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## A CALL FOR EVALUATION OF THE CONTRIBUTION MADE BY RESCUE, RESUSCITATION, REHABILITATION, AND RELEASE TRANSLOCATIONS TO KEMP'S RIDLEY SEA TURTLE (*LEPIDOCHELYS KEMPII*) POPULATION RECOVERY

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**Abstract.**—Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) conservation practices permitted by the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS), under authority of the U.S. Endangered Species Act of 1973, include translocations in which eggs or turtles are taken into captivity for various reasons and intervals, and turtles are later released into coastal waters of the Gulf of Mexico (GoM) or the Northwest Atlantic Ocean (NWAO). In 2013, the IUCN Species Survival Commission defined conservation translocation as the deliberate movement of organisms from one site for release in another, with the intention that it must yield a measurable conservation benefit at the levels of a population, species or ecosystem, and not only provide benefit to translocated individuals. Translocations of Kemp's Ridley Sea Turtles that are found injured, ill, or otherwise debilitated, then rescued, resuscitated if necessary, rehabilitated, and released into the GoM or the NWAO have not been evaluated to determine whether they qualify as conservation translocations. We refer to them as rescue, resuscitation, rehabilitation, and release (i.e., RRRR) translocations. Captivity and human care, by altering behavioral and physiological fitness of RRRR translocated Kemp's Ridley Sea Turtles, have the potential to influence post-release survival, growth, navigation, foraging, migration, maturation, natal beach homing, and reproduction. We recommend that NMFS and USFWS develop a plan for hypothesis-driven research and modeling aimed at determining if and how RRRR translocations contribute to Kemp's Ridley Sea Turtle population recovery. Similar evaluations of RRRR translocations are also needed for other sea turtle species.

**Key Words.**—advocacy; captivity; display; education; media coverage; outreach; training; welfare

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### INTRODUCTION

In 1970, the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) was listed by the U.S. Fish and Wildlife Service (USFWS 1970) as "endangered throughout its range," and it has received Federal protection under the U.S.

Endangered Species Act of 1973 ever since (National Marine Fisheries Service [NMFS] et al. 2011). In 1996, it was listed as Critically Endangered by the International Union for Conservation of Nature (IUCN) Marine Turtle Specialist Group (MTSG 1996 in Appendix 1). The geographic range of Kemp's Ridley Sea Turtle is

restricted to the Gulf of Mexico (GoM) and the North Atlantic Ocean (NMFS et al. 2011; NMFS and USFWS 2015). Most nesting takes place on western GoM beaches, predominantly in Tamaulipas, Mexico, but nesting also occurs regularly in Veracruz, Mexico, and southern Texas (NMFS and USFWS 2015). Nesting is sporadic elsewhere along the GoM coast and rare on the eastern coast of the USA. With few documented exceptions (Caillouet et al. 2015b), Kemp’s Ridley Sea Turtles in the North Atlantic Ocean were presumably carried there from the western GoM by ocean currents while in the pelagic (oceanic) stage of their life cycle (Morreale and Standora 2005; Putman and Lohmann 2008; Putman et al. 2010, 2013, 2015; Witherington et al. 2012).

The goals of the U.S.-Mexico Kemp’s Ridley Sea Turtle recovery plan (NMFS et al. 2011) are “To conserve and protect the Kemp’s ridley sea turtle so that protections under the Endangered Species Act are no longer necessary and the species can be removed from the List of Endangered and Threatened Wildlife.” The plan specifies that “...the highest priority needs for Kemp’s Ridley recovery are to maintain and strengthen the conservation efforts that have proven successful,” and that “Recovery plans delineate reasonable actions, which are required to recover and/or protect listed species based on the best available science” (NMFS et al. 2011). Together these statements convey expectations that the science-based conservation practices approved under the recovery plan (NMFS et al. 2011) will eventually lead to the recovery and removal of the Kemp’s Ridley Sea Turtle from the List of Endangered and Threatened Wildlife.

Among the Kemp’s Ridley Sea Turtle conservation practices that are permitted by NMFS and USFWS are translocations in which eggs or turtles are taken into captivity for various reasons and intervals, and turtles are later released into coastal waters of the GoM or the Northwest Atlantic Ocean (NWAo; NMFS et al. 2011; NMFS and USFWS 2015; Appendix 1). All such translocations are manipulative human interventions (Meylan and Ehrenfeld 2000). The IUCN Species Survival Commission (SSC) described two general categories of translocation (IUCN SSC 2013) Category 1 is: “Conservation translocation is the deliberate movement of organisms from one site for release in another. It must be intended to yield a measurable conservation benefit at the levels of a population, species or ecosystem, and not only provide benefit to translocated individuals.” Category 2 is: “... the release of individuals for the sake of their welfare, or for rehabilitation from captivity, as primarily for the benefit of the released individuals...”

An example of Category 1 is the movement of clutches of Kemp’s Ridley Sea Turtle eggs, from locations where laid on a given western GoM natal beach, into captive protection of hatcheries (i.e., artificial nest cavi-

ties within corrals or polystyrene boxes) for incubation on or near the same beach, followed by protected releases of emergent hatchlings into the western GoM from the same beach (NMFS et al. 2011; NMFS and USFWS 2015). Currently, translocations of Kemp’s Ridley Sea Turtles that are found injured, ill, or otherwise debilitated, and are then rescued, resuscitated if necessary, rehabilitated in captivity, and released into the GoM or the NWAo, likely fall into Category 2, because it has not been determined whether they yield a measurable conservation benefit at the levels of a population, species or ecosystem. We refer to them as rescue, resuscitation, rehabilitation, and release (i.e., RRRR) translocations. The injuries, illnesses, or other debilitations suffered by these turtles result from numerous natural and anthropogenic threats (NMFS et al. 2011; NMFS and USFWS 2015). Rescued individuals (both sexes) vary widely in size when taken into captivity (Teas 1993; Baker et al. 2015). Those judged sufficiently fit following rehabilitation are tagged and some are fitted with satellite transmitters before release (NMFS Southeast Fisheries Science Center [SEFSC] 2008; USFWS 2013 in Appendix 1). Artificial conditions of captivity and human care, by altering behavioral and physiological fitness of RRRR translocated sea turtles, have the potential to influence their post-release survival, growth, navigation, foraging, migration, maturation, natal beach homing, and reproduction (Appendix 1).

Although rehabilitation and release are mentioned numerous times in the recovery plan (NMFS et al. 2011), they are not given specific recovery action priority; however, the recommendation of the recovery plan to maintain a stranding network (Priority Action 23) encompasses RRRR translocations. Therein, Stranding Network undoubtedly refers to the Sea Turtle Stranding and Salvage Network (STSSN; Teas 1993; Shaver and Teas 1999). NMFS et al. (2011) suggested that a large percentage of live-stranded Kemp’s Ridley Sea Turtles taken to rehabilitation facilities have later been released, thus directly contributing to Kemp’s Ridley Sea Turtle conservation, but presented no evidence of their measurable conservation benefit to population recovery.

Increased strandings resulted in an increase in Kemp’s Ridley Sea Turtle RRRR translocations in 2010, the year in which the Deepwater Horizon oil spill occurred in the northern GoM (Deepwater Horizon Natural Resource Damage Assessment Trustees [DWHNRDAT] 2016). Exponential growth of the Kemp’s Ridley Sea Turtle female population since the mid-1980s (Caillouet et al. 2016) was unexpectedly interrupted in 2010, focusing attention on the need for remedial conservation actions to restore population growth (Caillouet 2011, 2014; Crowder and Heppell 2011; NMFS and USFWS 2015; Caillouet et al. 2015a, 2016).

In the USA, reporting requirements have been established for sea turtle strandings (Shaver and Teas 1999) and care and maintenance in captivity (USFWS 2013 in Appendix 1). During their rescue, rehabilitation, release, and recapture, Kemp's Ridley Sea Turtles are examined and characterized in numerous ways (Shaver and Teas 1999; Walsh 1999; NMFS SEFSC 2008; Bluvias and Eckert 2010; USFWS 2013 in Appendix 1). Additional sources of Kemp's Ridley Sea Turtle RRRR translocation data include observer programs (Belskis et al. 2013; Scott-Denton et al. 2014), projects that remove eggs and turtles from likely harm and relocate them to safer sites (Dodd and Seigel 1991), and research projects associated with in-water studies, mark-recapture, and tracking (Coyne and Godley 2005; NMFS SEFSC 2008; Halpin et al. 2009; Cooperative Marine Turtle Tagging Program [CMTTP] 2016 in Appendix 1). Consequently, voluminous amounts of data have been collected and archived, but no centralized and up-to-date database exists for use in determining whether Kemp's Ridley Sea Turtle RRRR translocations qualify as conservation translocations. In addition, these data cannot be used for such purpose without permission from numerous individuals, government agencies, universities, sea turtle hospitals, and rescue and rehabilitation centers that collected the data. Because RRRR translocations of Kemp's Ridley Sea Turtles are motivated at least partly by humane concerns, they can be considered a form of sea turtle welfare. Rescue, resuscitation, and rehabilitation save an undetermined number of injured, ill, or otherwise debilitated Kemp's Ridley Sea Turtles from likely death, but an undetermined proportion of these turtles cannot be released. Whether released or not, the turtles provide additional benefits associated with education, outreach, and collaboration among government agencies, universities, sea turtle hospitals, and rescue and rehabilitation centers in collection of valuable data, development of medical and surgical procedures, training in captive care and maintenance, research, public display, media coverage, and conservation advocacy (see Shaver and Teas 1999; USFWS 2013 in Appendix 1). Many of these additional benefits are similar to those attributed to the head-start, reintroduction, and captive-breeding experiments of Kemp's Ridley Sea Turtles (Wibbels et al. 1989; Donnelly 1994; Godfrey and Pedrono 2002; Caillouet et al. 2015b; Shaver and Caillouet 2015). The captive-breeding experiment for Kemp's Ridley Sea Turtles was terminated by USFWS after 1988 (Caillouet et al. 2015b), and the head-start experiment was terminated by USFWS in 1993 (Byles 1993; Williams 1993). The reintroduction experiment continues, as well as captive-rearing of Kemp's Ridley Sea Turtles for research (Caillouet et al. 2015b; Shaver and Caillouet 2015).

## RECOMMENDATIONS

We recommend that NMFS and USFWS develop a plan for hypothesis-driven research and modeling aimed at evaluating if and how RRRR translocations of Kemp's Ridley Sea Turtles contribute to population recovery; i.e., whether they qualify as conservation translocations (IUCN SSC 2013). At a minimum, the plan should require: (1) comparisons of turtle rescue and release locations within as well as between the GoM and NWAO, given that spatiotemporal differences in environmental conditions and anthropogenic threats between rescue and release locations might affect the potential for Kemp's Ridley Sea Turtle RRRR translocations to contribute to population recovery (Haas 2010; Lewison et al. 2003, 2013; Wallace et al. 2008, 2010, 2011; Murray 2015; Appendix 1), (2) demographic and stock assessment modeling (Committee on the Review of Sea-Turtle Population Assessment Methods [CSTPAM] 2010; Appendix 1), which have been used effectively to evaluate potential contributions of other categories of Kemp's Ridley Sea Turtle translocations to population recovery, (3) detailed assessments of the influences of numbers of stranded turtles that are rescued, rehabilitated, and released, size and sex of the rescued and released turtles, categories of injuries, illnesses, or other debilitations, length of time spent in rehabilitation, and distances between rescue and release locations, on the potential for Kemp's Ridley Sea Turtle RRRR translocations to contribute to population recovery (Appendix 1), (4) evaluations of cost-effectiveness of Kemp's Ridley Sea Turtle RRRR translocations, in the contexts of conservation budgets, scientific oversight, quality of rehabilitation facilities and care, federal and state permits, and data collection, management, availability, and accessibility (CSTPAM 2010), and (5) interview and questionnaire sampling surveys of sea turtle experts and the public, for purposes of determining levels of support for Kemp's Ridley Sea Turtle RRRR translocations (see Feck and Hamann 2013).

Resources for developing the plan should include: (1) IUCN/SSC Guidelines for Reintroductions and Other Conservation Translocations (IUCN/SCC 2013), (2) National Wildlife Rehabilitators Association Minimum Standards for Wildlife Rehabilitation (Miller 2000), (3) Standard Permit Conditions for Care and Maintenance of Captive Sea Turtles (USFWS 2013 in Appendix 1), and (4) relevant data that have been collected and archived, as well as published evaluations of head-start, reintroduction, captive breeding, rehabilitation, and post-release tracking of rehabilitated and released turtles (Appendix 1). Regardless of whether the recommended plan is developed or not, we encourage hypothesis-driven research and modeling to evaluate if and how RRRR

translocations contribute to the population recovery of Kemp’s Ridley Sea Turtles. Similar evaluations of RRRR translocations are also needed for other sea turtle species.

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## APPENDIX 1

Bibliography related to Kemp's Ridley Sea Turtle translocations. An asterisk (\*) marks sources that include some or all components of Kemp's Ridley Sea Turtle RRRR translocations.

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