

**Commercial Fishing License Restructuring
Implementation**

Shellfish Fishery Sector

DRAFT #2

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**Rhode Island Department of Environmental Management
Division of Fish and Wildlife
Marine Fisheries
3 Ft. Wetherill Road
Jamestown, RI 02835**

Bay Quahaug

Stock Status- The quahaug resource in Narragansett Bay is currently fully exploited with biomass below that needed to produce maximum sustainable yield (MSY). A non-equilibrium production model is used by the Rhode Island Division of Fish and Wildlife (RIDFW) to assess the overall stock in Narragansett Bay (Gibson 1999). The assessment was updated in 2002 to incorporate new landings and survey data and to adjust nominal license effort for active participants. The adjustment, based on RIDFW boat counts and analysis of dealer landing slips, eliminates latent effort from the calculations. The new results indicate that stock biomass in 2001 was only about 60% of that needed to support MSY (Figure 1). Fishing mortality rates (F) have declined over the past decade and in 2001 were at the $75\%F_{msy}=0.20$ target and below the $F_{msy}=0.26$ over fishing definition (Figure 2).

Recent low biomass follows an extended period of heavy over fishing and was likely exacerbated by an increase in predators of benthic invertebrates. The reduction in F in recent years is related to declining effort (Figure 3). Because of the low stock levels, landings are currently well below the MSY level for a rebuilt stock (Figure 4). Projections indicate that the stock can increase in biomass at a moderate rate if F remains at current levels (Figure 5).

While the assessment is on a bay wide basis, resource status may vary spatially within the overall stock area depending on intensity of harvest, proximity to protected spawning beds, and hydrodynamic conditions which disperse larvae. The distribution of quahaugs in the bay is patchy and the fishery selectively exploits patches of higher value product (new recruit necks) as they appear. Because of these factors, the bay wide assessment represents an average condition not necessarily those at a local level.

Management Program- Quahaugs are managed entirely within state waters by the Department of Environmental Management with advice from the Rhode Island Marine Fisheries Council. The Department, through the RIDFW, uses a series of management areas and a rotational transplant/harvest system to manage the resource. Permanent and conditional pollution closures restrict the fishery in addition to seasons, possession limits, and management closures.

Bay wide fishing mortality rates (F) should be maintained near the target level but below the F_{msy} over fishing definition to allow for biomass rebuilding. This will require maintaining effort near current levels. The rotational harvest and transplant/spawner sanctuary program should be expanded to include more areas. Recent boat counts and analysis of dealer landings slips indicate that about 350 active shell fishers prosecute the quahaug fishery. Gibson (1999) recommended a target fishing mortality rate equal to 75% of the F_{msy} value to preserve an adequate level of spawner biomass in the face of uncertainty. Since current active effort is sufficient to generate F at the target level on a bay wide basis, additional effort will move the fishery toward the over fishing level and reduce the rate of biomass rebuilding. New licenses will essentially compete for a limited yield with current licenses.

Fishery Management Goals and Objectives-

Goal- The following goal is consistent with the objectives of the Rhode Island quahaug management plan (Ganz et al. 1999).

Rhode Island will have a healthy bay quahaug resource and a fishery management regime which provides for sustainable harvest, cooperative management by stakeholders, and appropriate opportunities for fishery participation.

Objectives-

1. Maintain fishing mortality rates and brood stock abundance at levels which minimize the risk of stock depletion and recruitment failure.
2. Conserve and rebuild quahaug resources in Narragansett Bay with appropriate management strategies including transplanting, area closures and spawner sanctuaries.
3. Maintain existing social and cultural characteristics of the fishery wherever possible.
4. Provide for cooperative management with industry and efficient operation, consistent with biological objectives.
5. Provide for adaptive management that is responsive to unanticipated short term events or circumstances.
6. Provide for a simple, uniform and enforceable set of regulations.

Licensing Options and Recommendations-

Current shell fishers using multipurpose or shell fishing licenses are eligible for the new multipurpose and principal effort/shellfish endorsement licenses. These license holders would be entitled to the commercial limits specified in existing regulations (12 bushels state wide, 3 bushels in management areas.)

New entrants, eligible under the basic Commercial Fishing License, can be limited by the number of licenses issued and the Basic Harvest Level authorized. The new statute also provided for unlimited numbers of student and 65 and over shellfish licenses which could be limited by harvest level. Closed season and possession limits can be used to control harvest level. Various combinations of season length and possession limits for new licenses can be envisioned and translated into equivalent existing effort units assuming proportionality of the product of limit per day and number of allowable fishing days. Through the assessment-projection model, one can evaluate the impact of various new effort levels to future resource status and fishery performance. In order to offset new effort additions, additional restrictions would be needed on current participants. Examples are given below and many other permutations are possible.

Option One- Status quo effort, no new licenses, no change in current regulations. Results are shown in Figure 5. The fishery is maintained at target F level, stock rebuilds to B_{msy}

in six years. This option is not viable given the statutory requirement to issue new student and 65+ shellfish licenses and the expectation that a significant number of applications will be received for such licenses.

Option Two- 10% addition of new effort over current levels. This could be achieved by issuing 175 new licenses at Basic Harvest Levels defined by a May 1 to November 30 season with a 3 bushel statewide possession limit and a 1.5 bushel management area possession limit. F rises to 0.22 which is above the management target but below the over fishing definition. Biomass rebuilds to B_{msy} in seven years (Figure 6). The same results can be expected with the addition of 60 new, full participation licenses, i.e., Principal Effort Licenses at Full Harvest Levels. To offset a 10% new effort increase and maintain F at current levels, effective possession limits or days available for fishing would need to be reduced by 10% for current participants.

Option Three- 20% addition of new effort over current levels. This could be achieved by issuing 204 new licenses at Basic Harvest Levels defined by a year around season, a 3 bushel statewide possession limit and a 1.5 bushel management area possession limit. F rises to 0.24 which is above the management target but below the over fishing definition. Biomass reaches B_{msy} in eight years (Figure 9). The same results can be expected with the addition of 117 new Principal Effort Licenses at Full Harvest Levels. To offset a 20% new effort increase and maintain F at current levels, effective possession limits or days available for fishing would need to be reduced by 20% for current participants.

Option Four- 25% addition of new effort over current levels. This could be achieved by issuing 325 new licenses at Basic Harvest Levels defined by a May 1 to November 30 season with a 4 bushel statewide possession limit and a 2 bushel management area possession limit. F rises to 0.25 which is above the management target but below the over fishing definition. Biomass rebuilds to B_{msy} in ten years (Figure 7). The same results can be expected with the addition of 145 new Principal Effort Licenses at Full Harvest Levels. To offset a 25% new effort increase and maintain F at current levels, effective possession limits or days available for fishing would need to be reduced by 25% for current participants.

In addition to stock status and fleet impacts, effort inflation has implications for fishery performance at the individual licensee level. As new effort is added above current levels, landings per individual are reduced (Figure 10). The reduction is fairly small at low levels of effort inflation but becomes significant when effort is increased to the over fishing definition so that biomass rebuilding is prevented.

Recommendations- Current fishing effort in the Rhode Island quahaug fishery is at a sustainable level and biomass rebuilding is possible. A slight increase in effort can be sustained with only a small extension of the rebuilding period. Accordingly, it is recommended that the sum of new basic licenses and student/65+ licenses be admitted such that the number of licenses and associated season-possession limitations does not exceed a 10% effort increase. As discussed by the IWG shellfish subcommittee, it is further recommended that conditions for license upgrade from basic to full harvest level

be developed. The IWG suggested that an individual demonstrate a minimum of 50 day fishing during two years as a basic harvester to be eligible for upgrade. Also, it is suggested that both the new student license and the 65+ license holders be held to the reduced daily limit applicable with the Basic Harvest Level. Both licenses would be valid from May 1 to November 30.

Since it is unknown how many student licenses and 65 and older licenses will be issued, it is not possible to predict the number of new, basic licenses that should be issued to constrain overall effort to a 10% increase. It is possible that the student and 65 and over license will themselves equal or exceed the 10% effort increase so caution is warranted in issuing new basic licenses in this sector. During early 2003, a review of the number and type of licenses issued should be conducted. The quahaug stock assessment should be updated after completion of the summer 2003 dredge survey. Industry should be then be advised and tasked with developing entrance/exit and license upgrade criteria for long term management of effort in the Rhode Island quahaug fishery.

The following specific regulations governing commercial shellfish licensing for the quahaug fishery are recommended:

Regulation 1: All Rhode Island residents who possess a valid multi-purpose license as of December 31, 2002 shall be eligible to obtain a new Multi-Purpose License for 2003 and fish for quahaugs at Full Harvest and Gear Levels, provided that all applicable application requirements are met.

Regulation 2: All Rhode Island residents who possess a valid commercial shellfish, 65+ shellfish, or student shellfish license as of December 31, 2002 shall be eligible to obtain a new Principal Effort License with a quahaug endorsement for 2003 and fish for quahaugs at Full Harvest and Gear Levels, provided that all applicable application requirements are met.

Regulation 3: The Full Harvest and Gear Levels for quahaugs shall be the same harvest and gear restrictions in effect for quahaugs as of January 1, 2003, subject to modification, by rule, during the 2003 license year in accordance with the state's existing fisheries management program.

Regulation 4: All Rhode Island residents who possess a valid 65+ shellfish or student shellfish license as of December 31, 2002 shall be eligible to obtain a new 65+ or Student Shellfish License, respectively, for 2003 and fish for quahaugs at Basic Harvest and Gear Levels, provided that all applicable application requirements are met.

Regulation 5: New Student Shellfish and 65+ Shellfish Licenses shall be available for 2003. All eligible applicants shall be able to obtain said licenses and fish for quahaugs at Basic Harvest and Gear Levels, provided that all applicable application requirements are met.

Regulation 6: The Basic Harvest and Gear Levels for quahaugs shall be a May 1 to November 30 season with a 3 bushel statewide possession limit and a 1.5 bushel management area possession limit.

Regulation 7: No new Multi-Purpose Licenses, Principal Effort Licenses with quahaug endorsements, or Commercial Fishing Licenses with quahaug endorsements shall be available for 2003, except pursuant to sections 6.7-6 and 6.7-7 of the *Rules and Regulations Governing the Management of Marine Fisheries*.

Current Regulations Pertaining to Seasons and Possession Limits- R.I. Marine Fisheries Statutes and Regulations

4.3 Statewide Catch Limits -- (Daily Take)

Quahaugs, Soft-shelled Clams, Sea Clams, Bay Scallops, Mussels, and Oysters except in Management Areas

4.3.1 Resident Limit - No License Required. -- Unless otherwise specified in regulations adopted by the Marine Fisheries Council, any resident of this State may without a license, take in any one (1) day during the open season, if applicable, not more than one half (1/2) bushel each of quahaugs, soft-shelled clams, sea clams, oysters, and mussels, and not more than one (1) bushel of scallops; provided that those quahaugs, soft-shelled clams, sea clams, oysters, mussels, or scallops shall not be sold or offered for sale. (RIGL 20-6-1) [Penalty - Part 4.7; (RIGL 20-6-9)]

4.3.2 Commercial Limit - License Required. -- Unless otherwise specified by regulation of the Marine Fisheries Council, a holder of a commercial shellfishing license may take and/or possess, in any one (1) day, up to twelve (12) bushels of [bay] quahaugs, twelve (12) bushels of soft-shell clams, and three (3) bushels of oysters. RIGL 20-6-10(a). Commercially licensed persons may take and/or possess up to 200 bushels of surf clams, or 26 cages (832 bushels) of ocean quahaugs, in any one day (midnight to midnight) (RIMF REGULATION) [Penalty - Part 3.3, Part 4.4; RIGL (20-3-3)]

4.3.3 Non-resident Limit - Licensed Individuals Only. -- A holder of a non-resident shellfishing license may take in any one (1) day not more than one (1) peck each of oysters, quahaugs, soft-shelled clams, surf clams, or mussels. Any person taking more than these allowances in any one (1) day shall be fined upon conviction, one hundred dollars (\$100) for each bushel or part of a bushel exceeding the prescribed quantity or be imprisoned for not exceeding thirty days, or both. [RIGL 20-6-10(b)]

4.4 Allowance of Shellfish Taking Under License. --

(a) Unless otherwise specified by regulation of the Marine Fisheries Council, a holder of a commercial shellfishing license may take and/or possess, in any one (1) day, up to twelve (12) bushels of quahaugs, twelve (12) bushels of soft-shell clams, and three (3) bushels of oysters. Commercially licensed persons may take up to 200 bushels of surf clams in one day. (RIMF REGULATION) [Penalty - Part 3.3, Part 4.4; RIGL (20-3-3)]

(b) A holder of a non-resident shellfishing license may take in any one (1) day not more than one (1) peck each of oysters, quahaugs, soft-shell clams, or mussels. Any person taking more than these allowances in any one (1) day shall be fined upon conviction one hundred dollars (\$100) for each bushel or part of a bushel exceeding the prescribed quantity or be imprisoned for not exceeding thirty days, or both.

(RIGL 20-6-10)

4.8 Shellfish Management Areas - Catch Limits for Quahaugs, Soft-shelled Clams, Sea Clams, Mussels, and Oysters. – Bristol Harbor Shellfish Transplant Area, Potter Pond, Pt. Judith Pond, Ninigret (Charlestown) Pond, Quonochontaug Pond, Winnapaug (Brightman) Pond, Potowomut, Greenwich Bay, Mill Gut, Kickemuit River, Bissel Cove, High Banks, Sakonnet River, and Jenny’s Creek have been declared special Shellfish Management Areas in their entirety for a period of five years. Shellfish Management Area status shall expire five years from the filing date of this document unless renewed by subsequent R.I. Marine Fisheries Council actions.

No person may possess more than the maximum shellfish management area daily catch limit while in a management area. The following daily catch limits have been established for the Management Areas listed above:

Quahaugs, Soft-shelled Clams, Sea Clams, Mussels, and Oysters*

Maximum Daily Take by

BOAT HARVEST

R.I. Resident (no sale)	1 peck each/day/person
Commercial	3 bu each/day/license holder maximum of 6 bushels each/boat/day; and maximum of two licensed shellfishers per boat
Licensed Non-Resident (no sale)	½ peck each/day/license holder
* Oyster season is open from September 15 to May 15 annually	

SHORE DIGGING

This maximum daily catch limit for shoredigging of soft shell clams, bay quahaugs, mussels, and oysters [in season] is:

R.I. Resident (no sale)	1 peck each/day/person
Commercial	3 bu each/day/license holder
Licensed Non-Resident (no sale)	½ peck each/day/license holder
* Oyster season is open from September 15 to May 15 annually	

Daily catch limits apply to all Management Areas unless otherwise specified.

The use of diving apparatus is prohibited while shoredigging.

(RIMF REGULATION) [Penalty – Part 3.3; (RIGL 20-3-30)]

4.10 Greenwich Bay Shellfish Management Area

4.10.1 The conditionally approved waters of Greenwich Bay are established as a Shellfish Management Area for a five-year period. This area is defined as west of a line between the flagpole at the Warwick Country Club and the end of Sandy Point on the Potowomut Shore.

4.10.2 Shellfish harvesting will be allowed only when declared open by the D.E.M. Office of Water Resources based upon water quality considerations. Regulations by the Office of Water Resources shall supersede the regulations below.

4.10.3 **SHORE DIGGING** will be permitted between sunrise and sunset daily. The maximum daily catch limit for shore digging of bay quahaugs, soft-shelled clams, mussels, and oysters [in season] is:

Resident shoredigger (no sale)	1 peck each/person/day
Licensed non-resident (no sale)	½ peck each/person/day
Commercial License holder	
oysters [in season]	3 bushels/license holder/day
soft-shelled clams	3 bushels/license holder/day
mussels	3 bushels/license holder/day
bay quahaugs	one peck/license holder/day [EXCEPT: Mondays, Wednesdays, and Fridays beginning the second Wednesday of December until April 30 annually, when the daily limit shall be 3 bushels/license holder/day.]

The use of diving apparatus is prohibited while shore digging.

BOAT HARVEST

4.10.4 The entire area is closed to all shellfishing from a boat except as follows: Beginning on the second Wednesday of December shellfishing will be permitted only between the hours of 8 A.M. and NOON on Mondays, Wednesdays, and Fridays until April 30 annually. Effective June 26, 2002, the waters east of a line between Sally Rock Point and the westernmost flagpole on Promenade Street, Old Buttonwoods will be open to harvesting from a boat between sunrise and sunset daily until sunset September 2, 2002. Shellfishing will be subject to water quality status as specified by the D.E.M. Office of Water Resources.

4.20 Surf Clams and Ocean Quahaugs.

4.20.1 Gear Restrictions The following gear restrictions shall apply to vessels fishing in the territorial waters of Rhode Island for surf clams:

4.20.1-1 It is unlawful for any vessel to operate with any hydraulic dredge with a blade, knife, or manifold which is greater than 48 inches in maximum width.

4.20.1-2 It is unlawful for any vessel to operate more than one dredge while harvesting surf clams.

4.20.2 Trip Limits The following limits shall apply to vessels fishing in the territorial waters of Rhode Island:

4.20.2-1 It is unlawful for any dredge vessel to take and/or possess more than 200 bushels of surf clams per vessel.

4.20.2-2 Except as allowed in Part 6.8.3, it is unlawful for any vessel to catch, harvest, possess, have on board, land, or off load, any surf clams which are less than 5 inches in the longest shell diameter.

4.20.2-3 Vessels properly licensed to do so may land surf clams and ocean quahaugs legally taken outside the territorial waters of Rhode Island in excess of the trip limit established by Part 4.20.2-1, provided that no vessel engaged in fishing for surf clams or ocean quahaugs within territorial waters may possess or have on board more than the prescribed limit.

4.20.2-4 It is unlawful for any dredge vessel to take and/or possess more than 26 cages (832 bushels) of ocean quahaugs.

(RIMF REGULATION) [Penalty - Part 3.3; (RIGL 20-3-3)]

Suggested Regulatory Changes

- +Change statutory language to reflect new licensing bill
- Specify basic harvest level
 - Statewide: 3-12 bushels
 - Management Areas: 1½ -3 bushels
- Basic harvest license valid from May 1 through November 30
- Harvest limits and season for principal effort and multipurpose license holders would be those currently in place
 - Statewide: 12 bushels
 - Management Areas: 3 bushels
- Specify eligibility requirements for license upgrade
 - Commercial license holder must demonstrate a minimum of 50 days fished during previous two years
- Specify harvest level for “over 65” and student license holders same as basic license
- Student license valid May 1 to November 30, over 65 license valid year around

Other Shellfish

Stock Status- Other species of shellfish commercially harvested include soft-shelled clams, oysters, surf clams, and blue mussels. These species are not routinely assessed by RIDFW. Insufficient data is available to conduct analytical assessments. However, catch per unit effort indices suggest that both soft-shell clams and oysters are at relatively high levels of abundance (Figure 11). Since abundance seems relatively high for some species and lacking information on mortality rates, there is no basis to impose more restrictive regulations on the other shellfish endorsement.

Management Program- Steamer clams, oysters, blue mussels, and surf clams are managed in state waters by the Department of Environmental Management with advice from the Rhode Island Marine Fisheries Council. Additional federal regulations apply to surf clams and ocean quahaugs in the EEZ. The Department uses seasons and possession limits to manage the state waters fishery. Permanent and conditional pollution closures further restrict the fishery in addition to the above management measures.

Fishery Management and Licensing Recommendations- No changes are recommended to the management program for other shellfish until better data is available on resource status. New commercial licenses can have basic harvest levels equal to current licensees.

The following specific regulations governing commercial licensing for shellfish species other than quahaugs are recommended:

Regulation 1: Regulation 1: All Rhode Island residents who possess a valid multi-purpose license as of December 31, 2002 shall be eligible to obtain a new Multi-Purpose License for 2003 and fish for all shellfish species available for commercial harvest (including quahaugs) at Full Harvest and Gear Levels, provided that all applicable application requirements are met.

Regulation 2: All Rhode Island residents who possess a valid commercial shellfish, 65+ shellfish, or student shellfish license as of December 31, 2002 shall be eligible to obtain a new Principal Effort License with a non-quahaug shellfish endorsement for 2003 and fish for all shellfish species available for commercial harvest, except quahaugs (unless a separate endorsement is obtained) at Full Harvest and Gear Levels, provided that all applicable application requirements are met.

Regulation 3: All Rhode Island residents who possess a valid 65+ shellfish or student shellfish license as of December 31, 2002 shall be eligible to obtain a new 65+ or Student Shellfish License, respectively, for 2003 and fish for all shellfish species (including quahaugs) at Basic Harvest and Gear Levels, provided that all applicable application requirements are met.

Regulation 4: New Student Shellfish and 65+ Shellfish Licenses shall be available for 2003. All eligible applicants shall be able to obtain said licenses and fish for all shellfish

species (including quahaugs) at Basic Harvest and Gear Levels, provided that all applicable application requirements are met.

Regulation 5: New Commercial Fishing Licenses, with Non-Quahaug Shellfish endorsements, will be available for 2003. Any Rhode Island resident will be eligible to obtain such a license and endorsement and fish for all shellfish species available for commercial harvest, except quahaugs, at Basic Harvest and Gear Levels, provided that all applicable application requirements are met.

Regulation 6: The Basic and Full Harvest and Gear Levels for all shellfish species commercially available under the Non-Quahaug Shellfish endorsement shall be the same harvest and gear restrictions in effect for such species as of January 1, 2003, subject to modification, by rule, during the 2003 license year in accordance with the state's existing fisheries management program. There shall be no difference between Basic and Full Harvest and Gear Levels for shellfish species subject to the Non-Quahaug Shellfish endorsement.

Current Regulations- See above

Suggested Regulatory Changes- None

Literature Cited

Gibson, M.R. 1999. Assessment of quahaugs (*Mercenaria mercenaria*) in Narragansett Bay: technical analyses in support of a bay wide quahaug management plan. RI Division of Fish and Wildlife. Res. Ref. Doc. 99/2.

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