



# Evaluation of Remote Trap Monitors

*Can trap monitors save Wildlife Services (WS) specialists time and money by increasing the efficiency of trap checks? To find out, WS scientists and field specialists evaluated the use of remote trap monitors. In 2006, WS personnel evaluated the effectiveness of two remote monitoring devices to alert wildlife specialists when an animal is captured in a trap. The devices, which can be used with any type of trap, consist of small radio transmitters that emit unique pulse rates when an animal is captured. WS personnel tested the device on a variety of wildlife species using several different types of traps and bait stations.*

*This tech note summarizes the results of the evaluation and provides tips and recommendations for using remote trap monitors.*



Feral hog caught in trap with Telonics monitor.

## TRAP MONITORS

WS evaluated two trap monitors in 2006. The first constructed by Advanced Telemetry Systems (ATS, Isanti, MN), consists of a 0.82-inch-diameter transmitter encapsulated in a waterproof resin. The transmitter is encased in a 5.75-inch-long aluminum housing plus a 12-inch cable antenna that protrudes from one end. After being placed and left undisturbed, the ATS monitor transmits at a slow rate (40 pulses per minute), but when a trap is sprung, the pulse rate doubles.

The second trap monitor, made by Telonics, Inc. (Mesa, AZ), is 1.47 inches by 2.00 inches by 2.69 inches with a 14-inch whip antenna coming out of one end of the transmitter and a magnet attached to a 16-inch cable at the other end. A base plate with four holes is attached to the monitor so it can be installed near the trap. Unlike the ATS transmitter, which is motion activated, the Telonics monitor is activated

when the magnet attached to the cable is pulled from the housing. When this magnet is removed from the transmitter (by a trap being sprung), the pulse rate goes from slow (35 pulses per minute) to fast (75 pulses per minute).

Both trap monitors can be attached directly to the trap chain and buried under the trap or attached with a wire, string, or fishing line and then placed away from the trap in a tree or under a shrub. However, the Telonics trap monitor was not constructed to attach directly to leghold traps because of the possibility of an animal chewing on the monitor.

## METHODS

WS used monitors that emit signals in the 164–166-MHz frequency range and several different receivers for monitoring (Icom R-10, Icom R-20, Quick-Track QTR 5000+, and Lotek SRX-400A). Field specialists used three-element, folding, hand-held antennas and roof-mounted, omnidirectional antennas that

### TRAP MONITORS AT A GLANCE

Brand	Telonics	ATS
Cost	~\$160 each, based on number bought	~\$205 each, based on number bought
Activation method	Monitor activated when sprung trap pulls magnet from monitor	Monitor activated when wiggled or shaken
Warranty	3 years	2 years
Operational life	7 years	4 years
Effective distance	1/2 mile–16 miles depending on line of sight (2-mile average)	1/2 mile–16 miles depending on line of sight (2-mile average)

some specialists already had on their trucks.

Equipment and situations monitored included

- Conibear traps,
- Foothold traps,
- Foot snares,
- Neck snares,
- Cage traps,
- Culvert traps, and
- Signal devices for animal activity at bait stations.

WS used monitors when trapping coyotes, raccoons, black bears, white-tailed deer, mountain lions, nutria, wolves, raptors, feral pigs, skunks, beaver, and feral dogs.

## FINDINGS

### Distance

When it was hung aboveground on a hillside, the monitor could be detected in the valley below from 8 miles away. One Oregon WS specialist reported hearing the trap monitor from 12 miles away, and a West Virginia specialist picked up a signal from 16 miles away. However, if the trap monitor is completely buried or used in areas with rolling hills, the effective distance may be only half a mile. In relatively flat terrain with thick vegetation (e.g., northern Florida), the trap monitors could be heard from about 2 miles away, which appears to be typical for their range.

### Terrain

Terrain is the greatest factor that influences a transmitter's effective distance. Clear line of sight is also extremely important.

### Accuracy

WS personnel found no instances where an animal was caught and the trap monitor did not activate. But monitors did emit false alarms (activated by wind, for example), especially when suspended off the ground.

## FIELD OBSERVATIONS

WS field specialists found many ingenious uses for the monitors and commented that they had saved them hiking and/or driving time.

- Oklahoma WS specialists suggested using the trap monitors for beaver work to decrease time spent and the hazard of wading through beaver sloughs to check conibear traps.
- A Wyoming WS specialist used the monitors to alert him if an animal was caught while trapping wolves in areas inhabited by grizzlies so he could get additional help before going into thick brush to check the trap.
- Several States used the devices to remotely monitor multiple bait piles when trying to remove depredating deer or feral pigs.
- On Eglin Air Force Base, WS specialists used the monitors to remotely check traps when access was temporarily prevented due to weapons testing. Positive results from the monitors allowed the specialists to prioritize their trap checks once the area was reopened.
- Arizona WS specialists suggested the use of monitors in urban damage situations to minimize the number of times field crews have to enter people's property.

- An Oregon specialist calculated that the trap monitor saved him 2 hours of driving time on logging roads when checking his bear snares.

As with any new and different device, some specialists noted that they needed time and practice before they could build up complete confidence in trap monitors.

## BENEFITS FROM TRAP MONITORS

- Improve animal welfare
- Save considerable driving time over rough terrain
- Decrease fuel usage
- Save time hiking to remote locations or riding in by horseback or all-terrain vehicle
- Enable field crews to prioritize trap checks in areas of high visibility or human use
- Decrease need for human presence at trap sites
- Make 24-hour trap check regulations more feasible logistically



From left to right: a Telonics monitor, an ATS monitor, and an Icom receiver.

- Can help find lost traps and drags
- Have the potential of saving WS programs and customers time and money if monitors are applied correctly

## LIMITATIONS

- Limited usefulness in flat or gently rolling terrain
- Antennas often chewed when an animal is caught
- Inconsistent pulse strength between monitors and locations and environmental conditions
- False activations, especially by wind

when the monitor was placed off the ground

- High initial cost (~\$200/monitor + \$450/receiver)
- Inconsistent activation of monitors when a trap has been sprung without catching an animal

## HELPFUL TIPS

- Place the trap monitor in a tree or up off of the ground (securely fastened to prevent false positives).
- If buried, leave a small amount of antenna sticking out of the ground.

- Attach a length of wire to increase the length of the antenna.
- On hillsides, select a location for the trap monitor that can be seen from below.
- In low areas, place the trap monitor where it can be seen from above.
- Use in areas where access is difficult.

## TRAP MONITOR USE SUMMARY

When To Consider Use	When Not To Use
When frequent visitation to trap is limited or unwanted	On rolling terrain where there is not good line of sight
When trap sites are on a mountainside that can be seen from several miles away	In areas of very dense vegetation where long reception distances are required
When trap sites are in low-lying areas that can be seen from high spots	On flat land where traps are easily accessible
When prioritization of checking individual traps is important	May not be appropriate as the only check method
When accessing a trap site is difficult	

## ADDITIONAL INFORMATION

*For more information, please contact*

**USDA-APHIS-WS**

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