



NORTH CAROLINA
Environmental Quality

ROY COOPER

Governor

ELIZABETH S. BISER

Secretary

TANCRED MILLER

Director

CRC-24-15

August 16, 2024

MEMORANDUM

TO: Coastal Resources Commission
FROM: Heather Coats
SUBJECT: Fiscal Analysis, 15A NCAC 07H .0314 – Installation of Wheat Straw Bales for Sand Fencing

At your April 2024 meeting, the Commission approved rule language to allow greater flexibility to local governments/large oceanfront HOAs and state and federal agencies wanting to protect the frontal dune system. The proposed rule language would allow these entities to also use wheat straw bales as another option for dune protection in place of the existing standard wooden sand fencing. Straw bales may be more available at the local level as compared to sand fencing, as sand fencing has been in limited supply at times of high-volume use by local governments. Straw bales may be found at a typical home improvement store whereas sand fencing may not be stocked or in such a limited on-hand supply as to not be a practical option.

The proposed rules to allow the use of wheat straw bales as an alternative to traditional sand fencing would also require permit review and coordination with these wildlife agencies since those agencies have expressed concerns over this proposed use.

DCM does not anticipate significant economic impacts as a result of these proposed rule changes. The benefit of the proposed rule changes would be the greater flexibility allowed to local governments, large oceanfront HOAs, and state & federal agencies in providing dune protection alternatives to traditional sand fencing. It is unknown how many entities will opt to use wheat straw bales instead of sand fencing, but DCM expects uptake to be relatively limited due to the increased cost of the bales, higher replacement frequency, and unknown efficacy at trapping sand. DCM estimates a cost of approximately \$30-\$72 per 10-foot section of wheat straw bales versus \$12-\$24 per 10-foot section of traditional sand fencing. Because the potential impact to sea turtles and other natural resources is unknown, the proposed rule includes restrictions and additional review requirements to avoid and minimize potential impacts.

The fiscal analysis has been approved by DEQ and by OSBM. Staff is recommending approval of the fiscal analysis which will allow the rules to proceed to public hearing.



North Carolina Department of Environmental Quality | Division of Coastal Management
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Fiscal Analysis

Proposed Changes to Allow the Use of Wheat Straw Bales as Sand Fencing
15A NCAC 07H .0314

Prepared by
Heather Coats

NC Division of Coastal Management
910-796-7302

August 16, 2024

Summary

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| Agency | DEQ, Division of Coastal Management (DCM) Coastal Resources Commission (CRC) |
| Title of the Proposed Rules | Specific Use Standards for Ocean Hazard Areas- INSTALLATION AND MAINTENEANCE OF STRAW BALES FOR SAND FENCING - 15A NCAC 07H .0314 |
| Description of the Proposed Rules | The CRC is proposing specific use standards for the installation and maintenance of wheat straw bales for sand fencing. |
| Agency Contact | Heather Coats Beach and Inlet Management Project Coordinator Heather.Coats@ncdeq.nc.gov (910) 796-7302 |
| Authority | G.S. 113A-102; G.S. 113A-107; 113A-118; G.S. 113A-124 |
| Necessity | The Coastal Resources Commission proposes a new administrative rule to provide greater flexibility to local governments, large oceanfront homeowners associations and government agencies in allowing the use of wheat straw bales for dune protection in addition to sand fencing. |
| Impact Summary | State government: Yes Local government: Yes Substantial impact: No Federal government: No Private citizens: Yes |

Introduction and Purpose

Protecting both coastal development and the barrier dune system to minimize impacts to our state's economic and coastal resources is among the central tenets of the Coastal Area Management Act (CAMA) as well as an objective of the rules of NC Coastal Resources Commission.

The CAMA states as one of its goals: "To provide a management system capable of preserving and managing the natural ecological conditions of the estuarine system, the barrier dune system, and the beaches, so as to safeguard and perpetuate their natural productivity and their biological, economic and esthetic values".

15A NCAC 07H .0303 states the management objective of the ocean hazard area is to "further the goals set out in G.S. 113A-102(b), to minimize losses to life and property resulting from storms and long-term erosion, prevent encroachment of permanent structures on public beach areas, preserve the natural ecological conditions of the barrier dune and beach systems, and reduce the public costs of development within ocean hazard areas, and protect common-law and statutory public rights of access to and use of the lands and waters of the coastal area".

In consideration of these objectives, the Coastal Resources Commission has established specific use standards to allow the installation and maintenance of sand fencing to protect the dune system, while also imposing protections for sensitive biological habitat and the public's access to and recreational use of the

beach. Wooden sand fencing with wire has traditionally been used as a means for protecting and building the frontal dune system; particularly in local beach communities where tens of millions of dollars are spent on dune restoration and beach renourishment. However, sand fencing can become damaged resulting in hazardous debris on the beach when impacted by long-term coastal erosion and storm events. Current rules require the removal of non-functioning, damaged or unsecured sand fencing [15A NCAC 07H .0311(d)] and as a result, more local government and HOA officials have expressed interest in the use of straw bales to serve as an alternative means of protecting and building dunes that will not leave hazardous debris on the beach when impacted by long-term coastal erosion and storm events.

Since this will be a new dune stabilization method, the Commission is proposing the creation of a specific permit allowance for the use of wheat straw bales in limited circumstances. This allowance would only apply to local, state, and federal governments and large oceanfront HOAs (defined as having over one mile of oceanfront shoreline). This will limit the use of wheat straw bales until a better understanding of their efficacy can be achieved. Though the material may be staked in place, baled straw may be less durable over time, which can be beneficial since debris can be a concern after storm events. Also, if sand fencing works as intended, the material remains buried until the dune is eroded by storm or other means whereas the straw bale may degrade over time. Under the proposed rule, the bales can be maintained to authorized dimensions. Straw bales have been used in two pilot projects North Carolina with a limited level of success as the straw bales became covered with sand, but then washed away in minor storms less than a year after installation. The proposed rules for wheat straw bales would closely parallel the allowance for the sand fencing exemption. Permit applications would also require review by the U.S. Fish & Wildlife Service (USFWS) and N.C. Wildlife Resources Commission (NCWRC) in an effort to ensure projects would not have an adverse impact on sea turtles or other threatened or endangered species.

The group most affected by these changes will be local governments and large oceanfront HOAs, who can benefit from the proposed rule changes by having an alternative to traditional sand fencing for dune stabilization. The rule changes are not expected to have a significant impact on state and federal agencies as these agencies typically do not install sand fencing on state or federally owned and managed beaches. Individual private landowners are not expected to be impacted as they will not be eligible to utilize wheat straw bales and the NC Department of Transportation is not expected to be impacted by the proposed rule changes as it also does not typically install sand fencing to protect the dune systems.

DCM estimates that wheat straw bale installation costs are similar to or may exceed sand fencing depending on installation size. The estimated cost for installation is derived from the difference in materials cost between a traditional wooden section of sand fencing, estimated at approximately \$12-24 per ten foot section (based on an internet search) vs. a similar length of wheat straw bales at \$15-27 per roughly for a ten foot section, if installed one bale high and three bales long (estimated based on an internet search). Using the same assumed cost for a single wheat straw bale, the overall cost for the maximum allowable three foot high and ten foot long wheat straw bale section could increase to an estimated \$30-72 foot per section. But this increased cost is not required and would be assumed only at the permittee's discretion as this proposal only provides an additional option and does not mandate the use of wheat straw bale for dune protection. While it can be assumed that wheat straw bales will need to be replaced more frequently than sand fencing, they would not need another permit provided they are reinstalled within their originally permitted dimensions.

DCM anticipates the effective date of these rule amendments to be April 1, 2025.

Description of the Proposed Rules

The proposed rules would allow greater flexibility to local governments/large oceanfront HOAs and state and federal agencies wanting to protect the frontal dune system. The proposed rule language would allow these entities to also use wheat straw bales as another option for dune protection in place of the existing standard wooden sand fencing. Straw bales may be more available at the local level as compared to sand fencing, as sand fencing has been in limited supply at times of high-volume use by local governments. Straw bales may be found at a typical home improvement store whereas sand fencing may not be stocked or in such a limited on-hand supply as to not be a practical option.

DCM currently issues minor permits or exemptions for sand fencing pursuant to use standards described in 15A NCAC 7H .0311 and 15A NCAC 7K .0212. Proposals for sand fencing that do not meet the exemption criteria require review and approval through a minor permit application. The CRC is proposing to add a minor permit option for the installation of wheat straw bales, subject to the following:

- Allow for local governments, large oceanfront HOAs and state or federal agencies to use wheat straw bales for dune protection;
- Limit wheat straw bales to sections measuring no more than ten feet in length, two feet in width and three feet in height; with a minimum spacing of seven feet between sections of dune building materials (i.e. straw bales, sand fencing, or Christmas trees);
- Specify that wheat straw bale installation shall be placed as far landward as possible to avoid interference with sea turtle nesting, public access, recreational use of the beach, and emergency vehicle access;
- The overall requirements for wheat straw bale siting currently in place under the sand fencing exemption would apply to the use of straw bales;
- Require removal of any ties or binding to reduce the potential for entanglement of wildlife;
- Require review by the U.S. Fish and Wildlife Service and N.C. Wildlife Resources Commission to evaluate whether the proposed action will have an adverse impact on sea turtles or other threatened or endangered species; and
- Require that non-functioning, damaged, or wheat straw bale sections or stakes that are no longer within their authorized alignment shall be repaired or removed by the permittee.

Figure 1. A typical wooden sand fencing installation.



Image source: DCM

COSTS OR NEUTRAL IMPACTS

The CRC rules currently allow property owners the ability to install sand fencing through a permit exemption if the fencing is installed immediately waterward of the frontal dune, first line of stable natural vegetation or the erosion escarpment. Local governments and state and federal agencies can also install sand fencing under the exemption subject to the same conditions. Proposed sand fencing that does not meet the exemption criteria can be evaluated through the permit process, typically a minor permit, but these permit applications require coordination with the U.S. Fish & Wildlife Service and N.C. Wildlife Resources Commission to ensure the placement location would not have an adverse impact on sea turtles or other threatened or endangered species, as stated in 15A NCAC 07H .0311(c). The majority of sand fencing is installed under the exemption criteria. The proposed rules to allow the use of wheat straw bales as an alternative to traditional sand fencing would also require permit review and coordination with these wildlife agencies.

Because the overall location of wheat straw bales is the same as the existing allowance for sand fencing and only available for use by local governments and government agencies the proposed amendments should not impose any required additional costs or negatively impact private property owners.

Department of Transportation

Pursuant to G.S. 150B-21.4, the agency reports that the proposed addition of 7H.0314 will not significantly affect environmental permitting for the NC Department of Transportation (NCDOT). No cost or benefit applicable to NCDOT is anticipated as a result of these rule amendments and while NC DOT does not typically utilize sand fencing to protect dune systems, the use of wheat straw bales will be an available option.

Local Government

Local governments are expected to benefit from the increased flexibility in allowing the use of wheat straw bales as another option for dune protection in addition to traditional sand fencing. Straw bales may be more available at the local level as compared to sand fencing, as sand fencing has been in limited supply at times of high volume use by local governments. There is also a potential benefit from reducing the need to clean up sand fencing debris on beaches after storms. In recent years, several local governments have requested to use wheat straw bales in place of sand fencing due to issues with sand fencing supply. So, it is likely that there will be a small number of local governments who opt to use straw bales upon adoption of this rule. DCM does not expect usage of bales to become widespread, however, as the costs of using bales may be significantly higher than sand fencing in the long term due to their need to be replaced more frequently. In addition, wheat straw bales have not yet been shown to be as effective as sand fencing at trapping sand.

Private Property Owners

Because the proposed allowance to use straw bales will be limited to large oceanfront HOAs (in addition to state/local government), there is not expected to be a direct impact to individual property owners. DCM estimates there is only one HOA that currently meets the criteria to be eligible to apply to use straw bales under the proposed rule. Depending on how well the wheat straw bales function for dune stabilization, private property owners may benefit indirectly from the protection provided by the dunes. Less is known about the efficacy of wheat straw bales for dune stabilization as compared to sand fencing. As such, the likelihood that property owners will benefit from their use is highly uncertain.

Division of Coastal Management

DCM does not anticipate that the proposed action will significantly increase operating cost over what is currently required for authorizing, inspecting, and ensuring compliance of sand fencing. DCM does not anticipate any significant changes in permitting receipts due to the proposed action. Any increase in minor permits associated with straw bales as compared to a sand fence exemption is minimal, as many sand fence exemptions still require oversight. DCM staff could realize a net time cost savings from having the straw bale provisions in rule versus responding to individual requests for variances.

Natural Resources

As compared to sand fencing, little is known about the potential impacts of wheat straw bales to natural resources. Of particular concern are potential impacts to nesting sea turtles, which are protected under the Endangered Species Act. To balance the need for dune stabilization options with wildlife protection goals, the proposed rule includes provisions that avoid and minimize potential adverse impacts:

- Limit the use of wheat straw bales to government entities and large HOAs for which oversight and accountability measures are already established.
- Limit the dimensions that bales may be installed.
- Require that bales be sited and installed so as to avoid interference with sea turtle nesting.
- Require removal of any ties or binding to reduce the potential for entanglement of wildlife. This will also result in faster breakdown of the bales themselves.
- Require review by the U.S. Fish and Wildlife Service and N.C. Wildlife Resources Commission to evaluate whether the proposed action will have an adverse impact on sea turtles or other threatened or endangered species.

- Require that non-functioning, damaged, or wheat straw bale sections or stakes that are no longer within their authorized alignment shall be repaired or removed by the permittee.

COST/BENEFIT SUMMARY

The benefit of the proposed rule changes would be the greater flexibility allowed to local governments, large oceanfront HOAs, and state & federal agencies in providing dune protection alternatives to traditional sand fencing. It is unknown how many entities will opt to use wheat straw bales instead of sand fencing, but DCM expects uptake to be relatively limited due to the increased cost of the bales, higher replacement frequency, and unknown efficacy at trapping sand. DCM estimates a cost of approximately \$30-\$72 per 10-foot section of wheat straw bales versus \$12-\$24 per 10-foot section of traditional sand fencing. Presumably, an entity would only opt to use wheat straw bales if the supply of traditional sand fencing is limited. Because the potential impact to sea turtles and other natural resources is unknown, the proposed rule includes restrictions and additional review requirements to avoid and minimize potential impacts.

Proposed addition to NCAC 7H .0314- Installation and Maintenance of Wheat Straw Bales for Sand Fencing

15A NCAC 07H .0314 INSTALLATION AND MAINTENANCE OF WHEAT STRAW BALES FOR SAND FENCING

(a) Wheat straw bales shall only be installed by local, state, or federal government or a local homeowners association as defined in G.S. 47F-1-103(3) that has the authority to approve the locations of structures on lots within the territorial jurisdiction of the association and has jurisdiction over at least one mile of ocean shoreline, for the purpose of building and protecting dunes by trapping windblown sand.

(b) Wheat straw bales shall not impede existing public access to the beach, recreational use of the beach, or emergency vehicle access. Wheat straw bales shall not be installed in a manner that impedes or restricts established common law and statutory rights of public access and use of public trust lands and waters.

(c) Wheat straw bales shall not be installed in a manner that impedes, traps or otherwise endangers sea turtles, sea turtle nests or sea turtle hatchlings. CAMA permit applications for wheat straw bales shall be subject to review by the Wildlife Resources Commission and the U.S. Fish and Wildlife Service in order to determine whether the proposed design or installation will have an adverse impact on sea turtles or other threatened or endangered species.

(d) The permittee shall remove any ties or binding from wheat straw bales during installation;

(e) Wheat straw bales shall be placed as far landward as possible to avoid interference with sea turtle nesting, public access, recreational use of the beach, and emergency vehicle access. Additionally:

(1) Wheat straw bales shall not be placed on the wet sand beach;

(2) Wheat straw bale sections shall not exceed 2 feet in width, 3 feet in height as measured from the bottom bale, and 10 feet in length;

(3) Wheat straw bales installed on or waterward of the crest of the frontal or primary dune shall be installed at an angle no less than 45 degrees to the shoreline. No portion of a wheat straw bale section shall extend more than 10 feet waterward of the following locations as defined in 15A NCAC 07H .0305: the first line of stable and natural vegetation, the toe of the frontal or primary dune, or the erosion escarpment of the frontal or primary dune;

(4) Wheat straw bales along public accessways may span the length of the structural accessway and may be aligned no less than 45 degrees to the shoreline on the waterward end. The waterward location of the sections shall not exceed 10 feet waterward of the locations identified in Subparagraph (3) of this Paragraph above; and

(5) A minimum of seven feet of spacing shall be maintained between any sections of dune building materials.

(f) Non-functioning, damaged, or wheat straw bale sections or stakes that have moved from their authorized alignment shall be repaired or removed by the permittee.

History Note: Authority G.S. 113A-107; 113A-113(b)(6);

Eff. Month XX, 2025;