Fiscal Analysis for Proposed Rules, Readoptions, and Amendments to 15A NCAC 03 Rules Related to Highly Efficient Gears, Artificial Reefs, and Research Sanctuaries Pursuant to G.S. 150B-21.3A

Rule Amendments: 15A NCAC 03I .0109
15A NCAC 03J .0404
15A NCAC 03R .0119

Name of Commission: N.C. Marine Fisheries Commission

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Impact Summary: State government: Yes
Local government: No
Federal government: No
Substantial impact: No

Authority:

North Carolina General Statutes

G.S. § 113-134.	Rules.
G.S. § 113-181.	Duties and powers of Department.
G.S. § 113-182.	Regulation of fishing and fisheries.
G.S. § 113-221.1.	Proclamations; emergency review.
G.S. § 143B-289.52. [(b)(10)]	Marine Fisheries Commission – powers and duties. [artificial reefs]

I. Necessity:

General Statute 150B-21.3A requires state agencies to review their existing rules every 10 years to determine which rules are still necessary, and to either readopt or repeal each rule as appropriate. On Nov.19, 2020 the North Carolina Marine Fisheries Commission (MFC) voted to initiate the rulemaking process to restrict highly efficient fishing gears on artificial reefs in state ocean waters to protect all species of finfish. The following analysis examines two newly proposed rules and one rule proposed for readoption with substantive changes to accomplish this directive.

II. Summary

In August and November of 2020, the North Carolina Division of Marine Fisheries (NCDMF) delivered presentations to the MFC on strategies to help protect all species of finfish within the state's designated ocean artificial reef sites. The MFC voted in August 2020 for NCDMF staff to prepare recommendations towards this goal, and in November 2020 voted to begin the rulemaking process to restrict the use of all highly efficient gears on artificial reefs in state ocean waters. Based on this, NCDMF prepared two new rules for adoption as well as one rule for readoption with substantive changes to accomplish the following goals: set regulations for research sanctuaries and artificial reefs in state waters, define highly efficient gears, and codify the geographic boundary of existing artificial reef sites in state ocean waters. While these proposed changes to gear usage on these sites will ultimately incur costs to the state in terms of increased enforcement and decreased user access and efficiency, there are also corresponding benefits, as proposed changes will increase finfish population health and abundance throughout state ocean waters. However, the total geographic impact of these proposed restrictions is quite small, and therefore the total combination of costs and benefits from proposed rule changes is insignificant.

III. Introduction and Purpose of Rule Changes

Purpose of Rule Changes

The NCDMF manages 43 ocean artificial reefs located between 0.5 – 38 nautical miles (nm) off the coast of North Carolina in the Atlantic Ocean. The majority of these artificial reefs (30) are located in the federally managed Exclusive Economic Zone (EEZ; 3-200 nm) and the remaining artificial reefs sites (13) are located in state ocean waters (0-3 nm), which fall under the authority of the MFC.

A presentation titled "Special Management Zones in State Waters" was delivered during the MFC meeting on Aug. 20, 2020. The presentation included a summary of artificial reefs in North Carolina and the status of the NCDMF gear restriction request to the South Atlantic Fishery Management Council (SAFMC) for the 30 North Carolina reefs in the EEZ. Following the presentation, the MFC passed a motion asking the NCDMF to study making North Carolina's 13 artificial reefs in nearshore ocean waters Special Management Zones (SMZs), possibly limiting the allowable gear, and to bring recommendations back to the MFC at its November 2020 meeting.

Following this decision, an information paper titled "Gear Restrictions as a Management Tool for Artificial Reefs in State Waters" was delivered during the MFC meeting on Nov. 19, 2020. After discussion, the MFC voted to initiate the rulemaking process to restrict highly efficient fishing gears on artificial reefs in state ocean waters to protect all species of finfish as a complement to the restrictions in process for artificial reefs in the EEZ for snapper grouper species.

North Carolina's artificial reefs, both in state ocean waters and in the EEZ, are home to a myriad of resident and migratory species. The species abundance, biomass and richness of fish assemblages found on artificial reefs vary according to the type of artificial reef construction and water depth of the site (Paxton et al. 2018). Therefore, the composition of species at reefs in state ocean waters is likely different than that of artificial reefs in the EEZ.

The purpose of state artificial reef programs is to develop hard bottom habitat that aggregate fishery resources and improve user access to fisheries. Fish aggregating on artificial reefs may be subject to overexploitation, particularly when highly efficient fishing gears are used for harvest. Highly efficient fishing gears, for the purposes of artificial reef management, are those that offer advantages over other gears through increased catch per effort. Gears with this characteristic may be considered all those other than hand line, hook and line, rod and reel, and spearfishing gear and can lead to overly exploited artificial reefs. "Hook and line" is considered synonymous with "rod and reel", the latter of which is defined in the Code of Federal Regulations (CFR) for purposes of management by the SAFMC. Spearfishing gear is considered efficient but differs from other gears with this characteristic because its efficiency is derived from visually selective harvest of individual fish; catch per unit effort does not differ much from hand line and rod and reel gear. By restricting the use of highly efficient fishing gears on artificial reefs, the likelihood of overexploitation is reduced.

Currently, the MFC has one rule specifically pertaining to artificial reefs (15A NCAC 03I .0109) that also addresses research sanctuaries and originally provided a mechanism for implementing gear restrictions at designated locations. This rule does not contain specific gear restrictions; instead, it delegates authority to the NCDMF director who may issue a proclamation to prohibit or restrict the taking of fish and the use of equipment in and around artificial reefs and research sanctuaries. Restrictions under this rule are limited to one year and to be applied, artificial reefs must be marked in the center by a readily identifiable buoy; distances for closures or restrictions are measured from the buoy.

The MFC Rule 15A NCAC 03I .0109 is subject to readoption per G.S. 150B-21.3A by June 30, 2022. As part of that process, the rule is proposed to be amended to relocate the components of the rule pertaining to artificial reefs to new rules proposed for adoption, as discussed below. Removing the components about artificial reefs would focus the rule on research sanctuaries. Research sanctuaries are areas that are protected from fishing gears to provide sanctuary for research. Closures in and around a research sanctuary are for one-year periods with renewals allowed at the discretion of the NCDMF director by proclamation. Modified rule language is proposed to retain proclamation authority for the NCDMF director to issue time-limited closures or restrictions for research sanctuaries via 15A NCAC 03I .0109.

To establish gear requirements, area boundaries must first be codified to provide the location of artificial reefs that are subject to the specific gear requirements. A proposed new rule (15A NCAC 03R .0119) would set coordinates delineating boundaries of the artificial reefs in state ocean waters. Then, a second proposed new rule (15A NCAC 03J .0404) would set requirements for those artificial reefs in state ocean waters identified in NCAC 03R .0119. These coordinates would not change the size or shape of identified artificial reefs in state waters, but merely codify their location in rule.

For consistency with SAFMC gear restrictions for artificial reefs in the EEZ, the proposed new gear restrictions rule (15A NCAC 03J .0404) would restrict the harvest of all finfish within the artificial reef boundaries in state ocean waters from all gears other than hand line, hook and line, and spearfishing gear (which includes bang sticks and powerheads). "Hook and line" is considered synonymous with "rod and reel", the latter of which is defined in the CFR for purposes of management by the SAFMC. Definitions for "hand line", "hook and line", and "spearfishing gear" are proposed in the new rule. All harvest by spearfishing gear would be restricted to recreational limits. The proposed new rule does not explicitly name any species to ensure the rule would apply to all finfish species within the artificial reef site boundaries in state ocean waters, as requested by the MFC at its meeting on Nov. 19, 2020.

Management Implications

NCDMF manages 43 ocean artificial reef sites located between 0.5 – 38 nautical miles (nm) off the coast of North Carolina in the Atlantic Ocean (Figure 1). The majority of these artificial reef sites (30) are located in the federally managed Exclusive Economic Zone (EEZ; 3-200 nm) and the remaining artificial reefs sites (13) are located in nearshore state managed ocean waters (0-3nm; Figure 1).

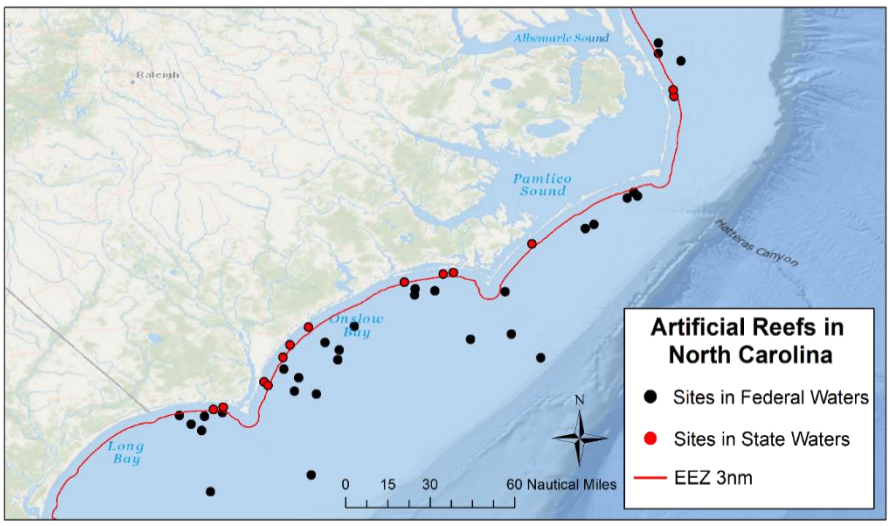

Figure 1: North Carolina ocean artificial reefs separated by state (13 sites; 0-3 nm) and federally (30 sites; 3-200 nm) managed waters.

Federal fisheries executed off the North Carolina coast in the EEZ are managed under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. § 1801 et. seq.). The responsibility for decision making for many of these fisheries is delegated from the United States Secretary of Commerce to the SAFMC, with the final decisions made by the Secretary. Therefore, management changes to these 30 offshore reef sites do not incur state-level impacts caused by MFC rules and do not need to be considered in this analysis.

The 13 artificial reef sites located within North Carolina's nearshore ocean waters are managed under the authority of the MFC, and management changes to these sites should be analyzed for state impacts. As previously stated, the MFC has one rule specifically pertaining to artificial reefs (15A NCAC 03I .0109). This rule does not contain specific gear restrictions. It delegates authority to the NCDMF director who may issue a proclamation to prohibit or restrict the taking of fish and the use of equipment in and around artificial reefs, but such a proclamation is dependent on measurements from buoys that no longer exist due to lack of funding and equipment to maintain them. As a result, no special restrictions are presently in place on artificial reef sites in nearshore ocean waters. The rule is subject to readoption per G.S. 150B-21.3A by June 30, 2022 and will be amended as part of that process.

Like those in the EEZ, artificial reefs in North Carolina's nearshore ocean waters are designed as publicly accessible fish aggregation areas, susceptible to overexploitation and potentially having negative interactions with protected species listed under the Endangered Species Act. The use of gear restrictions as a management tool for artificial reefs in the EEZ could be complemented by MFC implementation of similar gear restrictions for artificial reefs in the nearshore ocean waters through the rulemaking process.

While empirical data on fishing activity at artificial reefs are limited, the Marine Recreational Information Program (MRIP) and observational data suggests the artificial reefs in nearshore ocean waters do experience fishing effort. The MRIP seeks to survey recreational fishing effort and estimate catch on the state's resources, including fishing effort on artificial reefs. The MRIP uses an array of sampling techniques including mail and telephone surveys, vessel logbooks, and the Access Point Angler Intercept Survey (APAIS). Field technicians interview fishermen at fishing access points (e.g. piers, boat ramps) and obtain information from the fisherman such as demographics, where they fished, and what they caught. Notably, one of the questions asks whether the fisherman fished on an artificial reef. The 2016-2019 results from the APAIS show that trips made with private vessels to artificial reefs make up approximately 12-15% of all private vessel ocean trips (Table 1). The MRIP surveys do not gather specific information on which artificial reefs were visited, however on average, a greater proportion of trips were made to artificial reefs in nearshore waters than in the EEZ. This is noteworthy because there are considerably fewer artificial reef options in nearshore ocean waters, suggesting individual nearshore reefs may be visited more frequently and therefore receive more fishing effort than individual artificial reef sites in the EEZ.

Table 1. Access Point Angler Intercept Survey (APAIS) results from ocean artificial reef trips in private vessels only.

	Percent (%) of Trips to Artificial Reefs		
Year	**<3nm**	**>3nm**	**Total**
2016	8.78	6.29	15.07
2017	5.86	8.34	14.19
2018*	UNKNOWN	UNKNOWN	UNKNOWN
2019	7.06	5.74	12.80

*Data from 2018 are not known due to a categorization error from the artificial reef survey question.

Currently, there are not enough data to accurately quantify the economic value of artificial reefs (SAFMC 2020). Estimating economic impacts of gear restrictions at these locations is also difficult to quantify due to limited data on artificial reefs including: use, gear use, harvest, and other direct or indirect expenditures. However, restricting allowable gears on artificial reefs is likely to have a direct impact on fisheries which rely on those gears, through loss of revenue. The 13 artificial reefs in nearshore ocean waters have a cumulative area of approximately 3.45 nm^2 (Table 2). Given the relative size of these sites, maximum revenue losses may be low, as was forecasted for the snapper grouper fishery in Regulatory Amendment 34 (SAFMC 2020). However, gear restriction as an action to maintain abundance of the resource may offer an offsetting positive economic impact through increased user access and subsequent expenditures.

Table 2. Size (nautical miles squared) of all 13 nearshore artificial reefs in North Carolina. *Area of Material* is a representation of two-dimensional area of actual reef materials (vessels, bridge rubble, pipe, etc.) within the reef site boundaries. *Total Reef Area* represents the total permitted area of the reef site.

Site	Area Of Material (nm^2)	Total Reef Area (nm^2)
AR-160	0.00169	0.19146
AR-165*	--	0.19146
AR-275	0.00095	0.19146
AR-315	0.00960	0.76584
AR-320	0.00791	0.19146
AR-342	0.00387	0.19146
AR-360	0.00202	0.19146
AR-364	0.00197	0.19146
AR-370	0.00382	0.76584
AR-378	0.00391	0.19146
AR-378B	0.00022	0.19146
AR-425	0.00235	0.19146
AR-430	0.01987	0.19146
Total	0.05819	3.44630

*Area of material at AR-165 has not been calculated due to how recently material has been deployed.

From an enforcement perspective, similarities among restrictions at the artificial reefs in the EEZ and in the state ocean waters may be viewed positively. However, some compliance and enforcement challenges will likely exist, considering that license holders often visit multiple sites

with different regulations in a single trip. Perhaps most notably for spearfishing, possession limits for finfish harvested with this gear may be different at EEZ artificial reefs than at artificial reefs in state ocean waters because snapper grouper species harvested with spearfishing gear at EEZ artificial reefs is limited to the applicable recreational bag and possession limits (SAFMC 2020).

For enforcement, it is critical for the proposed Rule 15A NCAC 03J .0404 to prohibit possession of any finfish (not just snapper grouper species) taken with spearfishing gear in excess of a recreational limit within the boundaries of an artificial reef in state ocean waters because the regulations are on the gears themselves and applicable to all finfish species, as explained above. In effect, any license holder who harvests a commercial limit of any finfish species by spear may not visit an artificial reef in state ocean waters while in possession of those finfish.

IV. Fiscal Impact Analysis

Despite the breadth of substantive changes proposed regarding artificial reefs and research sanctuaries in the state of North Carolina, many of these changes do not practically impact management, and overall costs and benefits are not expected to be significant. In fact, two of the three rules in consideration are not expected to incur any additional impacts.

In regards to rule 15A NCAC 03I .0109 “Research Sanctuaries”, while all mention of artificial reefs and corresponding regulations have been removed, existing management strategies for fishing in state Research Sanctuaries will remain exactly the same. These areas have been managed by proclamation authority in the past and will continue to be so into the future using the same guidelines and mechanisms. Therefore, no new impacts are anticipated, including impacts to enforcement.

The new rule proposed for adoption, 15A NCAC 03R .0119, also does not incur any additional impacts, as it merely delineates boundaries for state and federal artificial reef sites. While these site coordinates had not formally been codified into rule prior to this proposed adoption, the rule does not actually address any management authority, simply the exact location of these sites. Therefore, there is no tangible impact from this proposed rule adoption, though the management considerations proposed in 15A NCAC 03J .0404 to these sites do contain meaningful changes for management of artificial reefs in the state.

Lastly, the other newly proposed rule, 15A NCAC 03J .0404 “Ocean Artificial Reef Gear Restrictions”, will likely incur a suite of state-level costs and benefits, though ultimately these impacts are considered as nonquantifiable and non-significant in totality. As discussed above, the impacts to consider from the proposed rule are the costs associated with loss of catch efficiency on artificial reefs and potential loss of access for certain fishermen, while the corresponding benefits relate to the increased productivity and health for finfish in state ocean waters.

Lack of access to highly efficient gears on artificial reefs will ultimately reduce angler catch efficiency on the water in these sites. Recreationally, this reduces satisfaction and may lead to increased effort or decreased participation. Commercially, this may reduce overall landings and

revenues in the industry. However, analysis shows that only around 7% of inshore private vessel trips visit artificial reefs (Table 1), which covers fewer than 3.5 square nautical miles of ocean bottom (Table 2). Additionally, while it is also unknown which gears these private vessel users typically employ on artificial reefs sites, it is highly likely that some proportion already rely on hand-line, rod-and-reel, or spearfishing, reducing the overall impact of this proposed change even further. In all, the costs to the state from these gear restrictions from reduced efficiency and participation cannot be quantified accurately, but given the data available these impacts are expected to be insignificant.

Additionally, there are also expected costs to the state in the form of increased enforcement at artificial reef sites. Given that the proposed rules would create a more stringent set of gear regulations on artificial reef sites, there is the likelihood that Marine Patrol staff may need to spend slightly more time during inspections on artificial reef sites to confirm stakeholders are meeting these proposed regulations. However, as artificial reef sites are already inspected by NCDMF Marine Patrol, and the added time on artificial reef sites is not expected to disrupt normal operations in any significant way, the overall costs to enforcement are not expected to be significant.

Lastly, these proposed gear restrictions will likely incur a small stream of benefits to the state, in the form of increased biological outcomes and improved resource access for all stakeholders. By reducing catch efficiency on artificial reef sites, the goal is to increase the overall productivity of finfish populations on reef sites, which would have positive spillover impacts to finfish stocks within North Carolina's state ocean waters. This will likely lead to very small increases in overall fishing efficiency and satisfaction across the state, which provides an unquantifiable stream of benefits. Given the small geographic scope of this proposed change, this benefit is not expected to be significant.

In conclusion, the proposed restrictions on highly-efficient gears in artificial reef sites in the state will generate both costs in terms of reduced efficiency and access across these sites, as well as benefits in terms of improved biological outcomes for finfish stocks that will impact users across the state. While the proposed changes are intended to protect these sites and increase long-term resource health, the total impact of these effects should not be considered significant to North Carolina.

V. References

Paxton, A. B., Revels, L. W., Rosemond, R. C., Hoeck, R. V., Lemoine, H. R., Taylor, J. C., & Peterson, C. H. (2018). Convergence of fish community structure between a newly deployed and an established artificial reef along a five-month trajectory. Ecological Engineering, 123, 185-192, https://10.1016/j.ecoleng.2018.09.012

South Atlantic Fishery Management Council (SAFMC) (2020). Regulatory Amendment 34 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region: Special Management Zone (SMZ) Framework Amendment to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405, from https://safmc.net/download/SG_RegAm34_Aug-10-2020_FINAL.pdf

VI. Appendix

Proposed Rules for Readoption

15A NCAC 03I .0109 is proposed for readoption with substantive changes as follows:

15A NCAC 03I .0109 ~~ARTIFICIAL REEFS AND~~ RESEARCH SANCTUARIES

(a) The Fisheries Director may, by proclamation, prohibit or restrict the taking of fish and the use of any equipment in and around any ~~artificial reef or~~ research sanctuary. Any closure or restriction shall be for no more than one year, subject to renewal at the discretion of the Fisheries Director.~~is subject to the following conditions:~~

~~(1) Artificial reefs shall not be closed or restricted beyond 500 yards in the Atlantic Ocean or 250 yards in internal coastal waters. Artificial reefs shall be marked as near center as feasible by one readily identifiable official buoy and distances for closures or restrictions shall be measured from such buoy.~~

~~(2) Any closure or restriction shall be for no more than one year, subject to renewal in the discretion of the Fisheries Director.~~

~~(3) The economic effect of the closure or restriction on fishing interests with respect to the size and location of the area and the nature of the equipment affected shall be considered before such closure is made and findings shall be made in writing which findings shall be available for public inspection at the office of Division of Marine Fisheries in Morehead City~~.

(b) It ~~is~~ shall be unlawful to engage in any fishing activity, use any equipment, or conduct any other operation ~~which~~ that has been prohibited by proclamation issued under this authority.

History Note: *Authority G.S. 113-134; 113-181; 113-182; 113-221.1; 143B-289.52;*
Eff. January 1, 1991;
Recodified from 15A NCAC 3I .0009 Eff. December 17, 1996;
Readopted Eff. (Pending legislative review pursuant to S.L. 2019-198).

15A NCAC 03J .0404 is proposed for adoption as follows:

15A NCAC 03J .0404 OCEAN ARTIFICIAL REEF GEAR RESTRICTIONS

(a) For the purpose of this Rule:

(1) "hand line" shall mean fishing gear that is set and pulled by hand and consists of one vertical line to which may be attached leader lines with hooks.

(2) "hook and line" shall mean one or more hooks attached to one or more lines and shall include rod and reel, a fishing rod designed to be hand-held with a manually or electrically operated reel attached.

(3) "spearfishing gear" shall mean spears, Hawaiian slings, or similar devices that propel pointed implements by mechanical means, including elastic tubing or bands, pressurized gas, or similar means.

(b) It shall be unlawful to use fishing gear in Ocean Artificial Reefs designated in 15A NCAC 03R .0119 except hand line, hook and line, and spearfishing gear, and except as further limited in accordance with Paragraph (d) of this Rule.

(c) It shall be unlawful to possess finfish taken with spearfishing gear in excess of a recreational limit within the boundaries of a designated Ocean Artificial Reef.

(d) The Fisheries Director may, by proclamation, close the areas designated in 15A NCAC 03R .0119 to the use of specific fishing gear, including the gears otherwise allowed in Paragraph (b) of this Rule, based on biological impacts or user conflicts.

(e) The Fisheries Director may, by proclamation, designate and modify Ocean Artificial Reefs in Coastal Fishing Waters of the Atlantic Ocean, based on biological impacts or variable spatial distribution, including shifted artificial reef material.

History Note: *Authority G.S. 113-134; 113-182; 113-221.1; 143B-289.52;*
Eff. (Pending legislative review pursuant to S.L. 2019-198).

15A NCAC 03R .0119 is proposed for adoption as follows:

15A NCAC 03R .0119 OCEAN ARTIFICIAL REEFS

The Ocean Artificial Reefs referenced in 15A NCAC 03J .0404 are delineated in the following Coastal Fishing Waters of the Atlantic Ocean:

(1) AR-160: within the circular area described by a center point at 35° 43.8880' N - 75° 26.7710' W and radius extending 1,500 feet.

(2) AR-165: within the circular area described by a center point at 35° 41.6720' N - 75° 26.3130' W and radius extending 1,500 feet.

(3) AR-275: within the circular area described by a center point at 34° 50.0930' N - 76° 16.8800' W and radius extending 1,500 feet.

(4) AR-315: within the circular area described by a center point at 34° 40.0850' N - 76° 44.8270' W and radius extending 3,000 feet.

(5) AR-320: within the circular area described by a center point at 34° 39.5330' N - 76° 48.4170' W and radius extending 1,500 feet.

(6) AR-342: within the circular area described by a center point at 34° 36.6720' N - 77° 2.1890' W and radius extending 1,500 feet.

(7) AR-360: within the circular area described by a center point at 34° 20.9830' N - 77° 36.1830' W and radius extending 1,500 feet.

(8) AR-364: within the circular area described by a center point at 34° 14.8060' N - 77° 42.8550' W and radius extending 1,500 feet.

(9) AR-370: within the circular area described by a center point at 34° 10.4530' N - 77° 45.2810' W and radius extending 3,000 feet.

(10) AR-378: within the circular area described by a center point at 34° 1.8070' N - 77° 52.0910' W and radius extending 1,500 feet.

(11) AR-378b: within the circular area described by a center point at 34° 0.6420' N - 77° 50.6540' W and radius extending 1,500 feet.

(12) AR-425: within the circular area described by a center point at 33° 53.0480' N - 78° 6.5250' W and radius extending 1,500 feet.

(13) AR-430: within the circular area described by a center point at 33° 52.2560' N - 78° 09.9680' W and radius extending 1,500 feet.

History Note: *Authority G.S. 113-134; 113-182; 143B-289.52;*
Eff. (Pending legislative review of 15A NCAC 03J .0404).