunter orange do not require turkey or waterfowl hunters to wear blaze orange. Statistics also indicate that fatal incidents are less likely while hunting turkeys or waterfowl as compared to big game hunting.

***C O N C L U S I O N***

Except for turkey and waterfowl hunting, wearing hunter orange would not be expected to reduce hunter success. Most game species (except birds) lack the color detection abilities to see blaze or hunter orange in the same way as humans. Most game species rely on other senses such as hearing or smell to detect danger, but many do have the enhanced ability to see in low light conditions and to detect movement. In general game species have greater ability to see under low light conditions than humans (many rod receptors in the retina), but this visual benefit visual comes at the cost of poorer color vision (fewer cone receptors in the retina).

# Law Enforcement Considerations Pertaining to Hunter Orange

As a part of this report, the Oregon State Police's Fish and Wildlife Division conducted a review of the mandatory hunter orange laws from other western states. Officers from states with hunter orange requirements described high compliance resulting in very few citations.

Based on their review, and associated conversations with other states' enforcement officers, OSP is not concerned with the enforceability of mandatory hunter orange regulations. However, if a new rule is adopted the wording must be easy to understand and easy to comply with. OSP would enforce violations of mandatory hunter orange at the violation level with a bail of $75.00 ($120.00 as of May 1st, 2010). A heavy emphasis would be placed on education through warnings during the first year of implementation.

# Report Summary

Hunting in Oregon is safe, even when compared to other states that require hunter orange. However, hunting in Oregon could be safer. In Oregon, 50% of all hunting-related incidents and 66% of all hunting- related fatalities are vision-related. Forty out of fifty other states have adopted hunter orange regulations specifically seeking to reduce these types of incidents. From the conversations we have had with other states, the data they have provided us and a search of existing literature, it is clear that hunter orange regulations achieve the desired result of reducing hunting incidents and fatalities.

Hunter orange requirements would not reduce non-vision-related hunting incidents and fatalities. Similarly, not all hunting situations warrant the consideration of mandatory hunter orange requirements; either because incident statistics do not point to a need or because wearing hunter orange would have a negative impact on hunter success. The review of Oregon's hunting incident reports over the past twenty years clearly show that the vast majority of vision-related hunting incidents and fatalities occur while hunting big game and upland game birds (excluding turkey) with rifles and shotguns. The review of the literature also shows that with the exception of turkey and waterfowl hunting, wearing hunter orange would not be expected to reduce hunter success.

# Hunter Orange Options

| Hunter Orange Option # 1 | |
|---|---|
| Action: | No Action |
| Clothing Requirement | N/A |
| Hunt and Weapon Requirement | N/A |
| Discussion | • The wearing of Hunter Orange in Oregon would remain voluntary for all hunters.<br>• The department would continue to encourage the use of hunter orange through education and information campaigns. |

| Hunter Orange Option # 2 | |
|---|---|
| Action: | Requires all hunters 17 years of age and under to wear hunter orange while hunting in certain situations. |
| Clothing Requirement | Hunter Orange upper garment with 360° visibility **and** hat with 360° visibility. Upper garment can be a shirt, jacket, coat, vest or sweater; camouflage hunter orange acceptable. |
| Hunt and Weapon Requirement | While hunting big game animals and upland game birds (excluding turkey) with any firearm. |
| Discussion | • May instill a safety ethic in young hunters that they carry forward as adults, and may also encourage adults who accompany youth to wear hunter orange.<br>• Easy to understand and comply with. Verification of each hunter's age in the field would be required. |

| Hunter Orange Option # 3 | |
|---|---|
| Action: | Requires all hunters, regardless of age, to wear hunter orange while hunting in certain situations. |
| Clothing Requirement | Hunter Orange upper garment with 360° visibility **or** hat with 360° visibility.<br>Upper garment can be a shirt, jacket, coat, vest or sweater; camouflage hunter orange acceptable. |
| Hunt and Weapon Requirement | While hunting big game animals and upland game birds (excluding turkey) with a centerfire firearm or shotgun. |
| Discussion | • Addresses those hunting situations that result in the majority of vision-related hunting incidents.<br>• Easy to understand, comply with and enforce. |

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