MODULE 4

Deterrents

4.2.5 – Shotgun Pyrotechnics
POLAR BEAR DETERRENTS

Power Point: A4.2 PPT - Deterrents Pyrotechnics

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**Props:**
- 12 gauge shotguns

**CRITICAL:**
No live cartridges in classroom! **Dummy Rounds Only.**
If no “dummy” rounds are available for the shotgun the demonstration of proper loading procedures will only be done at the live fire exercise.

**Trainer Notes:**
- It is important that anyone planning to use these devices (companies or agencies) consult ATF requirements and product requirements for the appropriate manner to store and use pyrotechnics prior to using these types of deterrents during human-bear interactions.
4.2.5 Pyrotechnical Deterrent Cartridges for 12-Gauge Shotguns

Until recently there were two types of 12-gauge pyrotechnical deterrents used for scaring off bears, the “Shell Cracker” and “Whistle Cracker.” Problems with the whistle crackers going off inside the shotgun or shortly after leaving the barrel has led many jurisdictions to eliminate these rounds from their programs. This shell cracker is the only reliable 12-gauge pyrotechnical deterrent round.

The shell cracker is a larger version of the pencil and pistol type “bangers.” When fired from the shotgun this fused projectile travels approximately 66 to 86 yards (200 to 260 feet) where it explodes with a loud bang of about 160 decibels. Shell crackers are ideal where long-range capabilities are required.

Capabilities

Like all banger type deterrents, the effective range of this noise making deterrent is greater than the range of the projectile. The projectile will explode at approximately 66 to 86 yards (200 to 260 feet) but the effectiveness of the noise can be much further out.

A solid first line of defense is early detection of the bear and use of shell crackers to alert the bear of the presence of humans while it is still a long way off. The sooner that the bear is aware of the presence of humans and moves off, the safer it will be for people and bears.
Polar Bear Deterrents

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Props:
- 12 gauge shotguns

Trainer Notes:
- Use whiteboard or flip chart to sketch shooting angle and trajectory of shell cracker.
Limitations

**Shell Crackers must not be used in semi-automatic shotguns.**
The low powder loads in pyrotechnical rounds do not produce enough pressure to properly work the semi-auto action. Rounds can get jammed in the action rendering the firearm useless.

For best results the shell crackers should be used within one year from the date on the box.

Shell crackers must be shipped under dangerous goods regulations; this may make them difficult to obtain on short notice. Advanced planning is required to keep an adequate number of rounds in stock.

Shell cracker explosive projectiles are very light; wind can change the range or direction of the projectile. A head wind will reduce the range while a tail wind might increase it. A side wind can blow the projectile off course.

**Considerations**

It is advised that a break-action shotgun (double or single barrel) be used to fire shell crackers. Then inspection of the barrel for residue or lodged crackers can occur readily after each round of shots.

To get the maximum effect from a shell cracker, manufacturers recommend that the shotgun be pointed up at an angle of forty-five degrees from ground level. This allows the explosive to travel out to its maximum distance and explode approximately twenty feet above ground level. Noise from a shell cracker that goes off at ground level is not as effective as one that explodes in the air. However if the explosion happens too high in the air, there is no longer any directionality to the noise. As a result, the bear may not make any connection between the noise and the position of the shooter.
The proper shooting angle is best achieved by firing from the hip position rather than shouldering the shotgun.

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<td>Shell Cracker shooting lanes diagram</td>
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Props:

Trainer Notes:
No “shell cracker” or any other pyrotechnical device should ever be shot directly at a bear. Firing directly at a bear risks hitting the bear and injuring it or having the explosive noise go off behind the bear. This may cause the bear to run towards the shooter or move in a direction that the shooter did not intend.
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Props:

Trainer Notes:

- Ammunition storage can be covered here or later as part of the firearm safety session.
- It is important that anyone planning to use these devices (companies or agencies) consult ATF requirements and product requirements for the appropriate manner to store and use pyrotechnics prior to using these types of deterrents during human-bear interactions.
The shooter should **always alert the bear** to the shooter’s location prior to firing a shell cracker. A bear unaware of a human presence might run towards the shooter rather than away. No matter the deterrent’s range, the shooter should **always aim** so that the explosive bang occurs off to the side of the bear.

Shell crackers can be a fire hazard if used improperly. Before firing, visually check for flammable or volatile materials located down range of the shooter and assess if conditions are dry. If the risk of fire is present, pyrotechnical devices should not be used.

Bears can become habituated to loud noises. A shell cracker used in combination with a direct contact deterrent, such as a rubber bullet, increases the chances of driving off the bear successfully. This practice of using both may prevent bears from habituating to the noise deterrent.

**SPECIAL CONSIDERATION**

1) Shell crackers, officially termed, “explosive pest control devices” (EPCDs), are explosives regulated by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). These include crackershells for 12 gauge shotgun platforms and some types of cartridges for 15 mm launchers. ATF regulates the purchase, inventory, storage, and transport of these devices. Companies with employees for polar bear deterrence need to be informed of the regulations surrounding crackershells. While they remain a viable option for deterring polar bears, there are additional federal license and permit requirements that operators may have to obtain in order to use these types of deterrents. This information can be found at:


Permit and license exemptions for federal, state, and local government agencies may apply: however, these agencies must maintain proper storage and record-keeping in compliance with ATF regulations.

2) Shell crackers and direct contact ammunition such as rubber bullets and beanbag rounds are very similar in shape, size and weight. Sometimes people can mix up the various rounds and fire a round not intended. People have hit bears with a shell cracker accidently thinking they were firing a short-range beanbag round. A bear within the effective range of a beanbag round is at a distance one quarter to half the range of a shell.
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Props:
- 12-gauge tactical shell strippers and cover

CRITICAL:

No live cartridges in classroom! Dummy Rounds Only.
If no “dummy” rounds are available for the shotgun the demonstration of proper loading procedures will only be done at the live fire exercise.

Trainer Notes:
- Be careful to not to let analysis of past incidents of ammunition mix-ups sidetrack discussions. The goal is to reduce the risk of ammunition mix-ups and have bear responders use best practices.
cracker. At this close distance a shell cracker projectile could penetrate the bears hide and explode within the body of the bear, injuring or even killing it.

The bear responder is likely to become more anxious when the bear is closer, increasing the chance of selecting the wrong round. Mixing up ammunition happens most often when people carry their deterrent ammunition in their pockets rather than in proper ammunition holders. Sometimes people stock ammunition holders with more than one type of round; this also leads to firing the wrong type of round.

A possible solution may be found in technologies used by competitive shot-gunners and police tactical squads. These shooters have similar needs as bear responders. They need to carry different types of ammunition in such a way that the correct ammunition can be easily and quickly accessed, retrieved and loaded into the shotgun.
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Props:
- 12-gauge tactical shell strippers and cover

CRITICAL:
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Trainer Notes:
- Be careful to not to let analysis of past incidents of ammunition mix-ups sidetrack discussions. The goal is to reduce the risk of ammunition mix-ups and have bear responders use best practices.
**SPECIAL CONSIDERATION CONTINUED**

Easy and quick retrieval of the correct ammunition is achieved by competitive shot-gunners by using a product called the 12-gauge tactical shell stripper. The strippers securely hold up to six shells of 2 ¾” to 3” length and are worn on the shooter’s belt for quick access.

To reduce the risk of accidentally retrieving the wrong type of ammunition some shooters use shell strippers that are equipped with covers. Once the shell stripper is fully loaded the cover flap is closed and fastened in place with a Velcro tab. The shooter cannot access the shells until they tug the flap open.

To reduce selecting and loading unattended ammunition, bear responders could carry their shell crackers in a shell stripper with a cover and carry the direct contact rounds in a stripper without a cover. As well the two strippers could be carried on opposite hips, placing the shell crackers on the hip that would require the most effort to retrieve and load.

When the bear is out at the proper range for shell cracker use, the shooter could open the cover of the shell stripper containing shell crackers and retrieve rounds as needed. If the bear approaches too close for shell cracker use, the cover of the stripper would be closed preventing easy access to these rounds.
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Props:
- 12-gauge tactical shell strippers and cover
- Chest rig if available

CRITICAL:
No live cartridges in classroom! Dummy Rounds Only.
If no “dummy” rounds are available for the shotgun the demonstration of proper loading procedures will only be done at the live fire exercise.

Trainer Notes:
- Chest rigs could also hold pistol type launchers and applicable deterrent rounds.
Only the shell crackers would be covered so that they could be easily distinguished from direct contact rounds (beanbags and rubber projectiles). If a shooter was to accidentally retrieve a beanbag round and fire it at a bear at the more distant shell cracker range, a beanbag round would be wasted but there would be no risk to the bear.

Carrying preloaded strippers on a belt may work in warm weather but would be impractical when heavier outer clothing is worn. Again the solution may come from others, in this case from police tactical shooters. Tactical team shooters use “chest rigs” (see below) to hold their ammunition, radios and other items they need to access quickly. The chest rigs are designed to be worn over top of outdoor clothing and are fully adjustable so they can be worn over parkas.

These chest rigs have many loops on which shell strippers and other items could be attached, allowing the shooter to position his equipment where it is most easily accessed. Separate chest rigs could be outfitted for the bear responder responsible for firing deterrent rounds and another for the responder that provides armed back-up with a firearm loaded with lethal rounds.

Other items could include pistol type launchers and deterrent rounds.