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US Fish and Wildlife Service Wildlife Inspectors seize sea turtle products at the Miami airport (see pp. 1-5). Photo: USFWS

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Trade Secrets: A Ten Year Overview of the Illegal Import of Sea Turtle Products into the United States

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For more than 25 years all sea turtle products have been prohibited from international commerce by the 170-member nations of the Convention on International Trade in Endangered Species (CITES). Sea turtles continue to be threatened by direct take (including poaching) and illegal trade despite multi-national protection efforts. Although take may contribute significantly to sea turtle decline, illegal take is difficult to measure since there are few quantified records associated with legal fisheries and fewer still for illegal take (poaching). We can, however, quantify one portion of the illegal sea turtle trade by determining how many illegal products were seized at United States ports of entry over a recent 10-year period. The United States Fish and Wildlife Service (USFWS) oversees the import and export of wildlife and wildlife products, ensuring that wildlife trade complies with United States laws and international treaties. Additionally, the USFWS has legal authority to target suspected illegal wildlife activity through undercover and field investigations. In an effort to assess the scale of illegal sea turtle take and trade, we have conducted a 10-year (1994 – 2003) review of the law enforcement database maintained by the USFWS. This database tracks the number and type of wildlife cases, the quantity of seized products, and the penalties assessed against violators. These data are *minimum* estimates of the sea turtle products passing through the United States borders, as smuggled wildlife is oftentimes not detected.

We reviewed the USFWS Law Enforcement Management Information System (LEMIS) database records specific to sea turtle take and trade. We requested two LEMIS files: one focused on illegal imports (1997-2003) and a second centered on investigations (1994-2003). The LEMIS database suffered some data loss in conversion to a millennium-compliant format, resulting in incomplete data for country of origin and penalties levied. Therefore, a third file on illegal sea turtle meat and egg imports (1995-2000) was used to supplement country of origin data. Consequently, import countries include those from 1995-2000 for meat and egg imports, and a partial listing of countries for all turtle products from 1994-2003. Although penalties for 22% of the cases were lost, the remaining penalty data is likely representative of the frequency and severity of penalties levied on all USFWS sea turtle cases. All data files were cross-checked to eliminate duplication of cases.

To facilitate analyses, we combined similar categories from the LEMIS database (e.g., body, shell, trophy and live animal were combined in a “body” category). Additionally, as data on meat and eggs were variously recorded by number of items and/or weight, units of measure required homogenization before data analysis could proceed. When meat items were counted, we speculated conservatively that each item (often described as a flipper or bag

of meat) weighed one kilogram. When eggs were weighed instead of counted, we transformed weight into a number of eggs so that data would be analogous. We chose olive ridleys as a representative species from which to extrapolate egg weights to number of eggs. We used olive ridleys because they are the most populous turtle (Marquez-M. 1990) and the most likely species intercepted from Central America, where the vast majority of illegal eggs originated (242 of 279 seizures with known country of origin). Using 34 g as the midpoint of the given range of olive ridley egg weights (Marquez-M. 1990), we estimated the number of eggs in 1 kg (29.4 eggs), and used this number to convert egg weights to an estimated number of eggs.

We used simple linear regression, tested at a 95% confidence level, to determine if the decline in the number of turtle cases, the decline in the number of products seized and the increase in wildlife imports over time were statistically significant.

From 1997 to 2003, legally declared wildlife shipments into the U.S. increased significantly ($r^2=94.5\%$; $p<0.001$), doubling from 57,491 to 115,667, while the number of USFWS Wildlife Inspectors remained virtually unchanged (mean = 91). Due in part to the increase in legal wildlife shipments relative to inspectors, the inspection rate dropped from a high of 36% of declared shipments in 1997 to a low of 22% in 2003 (Table 1).

According to records of illegal imports and investigations from 1994-2003 (Table 2), the total number of sea turtle cases decreased significantly over the 10-year period ($r^2 = 96.7\%$; $p<0.001$). A concurrent decrease in the total number of turtle products seized was also significant ($r^2= 41.8\%$, $p=0.043$). Penalties were imposed in only 3.7% of all cases for which data were available; severity of penalties varied widely. When just egg and meat cases were examined, penalties imposed increased to 13% of cases for which penalty data were available. Eggs represented the vast majority of seized items (by number), followed by boots, jewelry and body (Table 3).

The United States has a number of laws to interdict and punish wildlife poachers and traffickers. Among these are the Endangered Species Act (ESA) (16 USC § 1540), Lacey Act (16 USC §§ 3371-3378) and Smuggling Statute (18 USC §545). The ESA provides protection for threatened and endangered species with misdemeanor violations punishable by fines up to \$100,000 and imprisonment not to exceed one year for endangered species. The Lacey Act can be used to target those who transport illegally taken or acquired wildlife across State and international borders. It has more teeth than the ESA, as Lacey Act violations can be either misdemeanors (with the same penalty ceilings as ESA violations) or felonies, which are punishable by fines up to \$250,000 for individuals and \$500,000

Year	Declared Imported Shipments	Shipments Inspected	Inspectors ¹	Inspection Rate
1997	57,491	20,430	97	35.50%
1998	71,147	25,628	94	36.00%
1999	78,683	25,143	90	32.00%
2000	95,078	24,621	90	25.90%
2001	98,033	23,960	86	24.40%
2002	110,008	25,268	86	23.00%
2003	115,667	25,046	93	21.70%
Total	626,107	170,096		
Average	89,444	24,299	91	27.20%

Table 1. Number of declared imported wildlife shipments and inspection rates from 1997-2003. ¹Number of USFWS Wildlife Inspectors employed on 31 December of each year.

for organizations, imprisonment up to five years, and forfeiture of any equipment involved in the crime. The Smuggling Statute has been used more recently with wildlife trafficking violations. This statute also carries felony provisions with maximum penalties of \$500,000 in fines, 20 years imprisonment and forfeiture of wildlife and property. Money laundering charges may also be levied in international trafficking cases under Title 18. Despite the availability of stiff penalties for wildlife crimes, sentencing guidelines generally restrict these highest penalties to repeat offenders who traffic in contraband for pecuniary gain. These offenders are mainly discovered through long and complex undercover operations. As a result, there are few deterrents for most poachers and traffickers.

Records of the illegal take of sea turtle eggs in this study demonstrate that the legal repercussions provide little deterrent for most poachers and traffickers. Penalties were levied in only 83 of 615 cases (13%); nearly all of these penalties stemmed from just 13 cases (representing one-third of the eggs seized in the 10-year period studied). Ten of these cases involved undercover or sting operations and accounted for 100% of jail time imposed (206 months) and 97% of probation imposed (397 months). These same 13 cases accounted for US\$16,200 (45%) of the fines that were levied for cases involving eggs. Notably, in cases with 500 or more eggs seized, 31% of the cases with complete data had no penalties levied (Table 3).

Eggs: While many egg smuggling cases interdicted at the ports involved small numbers of eggs, one egg trafficking case illustrates how small, seemingly unrelated cases can be connected. In this situation, a family-run trafficking ring smuggling eggs from El Salvador into the U. S. was detected and halted. There were at least eight people in this ring. Male A and Male B made over 80 trips to the U. S. in a two year period, smuggling upwards of 10,000 eggs on any given trip (US Fish and Wildlife Service 2000). However, they were apprehended and charged for only one trip each. Male A (Female D's son-in-law) was arrested at Los Angeles International Airport (LAX) in 1998 after smuggling 3654 eggs into the country and subsequently sentenced to 8 months jail. Later that same month, Female D's common-law husband (Male B) was apprehended at LAX with 2880 smuggled sea turtle eggs; he was sentenced to 4

months jail and 2 months home detention. In January, 1999, Male C (a family associate) was stopped with 2605 eggs in his possession and was later sentenced to 6 months home detention and 2 years probation. Females D and E were apprehended together in March, 2000 in Houston, Texas with 2880 eggs. Female D was the ring leader, and was sentenced to 6 months probation. Female E was not penalized. In August 2000, Female F (Female D's sister) was caught smuggling 1524 eggs into the United States via Houston, Texas (US Fish and Wildlife Service 2001, 2003). Females G and H were apprehended together in Atlanta, Georgia and confessed to making 12 previous trips, bringing in approximately 2400 eggs each time. Their penalty, if any, is unknown. Females G and H were not family members, but it is thought they were working with this trafficking ring.

The smuggling ring was sophisticated enough to use more than one arrival city, so when enforcement intensified at any one port they would change their pattern. Additionally, ring members traveling on the same flight would not sit together nor would they all be in the same class of service.

This case also demonstrates how lucrative the smuggling business can be. According to the affidavit from Male A's case, he purchased eggs for US\$0.11 each in El Salvador and sold them in Los Angeles for US\$3.34 (1999 prices). He was apprehended smuggling 3654 eggs, the street value of which was US\$12,204. Using the number of illegally imported eggs seized from this family-run trafficking ring during this 21-month period, there was a gross cumulative street value of US\$53,260. And these criminals admitted to smuggling thousands more eggs than were seized at the time of their detention.

More dangerous to sea turtles' survival than the take and trafficking of eggs is the take and trafficking of juvenile, subadult and adult animals for products such as leather, jewelry, meat, oil and medicinals. Because of turtles' slow maturation and other demographic parameters, their survival is particularly sensitive to mortality in the large juvenile stage (Heppell *et al.* 2000; Heppell *et al.* 2004; Heppell *et al.* 1999)—a stage that, in the absence of human predation, would have high survival. Unfortunately, it is post-pelagic

Year	Sea turtle cases	Items seized from these cases
1994	990	15,785
1995	821	13,861
1996	792	5873
1997	538	2437
1998	519	10,138
1999	416	11,294
2000	344	7473
2001	240	9902
2002	186	1501
2003	137	1222
Total	4983	79,486

Table 2. Number of USFWS sea turtle cases/year.

juveniles and vulnerable nesting females that are often harvested for leather, meat, tortoiseshell and oil (Koch *et al.* 2006).

Meat: Law enforcement of the illegal meat trade followed a similar pattern as with the egg trade. There were 118 cases totaling approximately 1061 kg of meat. However, of the 107 cases with penalty data, only 14 cases (13%) carried penalties. The monetary penalties did not exceed US\$500 in any of these cases, and in only two cases was confinement levied. One confinement case involved an 18-month undercover operation and the other confinement case was from a sting operation. Penalties levied in these cases are detailed in “Sting and Undercover Operations” below.

Jewelry: A review of jewelry cases shows only 5 of 255 jewelry cases (2%) with known penalties were charged. Of the US\$4237 in penalties for jewelry shown in Table 3, two cases accounted for US \$4000, nearly the total amount. As for the 98% of jewelry cases in which no penalties were levied, we can hypothesize that many involved tourists returning from tropical vacations with baubles made of tortoiseshell. These tourists are not commercial traders and are unlikely to import large quantities of turtle products; as such, their punishment is limited to forfeiting their contraband when they are apprehended. Market surveys in countries where tortoiseshell items originate show that vendors are commonly aware the items they sell are illegal, and that the majority of their customers are tourists who may or may not know they cannot legally purchase or carry these items across international boundaries (Bräutigam & Eckert 2006; Chacón 2002; Fleming 2001; Pérez 2005). While their individual offenses may seem minor, tourists cumulatively drive a large trade in turtle products which can be significant to remnant turtle populations.

Leather Boots: Other economically important products include leather, oil, lotions, medicine and calipée. During the 10-year period studied, there were 2733 cases involving leather footwear. Mexico was the sole source of boots with known geographic origin. Again, penalties were negligible in these cases, with over 99.9% of the cases carrying no penalties beyond confiscation of the illegal product. The remaining 16 cases resulted in US\$4625 in criminal fines and US\$3480 in civil fines. One case, in which the defendant

had a commercial load of boots at his home, did include 12 months probation.

Sting and Undercover Operations: In addition to routine cases that are generated through the wildlife import inspection process, proactive sting operations—specifically aimed at stemming the import of illegal sea turtle products—are undertaken. An example is a two-week sting operation in 1998 which targeted airlines arriving into the United States from Central America. This operation resulted in the indictment of 12 defendants on felony smuggling charges, with 772 eggs and 34 kg of meat confiscated. One smuggler possessed 490 of these eggs and all the meat. This defendant was not fined, but was sentenced to 6 months home confinement (served while awaiting trial) and 36 months probation, which was not served before deportation (confinement for this case is shown under egg penalties in Table 3). In the other 11 cases in this operation, the defendants were fined \$500 each.

Undercover operations are also a powerful tool employed by law enforcement to stem the illegal take and trade of sea turtles. One such undercover operation, which lasted 18 months from opening to indictments, charged 11 defendants with violations of both the Endangered Species Act and Lacey Act for selling over 150 kg of sea turtle meat to three restaurants. For these felony violations, the defendants were collectively penalized 49 months in jail, with two boats, three vehicles, two freezers and 10 pieces of fishing equipment seized.

It is through sting and undercover operations that illegal activity is oftentimes most severely punished, potentially slowing the illegal activity. However, these operations require significant time, coordination, and human and financial resources that are always in short supply in wildlife law enforcement.

Broad (2003) estimates the annual value of legal international wildlife trade to be US\$15 billion for wildlife products excluding fish, food products and timber. Millions of legal wildlife products (Schlaepfer *et al.* 2005) worth over a billion dollars (US Fish and Wildlife Service 2006) are imported into the U.S. annually. Our data show a significant increase in legal wildlife trade into the United States, doubling from 1997 to 2003 (Table 1). While legal wildlife

Turtle Product	Number	Kg.	Other	Total	Cases	Cases with penalties	Cases with no penalties	Cases with data missing	Fine (\$US)	Jail time in months	Probation time in months
Eggs	57,832	379 (est. 11,143 eggs)	n/a	68,975 eggs	742	83	532	127	\$35,710	206	409
Boots	5542 ¹	n/a	341 ²	5883 items	2733	16	2151	566	8,105	0	12
Jewelry	2394	0.01	n/a	2395 items	333	5	255	73	4,237	0	0
Body	1115	0.51	n/a	1116 items	466	10	255	201	\$8,757	0	0
Meat	323 (est. 323 kg)	738	n/a	1061 Kg	118	14	93	11	\$2,400	49	12
Oil	333	n/a	n/a	333 items	63	1	54	8	\$1,025	0	12
Medicine	201	n/a	n/a	201 items	11	0	8	3	\$0	0	0
Total	67,740	1,117.50	341	n/a	4466	129	3348	989	60.03	255	445

Table 3 Turtle products seized from 1994-2003 and case and penalty data from 1997-2003. ¹ The text mentions pairs of boots (2733) instead of individual boots. Most seizures were of boot pairs, recorded as two items. ² Skin pieces, garments, leather pieces and leather trim.

imports doubled, the number of Wildlife Inspectors remained relatively constant during the same time period, making it difficult for Wildlife Inspectors to devote time to interdicting illegal trade.

The illegal trade in meat, eggs, jewelry, boots and shells detailed here provides only a glimpse of all the sea turtle products trafficked into and within the United States. The wildlife trade monitoring organization TRAFFIC estimates the illegal trade in wildlife at US\$5 - \$8 billion a year worldwide (Roe et al. 2002). Interpol estimates the illegal wildlife trade at US\$12 billion a year, second only to drugs (Derr 2002). While the Convention on International Trade in Endangered Species (CITES) does not put a dollar amount on it, it infers that the value of international wildlife trade is third, after drugs and weapons (Shinawatra 2004). The International Fund for Animal Welfare (2005) conducted a one-week review of the volume of Internet wildlife trade (including only live primates, turtle shells and other reptiles, wild cat, and elephant products). In this one-week period, 9000 animal products, predominately protected species, were for sale on English-language Internet sites. This relatively new method of commerce facilitates the illegal sale of protected species and makes such sales difficult to track. Because illegal wildlife trade is covert, it is difficult to calculate total numbers, but these estimates indicate that the money and goods involved are considerable and provide educated assessments as to the scope of the problem.

Data presented here show that the number of illegal sea turtle products interdicted at United States ports of entry steadily declined, with the number of cases in 2003 at only 15% of the total in 1994. Some possible causes of this decline include: fewer sea turtles to trade, decreasing demand for sea turtle products in the United States, less illegal activity, or a combination of these factors. Alternatively, the decline in seized imports could be due to shifted law enforcement priorities, a lack of resources for enforcement, or smugglers transitioning to more sophisticated trafficking techniques. Regardless, the persistent demand for rare species drives a widespread illegal trade in wildlife (Roe et al. 2002), and the cases glimpsed here cumulatively hint at an alarming level of illegal exploitation of often remnant populations (Bräutigam & Eckert 2006; McClenachan et al. 2006).

Most wildlife criminals do not receive stiff penalties in the United States. According to USFWS Special Agent-in-Charge Mike Elkins (now retired), the reversal of federal sentencing guidelines [United States v. Booker (04-104) 543 U. S. 220 (2005)] and limited resources for prosecution of wildlife crimes has further reduced penalties for these crimes. In addition, Assistant U. S. Attorneys are encouraged to focus on felony crimes, which draws attention away from the predominately misdemeanor wildlife crimes (M. Elkins, pers. comm.).

Unfortunately for sea turtles and the ecosystems of which they are a part, sea turtles remain an important economic, cultural, religious and subsistence resource in many areas of the world. The take and trade of sea turtles contributes to the decline of these threatened and endangered species. Sea turtles' highly migratory nature necessitates that all range and consumer countries share the responsibility to ensure sea turtles and their habitats are protected. This coordination will help ensure that the protection efforts of one country are not negated by the poor management of resources and habitats in another country (Chacón 2002). Education and community involvement are essential elements in turning the tide in illegal sea turtle trafficking (Pérez 2005). As García-Martínez &

Nichols (2000) state: "As long as people are unaware of the global and local consequences of insufficient protection of the sea turtle populations, they will not assume conservation culturally, and no law can change this."

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In-Water Observations of Recently Released Juvenile Hawksbills (*Eretmochelys imbricata*)

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Direct observations of animals at different life history stages provide important information regarding habitat use and behavior. Furthermore, understanding daily movements and activity patterns of sea turtles can provide insights into important foraging and resting sites, and therefore critical habitats (Seminoff *et al.*, 2002) that may require specific conservation measures. Focal follows of marine turtles have been reported by several authors (Houghton *et al.* 2000; Diez *et al.* 2002; Houghton *et al.* 2003; Meadows 2004; Schofield *et al.* 2006). Meadows (2004) used focal-animal activity budget observations to study impacts of human-turtle interactions and categorized observed behaviors as inactive on the bottom, swimming in the water column, being at the surface, active on the bottom, and feeding. In addition to a variety of solitary behaviors such as resting, swimming (Booth & Peters 1972; Schofield *et al.* 2006), foraging (Booth & Peters 1972; Houghton *et al.* 2000; Schofield *et al.* 2006), food handling (Davenport & Clough 1985), and self-grooming (Schofield *et al.* 2006; Frick & McFall 2007), several authors have directly recorded social interactions of male and female turtles, including antagonism and mating in loggerhead turtles (*Caretta caretta*) (Schofield *et al.* 2006), and initial courtship interactions, mounting behavior and intermale aggression in green turtles (*Chelonia mydas*) (Booth & Peters 1972; Jessop *et al.* 1999). However, relatively few direct observations of juvenile sea turtle activities are available in the published literature (Davenport & Clough 1985; van Dam & Diez 1997; Houghton *et al.* 2003), and we are unaware of reports of direct, in-water observations of captive-held turtles that have been released.

In most cases, surveys for sea turtles are conducted in areas where individuals occur in high densities, and cover relatively small areas of distribution (van Dam & Diez 1997; León & Diez 1999; Diez *et al.* 2002). However, expanding observational investigations in areas with little previous work may provide critical habitat and behavior information important for management of turtle species. Although some work has been done on the behavior and habitat use of the critically endangered hawksbill turtle, *Eretmochelys imbricata*, in its juvenile stage (Limpus 1992; Boulon 1994; Musick & Limpus 1997; van Dam & Diez 1997; León & Diez 1999; Meylan 1999; Diez & van Dam 2002; Whiting & Koch 2006), direct, in-water observations of hawksbill behaviors have not previously been reported from the waters of Honduras, despite the fact that the Bay Islands have been recognized as one of seven major nesting areas on record in the Caribbean for this species (McClenachan *et al.* 2006). In addition, there are numerous anecdotes by local fishermen and unpublished reports of hawksbill sightings in the past, especially around the Bay Islands (Carr *et al.* 1982; Cruz & Espinal 1987).

Our purpose here is to provide the first report of findings for in-water observations of activities for captive-held, recently-released, juvenile hawksbills from Honduras.

Juvenile hawksbill turtles were incidentally hand captured by local fishermen around Port Royal between March 2006 and June 2007, and kept in a large sea pen at our research site for periods ranging from a few weeks to eight months. Turtles were fed approximately every other day, but were not fed on the day of release. Prior to release, turtles were flipper tagged with Inconel style 681 metal tags