sure or underexposure by a full f-stop did not detectably alter the hue on the transparency. Of the two, overexposure is preferable because the film shifts toward green in parts of the image where exposure of the film is barely above threshold levels, such as in dark regions of the subject or in deep shadows. Therefore, if the hues to be studied are of low value, (e.g. the ground color of *Ambystoma maculatum*) the transparency as a whole may be overexposed so that those hues appear nearer to a middle tone on the transparency. The value will be changed but not the hue. This procedure will eliminate the shift toward green of low exposure areas and provide a broader acceptable range of exposure. Analysis of a series of exposures taken at different f-stops will provide a basis for determining if any correction is necessary.

**Equipment for Color Analysis.** The transparency is placed in the enlarger and an image of desired size projected onto the baseboard. Any enlarger of reasonable quality will do, but it must be equipped with a voltage regulator, so that fluctuations in line voltage do not alter the color of the light source. There are several color analysers on the market; Omega and Beseler are the most popular brands. They come with a variety of capabilities, of which only the digital read-out is recommended, because it is quicker and probably more accurate than reading the scale of a meter behind a needle. Most CAs are equipped with a probe that rests on the easel and permits analysis of a small portion of the enlarged image, usually a 3 mm to 5 mm disk. This corresponds to an area on the specimen which is highly variable depending on the magnification of the image on the film and in the enlarger. Assessment of subjects 100 micrometers in diameter or less is easily accomplished.

**Using the CA.** Operation of the CA requires that a reference gray be defined. This is the function of the gray card in the background. It is essential that the image of the subject and of the gray card be subject to the same sources of variation (film type, emulsion number, processing variation, etc.) so that these variables are cancelled. To accomplish this, CA is zeroed with the probe on the image of the gray card. When the probe is moved to the part of the image under investigation, the CA will display the difference between gray and that hue in terms of densities of cyan, magenta, and yellow, one of which will eventually be eliminated.

Recording changes that occur in a single individual requires evaluating the same surface area each time. This can be assured by tracing the projected image on paper or by marking registration points (such as the eyes, lip line and posterior width of the torso). Either will provide permanent records to be filed with the transparencies. It may be desireable to neutralize the impact of small irregularities in pigmentation (scars, freckles, warts, scale boundaries, etc.) if they are not resolved without magnification and hence are not part of the image presented to an observer. To neutralize these irregularities, the image may be thrown slightly out of focus so that they contribute their hue to the general appearance in proportion to their surface area, but do not dominate a particular reading. Alternatively, one could run transects through the image and take readings at any number of points along the line.

Consult Mitchell (1984) for additional information on colors and color sensitometry at a general level. The Kodak Data Books (Anonymous 1974) are also very informative.

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## A METHOD OF LIVE-TRAPPING WARY CROCODILES

Fifteen of the 21 presently recognized species of crocodilians are endangered (U.S. F.W.S., 1984). This status is a result of both extensive habitat destruction and intensive hunting practices. Managers of populations of endangered species have the difficult task of studying small numbers of wary individuals in large, remote and often inaccessible areas. For example, our experience is that the few remaining adult American crocodiles (*Crocodylus acutus*) in southern Florida are often difficult, and frequently impossible, to approach closely.

Several papers have described methods for direct capture of crocodilians (Chabreck 1963; Jones 1965; Joanen and Perry 1971; Webb and Messel 1977). Murphy and Fendley (1975; trap boards) and Webb and Messel (1977; rope nets) developed live-trapping methods for crocodilians that proved particularly successful with wary, difficult-to-approach individuals. We found two disadvantages to using these techniques: (1) The equipment is bulky, thus limiting the number of traps that can be carried to remote areas; and (2) they require bait. The habits and low numbers of American crocodiles in southern Florida generally mean that their occurrence at any trap site is infrequent. In addition, the bait may attract other predators. Blue crabs (*Callinectes* spp.) and black and turkey vultures (*Coragyps atratus* and *Cathartes aura*) are common and have consumed bait within 48 h of a trap being set. Another disadvantage of trap boards set on trails is that crocodiles easily avoid them. Here we describe a simple, baitless trap for capturing crocodilians.

The trap configuration consists of a #3 Kleflock wire noose (Woodstream Corp., Lititz, PA), trigger and spring pole (Fig. 1). The noose is set in a natural narrowing of an active trail between vegetation or where a crawl emerges from the water. The noose is held in place by forked sticks or is lightly taped to the trigger arm and spring-pole support. The snare is anchored to either a stout tree or an iron reinforcing bar driven into the ground, or is attached to a float with 6 mm diameter braided nylon rope of sufficient length to allow the crocodile access to water. We found that two flexible fiberglass bicycle flag poles taped firmly together were the most effective for springing the noose. The spring pole, supported in PVC pipe (2 to 2.5 cm diam., 1 m length) driven into the substrate to approximately half its length, is attached simultaneously to the noose and trigger using 50 kg test dacron trolling line (Fig. 2). The dacron trigger attachment is placed on the flathead nail between the two horseshoe nails and the tension adjusted so that only a slight pressure on the treadle is needed to release the spring-pole. The treadle is depressed by the crocodile's chest, after the head passes through the noose. The noose is usually set partly, or fully, between the fore and hind legs. Traps should be checked at least once a day, preferably by mid-morning to avoid exposing the animal to extreme temperatures.

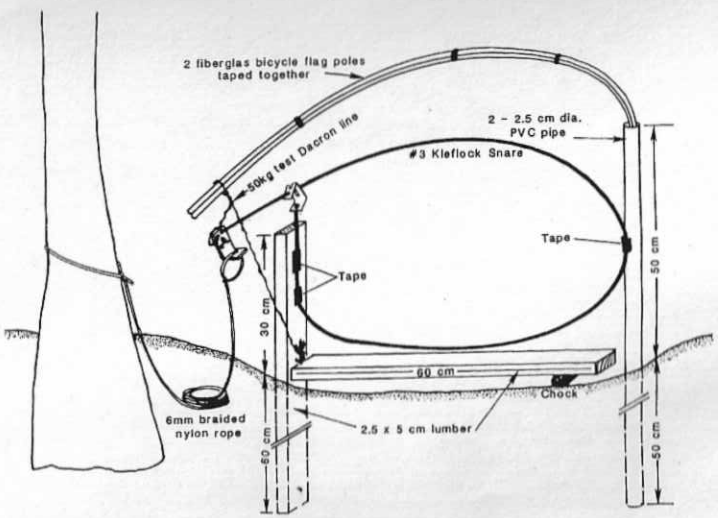


**Figure 1.** Configuration of crocodilian trail trap.

Seven of 15 adult crocodiles captured in Everglades National Park (ENP) and all (four) of the adult crocodiles captured at Florida Power and Light Company's Turkey Point power plant site (TP) were trapped using this method. Of the 11, 10 were females (seven from ENP associated with particular nests) ranging in size from 2.27 m, 47.6 kg to 3.08 m, 95.4 kg. The one male captured (at TP) was 3.5 m, 215 kg. Five of the 11 adult crocodiles trapped were recaptured using the same method.

One trap was set on each active trail in an area where we wished to capture crocodiles. For example, at nest sites in Everglades National Park we would set one or two traps on the trails that approached the nest from the water. To allow the crocodile access to water, and to keep her from destroying the nest, traps were placed as close to the water as possible. At Turkey Point, traps were set in locations where crocodiles were known to cross roads from one body of water to another (Gaby et al. 1985). Large limestone rocks (0.3-1.0 m diam.) were strategically placed in the areas where the trails emerged from the water, directing crocodiles through the traps.

The seven female crocodiles caught in Everglades National Park in 1979 were captured in 36 trap nights during two trapping periods, for a trapping success of 19.4%. During the first trapping period five traps were set early in the incubation period on active trails at five nest sites on 30-31 May 1979. Two females were captured. One, captured 30 May, continued to visit her nest after capture and opened the nest at the end of incubation. The other animal, captured 1 June, was found dead on 10 July. Based on size (3.08 m) and tooth and scute wear, this animal was judged to be the oldest crocodile captured in South Florida, and it was not possible to determine if she died as a result of capture trauma (a blood sample was taken via caudal puncture and a radio collar was attached).

During the second trapping period, seven traps were set at five nests from 26 June - 1 July 1979. Five animals were captured. Two failed to return to the nest sites after capture. One of these nests was destroyed by raccoons, the other opened by investigators. Two animals continued to visit their nests; one nest was successfully opened by the crocodile, the other was destroyed by raccoons. No active nest was located for the fifth animal. To prevent desertion of nests, we recommend that trapping of females at particular nests be limited to early in the incubation period.

Using these methods we have been able to capture adult crocodiles that we were otherwise unable to approach. We were able to capture females known to be associated with particular nests and, by attaching radio transmitters, to obtain detailed information on their movements and habitat use. The major disadvantage of snare traps is that they must be set on an active trail. However, this technique is very effective for capturing animals known to use specific areas and has the important advantage of ease in transporting materials. Also, because it is baitless, the daily maintenance is low, and it can be used when animals may not be feeding, i.e. during the cooler months of the year.

This method has been effective in capturing *Crocodylus acutus* in Florida and *Alligator mississippiensis* in north Florida (Phil Hall, pers. com.) and with modification it should work successfully for capturing other crocodilians, particularly those that are wary and in remote areas.

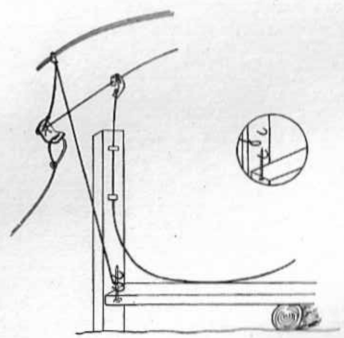

**Figure 2.** Closeup of trigger mechanism.

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