Florida Fish and Wildlife Conservation Commission

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TO: Nick Wiley, Executive Director

FROM: Dr. Thomas Eason, Director, Division of Habitat and Species Conservation

RE: Maintaining wildlife value of beaches: The importance of wrack and compatible beach cleaning

The attached "Maintaining wildlife value of beaches: The importance of wrack and compatible beach cleaning" was produced March 29, 2017, by the Division of Habitat and Species Conservation, Florida Fish and Wildlife Conservation Commission.

Pursuant to Section 9, Article IV, Florida Constitution, Sections 20.331, and 379.1025, Florida Statutes; and Internal Manual Policies and Procedures (IMPP) 1.12; the "Maintaining wildlife value of beaches: The importance of wrack and compatible beach cleaning" continues to be implemented by the Division of Habitat and Species Conservation, Florida Fish and Wildlife Conservation Commission.

Thomas H. Eason 7/13/17

Dr. Thomas Eason, Director Date

Florida Fish and Wildlife Conservation Commission
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POLICY☐; POSITION☒; GUIDELINE☐.

TITLE: Maintaining wildlife value of beaches: The importance of wrack and compatible beach cleaning

DATE: March 29, 2017

SUMMARY & PURPOSE

The purpose of this position statement is to demonstrate the importance for wildlife of retaining natural beach wrack, and outline the disturbance to wildlife that can be caused by incompatible mechanical beach cleaning. For the purpose of this position statement, mechanical beach cleaning includes activities such as beach raking, grooming or tilling that entail using tractors, trucks or other motorized equipment pulling rakes or other objects intended to remove both human-generated debris and biotic material from the beach or otherwise groom the sand. These activities are authorized by the Florida Department of Environmental Protection (FDEP) under Florida Statute 161, the Beach and Shore Preservation Act, through field permits. These permits include special conditions to protect threatened and endangered marine turtle nests and their nesting habitat, as required by Florida Statute 379.2431 (1), the Marine Turtle Protection Act. They do not currently require consideration or protection of other wildlife species, such as shorebirds and seabirds that depend on the same sandy beaches for foraging, resting and nesting. However, FDEP permit holders are required to comply with all federal and state wildlife protection laws to minimize activities that may negatively impact protected species.

Removal of human-generated debris from the beach is important for both people and wildlife. However, the inappropriate use of mechanical equipment to remove debris can injure or kill wildlife or disrupt their essential behavior. In addition, removal of natural biotic material, referred to as wrack, can decrease the value of the beach as wildlife habitat. Conducting or permitting mechanical beach cleaning may unknowingly impact wildlife (including threatened and endangered shorebirds and seabirds) by decreasing the habitat value of beaches.

THE IMPORTANCE OF WRACK

Natural biotic material that washes onto the beach is referred to as wrack and includes algae, sea grasses, carrion, and some invertebrates such as sponges and soft corals. Wrack serves as the primary source of nutrients to beach communities and the trophic foundation for the food chain (Mann 1988; Colombini and Chelazzi 2003). For example, fresh wrack harbors the invertebrate prey items (e.g., amphipods, isopods, and insects) on which many shorebirds depend (Dugan *et al.* 2003; Brindock and Colwell 2011). Once disrupted, those invertebrate communities may take years to recover after wrack removal ceases (Dugan *et al.* 2008). Nutrients from decomposing wrack cycle back into the surf zone (MacLachlan and Brown 2006) and contribute to the value of

this area as a nursery for economically important fish species. Wrack is also an important source of cover for wildlife. Wrack that washes onto the beach during storm events or normal high tides at the end of sea turtle nesting season can contain post-hatchling sea turtles.

Wrack deposited higher up the beach (e.g., by storm tides) plays a key role in the succession and maintenance of coastal habitats by catching windblown sand (Hesp 2002; Nordstrom *et al.* 2011; Jackson and Nordstrom 2013) as well as water and wind-born seeds (Jackson and Nordstrom 2011). As these seeds germinate, decomposing wrack fertilizes them (Williams and Feagin 2010), contributing to the development of embryonic dunes (Hesp 2002; Nordstrom *et al.* 2011).

Biotic wrack can contain plastics and other litter potentially hazardous to humans and wildlife. FWC recognizes that wrack may be viewed by some beach-goers as undesirable. However, the benefits of wrack to wildlife and maintenance of coastal habitats should be weighed relative to the potential negative aspects for people. Manual removal of litter from the wrack is one way to find this balance.

IMPACTS OF WRACK REMOVAL AND MECHANICAL BEACH CLEANING

Between 2012 and 2016, at least 291 miles (35%) of Florida's beaches were permitted for mechanical beach cleaning (FDEP 2016). Indiscriminate removal of wrack (whether manually or mechanically) can be detrimental to beach-dependent wildlife and their habitat. Research has shown that invertebrates have much lower species richness, abundance and biomass on beaches that are mechanically cleaned when compared with those that are not mechanically cleaned (Llewellyn and Shackley 1996; Engelhard and Withers 1997; Dugan *et al.* 2003; Deidun *et al.* 2009; Gilburn 2012). Invertebrates most heavily impacted by wrack removal include amphipods, isopods, and crabs (Brown and McLachlan 2002). Because shorebirds feed on many of these invertebrates, mechanically cleaned beaches may support lower numbers of shorebirds (Defeo *et al.* 2009). Recovery timescales for invertebrate populations once wrack removal ceases can be from weeks (Engelhard and Withers 1997) to years (Defeo *et al.* 2009).

Mechanical beach cleaning has been shown to prevent and disrupt vegetative growth (Dugan and Hubbard 2010), prevent dune formation (Nordstrom *et al.* 2009; Nordstrom *et al.* 2012), and result in greater loss of sand through wind transport (Dugan and Hubbard 2010). FWC's State Wildlife Action Plan (SWAP) ranks Beach/Surf Zone and Coastal Strand among habitats facing the greatest overall threats, and identifies beach cleaning specifically as a stressor to the Beach/Surf Zone (FWC 2012). Research suggests that mechanical cleaning can prevent succession to Coastal Strand and results instead in conversion to un-vegetated sand (Dugan and Hubbard 2010). While stretches of un-vegetated sand are critical to a number of species (Page and Stenzel 1981; Cohen et al 2008; Muir and Colwell 2010; Brindock and Colwell 2011), other species rely on Coastal Strand and dune formation.

During the breeding season of seabirds and shorebirds (February through August), mechanical beach cleaning can create areas of un-vegetated sand that attracts some seabirds to nest. However, if these areas are then routinely mechanically cleaned, it can disrupt courtship and nest-site selection, destroy nest scrapes, crush well-camouflaged eggs or flightless young, and

cause adults to flush from the nest – leaving eggs and chicks vulnerable to desiccation, heat stress, and predation (Warriner *et al.* 1986; Gochfeld and Burger 1994; Rodgers and Smith 1995). This process of creating un-vegetated areas that attract birds into areas with high recreational value can lead to human-wildlife conflict.

LAW & POLICY SETTING

Florida Statute 161.053 requires that all authorized coastal construction activities, including mechanical beach cleaning, are conditioned to protect marine turtles, their nests, hatchlings, and nesting habitat and salt-resistant native vegetation. While the statute does not address impacts to other wildlife resources, FDEP permit holders are required to comply with the federal Endangered Species Act and the federal Migratory Bird Treaty Act, as well as state wildlife protection laws (Chapters 68A-4, 68A-16, and 68A-27 of the Florida Administrative Code, among others, administered by FWC). Therefore, they must minimize activities that may negatively impact federally protected species. FDEP permit conditions also preclude cleaning within 10 feet of dune vegetation. However, without consistent operator compliance with the condition, there is significant potential for removal of dune vegetation. FWC staff recognizes the positive effects of the state's current explicit protection measures for marine turtles and encourages a similar approach for other wildlife. In cooperation with FWC, FDEP is developing a Florida Beaches Habitat Conservation Plan to minimize and mitigate impacts to listed species, including shorebirds and seabirds, resulting from activities permitted by FDEP's Coastal Construction Control Line (CCCL) Program.

CONCLUSIONS AND RECOMMENDATIONS

Mechanical beach cleaning, without the proper precautions, can pose a threat to wildlife and wildlife habitat and can interfere with natural coastal habitat succession (US EPA 2013). While the FWC acknowledges that strategic vegetation removal and management of successional processes are necessary for some species, it is the position of the FWC that mechanical cleaning should be discouraged. If used, mechanical beach cleaning should be employed sparingly, and the extent, timing, and procedures should be done in a manner that minimizes impacts to wildlife and minimizes disruption of natural beach habitat succession. For example, the FWC's "Share the Beach: Beach cleaning practices to minimize impacts to protected shorebirds" recommends limiting mechanical cleaning during sensitive periods of wildlife use, such as shorebird nesting season, which can minimize impacts to those species. If mechanical cleaning must occur during sensitive times, precautions should be taken, such as using a wildlife monitor to inspect the beach prior to cleaning.

Wrack is a natural component of beaches and has benefits for wildlife and the beach ecosystem. Wrack is often removed during the mechanical beach cleaning process, impacting wildlife and the beach ecosystem. Therefore it is the position of the FWC that biotic wrack should be left in place to the greatest extent practicable. Balancing wildlife and human usage may require site-specific management. Some areas are primarily used by people and have lower value as wildlife habitat while others have higher wildlife value. Therefore, managers should be spatially and

temporally aware as they identify areas where it is more important to leave wrack and work with regulatory staff, beach cleaners and other stakeholders on these important bird areas. Human generated beach debris can be hazardous to both people and wildlife. To minimize potential risks to wildlife, the FWC recommends manual removal of human generated debris. The FWC acknowledges that strategic removal of exceptional wrack deposition during red tide or drift algae events may be necessary. In instances when wrack removal is conducted, leaving a portion of fresh wrack intact at the strand line can help retain wildlife habitat values of the beach.

The benefits of wrack on the beach are not widely understood by the beach going public. The FWC believes that a directed and extended outreach and informational campaign on the value of wrack can help shift negative perceptions of the beach going public. Opportunities to view beach wildlife can enhance visitors' experiences, and for some, may be the primary purpose of their visit.

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