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POLICIES FOR THE PROTECTION AND RESTORATION OF ESSENTIAL FISH HABITATS FROM ALTERATIONS TO RIVERINE, ESTUARINE, AND NEARSHORE WATER QUALITY AND FLOWS (May 2026)

Policy Context

This document establishes the policies of the South Atlantic Fishery Management Council (SAFMC) regarding protection of the essential fish habitats (EFH) and habitat areas of particular concern (EFH-HAPCs) associated with alterations of riverine, estuarine, and nearshore flows. Such hydrologic alterations occur through activities such as dam operations, water supply and irrigation withdrawals, and other modifications to the normative hydrograph. The policies are designed to be consistent with the overall habitat protection policies of the SAFMC as formulated and adopted in the Habitat Plan (October 1998) and the Comprehensive EFH Amendment (October 1998), Fishery Ecosystem Plan for the South Atlantic Region one and two (SAFMC 2009a, SAFMC 2018), Comprehensive Ecosystem-Based Management Amendment 1 (SAFMC 2009b), Comprehensive Ecosystem-Based Amendment 2 (SAFMC 2011), The Habitat Blueprint (SAFMC 2023), and the various Fishery Management Plans (FMPs) of the Council.

The findings presented below assess the threats to EFH potentially posed by activities related to the alteration of flows in southeast rivers, estuaries and nearshore ocean habitats, and the processes whereby those resources are placed at risk. The policies established in this document are designed to avoid, minimize and offset damage caused by these activities, in accordance with the general habitat policies of the SAFMC as mandated by law.

EFH At Risk from Flow-Altering Activities

The SAFMC finds:

1. In general, the array of existing and proposed flow-altering projects being considered within the Southeastern United States for states with river systems that drain into the SAFMC area of jurisdiction together constitutes a real and significant threat to EFH under the jurisdiction of the SAFMC.

2. The cumulative effects of these projects have not been adequately assessed, including impacts on public trust marine and estuarine resources, use of public trust waters, public access, state and federally protected species, state critical habitat, and SAFMC-designated EFH and EFH-HAPCs.

3. Individual proposals resulting in hydrologic alterations rarely provide adequate assessments or consideration of potential damage to fishery resources under state and federal management. Historically, emphasis has been placed on the need for human water supply, hydropower generation, agricultural irrigation, flood control and other human uses. Environmental considerations are dominated by compliance with limitations imparted by the Endangered Species Act, and/or through provisions of Section 18 of the Federal Power Act, as administered by the Federal Energy Regulatory Commission, as well as the provisions of the Fish and Wildlife Coordination Act. Other laws and agencies that may impact projects with hydraulic alterations include the Magnuson-Stevens Act, the Clean Water Act, the Rivers and Harbors Act, state water quality departments, state stormwater management, and the EPA.

4. Hydrologic alterations have caused impacts to the following types of habitats and ecosystem functions:

   a. waters, wetlands and benthic habitats near the discharge and withdrawal points, especially where such waters are used for spawning, recruitment and migration.
   b. waters, wetlands and benthic habitats in the area downstream of discharge or withdrawal points
   c. waters, wetlands and benthic habitats in receiving estuaries of southeast rivers
   d. waters and benthic habitats of nearshore ocean habitats receiving estuarine discharge
   e. the quality of waters, wetlands and benthic habitats via increased runoff and contaminants or pollutants

5. The following riverine, estuarine and nearshore habitats are particularly important to the long-term viability of commercial and recreational fisheries under SAFMC management, and threatened by large-scale, long-term or frequent hydrologic alterations:

   a. freshwater riverine reaches and/or wetlands used as spawning, nursery, and foraging habitats
   b. downstream freshwater, brackish and mid-salinity portions of rivers and estuaries serving as nursery areas for estuarine-dependent species
   c. nearshore oceanic habitats off estuary mouths and
   d. areas supporting submerged aquatic vegetation (please see SAFMC's SAV Policy for further information).

6. Large sections of South Atlantic waters potentially affected by these projects, both individually and collectively, have been identified as EFH or EFH-HAPC by the SAFMC**,** as well as the Mid-Atlantic Fishery Management Council (MAFMC) in the case of North Carolina. Potentially affected species and their EFH under federal management include, but are not limited to (SAFMC, 1998) the following:

   a. summer flounder (various nearshore waters, including the surf zone and inlets; certain offshore waters)
   b. bluefish (various nearshore waters, including the surf zone and inlets)

c. many snapper and grouper species (live hardbottom from shore to 600 feet, and – for estuarine-dependent species [e.g., gag grouper and gray snapper] – unconsolidated bottoms and live hardbottoms to the 100 foot contour).
d. black sea bass (various nearshore waters, including unconsolidated bottom and live hardbottom to 100 feet, and hardbottoms to 600 feet)
e. penaeid shrimp (offshore habitats used for spawning and growth to maturity, and waters connecting to inshore nursery areas, including the surf zone and inlets)
f. coastal migratory pelagics (e.g., king mackerel, Spanish mackerel) (sandy shoals of capes and bars, barrier island ocean-side waters from the surf zone to the shelf break inshore of the Gulf Stream; all coastal inlets)
g. corals of various types (hard substrates and muddy, silt bottoms from the subtidal to the shelf break could negatively impact growth and reproduction) (Jones, 2019)
h. areas identified as EFH for Highly Migratory Species managed by the Secretary of Commerce (inlets and nearshore waters are important pupping and nursery grounds for sharks)

7. Projects which entail hydrologic alterations also threaten important fish habitats under federal, interstate, and state management (in particular, riverine spawning habitats, riverine and estuarine habitats, including state designated areas - e.g. Primary and Secondary Nursery Areas of North Carolina), as well as essential overwintering grounds in nearshore and offshore waters. These projects can also impact anadromous and diadromous fish management by the Atlantic States Marine Fisheries Commission.

8. Numerous habitats that have been impacted by these projects causing hydrologic alterations have also been identified as EFH-HAPCs by the SAFMC. These habitats and their specific fishery management plan (listed in parentheses) are provided below:

   a. all nearshore hardbottom areas (SAFMC, snapper grouper).
   b. all coastal inlets (SAFMC, penaeid shrimps, and snapper grouper).
   c. nearshore spawning sites (SAFMC and penaeid shrimps).
   d. benthic *Sargassum* (SAFMC, snapper grouper).
   e. from shore to the ends of the sandy shoals of Cape Lookout, Cape Fear, and Cape Hatteras, North Carolina; Hurl Rocks, South Carolina; *Phragmatopora* (worm reefs) reefs off the central coast of Florida and nearshore hardbottom south of Cape Canaveral (SAFMC, coastal migratory pelagics).
   f. Atlantic coast estuaries with high numbers of Spanish mackerel and cobia from NOAA's Estuarine Living Marine Resources program, to include Bogue Sound, New River, North Carolina; Broad River, South Carolina (SAFMC, coastal migratory pelagics).
   g. Florida Bay, Biscayne Bay, Card Sound, and coral hardbottom habitat from Jupiter Inlet through the Dry Tortugas, Florida (SAFMC, Spiny Lobster)
   h. Hurl Rocks (South Carolina), The *Phragmatopoma* (worm reefs) off central east coast of Florida, nearshore (0-4 meters; 0-12 feet) hardbottom off the east coast of Florida from Cape Canaveral to Broward County); offshore (5-30 meters; 15-90 feet) hardbottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida; Biscayne National Park, Florida; and the Florida

Keys National Marine Sanctuary (SAFMC, Coral, Coral Reefs and Live Hardbottom Habitat).

i. EFH-HAPCs designated for HMS species (e.g., sharks) in the South Atlantic region (NMFS, Highly Migratory Species).

9. Habitats likely to be affected by projects which alter hydrologic regimes include many recognized in state level fishery management plans. Examples of these habitats include Critical Habitat Areas (CHAs) established by the North Carolina Marine Fisheries Commission, either in FMPs or in Coastal Habitat Protection Plans (Other Exp: South Carolina).

Threats to Riverine, Marine and Estuarine Resources from Hydrology-Altering Activities

The SAFMC finds that activities which alter normative hydrologic regimes of rivers, estuaries, inlets and nearshore oceanic habitats may include projects such as dam operations and water withdrawals. These actions may pose a threat to EFH, EFH- HAPCs, state and federally-listed species, Federal critical habitat, and CHAs through the following mechanisms:

Water Withdrawals

Impacts to aquatic species and habitats from water withdrawals for municipal, industrial, and agricultural purposes could potentially include impingement, entrainment, temporary and permanent alterations to habitat from construction activities, decreased downstream flows, and degradation of downstream water quality due to decreased downstream flows. Minimizing impingement and entrainment requires knowledge of the life history and behavioral traits of sensitive species in the project area, their sustained swimming speeds, and the sizes of their vulnerable life stages. In addition, projected approach and sweeping velocities at multiple flow scenarios should be calculated during project design to minimize potential impacts. Approach velocity is the vector component perpendicular to the screen face as water passes through the screen mesh, measured approximately 3 inches from the screen surface. Sweeping velocity is the vector component parallel and adjacent to the screen face.

The most vulnerable life stages to water withdrawals are typically eggs, larvae, and juveniles. Protection devices to the greatest extent possible should minimize entrainment and impingement and help guide sensitive species away from the facility. The first consideration should be to separate the fish spatially and temporally from the intake. If intakes cannot be located away from habitats supporting sensitive species, reducing or eliminating withdrawals when these species are present can be an effective protection strategy.

Providing fish egress from the intake is important because without it they can eventually fatigue and become impinged. Preferably the intake should be placed in open water with a suitable sweeping velocity which will eliminate the need for a bypass is for the intake to be placed in open water, especially with a suitable sweeping velocity, because a bypass is therefore not required. However, when intakes are set into the bank, a bypass system with an entrance at the downstream end of the screen becomes necessary. Velocities at the bypass entrance should be high enough to provide efficient guidance for out migrating fish.

Keeping the screen surface clean of debris is critically important for maintaining proper approach velocities because clogged screens tend to develop hot spots having higher velocities that can significantly increase impingement.

Dam Operations

Impacts to aquatic species and habitats caused by flow alterations from dam operations include temporary and permanent alterations to habitat from construction activities, salinity changes that can alter emergent vegetation, reduced habitat suitability and growth rates of sensitive species with an increase in the colonization of predators, degradation of downstream water quality, and altered downstream flows. Degraded downstream water quality associated with dam operations may include reduced dissolved oxygen, altered water temperature, increases in algal blooms, and reduced wastewater assimilation. Additionally, there are large impacts from dams changing downstream geomorphology as well as hydrology. For example, dams reduce the occurrence of downstream coarse sediments (e.g., large pebbles and rocks), preventing the replenishment of downstream erosion (Poff et al., 1997; Simon and Rinaldi, 2006). This leads to a cascading effect and feedback loop of stream bank incision, erosion, and exposed substrate, which may be colonized by invasive species. Furthermore, altered disturbance regimes can favor invasive species (Commander 2013 and references therein; Stromberg et al. 2007 and references therein), further degrading the ecosystem and reducing biodiversity

Flow modifications of natural hydrologic regimes caused by dams can greatly alter aquatic systems. The current environmental flows paradigm emphasizes the importance of the natural variability of flows and the concept that biota have evolved in response to critical components of variable flows. Components of natural river flows provide ecological functions and include baseflows, high pulse flows, and floods. For example, seasonal and annual variability in baseflows creates habitat diversity that results in diverse aquatic communities. Higher baseflows increase habitat for aquatic organisms maintain suitable water quality, keep fish eggs and free floating larvae suspended, and enable fishes to move to feeding and spawning areas. Periodic naturally low baseflows can concentrate prey into limited areas to benefit predators. High pulse flows shape physical habitat of river channels, determine the size of substrate, prevent riparian vegetation from encroaching into the channel, restore normal water quality conditions after prolonged low flows and flush away waste products and pollutants, aerate eggs, prevent siltation, and maintain suitable salinity in estuaries. Floods provide migration and spawning cues for fishes, enable fishes to access the floodplain for spawning and feeding and provide a nursery area for juvenile fishes, maintain the balance of species in aquatic communities, deposit gravel and cobbles in spawning areas, and flush organic materials that serve as food and habitat structures into the channel. It is possible in some cases to purge invasive species through either desiccating them by significantly lowering flows (which could strand and kill the target species), or by increasing flows which could remove invasive plants, for example, by scouring or displacing them (Stromburg, 2007).

Five critical components of flow regimes that regulate ecological processes in river ecosystems are recognized: magnitude, frequency, duration, timing, and rate of change. Alterations to each of these components of the natural flow regime can cause a wide range of detrimental ecological responses. As an example, changes in the magnitude and frequency of high and low flows are common flow alterations from dam operations. The extreme daily variations below peaking power hydroelectric dams create an extremely harsh environment of frequent, unpredictable flow disturbance. Aquatic species living in these environments can suffer physiological stress, washout during high flows, and stranding during rapid dewatering. Frequent exposure can result in mortality of bottom- dwelling organisms and reductions in biological productivity. Many small fishes and early life stages found in shoreline or backwater areas can be negatively impacted by frequent or unpredictable low flow fluctuations that may ultimately result in reductions of both species abundance and diversity. Dams reduce the occurrence of downstream coarse sediments (e.g., large pebbles and rocks), preventing the replenishment of downstream erosion (Poff et al., 1997; Simon and Rinaldi, 2006). This leads to a cascading effect and feedback loop of stream bank incision, erosion, and exposed substrate, which may be colonized by invasive species. Furthermore, altered disturbance regimes can favor invasive species (Commander 2013 and references therein; Stromberg et al. 2007 and references therein), further degrading the ecosystem and reducing biodiversity. Conversely, flow stabilization below dams, such as water supply reservoirs, can result in artificially constant environments that lack natural extremes, decreased diversity, and reduced floodplain connectivity. Therefore, mimicking or ensuring the natural magnitude, frequency, duration, timing, and rate of change of baseflows, high pulse flows, and floods is preferable.

<u>Tidal Restrictions</u>
The following projects or structures may result in the restriction of tidal movement:

- Structure to protect lands by purposefully impeding movement of water
- Earthen berms, dikes, dams, or levees
- Commonly seen projects used to maintain tidal impoundments and/or historic rice fields for waterfowl management including those which:
    - contain structures that protect lands by impeding water movement
    - impound water behind earthen berms, dams, dikes or levees
    - maintain tidal impoundments for waterfowl management
    - drain water off tidal lands
    - involve ditches that facilitate drainage
    - regulate water levels with control structure (i.e. tide gates, weirs, or trunk gates)
    - contain transportation structures that allow crossing over or through tidal streams and wetlands (i. e. bridges, culverts, roads and railroad causeways).
- Structures to move or drain water on and off tidal lands
- Ditches
- Water control structures (i.e. tide gates, weirs, or trunk gates)
- Transportation structures over or through tidal streams and tidal wetlands
- Bridges and culverts
- Road and railroad causeways

Flow restrictions are often observed when undersized culverts or elevated road beds instead of bridges are used. Both negatively impact water movement and fish passage within tidal systems. NMFS encourages the construction of bridges where crossings must occur over tidal wetlands (especially vegetated wetlands).

It is fairly well understood how salt marshes respond to tidal restriction. With a reduction in seawater flow, salinities decline, marsh soils become drier and begin to oxidize, and *Spartina*-dominated salt marshes are typically replaced with monocultures or mixtures of *Phragmites* *australis* (common reed) and *Typha* (cattail) species (Burdick et al. 1997). The resulting plant communities in tidally restricted marshes, particularly drained sites, are dissimilar to the original salt marsh community, and many of the ecosystem services provided by salt marshes are lost (Gedan et al. 2009).

The origin of degraded salt marshes is often the constriction or blockage of tidal flow (Roman and Burdick 2012). Tidal barriers modify hydrological processes that alter marsh habitat and ecological interactions due to changes in tide levels, tidal prism, and salinity. In order to simulate a tide gate's ability to prevent upstream flooding while also providing tidal inundation, pre-construction modeling should be performed. Hydraulic modeling and geomorphic assessments can predict changes in upland flooding, sediment transport, aquatic habitat, marsh vegetation, salinity levels, and fish passage. Hydraulic modeling is also useful for comparing model runs under existing conditions to those generated under altered conditions to predict ecological impacts. Modeling should also incorporate rising sea level elevations on the tide gate's ability to prevent upstream flooding, as higher downstream mean sea level elevations will trigger more frequent gate closures and reduce their effectiveness (Walsh and Miskewitz 2013).

Water Quality and Stormwater Management

Much of the nearshore run-off adjacent to the SAFMC, jurisdiction contains various levels of agricultural, industrial, recreational and domestic contaminants. Examples of the contaminant impact include the significant blue/green algae blooms on both the east and west coasts of Florida following routine discharges from various lakes and rivers and the significant sea grass loss events routinely experienced following large freshwater discharges. In addition, large areas adjacent to the SAFMC jurisdiction have minimally effective or no stormwater management. Examples include the entirety of Monroe County Florida, which relies, primarily, on swales. These swales are used to direct untreated run-off directly into Florida Bay, the Gulf of Mexico and the Atlantic. These events negatively impact the critical ecosystems that provide the estuary with resources for replenishment of many SAFMC species. In certain instances, the contaminants enter the SAFMC jurisdiction.

Effective compliance with the directives of the Magnuson Stevenson Act by the SAFMC requires cooperation with and by all local and state governing bodies. It is critical that the project developers develop contaminant and stormwater mitigation strategies with all adjacent jurisdictions.

Setting Environmental Flow Standards
Three general approaches have typically been used to establish environmental flow standards: minimum flow thresholds, statistically based standards, and percent-of-flow approaches.

Minimum flow thresholds are the most commonly applied approach and involve setting a single minimum flow or seasonally varying minimum flows that must be maintained to support ecological conditions. These standards are straightforward to implement but may not fully capture natural variability in flow regimes.

Statistically based standards have been adopted more recently and are designed to maintain selected characteristics of natural flow regimes, such as magnitude, timing, duration, and frequency. This approach uses statistical properties of historical or modeled flow data to preserve specific characteristics of natural flow regimes and define acceptable conditions for ecosystem support.

Percent-of-flow approaches are increasingly being used and define environmental flow needs as a proportion of natural (unimpaired) flow conditions. An extension of this approach applies bands of allowable alteration, often referred to as *sustainability boundaries*, around natural flow regimes. Natural flows are typically estimated on a daily basis at points of interest and represent flows that would have occurred in the absence of existing alterations. Sustainable boundary limits are then established based on allowable departures from these natural conditions. This approach explicitly links ecological protection to the degree of hydrological alteration.

Richter et al. (2011), drawing on well-supported case studies and regional analyses, suggest that high ecological protection is achieved when daily flow alterations do not exceed 10%, moderate protection occurs with alterations of 11–20%, and alterations greater than 20% are likely to result in moderate to major changes in ecosystem structure and function, with increasing risk as alteration increases. When a single threshold is required, a presumptive standard of protecting 80% of daily flows is expected to maintain ecological integrity in most rivers, while 90% may be necessary in systems with at-risk species or exceptional biodiversity. Where local ecological knowledge indicates greater protection is needed, these values should be adjusted accordingly. When applied to hydropower-regulated rivers, standards based solely on daily average flows may be insufficient, as peaking operations can cause substantial within-day fluctuations that may adversely affect ecological integrity.

Interbasin Transfer

An interbasin transfer or re-diversion of water is the movement of water from one river or stream basin to another, often using canals, pipelines, or tunnels. These transfers are often used to address water shortages or optimize water use in a different region. The process involves diverting water from a "donor" basin, which can impact the environment and local water rights within the “donor” basin, and also within the receiving basin, so such projects are frequently subject to regulations and environmental reviews.

Of primary concern to the Council would be if such a proposed transfer would significantly adversely affect hydrological flow patterns (either quantity or timing) downstream of the transfer intake in the donor basin, or downstream of the discharge point in the receiving basin, and thereby impact delivery of freshwater to receiving riverine or estuarine habitats which are designated as EFH. Additional potential impacts may include alterations in flow velocity, temperature and/or salinity depending on the location of the withdrawal and discharge points.

The generic basin impacts may be characterized as follows: water is subtracted from the donor basin, and added to the receiving basin. Additional impacts which may occur will depend on the volume of water exchanged and location of the withdrawal and discharge points.

Irrigation Threats

Water withdrawals for agricultural irrigation or other similar purposes (i.e., non-agricultural irrigation such as for golf courses) may constitute a threat to estuarine or riverine ecological flow needs, and thereby adversely affect EFH when they are excessive (e.g., exceed recommended ecological flow levels).

In **North Carolina**, significant daily surface and groundwater withdrawals must be registered with the state's Division of Water Resources (DWR) under NC General Statute 143-215.22H. Agricultural users must register withdrawals of 1,000,000 gallons or more per day. Non-agricultural users have a threshold of 100,000 gallons per day. Registrations must be updated every five years. Per the **South Carolina** Surface Water Withdrawal, Permitting, Use, and Reporting Act, if withdrawing more than 3MG in any one month, a water user must secure either a registration or a permit from SCDHEC. Surface water withdrawal requires registration for agricultural use or a permit for all other uses, unless otherwise exempted. In **Georgia**, an Agricultural Water Withdrawal Permit is needed for any person who withdraws more than 100,000 gallons per day from surface water or groundwater. Finally, **Florida** requires a Consumptive Use Permit (CUP) for withdrawals of water from public water sources for irrigation, based on the principles of reasonable-beneficial use and without interfering with other users or the public interest. Applicants must demonstrate need for the quantity of water requested and ensure efficient use, with specific rules and potential limitations applying in various Water Use Caution Areas. For agricultural operations, implementing Best Management Practices (BMPs) can provide a presumption of compliance with water quality standards, reducing liability for pollution.

In South Carolina, irrigation withdrawals from public waters are regulated by the Department of Environmental Services (DES) under Regulation 61-119 (Surface Water Withdrawal) and Regulation 61-67 (Groundwater Withdrawal), with permits required for withdrawals exceeding specific thresholds, especially in Capacity Use Areas. Exemptions from permitting exist for smaller withdrawals and certain uses. All withdrawals, including exempt ones, must not infringe on public water supplies and may be subject to drought-related regulations under § 61-58.8.

Detailed information for irrigation withdrawals in Georgia is available here: https://epd.georgia.gov/watershed-protection-branch/agricultural-water-withdrawals

Here is detailed information for Florida:

1. Water Use Permitting

Water Use Permit (WUP) / Consumptive Use Permit (CUP): All withdrawals of water for consumptive uses, including agricultural irrigation, require a permit from the appropriate Water Management District or the Florida Department of Environmental Protection (FDEP).

Reasonable-Beneficial Use: To receive a permit, the proposed use must be deemed a reasonable and beneficial use of water, meaning the quantity of water is necessary for an economic and efficient utilization.

No Interference with Other Users: The permit process ensures that the proposed use will not interfere with existing legal water uses.

Public Interest: The proposed water use must be consistent with the public interest, which includes considerations for environmental harm, wetlands, saltwater intrusion, and other impacts.

2. Application Process

Application Filing: Applications for a Water Use Permit are filed with the governing board of the appropriate water management district or FDEP, and more information can be found on Florida's Water Permitting Portal.

Required Information: Applications must include the applicant's information, the source of the water, the quantity requested, the location of the withdrawal point, and the intended use of the water.

Reasonable Assurance: Applicants are responsible for providing reasonable assurance that the water withdrawal quantities are necessary to meet demand without negative impacts, both individually and cumulatively.

3. Agricultural Water Quality & Best Management Practices (BMPs)

Water Quality Standards: Beyond withdrawal, agricultural operations must also consider water quality regulations.

Presumption of Compliance: Implementing BMPs, a program administered by the Florida Department of Agriculture and Consumer Services (FDACS), can provide a presumption of compliance with state water quality standards. This protects farmers from liability for pollution from their operations, according to Florida Administrative Code 5M-8.003.

Notice of Intent (NOI): To participate in the BMP program, agricultural operations must submit an NOI to the FDACS after an initial site visit.

4. Water Use Caution Areas

> **Specific Regulations**: Additional or alternative provisions may apply for uses within designated Water Use Caution Areas, which are regions with stressed water resources.

Other Current State Policies on Water Flow and Water Quality:

North Carolina:
Surface and groundwater withdrawers who meet conditions established by the General Assembly register and annually report their water withdrawals and surface water transfers with the State. Registrations are updated at least every five years. Water withdrawal permits contain conditions to meet site-specific instream flow requirements. Specifics of each project are used by the Division of Water Resources of North Carolina Department of Environment and Natural Resources to determine the appropriate instream flow recommendation. Some of these specifics

include if the project is proposed or existing, presence or absence of a dam, purpose of the withdrawal, etc.
Some flow recommendations may be a percentage of a low flow value while others may be variable, seasonally dependent flows based on fieldwork and consensus among numerous stakeholders.

South Carolina:
Surface water withdrawals are regulated by the South Carolina Department of Environmental Services (SCDES) under the Surface Water Permitting, Withdrawal, and Reporting Act, which was signed into law in June, 2010. Most facilities that have a dam and withdraw surface waters must abide by the regulations provided in this Act. However, hydropower is exempted from the permitting requirements, including the minimum flow requirements, identified in this Act. Dams, whether for hydropower or other purposes, typically require federal permits or licenses to be constructed and operated. Minimum flows at dam projects can be required by the 401 Water Quality Certification administered by SCDES. In the development of 401 certifications, SCDES will consider recommendations from other State Agencies, such as the South Carolina Department of Natural Resources (SCDNR). SCDNR flow recommendations are guided the 2009 Instream Flow Policy, which was first established in 1989, and the policy is reflected in the 2025 South Carolina Water Plan developed for protection of fish and wildlife habitats, which says:

In the absence of a site-specific instream flow study, recommended minimum flows are as follows:

Piedmont Streams:
July-November = 20% of mean annual daily streamflow
January-April = 40% of mean annual daily streamflow
May, June, December = 30% of mean annual daily streamflow
Coastal Plain Streams:
July-November = 20% of mean annual daily streamflow
January-April = 60% of mean annual daily streamflow
May, June, December = 40% of mean annual daily streamflow

Georgia:
A centralized permitting process is in place under the Georgia Department of Natural Resources-Environmental Protection Division (GDNR-EPD), which issues surface and groundwater withdrawal permits for any use greater than 100,000 gallons per day. GDNR-EPD implements its 2001 Interim Instream Flow Protection Strategy through provisions in surface water withdrawal permits. It is applicable to new, post-2001, non- farm surface water allocations of water and is applicable to any non-federal impoundment. Therefore, exceptions to this policy are agricultural projects, Federal reservoirs, and withdrawals from highly regulated streams, such as the Savannah River, in which flows are significantly determined by the operation of Federal reservoirs.
GDNR will work to identify a consensus approach to address minimum flow requirements for those seeking to withdraw water from highly regulated streams.

Pre-2001 withdrawal permit holders seeking increases in permit quantities are required to comply with the policy for the increased allocation only, not for the previously permitted withdrawal amount. Low flow protection for those projects using previous withdrawal amounts is governed by an annual 7Q10 or, if using pre-1977 withdrawal amounts, no minimum flow requirements. Under the 2001 Interim Instream Flow Protection Strategy, the permit applicant is able to select from one of three minimum stream flow options, outlined below:

Monthly 7Q10 Minimum Flow Option: The applicant is required to release the lesser of the monthly 7Q10 or inflow. The monthly 7Q10 is a statistical figure that reflects the lowest seven-day running average of a stream's flow for each calendar month with a recurrence frequency of once in ten years.

Site-Specific Instream Flow Study Option: A site-specific instream flow study may be performed to determine what minimum flow conditions must be maintained for protection of aquatic habitat.

Mean Annual Flow Options:
30% Mean Average Annual Flow for direct withdrawals, or inflow, whichever is less.
30/60/40% Mean Annual Flow for water supply reservoirs, or inflow, whichever is less. This translates to the lesser of 30% of the mean annual flow or inflow during July through November, 60% of the mean annual flow or inflow during January through April, and 40% of the mean annual flow or inflow during May, June, and December.

Florida:
Under the Florida Water Resources Act (Chapter 373, Florida Statutes), the Florida Department of Environmental Protection (FDEP) holds overarching authority to supervise and regulate water resources across the state, including surface and groundwater flows, environmental protections, permits, and water-quality standards. FDEP exercises general supervisory authority over five regional water management districts, which are responsible for the administration of water resources at the regional level. Each district, in coordination with FDEP is required to develop Regional Water Supply Plans every five years (Chapter 373.036, Florida Statutes). These plans assess current and future water needs, identify alternative water sources, and outline strategies to meet demand while protecting ecosystems.

Each district is required to establish minimum flows and levels (MFLs) for aquifers, surface watercourses, and other surface water bodies to identify the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area. The law defines "significant harm" as a level of environmental damage that is not temporary and would require substantial time or intervention to recover from. MFLs must be set above this threshold to prevent it. Rivers, streams, estuaries, and springs require minimum flows, while minimum levels are developed for lakes, wetlands, and aquifers. MFLs are adopted into Water Management District rules (Chapter 40D-8, Florida Administrative Code) and used in each District's water use permitting program to ensure that withdrawals do not cause significant harm to water resources or the environment. Each Water Management District develops a priority list and schedule of rivers, springs, lakes, aquifers, and wetlands that need MFLs. These are updated annually and approved by FDEP. District scientists gather long-term hydrologic, ecological, and biological data for each waterbody that are used to develop specific MFL recommendations and to help define significant harm. If actual flows or levels are below established MFLs, or are expected to be below established MFLs within the next twenty years, the Districts develop and implement a recovery or prevention strategy (Chapter 40D-80, F.A.C.), in accordance with state law (Chapter 373.0421, Florida Statutes)

SAFMC Policies for Flow-Altering Projects

1) The SAFMC establishes the following general policies related to projects resulting in hydrologic alterations, to clarify and augment the general policies already adopted in the Habitat Plan and Comprehensive Habitat Amendment (SAFMC 1998a; SAFMC 1998b):

2) Components of the natural flow regime should be altered as little as possible. Although achieving a natural hydrograph in its entirety may not be possible, restoration of some of the natural flow regime components can restore EFH, water quality, and ecosystem functions that would be lost or reduced as a consequence of flow regulation.

3) Projects should:

   a. avoid, minimize and where possible offset damage to EFH and EFH-HAPCs, state and federally-listed species, Federal critical habitat, and State Designated Critical Habitat Areas (CHAs).
      i. North Carolina
      ii. South Carolina
      iii. Georgia
      iv. Florida
   b. provide detailed analyses of possible impacts to EFH, EFH-HAPCs, state and federally-listed species, federal critical habitat, and CHAs. This should include careful and detailed analyses of possible impacts, including short-term, long-term for population and ecosystem-scale effects.
   c. provide a full range of alternatives, along with assessments of the relative impacts on each type of EFH, EFH-HAPC, state and federally-listed species, Federal critical habitat, and (CHAs).
   d. avoid impacts on EFH, EFH-HAPCs, state and federally-listed species, federal critical habitat, and CHAs that are shown to be avoidable through the alternatives analysis, and minimize impacts that are not.
   e. avoid significant adverse impacts to local natural, hydrologic flows, ecological integrity, and water quality.
   f. include assessments of potential unavoidable damage to EFH and other marine resources.
   g. be conditioned on the avoidance of impacts, and the minimization of unavoidable impacts. Compensatory mitigation should be required for all unavoidable impacts to EFH, EFH-HAPCs, state and federally-listed species, Federal critical habitat, and CHAs, taking into account uncertainty about these effects. Mitigation should be local, up-front and in-kind, and should be adequately monitored.
   h. include baseline and project-related monitoring adequate to document pre-project conditions and impacts of the projects on EFH, EFH-HAPCs, state and federally-listed species, Federal critical habitat, and CHAs.
   i. meet state and Federal water quality standards.

4) All assessments should take into account the cumulative impacts and be based on best available science.

5) Construction activities should be scheduled to avoid spawning migrations or early development of sensitive species that are present in the proposed project areas.

6) Impingement and entrainment of sensitive species at water intakes should be avoided. Water intakes should not be placed in areas that would negatively affect EFH's, EFH-HAPCs, CHAs, Federal critical habitat, and state and federally-listed species.

7) When developing the intake design, intake screens in rivers and streams should be constructed away from the banks and within the flowing stream. If on the bank, the face should be continuous with the adjacent bank line to ensure a smooth transition to prevent eddies around the screen and a fish bypass system that returns fish to the main channel should be incorporated. Screens should be oriented so the angle between the face of the screen and the approaching flow is not more than 45 degrees off parallel. Anticipated sweeping and approach velocities of proposed projects should be compared to the known swimming speeds of sensitive species in the project area, egg size of sensitive species should be considered when deciding on mesh size, and the vertical distribution of sensitive species should be considered when deciding on the elevation of the intake. Approach velocities must be set lower than the sustained swimming speed of sensitive species. Sweeping velocities should be greater than the approach velocities. Using a non-withdrawal period or installing removable screens with reduced mesh size during the spawning and early development periods may also be options to avoid impingement and entrainment. Where possible, locate intakes where sufficient sweeping velocity exists to minimize sediment accumulation, facilitate debris removal, and encourage fish movement away from the screen face.

8) An on-going maintenance and repair program is necessary to ensure water intake facilities are kept free from debris and that screen mesh and other components are functioning correctly. Adequate facilities need to be in place for handling floating and submerged debris large enough to damage the screen. No project should impact flow regimes or water quality of the surrounding area.

9) Multiple years of post-construction monitoring should be used to study impingement and entrainment rates of sensitive species, and if a bypass system is included, for monitoring mortality through the bypass. Monitoring results need to confirm that the design criteria were met and that unexpectedly high mortality rates are not occurring. Monitoring results can then be used to improve the water intake structure, if needed. Review of construction already completed, impacts and requirements for monitoring and mitigating impacts i.e. stormwater and water quality.

10) For hydropower peaking projects, consider the implementation of ramping rate restrictions before and after the peaking operation and a non-peaking window during the critical reproductive and rearing periods of sensitive species.

11) Flow control structures (i.e. weirs, tide gates, culverts or earth filled structures) should

be designed and implemented to protect water quality, maintain natural hydrology, and support downstream habitat connectivity. Projects should minimize erosion, sedimentation, and pollutant discharge, and maintain natural flow regimes during and after construction through the use of best management practices consistent with state and federal stormwater regulations. Structures should be sized and installed to preserve natural streambed conditions, maintain aquatic organism passage, and avoid altering flow velocities that could destabilize channels or banks. Structures that impede aquatic organism passage should incorporate design features that preserve or restore connectivity between upstream and downstream habitats. Post-construction monitoring and adaptive management should be used to evaluate effectiveness and ensure long-term protection of water and habitat resources. Coordination with state and federal resource agencies is recommended throughout planning and construction to ensure compliance with environmental objectives. Designs should follow applicable state environmental permitting requirements and technical guidance from agencies such as the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and state transportation departments. Routine inspection and maintenance are essential to ensure long-term water quality protection and habitat function.

12) Stormwater outfalls discharging to ocean or estuarine waters must be designed and managed to minimize adverse impacts to Waters of the United States (WOTUS). Considerations include preventing the introduction of pollutants that may degrade water quality, ensuring outfall placement and flow conditions do not cause significant scour, shoreline erosion, or destabilization of adjacent habitat, and evaluating potential thermal impacts resulting from temperature differentials between stormwater discharges and receiving waters. Outfalls should incorporate appropriate treatment, energy dissipation, and monitoring measures to protect coastal and estuarine ecosystems and maintain compliance with applicable federal and state water quality standards.

13) Applicants proposing development in coastal or estuarine areas should evaluate stormwater collection, conveyance, and discharge in a manner that aligns with federal objectives to protect water quality and maintain the integrity of Waters of the United States (WOTUS), while also meeting all applicable state and local requirements. Development plans should broadly consider how stormwater runoff may introduce pollutants, alter natural flow patterns, contribute to erosion or scour, or create thermal impacts on receiving waters. To the extent practicable, projects should incorporate measures that support these overarching goals, such as approaches that reduce pollutant loads, attenuate flows, or minimize physical disturbances, recognizing that the specific methods and standards for achieving these outcomes are determined by state and local regulatory programs.

14) Projects that produce a thermal discharge (i.e., wind farms or power plants) should strive to limit temperature impacts on the surrounding water and adhere to National Pollutant Discharge Elimination System standards set up by the Clean Water Act. Discharging heated water can reduce dissolved oxygen, alter pH levels, and negatively impact aquatic ecosystems by lowering diversity and changing community structure. Similarly, cold water discharge can also impact fish

health and water quality and should be limited to the same standards as warm water discharge. When selecting a site for these projects, the impacts should be minimized, and projects should strive to limit the release of water until the temperature of the water discharge and the local environment match or are within safe standards for fish and larval health. This can be done by utilizing retention ponds or limiting water release over time. Additionally, thermal discharge of the warm or cold variety should not change the flow regime of the local environment.

15) The effects of projects on stormwater control and water quality should be analyzed and mitigated to ensure the health of the surrounding ecosystem. Water that is utilized in hydropower, stormwater, or other human development projects should exit all development with the same or better quality as it entered the system.

16) Developments that inadvertently increase flooding, stormwater, and runoff should require water quality restoration projects and utilize environmentally friendly building materials as much as possible. Mitigation to offset these impacts should be integrated into the project plan to decrease anthropological impacts on water flow and quality.

17) Permits for new flow-altering projects should require monitoring. If the project is having a negative impact on the surrounding ecosystem via water pollution, decreased water quality, changes in local hydraulic flow, or changes in temperature, then measures need to be taken to counteract negative impacts via mitigation, shutting the project down, or adjusting the existing structure." Not sure what word was meant for that blank space. Maybe "increases in flow

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