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## The Collaborative to Combat the Illegal Trade in Turtles: Addressing Illegal Wildlife Trade with an Adaptive Socio-Ecological Approach

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**ABSTRACT.** – Illegal wildlife trade is a complex and lucrative transnational crime that involves social, ecological, cultural, political, and economic factors. It is also a significant conservation challenge that can threaten species, ecosystems, and societies. Although illegal wildlife trade negatively impacts various species, many North American turtle populations are exceptionally vulnerable to the removal of wild individuals due to their life history traits. Some of the key challenges to addressing illegal trade in turtles include shortcomings in laws, regulations, and the criminal justice system; insufficient data to understand the issue; and insufficient resources to combat the issue. Herein, we provide a brief characterization of the illegal turtle trade in North America and describe how a grassroots working group, the Collaborative to Combat the Illegal Trade in Turtles (CCITT), formed in response to this urgent conservation crisis. Our collaborative and adaptive socio-ecological approach includes examples and serves as a case study on how wildlife trafficking can be addressed through identifying the need and scope of the problem, building and expanding a network of core partnerships, defining a strategy, and implementing that strategy in an adaptive and iterative way. Looking ahead, we recognize that the CCITT has gaps in representation and, therefore, a need to expand partnerships as well as work towards the full implementation of our strategic plan. While there will never be a “one-size-fits-all” approach to combating illegal wildlife trade, we maintain that sharing approaches, successes, lessons learned, and outcomes with others outside of the immediate area of focus is critical to advance conservation outcomes.

**KEY WORDS.** – wildlife trafficking; illegal trade; poaching; wildlife trade; pet trade; turtle trade; endangered species; socio-ecological

Illegal wildlife trade is a major conservation challenge affecting global ecosystems (Wilcove et al. 1998; Robinson et al. 2015; Scheffers et al. 2019), societies, and economies (Nellemann et al. 2016; Wright et al. 2016; Financial Action Task Force [FAFT] 2020). As one of the

top illegal transnational activities, it generates billions of dollars in criminal profits (Warchol 2004; Nellemann et al. 2016; Wright et al. 2016; FAFT 2020) and can facilitate the spread of zoonotic diseases (Chomel et al. 2007; Gómez and Aguirre 2008) and invasive species (Smith

et al. 2009; García-Díaz et al. 2017). Illegal wildlife trade occurs in a complex socio-ecological landscape which varies by country, species, and scale, and involves multiple sectors from individuals to groups, and syndicates to governments (Phelps et al. 2016).

North America supports one of the world's richest assemblages of freshwater turtles and tortoises (Mittermeier et al. 2015) (hereafter, turtles), some of which have been subjected to an extensive history of unregulated commercial collection (Moll and Moll 2004; Brennessel 2006). Today, illegal and unsustainable collection continue to threaten the viability of turtle and tortoise species, including those native to North America (Rhodin et al. 2018; Morton et al. 2021). Although overexploitation impacts many vertebrate species, turtle populations can be particularly vulnerable to the removal of individuals from the wild because of their life history traits. Turtle life history is typically characterized by delayed reproductive maturity, high rates of egg and juvenile mortality, high survivorship of adults in unimpacted populations, and long lifespans (Congdon and Gibbons 1990). Turtle population trajectories are most sensitive to reductions in adult survivorship, especially among females, and thus, population viability is heavily dependent on ensuring the survival of the relatively few turtles that reach adulthood (Congdon et al. 1993; Heppell 1998; Rachmansah et al. 2020). For some species, even the persistent loss of a few adults per year can lead to local extirpation (Howell and Siegel 2019). This demographic reality is of particular importance for species that are in even moderate demand for trade.

The vulnerability of North American freshwater turtles and tortoises combined with observations of their illegal collection and trade led to a collaborative response among concerned professionals. The Collaborative to Combat the Illegal Trade in Turtles (CCITT), a grassroots working group, has since grown into an organization engaged in broad strategic thinking, transnational conversations, and coordinated actions that focus on addressing the issue. In this paper, we discuss 1) the characterization of the global trade in North American turtles, 2) the identification of key challenges to addressing illegal trade, and 3) actionable strategies that address illegal trade that span disciplines, sectors, and geographies. These efforts have expanded from regional concerns and actions focused on immediate needs, to long-term strategic planning at multiple scales.

## CHARACTERIZING THE GLOBAL TRADE IN NORTH AMERICAN TURTLES AND TORTOISES

Characterizing the scope and scale of the trade in North American freshwater turtles and tortoises is challenging because trade networks are complex and sometimes underregulated, data are scarce, and legality is often obscured. However, the role of the United States is well documented as a major source, transit, market, and

consumer country for wildlife, including turtles (Luiselli et al. 2016; United Nations Office on Drugs and Crime [UNODC] 2020; Tow et al. 2021; Pires et al. 2023). Although available trend data are mostly limited to national imports and exports, it is clear that the trade in turtles is substantial and persistent, and that the United States plays a particularly important role in the global marketplace (Mali et al. 2014; Easter and Carter 2024). According to one analysis of data from the Law Enforcement Management Information System (LEMIS), 192 million live turtles were exported from the United States from 1999 to 2018 for commercial purposes, 99.8% of which were US native species (Easter and Carter 2024). In another analysis using data from the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), from 1999 to 2010 the United States was the single largest global importer of freshwater turtles registered as originating from the wild (source code W), and the second largest exporter (Luiselli et al. 2016). Caution is required when interpreting these results relative to other countries that may be underreporting as well as gauging the potential impact to wild populations. For example, the majority of live turtles being exported from the United States are produced at aquaculture facilities (i.e., turtle farms), including hatchlings with coding as “wild” because they may be the first generation (F<sub>1</sub>) of wild stock (Luiselli et al. 2016; US Department of Agriculture 2019). Conversely, Luiselli et al. (2016) also note that many species of freshwater turtles were not included in the CITES appendices, and thus their import and export numbers are largely unknown (with the exception of the United States, where LEMIS records legal shipments for all taxa). Regardless, the reported volumes make clear the significant demand for North American turtles as a commercial commodity.

Additional data elucidate the fact that illegal activity is widespread and persistent. In one study, reptiles constituted the largest proportion (69%) of global seizures of live, trafficked wildlife, and turtles made up > 50% of those seizures (Rosen and Smith 2010). Between 2007 and 2017, 9 of the top 10 most frequently seized reptiles globally were turtles, with the United States serving as the final destination or transit country for over 9% of these seizures, second only to China and Malaysia (2020). Easter et al. (2023) identified 54 known cases of illegal trade in the United States occurring between 1998 and 2021 by examining US Department of Justice (US DOJ) press releases and monthly bulletins along with news articles. These cases involved the illegal trade of at least 24,000 native North American turtles of 34 different species. Trade occurred in at least 43 US states and 6 countries, including Canada. As with other environmental crimes, a large portion of wildlife trafficking is likely to go undetected or be misreported (Wellsmith 2011; Kurland and Pires 2017). It is reasonable to assume that the true scope and scale of North American turtle collection

**Table 1.** Important law enforcement case examples of turtle trafficking that led to conviction in North America as reported by the US Department of Justice (US DOJ).

Case	Timeline	Species	Estimated market value, US dollars	Sentence
1 (US DOJ 2016)	Apr 2014–Sep 2014	Various species including eastern box turtles ( <i>Terrapene carolina carolina</i> ) and diamondback terrapins ( <i>Malaclemys terrapin</i> )	Unknown	57 mo in prison and \$17,000 restitution
2 (US DOJ 2019)	Nov 2011–Oct 2017	Diamondback terrapins ( <i>Malaclemys terrapin</i> ) and box turtles ( <i>Terrapene</i> sp.)	\$565,000–\$958,000	6 mo in prison, 3 yrs of supervised release including 6 mo of house arrest, and \$250,000 restitution
3 (US DOJ 2021)	Jun 2017–Dec 2018	Eastern box turtles ( <i>Terrapene carolina carolina</i> ), Florida box turtles ( <i>Terrapene carolina bauri</i> ), Gulf Coast box turtles ( <i>Terrapene carolina major</i> ), spotted turtles ( <i>Clemmys guttata</i> ), and wood turtles ( <i>Glyptemys insculpta</i> )	\$2,250,000	38 mo in prison, 1 yr of supervised release, and \$10,000 restitution, equaling total assets held in the United States
4 (US DOJ 2022)	2015–2017	Common musk turtle ( <i>Sternotherus odoratus</i> ), eastern mud turtles ( <i>Kinosternon subrubrum</i> ), loggerhead musk turtles ( <i>Sternotherus minor</i> ), and stripe-necked musk turtles ( <i>Sternotherus peltifer</i> )	Unknown but earned at least \$150,000	1 yr and 1 d in prison, 3 yrs of supervised release including 6 mo of house arrest, and \$10,000 restitution; ordered to complete 200 hrs of community service, and banned from trapping turtles and other wildlife during supervised release period

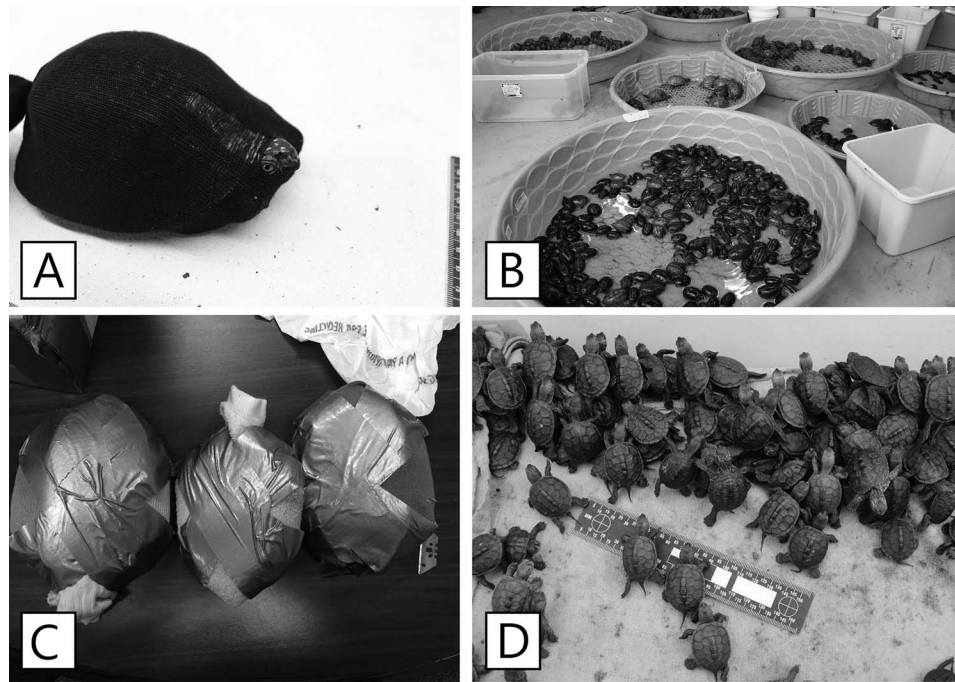
and trade, particularly illegal trade, is grossly underreported and underestimated.

In Table 1 we highlight several cases representing large-volume illegal trade to underscore key insights about the illegal trade of North American turtles and what inspired conservationists to take action. It should also be noted that when a suspect is charged with a crime, the number of turtles might only be related to the charges that are being prosecuted. Relevant conduct of the actors and the number of turtles involved may or may not be part of the total number of turtles confiscated or involved in the charged crime. The suspect may have been involved and engaged in the illegal trade for years but is only charged with certain conduct and number of turtles. In other words, it is often not reported or known if the number of turtles in each of these and other cases represent the total number of turtles involved, or a portion of turtles involved in each case. In the cases summarized, thousands of North American turtles were illegally collected from the wild and sold (Table 1). These cases highlight some common features of the illegal turtle trade in North America. For example, in all cases, there were significant animal welfare concerns. Animals prepared for transport are inhumanely handled and packaged, often to reduce or evade detection during transit. Shipping often occurs via postal services and express couriers but turtles can also be hand-carried by individuals. Turtles are often prepared for transport by being deprived of food and water before

shipment, causing dehydration and physiological stress. Subsequently, they are often then bound with tape and/or tight socks to restrict movement (Fig. 1). Together, with lack of food and water, these conditions can lead to direct mortality, or can be exacerbated by exposure to pathogens.

The case examples also demonstrate the various roles individual actors play, and the scope and scale of illegal transnational networks engaged in illegal activities. In Case 1, the offender admitted to smuggling or trying to smuggle more than 1600 turtles of different species out of the United States into Canada and China. The offender in Case 2 intensively collected locally, poaching thousands of diamondback terrapins (*Malaclemys terrapin*) and their eggs from New Jersey marshes and illegally sold them online as captive-raised. When law enforcement executed the search warrant of the offender's residence, they found 3442 diamondback terrapin hatchlings and 23 box turtles (*Terrapene* spp.). In Case 3, the offender did not enter the United States but was still able to finance a US ring of individuals who smuggled at least 1500 protected turtles valued at more than 2 million US dollars. The turtles were shipped to intermediaries across 5 US states, who repackaged and purposefully mislabeled them for shipment to Hong Kong. In Case 4, the offender shipped thousands of illegally trapped freshwater turtles from Georgia to a person in California who exported the turtles to China for the pet trade.

Data from overseas further exemplify that North American turtles are in high global demand and subject to



**Figure 1.** Images of North American turtles confiscated by US law enforcement authorities that demonstrate characteristic features of illegal collection and trade. (A) Eastern box turtle (*Terrapene carolina carolina*). Photo credit: US Fish and Wildlife Service (USFWS). (B) Florida box turtles (*Terrapene carolina bauri*) and 3-striped mud turtles (*Kinosternon baurii*) illegally collected from the wild in Florida that were seized in 2021. Photo credit: Florida Fish and Wildlife Conservation Commission. (C and D) Confiscated diamondback terrapins (*Malaclemys terrapin*). Photo credits: USFWS.

illegal trade. In Hong Kong, it was estimated that 36% of species offered on an internet forum were being illegally traded (Sung and Fong 2018). Results from these surveys (2013–2016) indicated that 3251 (23%) of the 14,360 individuals and 26% of the 136 species offered for sale were native to North America (Sung and Fong 2018). Of these, 12% were eastern box turtles (*Terrapene carolina*), 11% were diamondback terrapins (*M. terrapin*), and 3% were spotted turtles (*Clemmys guttata*), all of which have been central to recent confiscation cases in the United States (Table 1). In more recent surveys of physical reptile markets and online sites offering turtles for sale in Hong Kong, online sites were more likely to be selling turtles illegally (Sung et al. 2021). Although North American turtle species have long been sold in Hong Kong (Cheung and Dudgeon 2006) and determining whether these were captive-bred or collected from the wild is difficult or impossible, opportunities to sell North American turtles more widely and with less legal exposure have come with increased use of internet platforms (Sung et al. 2021). It is clear that the illegal collection and trade of North American freshwater turtles and tortoises is a pervasive and significant conservation issue.

### KEY CHALLENGES

*Shortcomings in Laws, Regulations, and the Criminal Justice System.* — In Canada and the United States, a mosaic of both federal and provincial or state statutes and

regulations exist to administer or restrict turtle possession, take of wild turtles for personal and commercial use, captive breeding and farming, and use for other purposes, including in research. These statutes and regulations may be collectively or separately administered by multiple governmental agencies within a jurisdictional area, thereby creating enforcement challenges. Loopholes or gaps in regulations are known to be exploited by wildlife traffickers (Romero-Vidal et al. 2022). In the United States, each state and jurisdiction maintains their own permitting, take, possession, and transport regulations, along with enforcement mechanisms, under an individual statutory framework. The variation among many different regulatory frameworks often confounds regional or national antitrafficking efforts and allows for legal loopholes to drive the trade dynamics in a region (Mali et al. 2014). In many jurisdictions, the evaluation and revision of statutes and regulations has not kept pace with risk to wild populations.

Wildlife trafficking is frequently viewed as a low-risk, high-reward crime (Brown et al. 2021). This dynamic arises, in part, from systemic limitations and challenges throughout the criminal justice system. Deficits in internal support, general knowledge, and training related to the scope, scale, and impacts of illegal wildlife trade, and insufficient capacity can limit field law enforcement response (UNODC 2020). Furthermore, prosecutors and the judiciary may be underinformed about the global scale of wildlife crime, including reptile or turtle crime and the associated

harms (Sosnowski et al. 2022). Furthermore, a lack of information on successful and unsuccessful deterrents to illegal wildlife trade hinders our ability to improve the effectiveness of the criminal justice response (Moreto and Gau 2017; Wilson and Boratto 2020). Adding to this complex legal landscape is the recognition that formal laws can conflict with local social norms, creating a discrepancy between legality and social legitimacy that affects compliance outcomes (‘t Sas-Rolfes et al. 2019). Further empirical research is needed to identify strategies that will be most likely to prevent and deter illegal turtle trade.

*Insufficient Understanding of Scale and Complexity.* — The clandestine nature of illegal wildlife trade inhibits our ability to quantify and understand its scale (Barber-Meyer 2010). A lack of accessible and reliable databases documenting reports of seizures at local, regional, or national scales also limits assessments of trends and predictive analyses (Kurland and Pires 2017). Another confounding factor in the United States and Canada is the inability to differentiate between legally and illegally sourced animals. For example, illegally sourced animals may be laundered into legitimate trade (Shi et al. 2007; Nijman and Shepherd 2009). Information on the links between legal and illegal trade is needed for targeting interventions (‘t Sas-Rolfes et al. 2019; UNODC 2020). In the United States and Canada data collection and record keeping can vary greatly by state or province. In many cases, data on the scale of collection and use from the wild are either lacking or absent altogether (Schlaepfer et al. 2005). As a result, management and policy or regulatory decisions to address trade issues remain uninformed or underinformed.

Identifying ways to prevent and respond to illegal turtle trade is also limited by a gap in systematic research on those involved, the underlying drivers of trade, and noncompliance with regulations. An effective response is further limited by a lack of data on those involved and network structures, particularly given that some individuals play multiple roles within dynamic trade networks (Phelps et al. 2016; Stoner 2018).

*Resource Limitations and Constraints.* — A general shortage of resources and the more efficient allocation of those resources are 2 major challenges facing wildlife conservation (Miller et al. 2002; Evans et al. 2016; Jewell et al. 2020; Wiedenfeld et al. 2021). For example, in the vast majority of jurisdictions, there are no dedicated facilities or funding sources for the care of confiscated animals, or the downstream resources needed to support potential repatriation (e.g., disease testing, genetic testing, postrelease monitoring). Wildlife management agencies must determine on a case-by-case basis how to cover costs within existing budgets or pursue nontraditional means of funding. Upon confiscation, seized turtles can require costly medical care and health assessments. Assessing welfare can be challenging for taxa such as reptiles, which may not display obvious indicators of stress or disease (Baker et al. 2013). Costs can also be incurred

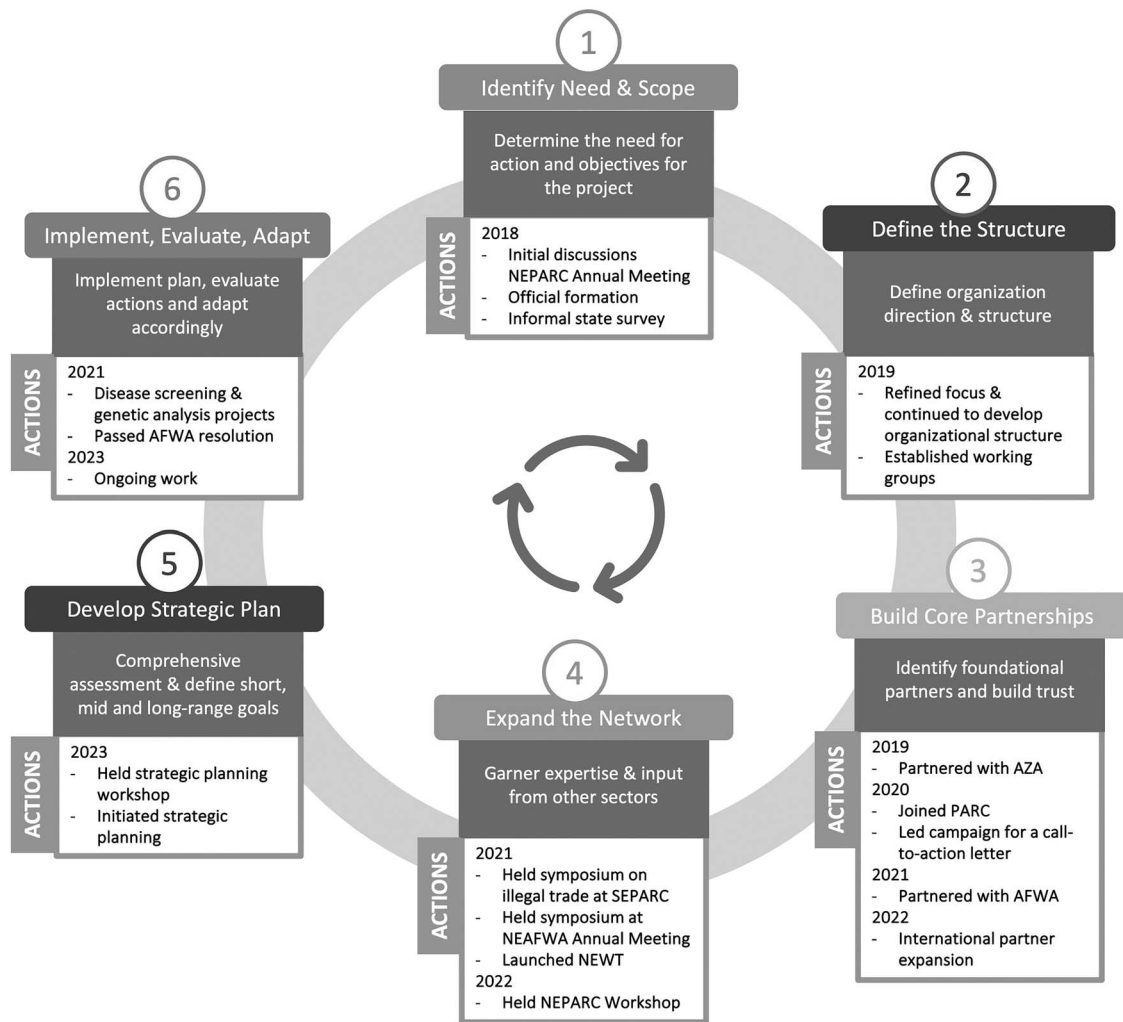
with long-term housing needs for confiscated turtles until health and genetic screenings can be conducted to assess the potential for release to the wild.

Despite being widely recognized as a significant conservation issue, few funding sources exist to study legal and illegal trade in turtles. Part of this issue is due to the “low social capital” of reptiles and amphibians, funding systems that favor charismatic taxa, and how management agencies allocate budgets (Sigouin et al. 2017; Duda et al. 2022; Olson and Pilliod 2022). Funding systems and decision-making can be misaligned with holistic conservation action and reptiles are often not prioritized for conservation and monitoring, further compounding the key challenges associated with the illegal turtle trade (Marshall et al. 2020; Olson and Pilliod 2022).

## AN ADAPTIVE AND COLLABORATIVE SOCIO-ECOLOGICAL APPROACH

Like other forms of wildlife crime, turtle trafficking occurs in diverse social and ecological settings at local, national, and global scales (Browne et al. 2021). Every step along the wildlife trade chain involves human behavior, which can be influenced by internal factors, like knowledge, beliefs, and values, and external factors such as economic conditions, governance structures, and geography (Wallen and Daut 2018; Manfredo et al. 2021). This dynamic makes illegal collection and trade of turtles a formidable challenge to confront, particularly for a small grassroots organization. Our experience demonstrates that facing such a daunting challenge with a phased approach makes for a more manageable and effective strategy (Fig. 2). Below, we describe the iterative steps taken by the CCITT to grow our group and address this conservation crisis.

*Identify Need and Scope.* — The collective recognition and exploration of the problem and its extent are important initial steps. For the CCITT, these steps included reaching out to a diverse group of colleagues with relevant expertise to get their perspectives on the issue. As the extent and severity of illegal collection and trade in North American turtles became more apparent, the desire to confront the problem in a meaningful way reached a tipping point among conservation professionals. Calls for an interdisciplinary and cross-sectoral working group to address the issue were initiated during the Northeast Partners in Amphibian and Reptile Conservation Annual Meeting held in August 2018 in Amherst, Massachusetts. In response, the CCITT officially formed in October 2018 as a grassroots working group focused, at first, on all amphibian and reptile species that might be subject to illegal collection and trade in the northeastern United States. The group later reached consensus that turtles should be prioritized given their vulnerable life history characteristics and evidence suggesting that the prevalence of illegal trade was greatest among turtles. These early decisions were instrumental in determining a



**Figure 2.** Iterative approach used to build a collaborative network and strategy to address illegal turtle trade highlighting impactful actions undertaken by the Collaborative to Combat the Illegal Trade in Turtles. AFWA = Association of Fish & Wildlife Agencies; AZA = Association of Zoos and Aquariums; NEPARC = Northeast Partners in Amphibian and Reptile Conservation; NEWT = Network Exploring Wildlife Trade; PARC = Partners in Amphibian and Reptile Conservation; SEPARC = Southeast PARC.

trajectory for the CCITT, which soon after developed its mission statement—to advance efforts to better understand, prevent, and eliminate the illegal collection and trade of North America’s native turtles.

*Define the Network and Structure.* — The initial efforts of the CCITT focused on building a foundational network of conservation professionals with expertise and resources that could confront key challenges related to illegal collection and trade of turtles. From the outset, emphasis was placed on building relationships between biologists and wildlife law enforcement officers, and raising the profile of the issue among all conservation professionals, including leadership within governmental agencies.

The CCITT organizational structure has changed little since it was first defined. Business and coordination responsibilities fall primarily to a leadership board that meets several times a month and a slightly larger steering committee that meets 4 times a year. Members are from governmental agencies, academia, and nongovernmental

organizations and have a variety of professional backgrounds, such as conservation biology, law enforcement, policy, social sciences, and communications. Nonagency personnel are vetted via an application and reference-check process to ensure adherence to policies around the sharing of potentially sensitive information. All members are encouraged to participate in at least 1 working group focused on targeted projects and initiatives. There are 5 working groups organized around different key challenges associated with illegal collection and trade: Confiscation and Repatriation, Human Dimensions and Communications, Law Enforcement, Regulatory and Judiciary, and Research and Data (Table 2).

*Build Core Partnerships.* — Engagement with core partners can help build momentum and bring new resources to catalyze the most urgent and implementable actions. With consistent interest from areas outside of the northeastern United States in October of 2020, the CCITT officially became a national task team of Partners in

**Table 2.** Collaborative to Combat the Illegal Trade in Turtles (CCITT) working groups organized around key challenges of illegal collection and trade in turtles.

Working group	Key challenges	Actions
Confiscation and repatriation	Lack of capacity to house and rehabilitate confiscated turtles and to evaluate risk factors (disease and genetics) leads to reduced enforcement and reduced ability to repatriate turtles	Developed a standardized process for documenting information on confiscated turtles Continue to expand a network of facilities that can provide housing Develop decision-support tools to inform the final outcome of confiscated turtles Developed protocols for handling confiscated turtles Developed template confiscation plan
Research and data	Lack of publicly available databases leads to inability to assess trends and predict demand, species and geographies	Compiled literature database Launched undergraduate education program on wildlife trade Compiled research on gaps in knowledge Examined online turtle sales
Human dimensions and communications	Lack of research on the different types of actors from source to end buyer, and underlying motivations and drivers of trade	Developed CCITT Communications Guide Developed Wild Turtle Week and other educational awareness activities Strengthened Community of Practice on social science as it relates to illegal trade
Law enforcement	Limited public awareness Challenges with communication and capacity among jurisdictions and agencies; competing priorities for limited resources	Identified law enforcement needs and allocation of resources towards needs Facilitated communication among law enforcement agencies Elevated issue to broader conservation community through presenting at workshops and training
Regulatory and judiciary	Broad variation in legal frameworks and governance structures confounds anti-trafficking initiatives and allows for legal loopholes	Provided biology and trade data to prosecutors so they may assist the judiciary in imposing informed criminal penalties Assisted with the development of the AFWA resolution and model statutory language

Amphibian and Reptile Conservation, an umbrella partnership that focuses on the conservation of amphibians and reptiles.

With a national direction, we soon focused on expanding our scope outside of the northeastern United States. In 2021, the CCITT partnered with the Association of Fish and Wildlife Agencies (AFWA), a nongovernmental organization that works with state, provincial, and territorial wildlife agencies and partners across North America. AFWA staff coordinate with member agencies and their senior staff to collaborate on cross-cutting national and international issues such as the illegal trade in turtles. Over the last several years, AFWA has worked to elevate illegal trade issues to agency leadership and the roles that states play. For example, in September 2022 in concert with the CCITT, AFWA passed a resolution “In Support of Enhancing Regulatory, Collaborative, and Strategic Capacity to Combat the Illegal Trade in Turtles” (AFWA 2022a). This resolution contains principles to support the continued survival of North America’s native turtles by raising public and professional awareness and acknowledgement of the threat of illegal trade, strengthening legal frameworks, encouraging agency nongame funding and capacity enhancements, and recommending increased interstate and regional information-sharing. The resolution also aims to address inconsistencies between states in their legal frameworks governing turtles. It is accompanied by model statutory language for state

agencies to consider voluntarily adopting in whole or in part, primarily concerning agency jurisdiction and regulations regarding the harvest and possession of wild reptiles and amphibians (AFWA 2022b). Since the resolution has passed, AFWA has worked to convene state agency representatives to share information on strengthening state legal frameworks to conserve turtles and other reptile species.

Another important partnership formed was in response to the key challenge of a lack of capacity to house and care for confiscated turtles. The Association of Zoos and Aquariums’ (AZA) Saving Animals from Extinction (SAFE) program is the flagship conservation program of AZA. SAFE programs bring together the resources of multiple AZA members with non-AZA field partners to address the conservation needs of threatened species, uniting all stakeholders around a common cause. To support this endeavor, the AZA SAFE American Turtle Program is providing important capacity through infrastructure, trained veterinary staff, establishing procedures and protocols for holding and disease screening, and education programs to raise public awareness and community outreach and engagement. The SAFE American Turtle Program has collaborated with the CCITT since 2019 and fills a co-chair role on the CCITT Confiscation and Repatriation working group. Together, AZA and the CCITT have expanded a network of facilities available for housing and care of confiscated turtles and continue to



quantify the costs and needed housing capacity to help inform long-term funding needs.

With the help of AZA, the CCITT developed several documents and tools to assist with the determination of outcomes of seized turtles. These included protocols for handling turtles at the time of confiscation to optimize health and welfare, and maximize the conservation value of these animals (CCITT 2021). In addition, decision-support tools were developed that evaluate risk factors to help inform the final outcome of confiscated turtles, which can include euthanasia, use as educational or research animals, use for ex situ conservation breeding programs, or release back to the wild (CCITT 2022). Finally, the CCITT and AZA have drafted a state confiscation template to guide individual states on the development of a formal confiscation response.

*Expand the Network.* — Once core partnerships are built, it is important to expand the network by broadening represented expertise and input from other sectors while also increasing visibility. Core partnerships can also be leveraged to bring in new partners, members, and/or resources. Network expansion and growth opens opportunities for the integration of additional perspectives and experiences, providing a deeper or more refined understanding of the problem. New perspectives from multiple sectors support the identification of key gaps and a greater variety of possible solutions.

In an effort to increase visibility and broaden the CCITT network, members presented on turtle trafficking at the North American Wildlife and Natural Resources conference (2020) and brought forth a call-to-action letter, which was endorsed by 36 conservation organizations and 655 conservation professionals. The call to action highlighted a need to coordinate state regulations to address conservation risks to turtles, provide additional resources for wildlife law enforcement, enhance public outreach by communicating the extent of the crisis, eliminate demand for wild-caught turtles, increase resources for housing confiscated turtles, and implement science-based strategies to guide outcomes for confiscated turtles.

Following the call to action, momentum to address illegal trade of North American turtles was built in multiple spaces. In conjunction with AFWA and other partners, the CCITT convened several regional workshops focused on illegal trade in turtles in the eastern and midwestern United States and southern Canada (Wixted and Christman 2022; Wixted 2024), with an explicit purpose of bringing state, federal, provincial, and Native North American and Indigenous law enforcement and biologists together. As the profile of the work of the CCITT increases, so do new opportunities for new partnerships. Significant relationships were established with Canadian governmental representatives and a nongovernmental organization working on international turtle trade. These partnerships and workshops raised awareness of the issue, increased communication, and aided in developing a better understanding of the needs and challenges associated

with illegal trade in turtles while also guiding the current work of the CCITT. The workshops also highlighted an opportunity to improve partnership efforts through strengthening engagement of the CCITT with Native North American and Indigenous peoples expertise and capacity.

The CCITT also identified the need to expand its reach into higher education institutions. A comprehensive survey of US institutions by the CCITT determined that < 1% of universities and colleges offer courses on wildlife trafficking (J. Sevin, unpubl. data) and the subject is generally limited to 1 lecture in a conservation biology course or other similar courses. This lack of educational opportunities creates a knowledge gap for future conservation practitioners. To address this gap, the Network Exploring Wildlife Trade (NEWT) was created by the 2 co-chairs of the CCITT Research and Data working group. The NEWT network included faculty and classes at 30 universities and colleges in the United States and engaged > 1000 undergraduate students in learning about wildlife trade through lecture-style material and research activities that included developing and answering authentic research questions on the subject. Through this program, students were exposed to new career paths and exhibited increased awareness and understanding of wildlife trade, and some have had the opportunity to publish their research on wildlife trade in scientific journals (Montague et al. 2022).

*Develop Strategic Plan.* — Strategic planning is a systematic process that helps organizations develop measurable goals and targets to maximize focus to track key performance indicators. Identifying major system drivers and roots of the issues, designing effective responses, articulating assumptions, and assessing potential and actual impacts or consequences of proposed actions requires interdisciplinary systems thinking, and deliberate collaboration between different sectors of society (Núñez-Regueiro et al. 2020; Browne et al. 2021).

One tool for addressing complex conservation challenges is Conservation Standards (Núñez-Regueiro et al. 2020). Designed as an open-source decision support framework, this process enables partners to effectively conceptualize complex situations to develop strategies and assessment tools to achieve desired outcomes (Conservation Measures Partnership [CMP] 2020). In 2022, the CCITT began a facilitated multipartner strategic planning process to better understand and address the illegal turtle trade of North American freshwater turtles and tortoises using Conservation Standards. Through this process, a situation analysis was conducted, and a conceptual model of the socio-ecological context of the illegal freshwater turtle trade was developed. This strategy helped collaborators see the full context of a problem by visualizing the direct and indirect factors and drivers; ask explicit questions about the human behaviors and the social, cultural, and economic factors that drive them; and identify key points of intervention.

**Table 3.** Emerging Collaborative to Combat the Illegal Trade in Turtles (CCITT) strategic planning priority areas of focus, goals, and objectives resulting from collaborative process soliciting focus group and workshop participant input.

Area of focus	Goal summary	Example objectives
Strategic partnerships	Build and maintain strategic partnerships to create a coalition around addressing illegal turtle trade	<ul style="list-style-type: none"> <li>• Establish, maintain, and expand partnerships in the United States, Canada, and Mexico</li> <li>• Establish, maintain, and expand international partnerships in transit and demand areas</li> <li>• Identify and secure sustained funding for network priorities</li> </ul>
Human dimensions	Understand how people affect and are affected by the turtle trade and apply evidence-based approaches to ethically reduce illegal trade	<ul style="list-style-type: none"> <li>• Support developing and implementing evidence-based strategies, prioritizing demand reduction of illegally sourced live North American turtles in domestic and international trade</li> <li>• Develop and implement science-based communications initiatives and outreach tools to foster action at multiple levels to reduce the illegal turtle trade</li> </ul>
Confiscation and repatriation	Build capacity and secure dedicated resources to accommodate confiscation and repatriation or permanent placement of turtles	<ul style="list-style-type: none"> <li>• Develop a network of dedicated facilities with sufficient resources to care for confiscated turtles</li> <li>• Explore the feasibility of establishing an information sharing network to facilitate data collection, data sharing, and resource sharing in confiscation and repatriation efforts</li> </ul>
Model legal framework	Develop model legal framework and resources to effectively combat the illegal trade in turtles	<ul style="list-style-type: none"> <li>• Assemble a team of policy experts and practitioners to develop a road map for a comprehensive, practical, and functional legal and policy framework</li> <li>• Build a coalition of relevant stakeholders from representative jurisdictions to increase feasibility, buy in, and public support for a policy road map</li> </ul>
Law enforcement and information tools	Provide law enforcement professionals with information and tools to understand the illegal turtle trade and utilize existing resources, laws, and regulations	<ul style="list-style-type: none"> <li>• Develop and provide law enforcement with interdisciplinary tools and resources</li> <li>• Increase intelligence, information sharing, networking, and training related to turtle trafficking</li> <li>• Understand how wildlife trafficking overlaps with other criminal activities (crime convergence) and how it may be applicable to turtle trafficking</li> </ul>

To build a common understanding of the illegal turtle trade, virtual expert focus groups were convened to refine elements of the conceptual model. The planning team then held a workshop with 40 targeted representatives from state and federal agencies, academic institutions, and nongovernmental organizations in the United States and Canada. Leveraging their diverse areas of expertise—conservation biology, law enforcement, policy, social science, and communications—participants co-developed actionable strategies to address the illegal trade in turtles. With guidance from a nongovernmental conservation organization (Foundations of Success), workshop attendees used the conceptual model to identify opportunities and strategies to intervene and prioritized them based on 3 factors: potential impact, feasibility, and urgency. The top strategies prioritized for action were to 1) reduce demand through behavior-change efforts based on market and social/behavioral research in the United States and abroad, 2) develop a model legal framework that could

strengthen protections for freshwater turtles and tortoises, and 3) increase capacity to house confiscated turtles and develop guidance to determine their final disposition, including repatriation when possible.

After identifying the priority strategies, workshop participants developed solution pathways or “theories of change” (CMP 2020) for those strategies to outline the steps and assumptions of the proposed intervention strategy to define how it contributes to reducing illegal turtle collection and trade. The workshop outputs and associated objectives, activities, and metrics have laid the foundation for a strategic plan for the CCITT that includes 5 priority goals with focused objectives, actions, and monitoring to be advanced through our partner network (Table 3).

*Implement, Evaluate, Adapt.* — Throughout the process of a collaborative socio-ecological approach, it is important to implement a strategic plan that guides specific action, while also evaluating and adapting as new information and processes are gained. A pragmatic

strategic plan will clearly define goals, metrics of success, and a timeline for reviewing those goals. The implementation will take time, dedicated effort, and adjustment to unpredictable or changing circumstances and new information. In the multiphase, iterative process we outline, action is happening within and between the interconnected stages of planning. We continue to assess needs and scope, reevaluate organizational structure, maintain key partnerships and seek out new partnerships, increase visibility and expand membership, implement actions, and evaluate the process and our actions.

At this time, the CCITT is focused on the full development of our strategic plan, and we recognize that the steps of implementing, evaluating, and adapting may be the most challenging steps to come. The plan will further build upon the momentum and successes already realized.

### FORWARD OUTLOOK

The issue of illegal turtle trade is dynamic and complex, and we should expect that characteristics of the issue will change over time. Consumer behaviors or demand may shift; technology, regulatory, enforcement, or prosecutorial changes may alter trade dynamics and criminal network behavior; and funding availability may affect implementation of strategic actions. Nonetheless, collaborative and adaptive responses will continue to drive progress.

*Future Direction of the CCITT.* — We maintain that the key to being impactful is through the explicit development of sustained relationships to collectively take strategic actions. Although the problem is complex, tools for reducing illegal trade of wildlife are available (Fukushima et al. 2021). Systemic changes are needed in the realms of policy, regulation, demand reduction, supply systems, and allocating resources for people and actions to match the scale of the issue. However, our approach with the CCITT shows that starting at the ground level and implementing high-priority, high-impact, and achievable actions can create a foundation for change. Today, the CCITT has over 200 members from the United States and Canada composed of a diversity of relevant expertise. Approximately one-third of these members are law enforcement personnel (i.e., wildlife law enforcement officers, wildlife inspectors, intelligence specialists). The structure of the CCITT, its wealth of technical expertise, and its diversity of membership coupled with comprehensive strategic action planning will prepare the organization to face a shifting landscape in the future. The CCITT has gained tangible momentum in a few short years. It will be important for our organization to harness that momentum as we grow, and as future challenges arise.

While our current membership is composed of people across a variety of sectors with diverse expertise, we acknowledge and are mindful of gaps in representation. Opportunities exist to adaptively modify our partnership

approach to foster a more diverse network, particularly as interest in the CCITT continues to expand. This includes building relationships with and learning from interested collaborators, particularly Indigenous perspectives, knowledge, and expertise. And because our intended scope of focus is North American, we also hope to increase engagement, coordination, and collaboration with counterparts in Canada and identify partners in Mexico with whom we can work. Finally, because the trafficking of turtles is global in scope, measurable progress will require growing and strengthening international relationships to better understand global trade dynamics of North American turtles and to work in partnership to identify and implement specific demand-reduction strategies.

*Adapting the Approach.* — There will never be a “one-size-fits all” approach to combating wildlife trafficking, especially a nuanced problem like the illegal trade in turtles. Sharing information and strategies with others is crucial to effectively contemplate, initiate, and take action. As more resources become available (TRAFFIC 2018, 2022; Williamson et al. 2020; International Consortium on Combating Wildlife Crime 2022; Cassolis 2023), sharing approaches, successes, lessons learned, monitoring outcomes, and more is essential for shared learning and for achieving collective positive conservation results. By sharing this example of the CCITT, we aim to provide insights into how others can embark on their own efforts to organize towards making a meaningful impact. Moreover, we hope to inspire others who may feel overwhelmed with the magnitude of a newly emerging or existing problem. We encourage others to start small while assessing the complexity of the issue at hand, then adapt our approach to fit other wildlife trade conservation issues. For example, opportunities exist for exploring locally driven, community-based, and audience-tailored approaches to addressing illegal trade (Cooney et al. 2017; Roe and Booker 2019; Hu et al. 2023).

Building collaborative partnerships can be difficult and time-consuming, and the obstacles can feel daunting or insurmountable. Our team has formed strong partnerships cultivating respect around a shared vision, ultimately strengthening our collaborative work and expanding our reach. A foundational component of sharing our approach and progress is the importance of fostering your network.

Small victories are cumulative, build momentum, and lead to larger victories and broad success. As the CCITT evolves and gains visibility, an ongoing challenge and opportunity will be facilitating strategic and inclusive growth while securing the necessary resources and capacity to support that growth. It is a challenge we look forward to and a reminder that to collaboratively address the socio-ecological dimensions of complex wildlife trafficking issues, over the distance, slow and steady wins the race.

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