Passive Integrated Transponders

Typically two snakes of the same species look so much alike that it is very difficult to tell them apart. In addition, wild-born reptiles look very similar, if not identical, to captive-born animals of the same species. For this reason, the Ohio Division of Wildlife requires that all captive snakes with a snout-to-vent length greater than 18 inches and captive turtles with a carapace four inches or longer be implanted with a passive integrated transponder (PIT). Regardless of what brand of PIT you choose to implant in your captive reptile, the Division only requires that the PIT be one which is readable by an *AVID Mini Tracker*. The Reptile and Amphibian regulation, Ohio Administrative Code Section 1501: 31-25-04, does not dictate how or where in the animal the PIT be implanted; this is left to the owner's discretion.

The Division of Wildlife believes PIT's provide a marking technique for native species that is cost effective, permanent, non-duplicated, and safe, while providing an objective way to identify individual animals by untrained eyes. PIT's also provide a way to protect the property of the owner, like a serial number. In conjunction with record keeping requirement of the animal owner, the unique number of each PIT could also aid the Division in preventing the illegal black market trade of wildlife. The Division has been implanting PITs for many years to identify thousands of endangered species of snakes during survey and research studies. Because of our familiarity with the devices we are confident they can be implanted safely, without harming the animal.

As a courtesy, the Division of Wildlife has made available the purchase of AVID PITs at each of our five District Wildlife Offices. If you choose to purchase a PIT tag from the Division, here is some additional information.

What is a PIT tag?

PIT is an acronym for "passive integrated transponder." A PIT tag is a small, durable microchip approximately the size of a grain of rice. When a hand-held scanner is waved over the PIT the wand generates a low energy radio signal that energizes the PIT tag to transmit its unique number. The animal feels nothing as the scanner is passed over it. The microchip sends its number back to the scanner. It appears in the viewing window as, for example, **213*679*321**. This is very similar to scanning an item's bar code at the grocery store check out.

Why is using PIT tags in native Ohio reptiles a legal requirement?

PIT tags serve the same purpose as vehicle identification numbers on automobiles and motorcycles or serial numbers on computers and stereo components. All of these numbers can be used to document ownership. Once implanted, the PIT tag is virtually impossible to remove and cannot be altered.

How difficult is it to implant a PIT tag?

PIT tags can be implanted by the average person. Some very basic precautions should be applied. If one is uncomfortable performing the procedure, then an experienced herpetoculturist (a person knowledgeable in reptiles and/or amphibians) or veterinarian should be consulted.

How to Insert a PIT Tag in a Snake

Experienced herpetoculturists can insert a PIT tag with no assistance, however if you are implanting an animal for the first time, it may be helpful to enlist the aid of another person.

1. Remove a syringe and needle from its protective case and place it in a position where the needle does not touch any surface (like the edge of a counter).
2. Determine the thickest portion of your snake's body.
3. Hold the snake with its head facing away from you.
4. Arrange the coils so that 3-4 inches of body can be held in a straight manner. If performing the procedure alone, this is easily accomplished by curling the second and third fingers and holding against those fingers with the first and fourth fingers (figure 1).

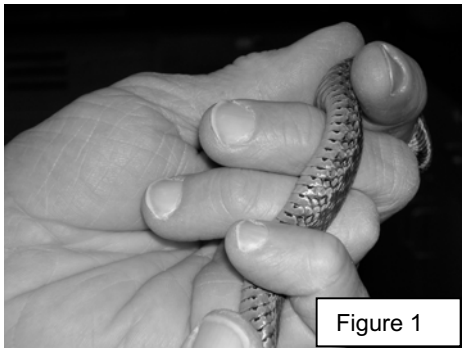
Figure 1

5. Turn the snake so that its side is facing up as shown in Figure 1. By slightly raising the third and fourth fingers toward the first and fourth fingers the snake can be arched upward. This is very effective when dealing with smaller sized snakes. The snake must be firmly but gently restrained to prevent it from moving.
6. Wipe the area where the tag is to be inserted with an alcohol-soaked cotton ball (figure 2).

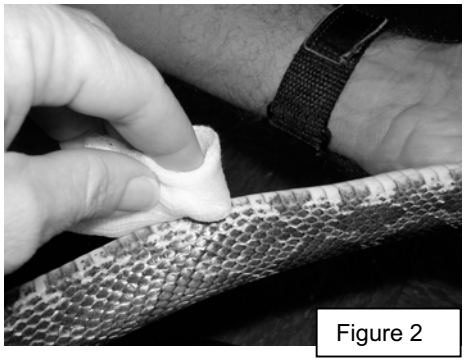
Figure 2

7. Insert the syringe in the snake between the first and second lateral scale rows (2nd scale row from the belly) and pointed at a slight angle toward the ventral scales (figure 3). An area between scales that is darkly-pigmented will hide the needle mark until it disappears after a few sheddings.
8. Push the plunger of the syringe forward to implant the PIT into the snake and remove the needle. If necessary a tag implanted in the abdominal cavity can be gently moved toward the center of the belly and tucked under the ribs.

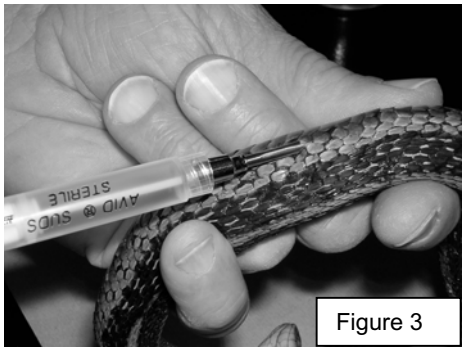

Figure 3

9. If any bleeding occurs, it may be necessary to apply a drop of liquid bandage. Allow the liquid bandage to dry before placing the animal in any type of bedding material. Use clean paper towels for bedding until the liquid bandage dries. Don't be alarmed if there is bleeding. Snakes, unlike birds and mammals, can lose considerable amounts of blood with no ill effects.
10. Keep a record the PIT number, along with information about the snake implanted, such as species, sex, and age.

Contact the manufacturer of the PIT tag you are implanting for additional assistance

How to Insert a PIT Tag in a Turtle

One may find turtles more difficult to PIT tag than snakes, and enlisting the aid of another person may be necessary.

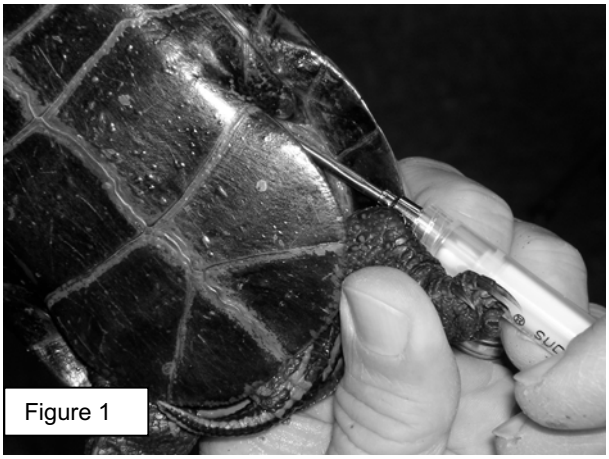

Figure 1

Figure 2

1. Remove the syringe and needle from its protective case and place it in a position where the needle does not touch any surface (like the edge of a counter).
2. Hold the turtle with its head facing away from you.
3. Carefully stretch one hind leg toward you.
4. The PIT tag will be inserted into the body cavity through the skin where the leg attaches. In other words the “pit” of the leg.
5. Wipe the “leg pit” with an alcohol-soaked cotton ball.
6. Insert the syringe into the body cavity, parallel to the edge of the shell (figure 1 and 2).
7. Push the plunger of the syringe forward to implant the PIT into the turtle and remove the needle.
8. If any bleeding occurs, it may be necessary to apply a drop of liquid bandage. Allow the liquid bandage to dry before placing the animal in any type of bedding material. Use clean paper towels for bedding until the liquid bandage dries. Don’t be alarmed if there is bleeding. Turtles, unlike birds and mammals, can lose considerable amounts of blood with no ill effects.
9. Keep a record of the PIT number, along with information about the turtle implanted, such as species, sex, and age.

Contact the manufacturer of the PIT tag you are implanting for additional assistance

Are PIT tags safe for reptiles?

The following studies have specifically looked at the effects of PIT-tagging on reptiles and can be referred to by those who desire additional details. All of these studies were published in peer reviewed scientific journals. If you have questions about these studies, contact the author for further information. PIT tagging is widely used by universities and zoos across the country and undergo thorough scrutiny prior to their use. The scientific literature documents hundreds of other studies that have used PIT tags as an easy and effective way to permanently mark study animals.

Jemison, S.C., L.A. Bishop, P.G. May, and T. Farrell. 1995. The impact of PIT-tags on growth and movement of the rattlesnake, *Sistrurus miliarius*. Journal of Herpetology 29(1): 129-132.

In this study, 29 snakes were PIT-tagged and 28 of them had their ventral scales clipped. All snakes were released back into the wild. After 16 months the snakes were recaptured. No negative effects on growth, movements, or capture probability were observed.

Keck, M.B. 1994. Test for detrimental effects of PIT tags in neonatal snakes. Copeia 1994 (1):226-228.

This study PIT-tagged 12 newborn snakes and compared them to 11 that were not PIT-tagged. Animals were maintained in captivity for 11 weeks. There was no significant difference in growth or speed. All were sacrificed at the end of the study and dissected to determine any internal damages. No organ damage or septic tissue was found and all PIT-tags were attached to abdominal fat bodies with connective tissue.

Roark, A.W. and M.E. Dorcas. 2000. Regional body temperature variation in corn snakes measured using temperature-sensitive passive integrated transponders. Journal of Herpetology 34(3):481-485.

In this study the researchers PIT-tagged 15 corn snakes. Each snake received a PIT tag near the neck, at mid-body, and near the cloaca. Some PIT tags placed near the neck and cloaca were expelled but all that were implanted at mid-body were retained. This study clearly demonstrates the need to implant at mid-body.

Buhlman K.A. and T.D. Tuberville. 1998. Use of passive integrated (PIT) tags for marking small freshwater turtles. Chelonian Conservation and Biology 3(1):102-104.

These authors implanted PIT tags in seven red-eared sliders. Six of the seven were recaptured during the following 24 months. One was found dead from causes not related to its PIT tag. The remaining five turtles had maintained their PIT tags and showed growth.

Elbin, S.B. and J.Burger. 1994. Implantable microchips for individual identification in wild and captive populations. Wildlife Society Bulletin 22:677-683.

In this study 163 pine snakes were implanted with PIT tags and released back into the wild. Over the following three years all were recaptured. None of the snakes experienced rejections, infections, or migrations.