Program Review of

The Maine Department of Marine Resources

Program Review Committee

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EXECUTIVE SUMMARY

The Department is not structured or managed in a way that will carry out the Purpose of the Department as stated in Maine's Marine Resource Law Chapter 603: "The Department of Marine Resources is established to conserve and develop marine and estuarine resources; to conduct and sponsor scientific research; to promote and develop the Maine coastal fishing industries; to advise and cooperate with local , state and federal officials concerning activities in coastal waters; and to implement, administer and enforce the laws and regulations necessary for these enumerated purposes, as well as the exercise of all authority conferred by this Part."

We have identified many serious impediments and deficiencies in the Department that will continue to impede the Department's ability to satisfy the purposes of the Department, as stated in the General Laws. The Department should be restructured, and activities prioritized, around a strong legislative policy requiring sustainable resource management based on management plans with clear objectives and goals, all of which are based on the best available science. In our view the Legislature should craft and adopt statutory language and specify conservation standards for fishery management within the State. It should then be up to the Department to work with the participants in each fishery, advisory Councils, zone Councils, and coastal communities to develop management plans that achieve the standards specified by the Legislature. The Department should also be given the clear authority to reject management plans that do not meet the State standards.

We encountered a high level of concern among Departmental staff over the status of many of the fish and shellfish stocks that support the Maine marine fisheries economy. These concerns ranged from concern over whether the continued high level of lobster harvest can be sustained to concern over fisheries that exhibit the classic symptoms of “boom and bust” when harvests are allowed to increase without constraint and a subsequent steep decline. In technical terms this is often referred to as “overfished” or “overfishing”, however in the absence of reference points by which to judge the status of stocks, those terms cannot be accurately defined for

Maine's fish and shellfish stocks. Nonetheless, a pronounced concern was expressed that not enough was being done to protect stocks from possible overfishing or to institute rebuilding programs for stocks where the harvest has already declined. One particular concern was that the continued increase in the harvest of lobsters that is largely unexplained may not be sustainable but there were no efforts underway to constrain the harvest to an identified sustainable level. Staff concerns, especially the "boom and bust" nature of many fisheries, are reflected by the graphs of landings attached to our report. We also note that landings of some species have been diverted to other states because of more favorable policies in other states that exacerbate the loss of income to Maine through declining harvests. A key concern of the review committee is the fact that 70% of the income from commercial fishing comes from one fishery: the lobster fishery. We believe there is a critical need for the Department and State government to take aggressive action on a number of initiatives in order to diversify the sources of income for commercial fishers. Failure to do so could jeopardize a number of coastal communities, should there be even a slight decline in the lobster resource in the future.

There are excellent opportunities to increase the economic value and job growth of Maine's marine fishing economy through changes that foster rebuilding stocks, managing fish and shellfish stocks for sustainability, facilitating aquaculture, policy changes to make Maine a more fish business friendly state, and improved management of the Department.

Finally, in this time of declining State and Federal fiscal resources, the Department must seek to do the critical issues well with the available resources instead of attempting to do everything unsatisfactorily without adequate resources. Achieving this objective will require the Department to prioritize issues and workload, and in some case stop participation in activities that are low priorities.

Section 1 – DMR STUDY INTRODUCTION:

We were asked to assess from top-to-bottom the structure, operations, procedures and policies of the Maine Department of Marine Resources in an effort to improve DMR operations and its service to the people of Maine, including assessing existing and anticipated challenges facing Maine's Marine Resources Community and the Department. We were asked to gauge and prioritize the challenges facing the Community and the Department as well as the significant additional Department responsibilities for compliance with and enforcement of new state, regional, and federal laws and regulations and assist in the development of a strategic vision and an operations plan for addressing challenges and the Department's responsibilities.

The current day Department is a continuation of a Department that originated in 1867 with the establishment of a Commissioner of Fisheries. Much has changed over the intervening 144 years but recognition that marine resources have been and are an important part of the culture and economy of Maine has not changed. It is equally important today as in 1867 that the marine resources of Maine be conserved and managed efficiently to preserve the legacy of Maine seafood and its benefits to the people of Maine. This goal can best be attained with a sustainable resource that will result in sustainable economics and sustainable communities. This goal is not assured under existing policies and procedures.

The Department is not structured, managed, or authorized by law to permit them to meet the Purpose of the Department as stated in Maine's Marine Resource Law Chapter 603; "The Department of Marine Resources is established to conserve and develop marine and estuarine resources; to conduct and sponsor scientific research; to promote and develop the Maine coastal fishing industries; to advice and cooperate with local, state and federal officials concerning activities in coastal waters; and to implement, administer and enforce the laws and regulations necessary for these enumerated purposes, as well as the exercise of all authority conferred by this Part."

We have identified many serious impediments and deficiencies in the Department that will continue to impede the Department's ability to satisfy the full purpose and intent of the law. A major restructuring and broader authority is required along with the establishment of firm goals and objectives and a prioritization of activities that will bring adequate attention to critical issues. The Department must seek to deal with the most important issues well with the available resources rather than attempting to do everything without adequate resources. These deficiencies relate broadly to two areas; day to day operations of the Department and; resource management that is reflected in the decline of many fisheries.

Limitations on the Department's ability are openly acknowledged in their Strategic Plan that states the Department is very limited in what actions it can take. This appears to be reflected in the overall structure of the Department's programs and activities that portrays a sense of being random rather than being directed to the resolution of specific resource problems or achievement of specific outcomes.

We approach this assignment with an appreciation of the legacy of Maine seafood and a need to pass this legacy on to future generations of Mainers. Central to this goal is the effective management of the production, harvest, and marketing of Maine's marine resources without reducing the future capacity of the marine resources to support these benefits to the people of Maine.

A review of the Department cannot be undertaken without recognizing and considering the laws and Legislative policies governing the Department's responsibilities and authorities and the many specific measures in the law. Maine's Marine Resources law is extensive and complex including co-management provisions for the adoption of management plans and regulations with the advice and consent of the Marine Resources Advisory Council (paragraph 6171.2-A Management Plans; "The Commissioner may only adopt a management plan or other policy on the conservation or regulations of marine resources after prior notice and public hearings and with the advice and consent of the advisory council."). The Marine Resources Advisory Council

has advocated and adopted numerous fishery specific regulations, but we can find no record of them adopting comprehensive management plans, with clearly stated management goals for each fishery.

Even though the Department has a Strategic Plan (last updated in 2004) it acknowledges that the Legislature establishes the policy for the State and the Department is very limited in what actions it may take. The Strategic Plan, based on Maine's marine resources laws, includes reference to fisheries management plans, but as noted above no such plans have been prepared or approved by the advisory council. The consequences of a lack of management plans is that there is little direction for the Department and its employees to implement management measures based on sustainable harvests for all of the fisheries for which the Department has responsibility or opportunity for the public to participate in formulating sustainable management goals and measuring their progress.

Co-management as established in Maine law is a laudable policy but there must be a balance between the needs of the industry and the science to assure sustainable resources into the future based on management plans and measures based on research and monitoring.

We were guided in our review by the recognition that these are difficult times that require some innovative approaches in light of limited or reduced financial support for Departmental programs which is likely to continue for some years into the near future. A new unity of purpose and direction is needed to guide the Department through these times.

The existing Department's Strategic Plan was last updated in 2004. The plan is based on the fundamental purpose of the Department to conserve and develop marine and estuarine resources, conduct and sponsor scientific research, promote and develop the Maine coastal fishing industries advise and cooperate with local, state and federal officials, and to implement, administer, and enforce the laws and regulations. The broadly stated goals of the Strategic Plan are relevant and appropriate for the challenges of today and in the future but there is no

mechanism, objectives, timeline, or prioritization to achieve the goal of sustainability. The Strategic Plan also identifies external forces that impact its ability to carry out its mission which are relevant. What is missing is how these objectives and challenges must be addressed, prioritized, and managed in today's environment of limited financial resources. Sustainability must be the central objective of the Department and plans must be in place to implement management to achieve sustainability.

In 1950, Maine had record seafood landings of 356,266,000 pounds without aquaculture. Maine ranked among the top seafood producing States. In 2009, the last year available for national seafood landings, Maine ranked 11th in pounds landed and 3rd in value. The preliminary 2010 landings were 251,299,375 pounds including aquaculture valued ex-vessel at $450,664,717, an average of $1.79/lb. Seafood landings still contribute substantial economic activity even though landings are down by about a third since the record landings in 1950. The comparison is complicated by the fact that aquaculture is included in the 2010 values and the mixture of species landed has changed significantly over the years. For example, Atlantic salmon produced in aquaculture accounted for 10% of the pounds and 18% of the value in 2010. American lobster accounted for 37% of the pounds and 70% of the value. Economic multipliers are not well understood, however, some industry sources believe that the total value of Maine's commercial seafood exceeds 1.2 billion dollars. Recreational, party/charter boats and Maine fishing guides add additional benefits. As is the case with the commercial landings, the economic multipliers are not well understood.

We believe that Maine should have an overall goal to achieve sustainable levels of landings and aquaculture production and associated values to be achieved in the future that will justify continued investments by both the State and the citizens of Maine. We are not prepared to suggest what that level of investment should be but believe that it would be helpful to develop a benchmark of a sustainable harvest level for each species that would guide management and investment in the future followed by specific management plans. Even though the outlook for

funding is not positive, some new resources are needed immediately as detailed in our recommendations.

We very much appreciate the reception we have received in all of our talks with Department employees and members of the Legislature. They were all informative and offered many insights on Department organization and operation. Many points of view were expressed and many ideas were suggested that can be a part of the future direction of the Department. It is our hope that in addition to our recommendations these discussions have initiated a thought process that will continue to make positive changes as the Department addresses the challenges ahead. The Department has many talented and experienced people to address the challenges if they are given direction and encouragement to bring ideas forward. Consultation and co-management with the Legislature, the Marine Resources Advisory Council and other advisory bodies will assure full consideration of all aspects of sustainable resource management.

Our special thanks to those members of the Commissioner's office who looked after the details, scheduling, and arrangements during our study, especially Cathy Fetterman, and to the employees who made time available to talk with us. We are impressed with the level of commitment and dedication we experienced.

Section 1-2: Importance of DMR to State Economy, Statistics on Number of Participants (Recreational and Commercial), Dollar Value, Multiplier, Number of License Holders

Maine's commercial and recreational fisheries are highly diverse with more than 70 marine, estuarine, and diadromous species harvested commercially, caught by saltwater anglers, or reared by aquaculture. Marine resources are a traditional part of Maine's culture and economy and many generations of Mainers have derived their income from the sea. In 2010, the landed value of Maine seafood was $452 million, with a final value to the Maine economy estimated at

$1-1.2 billion (Charles Colgan, personal communication). Over 9,200 active fishermen and 3,500 licensed dealers participated in this effort.

Maine ranked 2nd on Atlantic coast in terms of ex-vessel value and 4th on the Atlantic coast in terms of live pounds landed in 2010. Lobster continued to be the most valuable species landed in the region and the state with Maine accounting a record 94.7 million pounds with a dockside value in excess of $313 million, accounting for over 70% of coast wide revenues. Farm-raised Atlantic salmon was 2nd in value ($76.8 million) and soft-shell clam landings were 3rd ($12.9 million). Other species of importance include Atlantic herring, northern shrimp, sea urchin, marine worms, and groundfish.

Maine's saltwater recreational fishery is valued in excess of $27 million (without economic multipliers) with striped bass as one of Maine's premier recreational species. Over 290,000 anglers made over 750,000 individual fishing trips in Maine saltwater in 2010. Striped bass is the primary targeted species for private boat, shore and charter boat anglers with an estimated 213,000 fish caught in 2010, the lowest amount in the past five years. Maine depends on the migration of striped bass that are produced primarily in Chesapeake Bay and to a much less extent the Hudson River. Fishing for pelagic species such as Atlantic bluefin tuna and sharks is also an important component of Maine's recreational fisheries with numerous tournaments along the coast. The growing success of restoration efforts for diadromous species such as American shad and Atlantic salmon may provide increased recreational fishing opportunities in Maine in the future. Restoration efforts have also contributed to an increase in species which are prey for groundfish, which are once again being targeted by party/charter vessels and this increase in effort has shown a growth in what had become a depressed segment of the industry.

Marine aquaculture is a valuable industry in Maine and includes the culture of Atlantic salmon, trout, oysters, and mussels. Although the finfish aquaculture industry has undergone a period of consolidation, improved management practices have enhanced production levels to nearly

25 million pounds, the highest level since 2001. The number of shellfish growers has increased with 66 shellfish leases, totaling 594 acres located in marine and estuarine waters along the Maine coast. Sales of cultured oysters exceeded $1.7 million in 2010 and blue mussels were valued at $0.9 million in 2009. The potential for growth of aquaculture in Maine is high with new aquaculture ventures under development for species like Atlantic cod, halibut, scallops, and seaweed.

The importance of fisheries and aquaculture to Maine's economy is significant. Dockside value provides an indicator of the immediate return to the state's fishermen, but alone is not a good indicator of the total contribution to the state. The economic activity surrounding fishing is a complicated web of interdependent behavior, including boat building and repair, shore-side processing, supplies, and purchases and spending within communities. The importance of fishing to Maine's coastal communities, particularly as one moves east along the coast, is more difficult to measure. There are 144 coastal communities in actual contact with the sea with over one half of the state's population living in this area, which makes up less than 12% of the state's land mass. There are 68 ports, including the major ports of Portland and Rockland along the coast from which some kind of fishing is conducted. While ground fishing vessels now land primarily in Portland and Port Clyde, the remainders are small communities with a heavy dependence on inshore fisheries such as lobster, herring, scallops, shrimp, clams, sea urchins, and worms. Management of Maine's marine resources is of utmost importance to ensuring sustainable fisheries and the productive coastal economy.

Recommendation:

DMR needs complete an up to date economic study of the marine fishing industries in Maine with purpose of documenting the current and multiplier value of the industry to the State's economy. Any such study should calculate both direct and indirect employment by fishery and industry sector. Study should focus on commercial, recreational, aquaculture, fish processing, makers of fishing gear, and charter fishing

industries, and all of the businesses that support those sectors of the economy. The State Universities in Maine are ideally suited for such a task which could be paid for with funding from the DMR indirect account. This type of study would be an invaluable aid to the Governor's office, DMR staff and members of the Legislature, as the State sets priorities for future work and prioritizes issues due to budget cuts.

Section 1-3: Description of review

The review committee started the review process during the first week of June, 2011, with an assigned deadline of submitting a draft report to the DMR Commissioner by late August, 2011. The short timeline was dictated in order to have results available by the start of the Legislative process in Maine. The review process was composed of three parts which relate to information collection, review of enabling legislation, and personnel interviews. Department staff provided the review committee with volumes of material on each of the first two subjects, which were distributed to each of the panel members.

In regards the interview process the Commissioner sent a letter to all staff and various other constitute groups announcing the process in early June, inviting as many staff members to be interviewed and participate in the process as possible during the brief period of the study. The review committee was originally tasked with meeting with members of the DMR staff, legislative representatives, and all constituent organization. The Department subsequently removed the task of meeting with the constituent organizations, due to funding, process, and timing considerations. That task could be considered in the future, as part of a phase two process, in order to ensure that constituent perspectives are considered as part of the review process.

Members of the review panel traveled to Maine on three occasions and interviewed a total of 65 staff members (approximately 34% of the entire staff) of the department, many of which

volunteered to come back for a second interview, in order to adequately detail some particularly complex issues. In addition, the committee conducted the interviews at most DMR facilities in order to view the work conditions at each site.

Review committee members also communicated via email directly with individual staff to gain additional insight on issues or gain clarification on specific points. Prior to initiating the individual staff reviews, members of the review panel traveled to the Hallowell Office, met with senior DMR staff, and received a detailed financial briefing, which included both current finances and a history of funding for each program. The committee also conducted a general briefing on the issue and review process at the Boothbay Lab, with approximately 60 staff members present. Neither the DMR Commissioner and/or the Acting Deputy Commissioner attended individual interviews to ensure unencumbered dialoged. At the Boothbay Lab briefing, again, in order to promote a free and unencumbered dialog on all issues, no Headquarters staff was in attendance.

The review process consisted of a multiple cross check process, where all employees are asked similar types of questions. Responses are recorded, problems and solutions noted and then compared to responses from other employees within the same office and to responses from employees in other facilities. When a pattern develops, questions are then focused on the specifics of the issue to gain further clarity. If a single employee suggests that a problem exists, the review team did not place much credence in the suggestion. However, if 5/10/ or 20 plus employees raise an issue, particularly if they are located in different facilities, more credence is placed on that perspective, and we then asked for copies of the written DMR policy or statute on the subject. The review committee then compared the employee comments to the policy to draw a conclusion which may in the end be characterized as a systemic problem.

Each interview began with a general statement by a member of the review committee stating that the discussion within the room were confidential, outlining the purposes of the discussion, encouraging employees to speak candidly, asking that they identify problem areas, and offer

suggestions on ways to resolve the problem. Prior to meeting with each individual, members of the review committee read an employee profile which documented each employees work assignments, task, job classification, and most recent State of Maine employee performance review.

Each staff member was initially asked to introduce themselves verbally, asked to talk about the strengths and weakness of their own programs, and then asked to talk about the broader role and functions of the Department. The broader discussion on the Department functions, focused on internal procedures, supervision, relations between offices, communication, employee morale, program effectiveness, relations and level of service to the constituent group. Review committee members maintained their own notes on each session, highlighting important issues that needed further discussion, clarification or additional follow up during subsequent interviews. At the conclusion of each interview, the review panel members would briefly talk about the interview to ensure that they drew the same conclusions from the discussion.

The review committee followed this general process throughout the deliberations to develop its' recommendations. The committee then took the added precaution of only including recommendations in this report where the review member's unanimously agreed on the recommendations, in order to eliminate potential individual reviewer bias.

Section 1-4: Review Panel Composition

The review panel was made up of three members with combined experience of 133+ years in fisheries science, management and private fishing business operations. All of the review panel members at one time held prominent positions in federal/state agencies, or headed large companies or divisions in private sector.

Over the course of a few months the review panel made three trips to Maine and interviewed 65 people. There were cases where the panel requested more information from specific individuals, who later came back for second and third interviews to explain the specifics of the information they provided. Overall the review panel conducted 79 separate interviews. There was no requirement for any DMR employee to meet with the review panel, as all meetings were voluntary. We also had a number of employee's request interviews outside of DMR facilities as they feared potential reprisals from superiors. All requests for interviews were granted. Most of the employees that we interviewed were interested in informing the panel of their insight into the department, and were extremely positive about offering suggestions on how to improve the operations of the agency.

The review panel also met with a limited number of Legislators, all of whom serve on the Joint Marine Resources Committee. All of the legislators that we spoke with took the initiative to request their own meetings with us, as the review panel did not solicit input from any Legislators.

David Wallace has been in the seafood industry for 45 years. He has owned seafood processing companies, fishing vessels, worked for a publicly held company as the assistant of the CEO which was involved in domestic seafood production and international manufacturing of food and seafood products. He has also served as the VP and Chief Operating Officer of vertically integrated seafood company with 30 plus large fishing vessels, three major processing plants and seven other locations with 1200 employees.

W "Pete" Jensen has been involved in natural resources management for 50 years. He has held positions at the national level in the National Marine Fisheries Service (NMFS) and as a Director of Fisheries for Maryland, as well as Deputy Secretary of the Maryland Department of Natural Resources. He was Commissioner to the Atlantic States Marine Fisheries Commission (ASMFC) for many years; a Commissioner on the Potomac River Fisheries Commission; and a member and Chairman of the Mid-Atlantic Fisheries Management Council (MAFMC). He has served on

U.S. delegations to international treaties such as the International Commission for Conservation of Atlantic Tuna (ICCAT) and the North Pacific Fur Seal Treaty. His experience spans administration of public agencies, marine mammal and protected species programs, law enforcement, environmental review, promulgating regulations and testifying before the U.S. Congress and State legislatures. He also served a Senior Consultant to the National Academy for Public Administration.

David Borden has been involved in fisheries management for 38 years. He was the Associate Director of Natural Resources, RI Department of Environmental Management from 2002-2004, and worked for the Department for 30 years. Responsibilities included supervision of all of the Natural Resource Divisions in the Department including Divisions of Fish and Wildlife (which includes all marine programs), Enforcement, Forestry, Coastal Resources, Agriculture, Parks and Recreation. These Divisions employed 375 full and 300 part time staff. Work responsibilities included serving as Chairman of the RI Marine Fishery Council, which formulated marine policy for RI, and represented RI on all major state and federal fishery management committees including ASMFC, New England Fishery Management Council (NEMFC), NMFS Highly Migratory Species (HMS), ICCAT, and various US/Canada committees. Administrative responsibilities included establishing Department policies at the federal level for all marine species. Commissioner/Chairman/Vice Chairman/and Member of Executive Committee of the ASMFC from 1988 to 2004. Prior to that he headed various Divisions and Sections of the Department including Chief of the R.I. Division of Fish & Wildlife Estuarine Resources, Deputy Chief of RI Marine Fisheries, and a range of scientific positions within the RI Division of Fish and Wildlife.

Section 2 – GENERAL FINDINGS:

Section 2-1: Budget Issues

The review committee initiated the review process with a meeting in Hallowell with focused discussions on staff resources and budget issues. Figure 1 represents actual Department

expenditures from fiscal year 1988 to 2010. In FY 1988 the Department obtained 84% of its funding on a percentage basis from State sources, which declined to approximately 45% in 2010. We note that State funding for DMR increased from $5,654,881 to $9,613,234 during this 22 year period but that increase barely kept up with the inflation rate.

During this time, Maine DMR staff has had to dramatically expand work on a number of species in order to provide support for the industry. Best example of the latter is that the staff has had to engage in numerous fishery management efforts involving whales, salmon, smelt, etc. in order to minimize possibility of federal preemption and or minimize the potential for negative impacts on the Maine industry. The volume of fishery management work at the federal level involving the Councils and the interstate fishery management process has more than tripled during the same time period. Of equal importance DMR scientific staffs have become fully engaged in the management of federally managed species in order to ensure that Maine's perspective is included in management proposals. It is also important to note that user fees (DED funding) have increased from 7.9% of the budget to 32.8% of the budget 1988-2010. In addition, federal funding has increased from 7.7% of the budget to 21.9% of the budget during the same period.

Our conclusion on the above facts is that State support for DMR has been declining at precisely the time when the opposite should be taking place. Most people we spoke to emphasize the importance of increasing economic activity in the State and promoting job growth, which are all possible with improved stewardship of these natural resources. Of great concern is the fact that a sizable number of the current staff are being paid on federal sources of funding, which are unlikely to continue in the near future as Congress deals with the federal budget deficit. We estimate that 25-40 DMR employees are at risk of losing their positions due to the potential loss of 4 million dollars in federal funding in the near future.

Of equal concern, the Department has drawn heavily on dedicated accounts in the last few years, in order to maintain programs, with the consequence that the surpluses in these

accounts have been drawn down. As outlined in Section 1-2, the industries managed by DMR staff annually contribute in excess of 1 billion dollars to the States economy, and the State resident contribute less than 10 million dollars (less than 1%) to manage these fisheries. The balance of the funding comes from user fees (dedicated sources) and federal aid.

Our view is that Maine is well positioned to substantially expand production from a number of these fisheries if managed on a sustainable basis rather than the current approach that results in boom and bust fisheries. In order to accomplish that result, DMR will need to modify its management approach and also receive enhancements to its funding, to ensure that the Department has the fiscal resources to do what it needed.

Recommendations:

1. **We suggest that Department develop a budget proposal for the Legislature that increases funding by 20 % with one half to be paid for by additional general fund appropriations and the other half by user fees (license revenue). This specific fee increase was selected , as there is uncertainty in federal funding estimates , and that value appears to be representative of approximately one half of the near term budget shortfall. A minimum of 25% of any funding increase should be directed to Marine Patrol to address funding shortfalls in that program.**

2. **According to the annual report, contractor services represent a sizable portion of the annual budget, depending on the year you use as a reference point. Most contracts require payment of a profit and contracts with specific Universities all include overhead which can run as high as 40-50% of the value of the base contract. All of these factors significantly increase the cost of the service, which in some cases could be done far cheaper by simply adding state staff, and paying the individual a state salary. This process had developed in order to deal with caps on State personnel. A good example of this point is the DMR education program.**

That program is very well run but hires seasonal summer education assistants via contracts with outside vendors. It would lower actual cost if the DMR received authorization to add seasonal state staff and pay them from these same sources. We have no doubt that this recommendation would also improve program performance, as the education staff would have more input in the candidate selection process.

We therefore recommend that the Department review all contracts and identify specific contracts that could be terminated and reassigned to DMR staff. The objective should be to lower costs, while increasing service to the residents of the State, even if that means adding staff. Caution should be exercised in this process as some of these contracts are associated with programs that require special expertise such as the modeling efforts done by Universities in Maine. These should continue, due to the special nature of the contract.

3. **Federal aid coordination is one of the key fiscal components of the DMR program as 21% of the Department funding is derived from federal sources. Most of these grants relate to funding from the Department of Commerce and Interior, both of which have very specialized and detailed funding criteria. We were very impressed with the competence of the staff members in DMR who manage in excess of 100 federal accounts. That being said we note that both plan to retire in the near future. Our suggestion is to convert one of these vacancies into a Federal Aid Coordinator position for the Department, and recruit a highly trained individual for the position. This individual's sole function should be to stay abreast of the federal aid requirements and coordinate all federal aid functions with the Department. There should be little or no additional expense associated with this recommendation, as expenses could be charged to the grants or indirect accounts.**

Section 2-2: General Findings

In addition to several major recommendations that we make regarding management plans, strategic plans, goals, objectives, and restructuring of the Department for sustainable resource management, we have identified some overall issues that we believe will facilitate and clarify the operations of the Department for the benefit of the staff and the public. In some cases they may overlap other recommendations.

1. **The Department must provide additional educational opportunities for staff involved and responsible for management decisions to sharpen their skills in dealing with implementation of management and conflict resolution. The initial focus for this effort should be to enhance the skills of the staff that interface with advisory panels and the public on management issues and controversies.**

2. **Internal communications with the Department did not receive high marks from staff at all levels. We were made aware on many occasions that some staff and programs felt isolated within the Department and did not know what was happening in the Department beyond their own activities. There is a broad interest among staff in what the Department is doing and a willingness on part of staff to help Department programs that are short staffed or have seasonally heavy workloads. There is a need to provide cross training and familiarization with other programs and available skills so that the existing skills of the technical staff can be readily utilized in other programs when needed. A good example of this point is the trawl project which appears well run. Staff members working on this project have excessive work responsibilities, requiring them to work five weeks of sea time with limited breaks. The Department needs to cross train other individuals on staff to fill in when project staff need a break or time off for family issues.**

3. **Every office should have daily attendance records that records who is in or out of the office, what they are doing if out of office, location of employees, and contact information.**

4. **We reviewed the State policy on working from home but could not obtain a written DMR policy on the subject. The State policy delegates responsibility to the Department to determine its own practice on the issue. It appears that individual supervisors in DMR are determining the policy for each facility. This leads to a disjointed practice on subject with consequence that some staff members get treated in a more liberal or conservative manner based on their work location. This builds resentment among staff depending on their perspective of how they are being treated compared to other employees. The Department needs to develop a consistent policy on the issue that clearly identifies which employees are authorized to work at home, under what conditions, and reporting and contact information. Departmental policy should clearly identify the supervisory conditions under which an employee can work from home, and apply extensive supervision requirements that must be met and agreed to before work at home is authorized. As a general rule all employees should be required to work out of and report to a designated office unless there are compelling and well documented reasons for being authorized to work at home. Such exceptions should only be granted when it is documented to be in the States best interests.**

5. **Performance reviews should be personally completed every six months by supervisors for all employees. We were made aware of a number of instances that indicate an inconsistent review process among supervisory personnel. Some supervisors did a commendable job of implementing and completing performance reviews while others only did so minimally or did not comply with requirements. In some cases performance reviews had not been completed for several years or**

were perfunctorily completed by the employees that the supervisor would then sign.

6. Staff meetings should be held weekly and/or monthly within each section. Senior staff in headquarters should identify any poorly performing sections within DMR that require more intense frequency of staff meetings in order to meet Departmental goals.

7. Transition planning among various members of staff appears inadequate. Numerous staff members cited approaching retirements but younger staff members have not been developed to fill positions that will be open by retirement.

8. As cited in other recommendations, changes and improvements are needed to implement fishery management plans and goals. The Department will need to increase the size of the fishery management staff, a minimum of four, by adding staff with education or actual work experience with fishery management programs on a regional or national level. This can be done at little additional cost by converting existing DMR position vacancies into fishery management positions.

9. The Department should establish a press and public relations position. We were made aware of a lack of ability to provide positive information about the Department's activities. Having a press position would facilitate the public's understanding of Department functions and aid the Legislature in understanding the operations of the Department.

10. Research priorities in the Department need to be prioritized and better aligned with management goals, promoting economic development, economic diversification, and adding employment in the State's fishing businesses.

11. **An annual summary of the status of each major fish stock within the State should be prepared to include management actions implemented and identify any management steps that are needed or being considered. The summary should specifically identify a timeline for rebuilding overfished or overexploited stocks and a rebuilding target for each stock.**

12. **A referral list on each issue should be available to all staff that identifies the primary contact person on relevant issues with the Department, their phone number, and an alternative in the event that person cannot be reached immediately. This will aid staff when members of the public contact the Department by allowing staff to direct inquiries to the correct point and provide a prompt response. This practice is followed by some offices but is not uniformly followed throughout the Department.**

13. **An annual abstract of all major regulations should be available in all offices and distributed to all licensees when their licenses are renewed.**

14. **The Department should have a seafood marketing program to promote both wild and aquaculture products and the development of a value added industry in order to retain and create jobs in Maine. There are a number of marketing programs in other States that could provide a model adapted to Maine's needs. The Alaska Seafood Promotion Council should be viewed as a possible model.**

15. **The Department should also be given the clear authority to reject management plans that do not meet the State conservation standards, and remand such recommend back to the organization, advisory committee, or entity that made the recommendation.**

Section 3 – LIST OF SPECIFIC RECOMMENDATIONS FROM MAINE STUDY THAT APPLY TO EACH BUREAU:

Section 3-1: Bureau of Marine Patrol

The responsibilities of the Bureau of Marine Patrol are well defined in law and practice. As stated in Maine Resource law; Officers shall enforce all marine resources' laws and may arrest and prosecute all violators; serve process; and are vested with the authority to enforce all laws of the state and may arrest for violations of any criminal laws as well as having search without warrant authority. They also participate in search and rescue. The broad sweep of responsibilities for Marine Patrol officers requires specialized training and equipment with continuous and current updates on applicable laws, regulations, and policies to obtain maximum efficiency.

The Marine Patrol is the oldest law enforcement agency in the State of Maine and has developed into a cohesive and effective agency. There are many aspects to marine patrol activities. Marine Patrol officers are the face of the Department in their interactions with the public and are often asked about Departmental activities or policies beyond their immediate responsibility. They frequently make inquiries from the field of other Departmental employees to find answers to questions outside their immediate area of expertise. Officers are guided in their activities by a Policy Book as well as the law and regulations they enforce. Search and rescue missions add to the work load of officers. With a total force of about 36 field officers and a coastline of about 6,000 linear miles there is a manpower shortage even when the agency is at full strength. Vacancies as a result of recent budget shortfalls further limit their ability to cover such a large range.

For comparison, in 2003 the Marine patrol had 45 active enforcement positions funded by the General fund and a total budget of $3,035,912. Since that time there has been a gradual reduction of enforcement personnel in the general fund down to 36, only 26 of which are paid

for by the General Fund, in 2011. This means that the marine patrol has lost 9 positions (20%) funded by the General fund since 2003. The General Fund appropriation for the Department has increased substantially from 1988 to date, which means that the Enforcement program has received disproportionate General Funding cuts in recent years.

To complicate matters, the budget has not kept up with the inflation rate during this period, which has negatively affected the operations of the unit. The current budget is approximately $500,000 less than an inflation adjusted value. We do not think this logical or desirable and the situation should be reversed if the State intends to optimize the economic value of the industry in the future. To put all this in perspective, if one third of the current enforcement force is on duty at all times (24 hours a day), each officer has to establish an effective enforcement deterrent in approximately 460 linear miles of coastal waters.

Much to its credit, the Marine Patrol effectively uses community based enforcement. Each of the officers is required to live in the area of their responsibility and make their phone number and home address available to the public.

After 911 there was pressure on state and local law enforcement agencies to add to their forces using federal funds. The Maine Marine Patrol did not take full advantage of those offers because they realized that at some point the funds would no longer be available. Funds received were used for some equipment but for the most part the agency did not become dependent on this short term federal funding. The Patrol does have agreements with federal agencies to receive payment for the enforcement of federal fisheries regulations and recreational boating. This is an extension of their core mission and is compatible with their state responsibilities.

Officers in the field are burdened with many responsibilities and activities that require a lot of administrative time and reduce the time spent on active patrol or investigation. One example is the lobster trap tag system. Officers are required to maintain records of trap tags issued to

individual fishermen, sign apprentice certifications, and do other tasks that take them away from their core function.

Although the Marine Patrol is generally a well run agency, there are some core issues that need attention. Officers are leaving the Marine Patrol for positions in other State and local law enforcement agencies, primarily because of salary and working conditions. Marine Patrol officers work 8 hour shift but are on call for 24 hours and must stay in their patrol area. If called out during the 24 hour period they must be paid overtime. We had several officers complained about this rule, and thought it inequitable when compared with other police forces in the State and is another factor causing officers to leave. This has been an issue raised by the union in contract talks. When an officer leaves there is an additional cost to the Department to recruit and train replacements as well as losing an experienced officer.

In spite of being generally well run the Marine Patrol has some indications of a morale problem brought on by a heavy work load, pay issues, inequity with other police forces, and a perception that the agency has not changed with the times. Communications within the Department are often inadequate or slow to address problems or suggested improvements. Issues such as officer input into equipment purchases based on what is needed in the field become important in times of reduced resources.

Recommendations:

1. **At full staff there are now about 36 field offices to cover 6,000 miles of coast line 24/7/52. The Department should increase staffing for Enforcement by two positions a year for a five year period of time. The new positions should be paid for with General Fund revenue or funds from dedicated accounts that have stable sources of income. This would result in 46 field officers, and allow Marine Patrol to staff each section (there are 6 enforcement sections in the State) at a minimum of 7 officers.**

2. **In the next few years most of the high ranking officers are going to retire. We recommend that the Bureau develop a program or process to train officers to be prepared to move up to higher ranks.**

3. **There needs to be more clarity and flexibility in filling the Chief and Deputy positions. While we have no specific recommendations, with the retirement of many of the ranking officers in the near future, it is very important that qualified people are available to consider for those top positions.**

4. **Efforts should be made immediately to provide additional funding for overtime pay and to compensate officers in an equitable manner compared to other police forces.**

5. **Steps should be taken to reduce the administrative duties of officers in the field such as maintaining lobster tags and records and other duties that do not need a trained law enforcement officer to perform.**

6. **Officers should be given opportunity to participate in reviews of laws, regulations, and policies to streamline field activities and reduce administrative field duties. "Brainstorming" sessions would offer opportunity for officers to be heard on issues that are important to field operations and would improve their efficiency in carrying out the core mission.**

Section 3-2: Bureau of Sea Run Fisheries

The Bureau Sea Run Fisheries has a staff of scientists and technicians that are charged with restoring habitat and a number of anadromous fish stocks that have been diminished because of manmade habitat changes and environment shifts. Sea Runs focus is a few rivers in the

eastern part of the state to restore the various (14) fish populations with a focus on Atlantic salmon. Sea Run Fisheries is supported almost entirely by federal grants because salmon and Atlantic short nosed sturgeons are both listed on the Endangered Species List. Resource Management also has a group that work on anadromous fish but not the same species.

Our overall impression of the unit is that the staff is well trained and capable of fine professional work. Employees in the unit appear very dedicated to the tasks and motivated to rebuild population of anadromous fish species. We note that there is a disproportionate number of scientific staff in this program and their expertise could be used seasonally by other programs in the Department (see our restructuring recommendation).

Recommendations:

1. **Need to cross train the scientists and make their sampling expertise available seasonally to other programs within DMR. For instance it is highly likely that some of the scientific expertise in Sea Run Fisheries could be brought to bear on problems in municipal shell fish program or public health, or fishery management.**

2. **Staff needs to develop a comprehensive state plan that sets the restoration priories for the State based on the environmental characteristics of the river system and watershed, rather than have funding determine program focus, which is currently the case.**

3. **Program should be merged with scientists at Boothbay Lab. Employees should continue to work out of their current offices as most of the work is located in eastern Maine.**

4. **A large portion of the program funding is derived from federal sources that may not continue into the future. Need to diversify funding sources for this effort.**

Section 3-3: Bureau of Resource Management

The review panel interviewed a large number of Resources Management staff. Many of the employees interviewed were scientists that are working on various species. It was apparent that most of the staff is very capable and interested in their research. What we found missing was that there are no goals and objectives to be used as a plan for the science and data collection. These scientists were conducting research, monitoring stocks, and in some cases landings of all species, but the information ended with them, as there appears little connection between what is scientifically known about a species and the Department management effort on that species. This disconnect does not build a feeling of accomplishment by the staff. Many of the scientists at Boothbay spend a great deal of their time working on federal grants to fund the work on their particular species. While writing grant proposals for possible funding is important, the time and energy spent in those tasks does not help in working with the policy staff and the industry fishery advisory committees. Many of the scientists are good at what they do but they may not be trained to be advisors to industry committees and they are not necessarily trained in fishery management. Since there are few fishery management plans, goals, or objectives for any fishery in state waters neither the advisory committee nor DMR staff have direction.

There are five units in the Bureau of Resource Management, they are: Commercial Monitoring and Assessment, Ecology, Public Health, Education and Maintenance. Commercial Monitoring and Assessment, Ecology, and Education are almost entirely funded by grants. There is concern that as the federal budget problem gets worse grants will be diminished or cancelled all together.

The Commercial Monitoring and Assessment section is made up of the scientists that study and monitor all the fisheries. In the monitoring section the staff has a huge work load in collecting the vast amount of data that is generated every day and putting it into a form that is useful to the department and public. In the assessment section most of the staff is focused on the

particular species that each studies. Many of the scientists in the unit also interact with the industry advisory committees which in some cases make them uncomfortable because of what appears to be the lack of willingness of some of the committee member to deal with what the science tells them. Since many of the scientists are not trained as managers they have a difficult time dealing with these types of situations. In the large fisheries, in particular the lobster fishery, the Headquarters staff does the interface with the lobster zone councils and the scientists only get involved when one of the councils ask for science information. What is missing is the ability to monitor the economics of each fishery because there is no one on the staff that has an economic background. The little work done on the economics of the fisheries is done by a biologist who is not trained to do such work.

The Bureau Sea Run Fisheries has a staff of scientists and technicians that are charged with restoring habitat and a number of anadromous fish stocks that have been diminished because of manmade habitats changes and environment shifts. Sea Runs focus is a few rivers in the eastern part of the state to restore fish populations, in particular, Atlantic salmon. Sea Run Fisheries is supported almost entirely by federal grants because salmon and Atlantic short nosed sturgeons are both listed on the Endangered Species List. Resource Management also has a group that work on anadromous fish but not the same species.

The ecology section includes the trawl survey, recreational fishing, and education. The trawl survey appears to be well run and the data collected is vital to the assessment section. With a very small staff they spend a great deal of time at sea and then compile all of the data. The weakness in this program is that it is at least one person short when doing the survey. They recruit a staff member from some other part of the department when needed but in many cases this person is not trained and is not as much help as they would be if they did the work on the trawl survey on an ongoing basis. The other draw back to being a person short is that they are far behind in their aging on some species. If the aging was up to date it would be a help to the assessment staff and the federal scientists that are working on the federally managed species. The program appears to be well run but suffers from a shortage of funds to fully

evaluate opportunities. There is income growth potential for the state if this section gets a small increase in its funding.

The department's aquarium is in Boothbay and is a significant educational facility that is capable of being self-sustaining. The department also has an island with a light house which is used for educating educators in marine and fisheries issues.

Public Health and Municipal shellfish program are also based in Boothbay Harbor. Public Health is shellfish and water quality required by the federal government for any state to ship live shellfish in interstate commerce. Public health is the one section in Resource Management that is almost entirely funded by general funds.

The Boothbay Harbor building and property is a wonderful and well maintained facility. It was brought to our attention that the maintenance department needs an additional person to help keep the building and grounds up. The aquarium alone sees tens of thousands of visitors each year. The Marine Patrol's regional office is in the building and receives a number of visitors during the year. It has been reported that in the winter the current staff has a difficult time keeping the walks clear of snow which is a safety issue.

Comments on Specific Sections within the Bureau of Resource Management

Section 3-4: Commercial Monitoring and Assessment

The review panel was very impressed by the recent progress that DMR staff had made documenting landings by commercial fishermen. Figure 5 documents the extensive amount of work being accomplished by staff in this program, as Maine staff now records more trip level landings information than any other State. The critical issue to keep in mind is that technical staff needs accurate catch data in order to craft effective management program, and that good data generally leads to good management decisions. That being said there are a number of

weaknesses in the program that need to be addressed in order to maintain this commendable record.

Recommendations:

1. **Staff publishes an excellent news letter which outlines specific information about the program. This effort needs to be expanded to include an outreach effort with the fishing community in order to improve compliance with the program.**

2. **Funding for the program is provided by ASMFC as part of the ACCSP data collection effort. The ASMFC program is designed to provide seed funding for States to initiate new data collection efforts, but it is not designed or intended to fund data collection on a continuing basis. The Maine program relies primarily on this source of funding to pay the cost of the program, which will most likely be terminated or curtailed in the next few years. The Department needs to acquire long term funding from State sources to continue this commendable effort.**

3. **DMR Staff have identified a number of weaknesses in the data collection program that can only be corrected by Legislative action. Most of these weaknesses relate to direct sales of products to the consumers, and problems generally apply to scallops, shrimp, and lobsters. The Review Committee does not have an issue with direct sales per say, but recommends that the Legislature meet with members of the DMR data collection staff, identify the reporting loopholes, and craft legislation to ensure 100% compliance with the State reporting requirements.**

Section 3-5: Public Health

The Public Health Program (PHP) has five components parts of their operation. They are water quality, monitoring, and classification; marine toxins monitoring; water testing laboratories;

inspection of shellfish processors and dealers; and municipal shellfish program. A Public Health Program is required under the Food and Drug Administration (FDA), Interstate Shellfish Sanitation Conference's (ISSC) National Shellfish Sanitation Program (NSSP) for any state to ship shellfish in interstate commerce. The FDA monitors state compliance with the NSSP and if the state is out of compliance the FDA withdraws the states certification which in turn decertifies all of the shellfish processors and dealers from shipping their products out of the state. The NSSP rules are clear and the FDA audits each producing state every year. To maintain FDA certification all states are required to certify the shellfish waters as in compliance, or conditionally in compliance, or out of compliance. Water samples must be regularly collected and tested through an approved laboratory and an enforcement presence must exist that assures that no harvesting takes place in closed areas. The municipal shellfish program is not part of the FDA review program but is affected by closed areas or if the state is out of compliance with the NSSP.

There has been an ongoing problem with management and leadership in the Public Health Program according to a numerous people that the team interviewed. We were told that there was little interest in the upper management of the department, bureau or director of the Public Health Program in dealing with the problems. The problems got addressed when industry voiced their displeasure in the way the shellfish programs were being affected because of the lack of interest, funding, and cooperation from the department. That appears to still be the case today.

In the past and currently, the shellfish industry has complained about how the state operates the shellfish programs, in particular, the towns in the Municipal shellfish program. There are thousands of acres of productive shellfish grounds closed because the State continues to allow waste water discharge from residential, small businesses, and vessels. There are a minimum of 1007 known outflows within the State that directly impact water quality in specific coves and harbors. All discharges from municipal waste water treatment plants have large closed areas around their outfall pipes. The collective impact of these policies result in the unnecessary

closure of thousands of acres of productive shellfish management areas, which could be reversed if the policies changed or a different management approach were taken. Although the current State policy on these issues may be prudent if viewed solely from a public health perspective, they result in a significant loss of jobs and economic activity within the State.

In 2007, after complaints from the shellfish industry, the state contracted with three experts to review the Public Health Program. The experts pointed out that the industry mistrusted DMR and in some cases were hostile toward them. The expert panel made 19 recommendations many of which have not been put in place. The lack of adequate funding was addressed. A number of non-financial issues were implemented.

Water quality monitoring and the shellfish growing areas classification section collects water samples and has them tested to assure that shellfish taken from the open areas is safe to eat raw. The program monitors open and closed areas. When an area that has been closed because of pollution has been cleaned up the PHP can certify that the shellfish from the grounds are safe for human consumption and open the area. The section also does shore line surveys looking for illegal overboard discharges. The water quality section of the program has continuing management problems as it lacks a program manager for Public Health, and the water quality section is without a chief scientist. At this time, the FDA is preparing to audit the program and the former chief scientist resigned, which significantly complicates the review as the program documentation is incomplete. This has left the program scrambling to complete the requirement using staff from outside the PHP in an attempt to complete the paper work properly and in a timely manner.

The Marine Toxin Monitoring program collects shellfish samples and test for Paralytic Shellfish Poisoning (PSP). This is section is well run and is up to date in all areas of its responsibilities.

PHP has two Laboratories, one in Boothbay Harbor and the other is Lamoine. Boothbay does all of the water and PSP testing for the western part of the state and the Lamoine lab does the

eastern part. The lab director is stationed in Lamoine and oversees the operations of both labs from there. The lab director is also the laboratory certification officer for the state. We heard a number of complaints from Staff that independent laboratories within the State cannot get certified to perform shellfish growing area water or shellfish testing. We urge the Department to review the facts in this regard, and take appropriate action to remedy the situation and allow independent laboratories to perform the testing.

The shellfish inspection program is a requirement of the NSSP. Each shellfish processor and dealer must be permitted to handle shellfish products. Each permittee is inspected a number of times each year. When the permit must be renewed, a complete inspection must take place. One of the problems that have come to light is that the inspectors sometimes do not take potable water samples at the place of business during the annual inspection. The rule is that if there is no potable water sample testing result then a permit may not be issued. This has caused problems for some of the processors in the past when their permit expired and they could not renew their operating permit because the inspector had not collected the water sample.

The Municipal Shellfish Program was created more than 100 years ago. This program allows towns to manage their shellfish beds with scientific and management support from DMR. The state is divided into four sections with one scientist assigned to the two center sections and one scientist assigned to the extreme eastern and western areas. When asked why this was set up this way, we were told that needed to be changed. This program has caused a great deal of controversy over the years because some towns manage their flats well and other do not. We could find little scientific or definitive information on the status of the shellfish resources managed in the towns that participate in the program. We heard allegations that there are reports of towns with limited number of digging permits that are under fishing their resource while benefitting a few diggers that can harvest large quantities of clams in a short period of time. There is a possibility that some towns are allowing their shellfish grounds to be overfished, but there is inadequate factual information to confirm these assertions by staff.

Recommendations:

1. **There is a general lack of management and leadership within PHP.**

2. **Some sections within PHP are not well coordinated, supervised or run and DMR staff generally characterized the situation as dysfunctional.**

3. **The management function for the Municipal shellfish program should be taken out of PHP and put into the fishery management section of the Department as proposed.**

4. **The science part of the Municipal shellfish program should be put into the science arm of the department. There needs to be an ongoing assessment of each of the towns clam resource so that there is an extraction rate that allows for a sustainable harvest over the long term. We recognize that there are limitations on staff resources, but there is no reason that a few towns could not be randomly selected for an intensive audit each year. This small step would add credibility to the program.**

5. **The individual point sources and vessel should not be allowed to discharges waste water into state waters. The State may need to consider developing a resolving fund to assist landowner and marine operators with low cost loans to expedite this process.**

6. **Allow independent laboratories to be certified to do growing water and shellfish testing for industry. Allowing independent certified labs to collect shellfish plant potable water samples has been suggested as one solution, but currently is not permitted.**

7. **The Lamoine laboratory should be moved to a large town near route 1. The lab and office space is very small for all of the work that must be performed in that facility. This would also save travel time and mileage for the staff that are on the road collecting samples that must be delivered to the lab on a timely basis. We also note that it would be far more convenient if the laboratory was located closer to route 1, to facilitate greater public access for the fishing community in down East Maine.**

Specific Comments on Individual Fisheries Programs

Section 3-6: Lobster Management Program

Although we did not interview anyone from the lobster industry or DMR lobster advisory panels, we receive a large volume of comments/views from staff on the status of the fishery, conduct of the industry, advisory Council process and need for different management approaches. As we indicated in prior sections we interviewed all senior staff, including the lobster staff, and also solicited comments on most fisheries from all staff as a means of gauging the viability of each management program.

The vast major of DMR staff who discussed this subject, expressed the perspective that the industry was currently doing quite well economically, but voiced various concerns about the long term prospects for the industry or offered specific suggestions on the need to manage the fishery differently. Given the fact that lobster landings comprised 70% of the 2010 commercial landings for the entire State (Figure 3: all species and all fisheries) the committee focused a number of questions on various staff relating to the state of the industry, need for alternative management approaches, the zone Councils process, and long term prospects for the industry. It is important to outline a few facts prior to offering comments and suggestions on the lobster industry.

Abundance in Maine is currently at record levels according to the recent stock assessment. Maine landings averaged approximately 20 million pounds +/- from 1950 to 1990, but have increase to approximately 94 million pounds in 2010 (graph 2). Lobster is managed in Maine waters through a co-management process, and regionally by the ASMFC, and or federally by the NMFS. The coast wide lobster stock is assessed every five years and the last assessment determined that the stock in the Gulf of Maine was not overfished nor was overfishing taking place. However, we note that exploitation rates in the Gulf of Maine are approaching the reference points, which would trigger consideration of additional restrictions on the fishery. Minor decreases in lobster recruitment could have extremely adverse impacts on a large number of coastal communities so there is cause for concern on the future status of the stock. In essence, the State is precariously positioned despite having a healthy and robust resource. A new coast wide assessment will be compiled in 2014 by the ASMFC.

During the time period 1950 to 1990 traps set per year increased from 430,000 in 1950 to 2,605,000 in 1996. Since 1997 there has been an additional 25% increase in traps, which now total in excess of 3 million traps allocated to 5,977 fishers. The average age of a Maine lobsterman in 2008 was is 46.7 with a median age of 48. Maine instituted limited entry in all areas, with the exception of one, so in essence there is now a cap on the total number of traps that can be set in State waters (Sources for all data ME DMR staff or web site).

The Maine lobster fishery has been experiencing unprecedented landings in recent years, and most staff expressed the view that the scientific community did not understand why this had taken place nor could any staff member predict how long this trend would last into the future. If past history is any indication, it is unrealistic to assume that this condition will continue indefinitely. Most staff members discussed the fishery in the context of "when the eventual landings decline occurs" rather than supporting the prospect that this condition would continue indefinitely.

These observations are not a criticism of DMR staff, as we view the lobster staff at DMR as very competent. The reality of the circumstances is that staff members are unable to determine the conditions that caused the sudden population increase, thus it is highly likely that no one will be able to predict exactly when a reversal of that condition would occur, triggering a decline in landings. There are also some similar characteristics between the situation that occurred in Southern New England (SNE) in the 1990s and the current situation in Maine. Both experienced large unexplained increases in lobster stock abundance and rapid increases in fishing effort. In the case of SNE, that stock went from a period of unprecedented landings in the 90s to a collapsed stock within 10 years. We also emphasize that State and Federal agencies in SNE have spent in excess of 10 million dollars studying the causes of the decline and have yet to determine a specific cause for the stock collapse. Given the uncertainty in our collective understanding of what factors are driving this stock to new levels, we think it prudent to initiate a process to slowly transition the industry away from several practices that we view as undesirable and/or damaging in order to promote the long viability of stock and industry.

Recommendations:

1. **As noted in earlier sections, we think it critical for the State to develop specific management plans for each of the major fisheries with clearly defined goals and objectives. All fishery management plans should have to meet specified conservation standards, which need to be established by the Legislature. Maine needs to define goals and objectives within a management plan framework for the lobster fishery that reconcile the disparate interests of the fishery and industry, while also promoting a healthy and sustainable fishery for future generations. The lobster fishery should be a prime candidate for such an effort given the fact that it generates 313 million dollars for the State's economy.**

2. **Given the somewhat uncertain nature of predictive science on lobster, it would be prudent for the State to initiate a process that gradually reduces effort in the**

fishery. We intentionally used the word "gradually" as we advocate a long term process, rather than a dramatic short term reaction to the problem. During 2010, there were 5,977 licenses issued of which 4,276 were active and 1,701 inactive. These individuals were allocated 3.01 million trap tags, of which 2,553,600 were fished and 455,896 were not fished. This high degree of latency, 28% for licenses and 15% for tags, complicates future management action, particularly if the resource declines.

Our suggestion would be for the State to implement a management measure that gradually reduces allocated traps in a very predictable and transparent way. DMR staff have documented the economic merits of cutting traps which would lower costs for all fishermen. In addition there appears some support within the industry for a strategy based on this concept. In 2008, DMR conducted a survey of all participants and nearly 35% of all lobster license holders responded. A total of 76% of all respondents indicated that they were worried or very worried about the number of traps in their area. Additionally, 60% of respondents indicated they would remove traps from their area. Ultimately a state wide referendum on the issue failed, but that should not be an indictment of this concept, rather it means that the wrong approach was advocated at that time (Sources for all data ME DMR staff or web site).

We do not advocate a history based allocation strategy at this time, as there are 1701 inactive permits and that type of strategy would generate endless distributional debates among the fishing industry. It is also highly unlikely that the political leadership in Maine would be unwilling to take fishing privileges away from such a large group. A number of other State and Federal agencies have dealt with similar problems by instituting programs that gradually reduce the number of allocated traps, while allowing individuals to scale their business needs by transferring trap tags. This approach ends up at the same end point as a history

based allocation strategy but generally takes longer to deal with the latent effort issue.

Although it is beyond the scope of our review to develop all of the specific details of such a program, the Staff should also examine the merit of the consolidation approaches advocated by the Area 2 and Area 3 lobster conservation and management teams of ASMFC. Those strategies include a conservation tax on transfer that further facilitates a reduction in authorized traps. Finally we note that implementation of this strategy would position Maine to better cope with the developing turtle and whale rules being proposed by NMFS.

3. The Maine DMR needs to partner with the Governor's office and Department of Economic Development, to examine and identify all of the internal obstacles that impede development of the value add shore side lobster processing industry in Maine. The initial focus should be on lobster and shrimp but expanded to other species. This could be organized under the aegis of a joint task force, with an assigned reporting deadline in early 2012. Any such review should identify all impediments to the expansion of this industry including issues like waste disposal and water treatment capacity. According to staff, 60 to 80% of the lobster and shrimp caught within the State are exported to out of state facilities, and this represents a major opportunity for Maine to expand economic development and job growth in the State. It should be noted that the Stinson Canning factory has recently had a rebirth as a lobster processing facility, creating 70-90 new jobs, and important perspectives could be learned from that effort. Expansion of this sector of the industry, based on the Stinson factory example, could increase employment in the State by 800 to a 1000 jobs.

4. As noted in other sections, Maine needs to create a Maine Seafood Promotion Council, model it on the Alaskan Seafood Promotion Council or one of the other

seafood promotion organizations. Maine already has a Lobster Promotion Council which should be folded into the new entity. Justification for such a strategy is fairly simple in that a 25 cent increase in price per pound for lobster would generate an additional 23.5 million dollars for coastal communities and Maine fishermen at little or no additional cost. If created, the new Council should promote both wild and cultured products and the development of value added industries in order to retain and expand jobs in the State. We suggest that the Council be funded by a small assessment on all landings so that it will have continuity of funding during these difficult financial times.

Section 3-7: Aquaculture Management Program

The U.S. imports in excess of 80% of its seafood supply. 50% of the imports are produced by aquaculture. The demand for seafood is not expected to decrease. Aquaculture has the highest potential for short term growth of any fisheries in the State and can grow with little cost to the State and create private sector jobs. The highest income, by far, per cubic foot of water comes from aquaculture of fish or shellfish.

Atlantic salmon is a $76 million business in Maine now and has the potential to be multiplied many times. Worldwide Atlantic salmon aquaculture totaled almost one and one half million tons in 2007. Maine produced 11,130 tons in 2010.

Shellfish aquaculture is common in most coastal states in the U.S. and around the world. Oyster and hard clam production is high along the Mid-Atlantic, south Atlantic and Southern New England coast. There is a very large oyster industry in states bordering the Gulf of Mexico based on bottom leases. A large oyster and clam aquaculture industry on the west coast of the U.S. operates on inter tidal leases. There is a small oyster aquaculture industry in Maine that could be expanded by leasing areas for rafts that would allow for string and cage production without leasing inter tidal areas.

Currently the soft clam, hard clam, and oyster harvests are valued at about $16.2 million to the economy of the State. Some of the municipal shellfish operations have programs to enhance their soft clam production through seeding of flats. This is an area where a more focused management program with State support could increase production from the municipally managed flats at minimal cost.

Expansion of aquaculture is currently hindered by a complex, lengthy, and costly permitting process. It is recognized that there are many concerns and oppositions to leasing that drag out the permitting process, however, the aquaculture industry has spent time and money addressing problems and issues that have been raised that once gave the industry a bad name. If Maine is to join the worldwide expansion of aquaculture to provide seafood to the nation and add jobs in Maine, a serious effort must be undertaken to simplify the permit process.

Recommendations:

Aquaculture appears to be one of the major expansion opportunities within the Department that could add millions of dollars of economic activity and potentially hundreds if not thousands of jobs. Aquaculture projects involving shellfish, (oyster, clams, mussels, and quahogs) offer the best near term opportunity for expansion as the scope of the projects is limited and environmental impact far easier to predict and measure.

1. **Regulations and statutes controlling the aquaculture industry in Maine appear overly complex and in need a rewrite.**

2. **The Legislature needs to convene a task force to review the aquaculture siting rules and make recommendation on specific changes that should be implemented in order to shorten the application process. Task force should include Members of**

the Marine Resource Committee in the Legislature, Members of the DMR staff, Members of the aquaculture industry (both finfish and shellfish), Members of the mussel industry, and representatives of various lobster Associations. The Task Force should report its findings prior to August 2012, so that the Department or Legislature can sponsor changes in legislation for the next session. We note that the Maryland DMR recently implemented an expedited application/approval process that results in applications being approved by State and Federal agencies within 60 days so there are good examples of different ways to promote growth of this industry in Maine waters.

3. **Legislature should define conditions for small scale projects with an expedited application process that results in the permit being granted within one year of the application submission.**

4. **Priority should be given to applicants in existing fisheries in order to promote diversification in the commercial fishing industry.**

5. **Legislature, working with the Department and Advisory committees, should establish a long term production goal for the industry and Department such as doubling the output from the industry within ten years, and require the Department to provide an annual report on status, also noting deficiencies and impediments to achieving the goal. Actual amount of targets to achieve should be set after public discussions with the affected constituents.**

6. **Pre site planning meetings on applications with Town officials need to be routine.**

7. **Consideration should be given to establishing aquaculture zones where aquaculture would be given a priority under expedited permitting processes.**

Section 3-8: Proposed Restructuring

The review panel has completed a thorough review of the Department of Marine Resources and its overall structure and makes the following recommendation for restructuring the Department. We believe the Department of Marine Resources would function more efficiently and effectively if structured in three parts: Fishery Management, Fishery Science, and Enforcement. We would leave the Marine Patrol as it is since its missions are clear and, except for being under staffed, is running well. The Bureaus of Resource management and Sea Run Fisheries perform many of the same scientific functions but for different species. Sea Run Fisheries operations are mostly based in the eastern part of the state where Resource Management has the least amount of staff in that area for the size and importance of the fisheries in that area. It is the review panel's recommendation that scientific expertise in these two Bureaus be merged, but further separated into two parts: Fishery Science and Fishery Management. There would be great benefits of consolidating all of the fishery management staff in one Bureau, as opposed to the current fractured arrangement where different fishery management staff report to different supervisors. Each of the new units should have its own supervisor who reports directly to the Deputy Commissioner. The science section would be based in Boothbay and designed to do the research and collect the data that would support the fisheries management and policy unit. It is envisioned that management and policy would be directed out of Head Quarters in Hallowell.

We have also recommended in other parts of the document, that all sections begin a cross training program to capitalize on the strengths of each section for the benefit of all sections. As an example, the existing Sea Run scientific staff has excellent skills that could be brought to bear of scientific issues in other parts of the Department, such as projects in the Boothbay Lab or in the shellfish assessment program. Scientific expertise is also needed on assessment projects in the public health portion of the program. The same could be said of the scientific staff at the Boothbay Lab. An additional benefit of merging scientific staff is that the same standards can be expected of both units, as they will be all supervised by the same individual.

We also suggest that the Department take great care in selecting the supervisors for these two new units as both individuals will need documented proficiency in the ability to supervise staff and also technical ability to manage the subject matter. An added benefit of this strategy is that Sea Run Fisheries and the staff at Boothbay depend heavily on federal grants to pay their staffs. It is highly likely that federal funding will be curtailed in the near future, and this structure will make it far more efficient to deal with potential budget cuts. The department is going to have to do more with less money and staff.

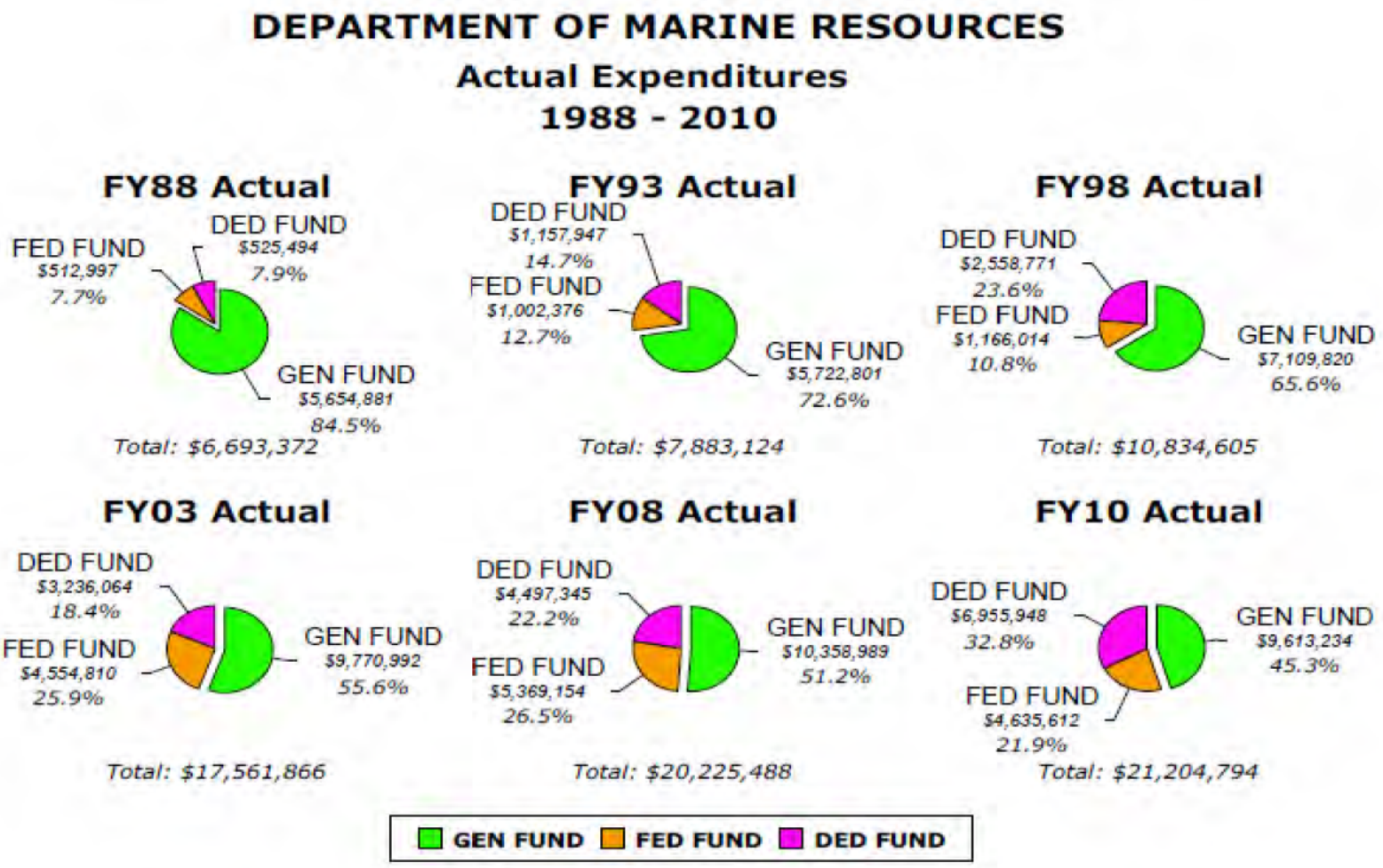
The review panel also recommends that the Deputy Commissioner be a career employee. This would allow for continuity of the department, particularly fisheries management, when administrations change. Currently, when the administration changes the two highest ranking people in the department can be out in one day. That leaves the department without an experienced central upper level person to deal with the issues on a day to day basis, until new appointees are installed and get up to speed on all of the issues.

An additional recommendation is that the Deputy Commissioner supervises the three new sections. This would free up the Commissioner to deal with policy issues, the Governor's office, constituent advocates, and the Legislature. In our view, there also would be distinct advantages of having the Deputy Commissioner be a civil service employee vs. an appointed position. This would ensure that as Commissioners change the core functions of the Department continue to serve the needs of the residents of the State in an efficient and effective manner.

Law enforcement, in the review panel opinion, does not need to be restructured or made part of management or science. Its mission and duties are clear and they are not required to do management or science.

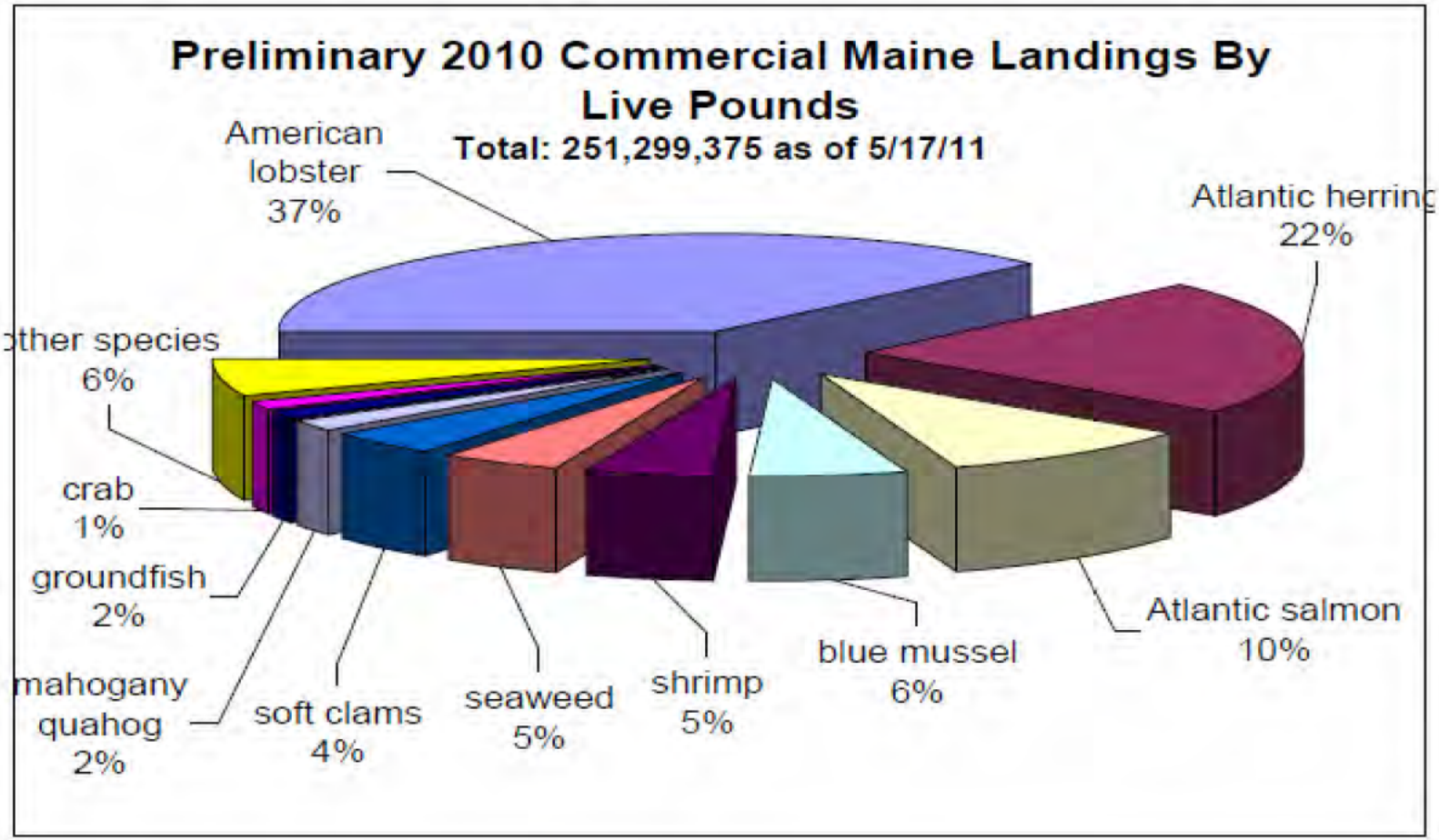
Section 3-9: Figures (Source DMR Staff)

Figure 1: Department of Marine Resources Actual Expenditures 1988-2010 by budget source



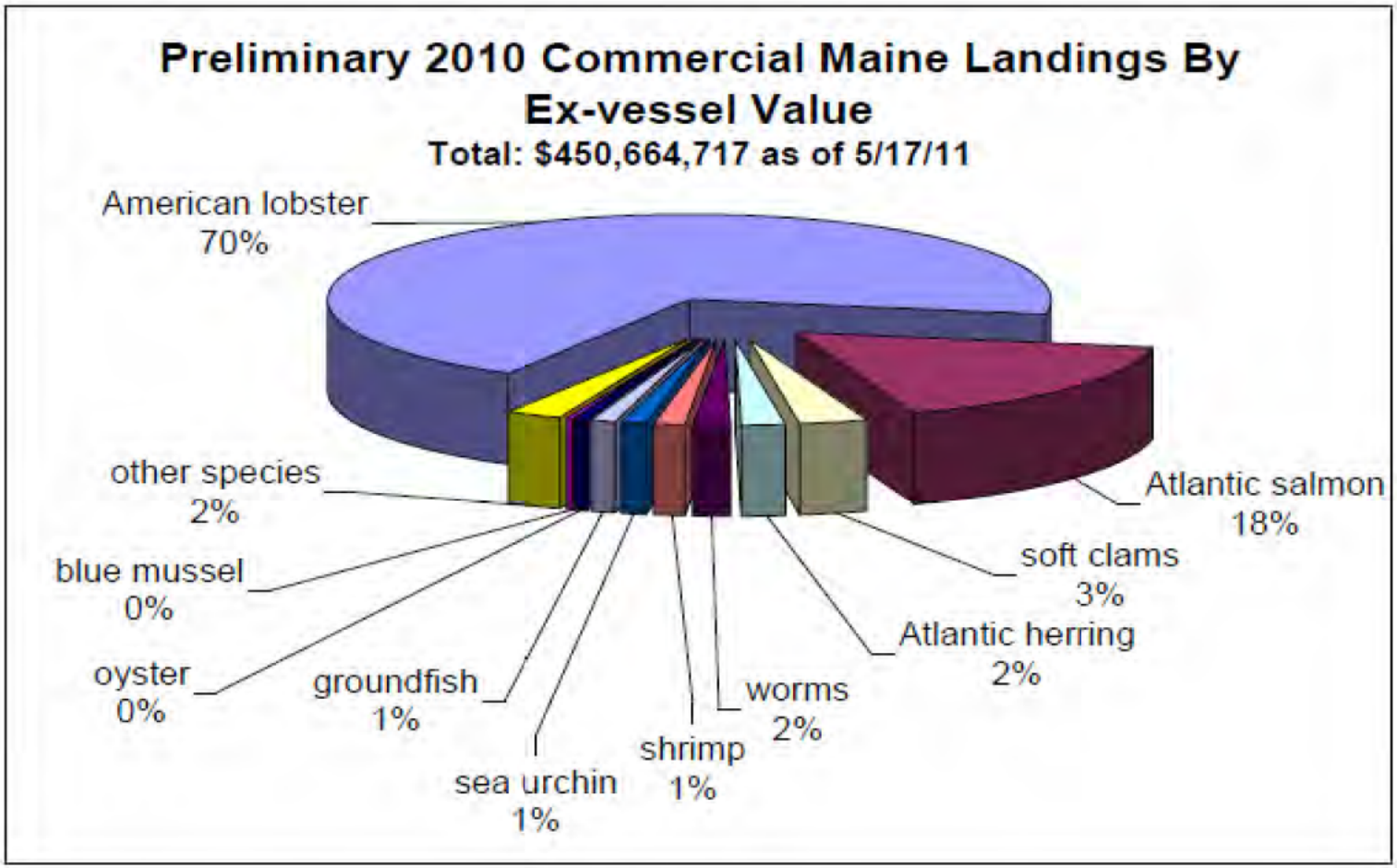
Source: Department of Marine Resources

Figure 2: Preliminary 2010 Commercial Landings by Live Pounds



Source: Department of Marine Resources

Figure 3: Preliminary 2010 Commercial Landings by Ex-vessel Value



Source: Department of Marine Resources

Figure 4: Harvester License Sales 2010

FIGURE 4: HARVESTER LICENSE SALES 2010

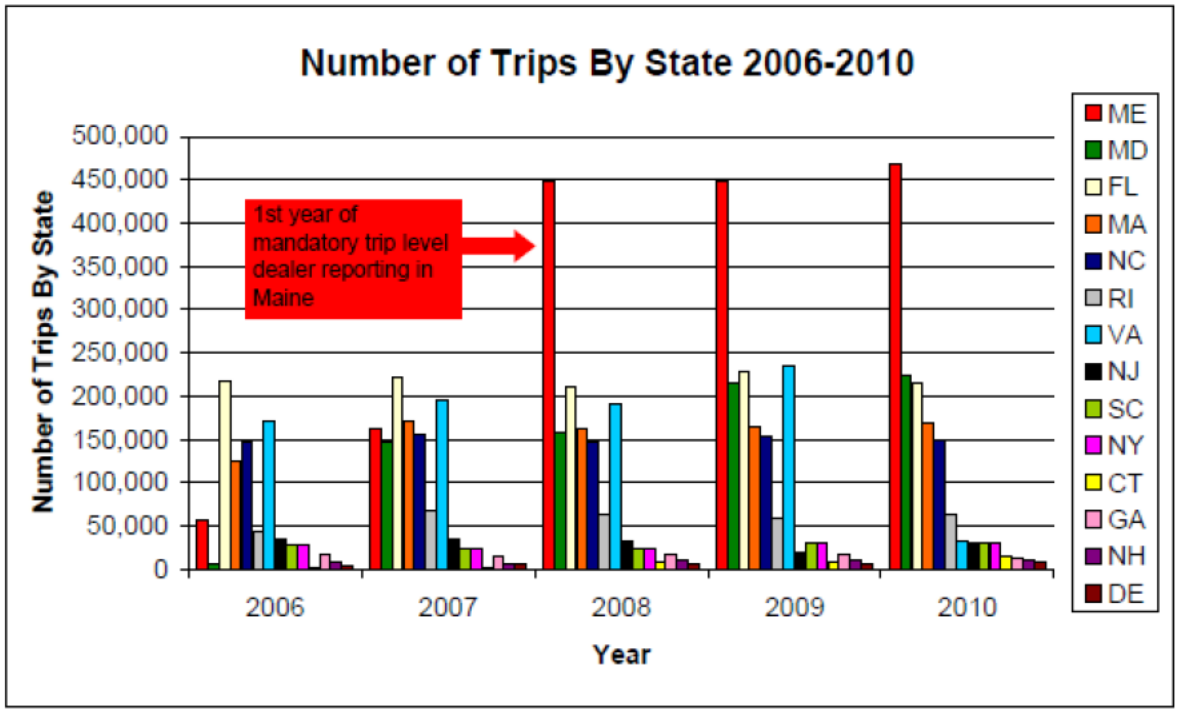
	Party ID COUNT 2010
COMM FISHING/CREW	739
COMM FISHING/NON-RESIDENT	40
COMM FISHING/SINGLE	1048
COMM SHRIMP-CREW	404
COMM SHRIMP-NON RES	2
COMM SHRIMP-SINGLE	114
COMMERCIAL SHELLFISH	1679
COMMERCIAL SHELLFISH +70	55
DEMO-LOBSTER	36
DEMO-SCUBA	1
EEL (EEL POT/HOOP NET)	11
ELVER-1 FYKE NET	173
ELVER-2 FYKE NETS	71
ELVER-DIP NET	135
ELVER-DIP NET-1 FYKE	51
GREEN CRAB	11
GREEN CRAB NON RESIDENT	1
LOB/CRAB APPRENT UNDER 18	15
LOB/CRAB NON-COMM	1900
LOBSTER CRAB CLASS II +70	213
LOBSTER CRAB CLASS III +70	45
LOBSTER/CRAB APPRENT	192
LOBSTER/CRAB CLASS I	1458
LOBSTER/CRAB CLASS II	2476
LOBSTER/CRAB CLASS III	770
LOBSTER/CRAB OVER AGE 70	226
LOBSTER/CRAB STUDENT	697
LOBSTER/CRAB UNDER AGE 18	58
MARINE WORM DIGGING	815
MUSSEL - DRAGGER	28
MUSSEL - HAND	29
NONRES LOB/CRAB LANDING	4
NONRES LOBSTER CLASS I	1
QUAHOG (MAHOGANY)	39
SCALLOP - DIVER	67
SCALLOP - DRAGGER	608
SCALLOP WITH TENDER	44
SCALLOP, NON-COMM	93
SEA CUCUMBER DRAG	10
SEA URCH/SCALLOP TEND	97
SEA URCHIN - DIVER	138
SEA URCHIN - DRAGGER	161
SEA URCHIN - RAKING	1
SEA URCHIN WITH TENDER	83
SEAWEED	85
SEAWEED NON-RES SUPP	7
SEAWEED, NON-RESIDENT	2
SEAWEED, SUPPLEMENTAL	19
SURF CLAM BOAT	1
Sum	14953

Source: Department of Marine Resources

Figure 5: Number of Trip Records by State

*updated 6/23/11

State	2004	2005	2006	2007	2008	2009	2010
ME	18,034	27,455	57,608	163,557	448,698	447,583	469,039
MD	4,372	5,759	6,669	147,147	158,710	215,730	224,138
FL	233,121	208,065	218,138	221,084	210,954	228,854	215,517
MA	55,732	100,106	125,637	170,513	163,284	163,631	168,689
NC	182,427	152,346	146,990	155,813	146,542	154,368	148,749
RI	35,462	30,283	42,649	67,223	62,853	59,711	63,523
VA	15,305	16,651	171,724	195,093	189,938	235,265	33,087
NJ	31,645	35,113	34,091	35,080	33,653	18,443	29,575
SC	33,939	30,352	27,814	23,594	23,275	30,176	29,322
NY	32,327	41,638	41,287	37,209	35,564	30,670	27,591
CT	1,881	1,191	1,173	2,590	7,251	9,181	15,125
GA	14,604	15,278	16,203	14,925	16,263	16,440	13,156
NH	8,702	9,266	9,024	5,861	10,893	11,481	9,655
DE	4,504	3,143	3,053	5,151	5,645	6,850	7,378
UN	1		1	3	35	8	86
CN	56	31	44	40	15	13	8
PR		5	1			4	2
MS				2			
PA	6		4				
TX					2		



Source: Department of Marine Resources

Section 3- 10: Graphs (Source DMR Staff)

We have attached the graphs of each commercial species landed in Maine, 1950 to date, all data from the Maine DMR web site. The graphs are useful to illustrate trends in landings over time, and also as a good indicator of how effective a management program is compared to historical performance. All graphs show the total landings using the bar graph and line graph shows the total dollars. The total price is the volume in pounds times the price per pound paid.

We have organized the species into two groups based on management authority. The first group consists primarily of inshore species where Maine regulations are the primary mechanism controlling harvest. Historically, these species have been harvested primarily in inshore waters although in some cases there is a federal component of the fishery. The following species fall into group 1:

1. American Lobster
2. Seaweed
3. Northern Shrimp
4. Alewife
5. Bloodworms
6. Blue Mussels – Crabs
7. Elver's – American Eels
8. Periwinkles
9. Softshell Clams
10. Sea Urchins
11. Mahogany Quahogs
12. Sandworms
13. Sea herring
14. Yellow eel
15. Atlantic Salmon Aquaculture

16. Sea Cucumber
17. Crab

Of the 17 species noted above three have increased, one is considered stable, and 13 have declined dramatically from a historical perspective. Two of the stocks that have increased are managed by detailed fishery management programs developed by regional organizations, both of which prohibit overfishing. The third stock that has increased is salmon which is managed by private industry in leased areas. Many of the stocks noted above have declined precipitously, lack management plans, lack an up to date stock status determination for the population in Maine waters, and or are considered overfished or have overfishing taking place according to regional fishery management programs. A number of these graphs exhibit a pattern typically associated with boom and bust fisheries, where the stock increases, followed by increasing landings, followed by a collapse.

Group 2: The second group consists of species that are harvested primarily in federal water or primarily in Federal waters with a State component. These species are managed by the New England Fishery Management Council (NEFMC) in federal waters, ASMFC, and/or NMFS. These include:

18. Cod – Overfished, population increasing, being rebuilt by NEFMC
19. Halibut – Overfished being rebuilt by NEFMC
20. Cusk – Overfished being rebuilt by NEFMC
21. Haddock – Rebuilt with federal quota of more than 30,000 MT, most of which is not harvested
22. Monkfish – Rebuilt
23. Plaice – Overfished being rebuilt by NEFMC
24. Pollock – Overfished being rebuilt by NEFMC
25. Redfish – Overfished being rebuilt by NEFMC
26. Skates – Some species overfished and being rebuilt by NEFMC
27. White Hake – Overfished being rebuilt by NEFMC

28. Silver hake – Overfished being rebuilt by NEFMC
29. Winter Flounder – Overfished being rebuilt by NEFMC
30. Witch Flounder – Overfished being rebuilt by NEFMC
31. Sea scallops – Rebuilt in federal water but according to staff overfished and or overfishing taking place in State waters
32. Wolfish – Overfished being rebuilt by NEFMC
33. Yellowtail flounder- Overfished being rebuilt by NEFMC

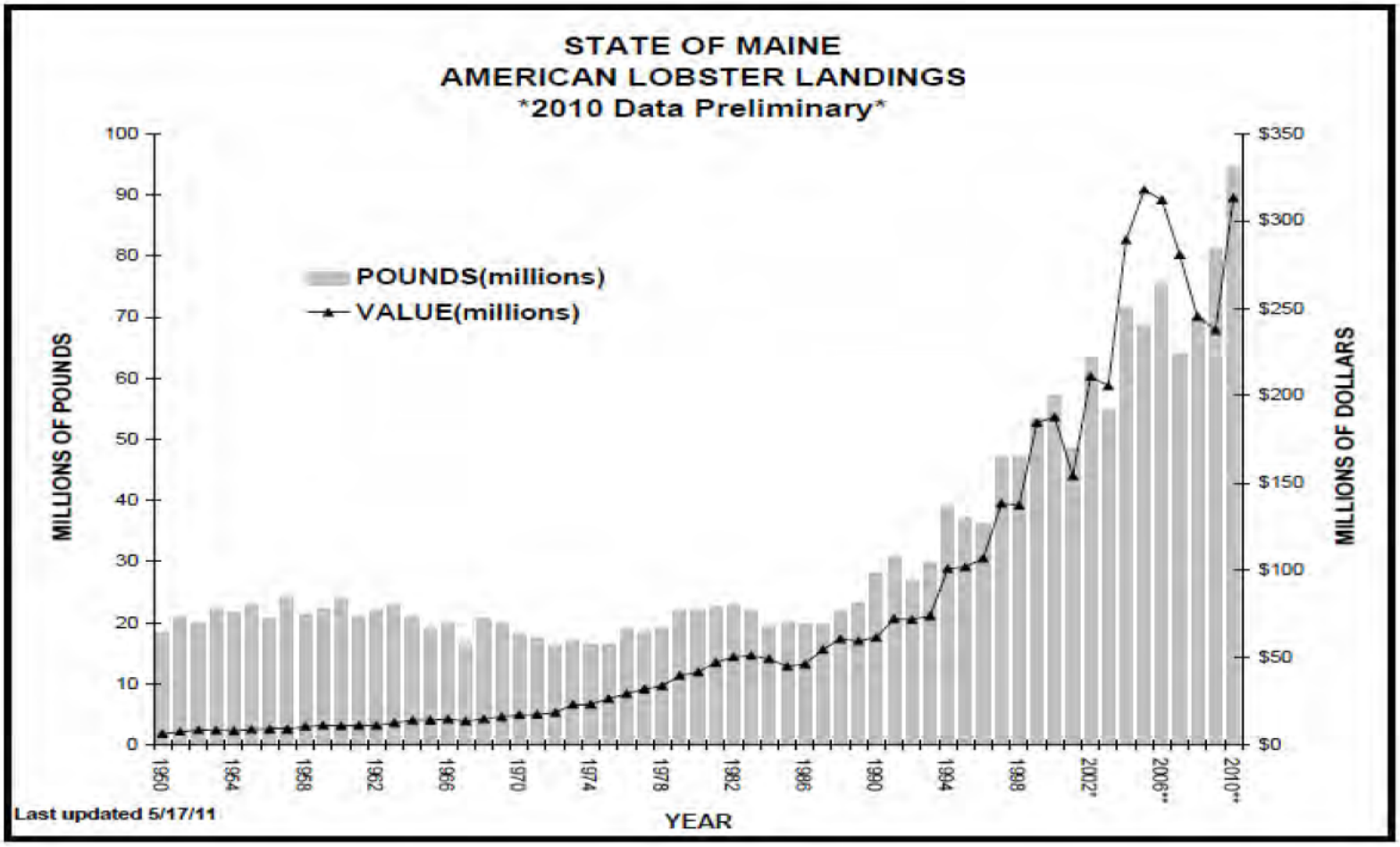
Of the 16 species listed above 2 are up slightly and 14 are down dramatically, so one might conclude that there is not a dramatic difference between the two groups. The similarities really end at that point. All of these species listed above have detailed fishery management plans in place that require these stock to be managed sustainably, and/or be rebuilt if determined overfished. Since May 2010 federal law has prohibited overfishing, and all stocks have to be rebuilt in order to attain maximum yield as specified in each management program. If overfishing takes place in one year, there is a requirement to lower the harvest the following years, in order to compensate for the overage. From an economic perspective all of the above listed species, with the exception of sea scallops in Maine waters, will generate increasing economic activity and job growth based on increased future landings. The sea scallop fishery in Maine waters exhibits the same pattern as most of the stocks managed in the first grouping, and most staff we spoke with characterized it as overexploited. Both urchins and sea scallop have very similar exploitation patterns. By contrast the federal sea scallop management plan has been extremely successful rebuilding the stock, and promoting sustainable fishing practices.

Most of the stocks listed above are members of the groundfish complex. The groundfish industry in NE currently lands approximately 90 million dollars of groundfish annually and that value is expected to increase to 300-400 million dollars when stocks are fully rebuilt. Maine residents own a large portion of the fishing rights that are associated with these fisheries, and therefore will accrue the economic benefits of these rebuilding programs. That being said, that statement should not be interpreted to mean that the State of Maine will accrue the benefits

associated with these fisheries. Most of the major vessels that own the fishing rights in these fisheries have relocated to other States, because the competing States provide economic incentives, such as fuel credits, low cost dockage, enhanced infrastructure, processing capacity, waste treatment facilities, etc. and allow trawlers to land lobsters. Our conclusion is that Maine needs to review and revise its practices on these issues in order to ensure that the State is able to compete in the future with the neighboring States, and thereby enhance economic and job growth activity within the State. Failure to do so will result in the State missing an opportunity to participate in the economic benefits of these sustainably managed fisheries.

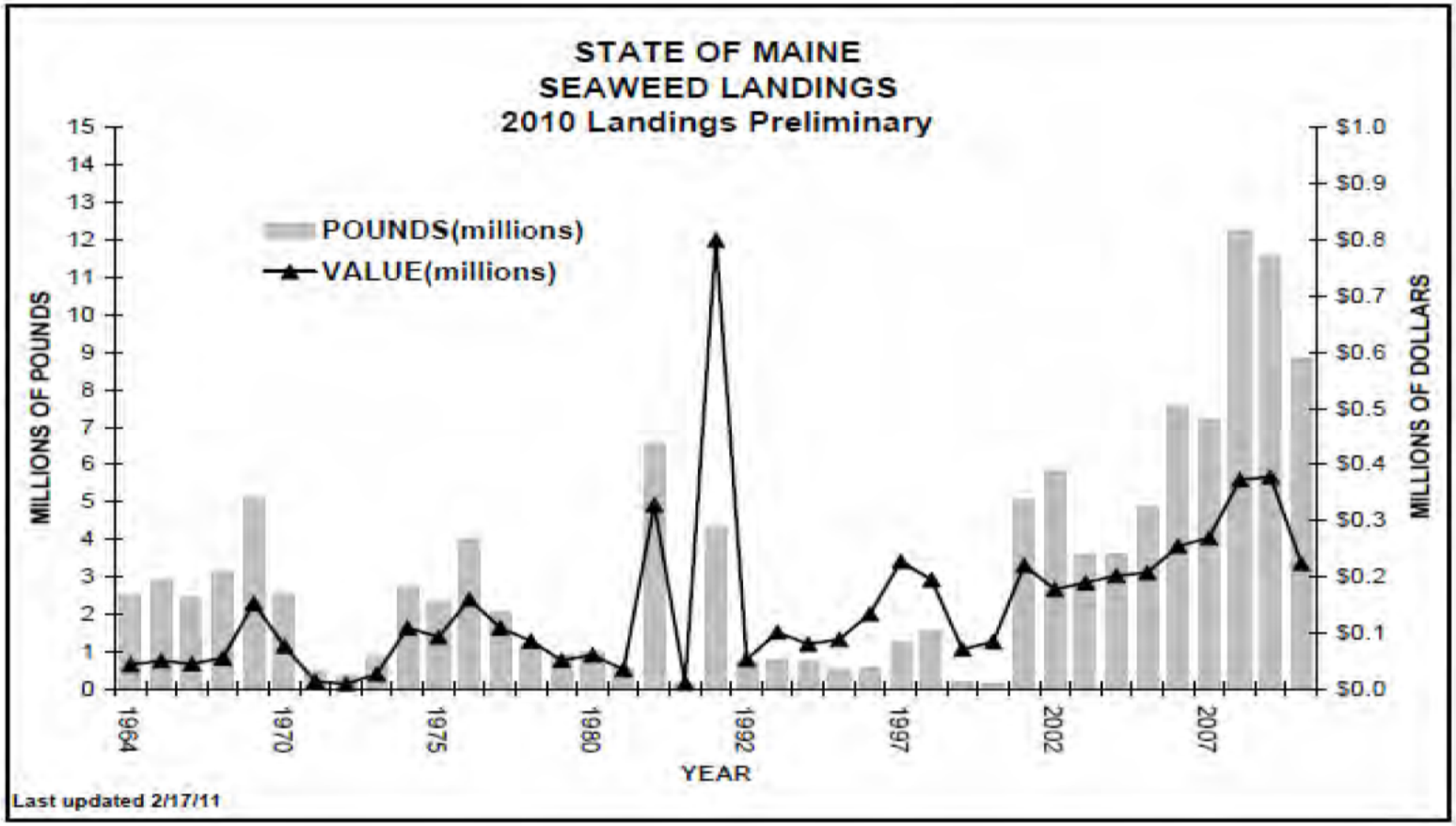
Historical Landing Graphs by Species in Maine 1950-date (Source DMR web-site):

Graph 1: American Lobster



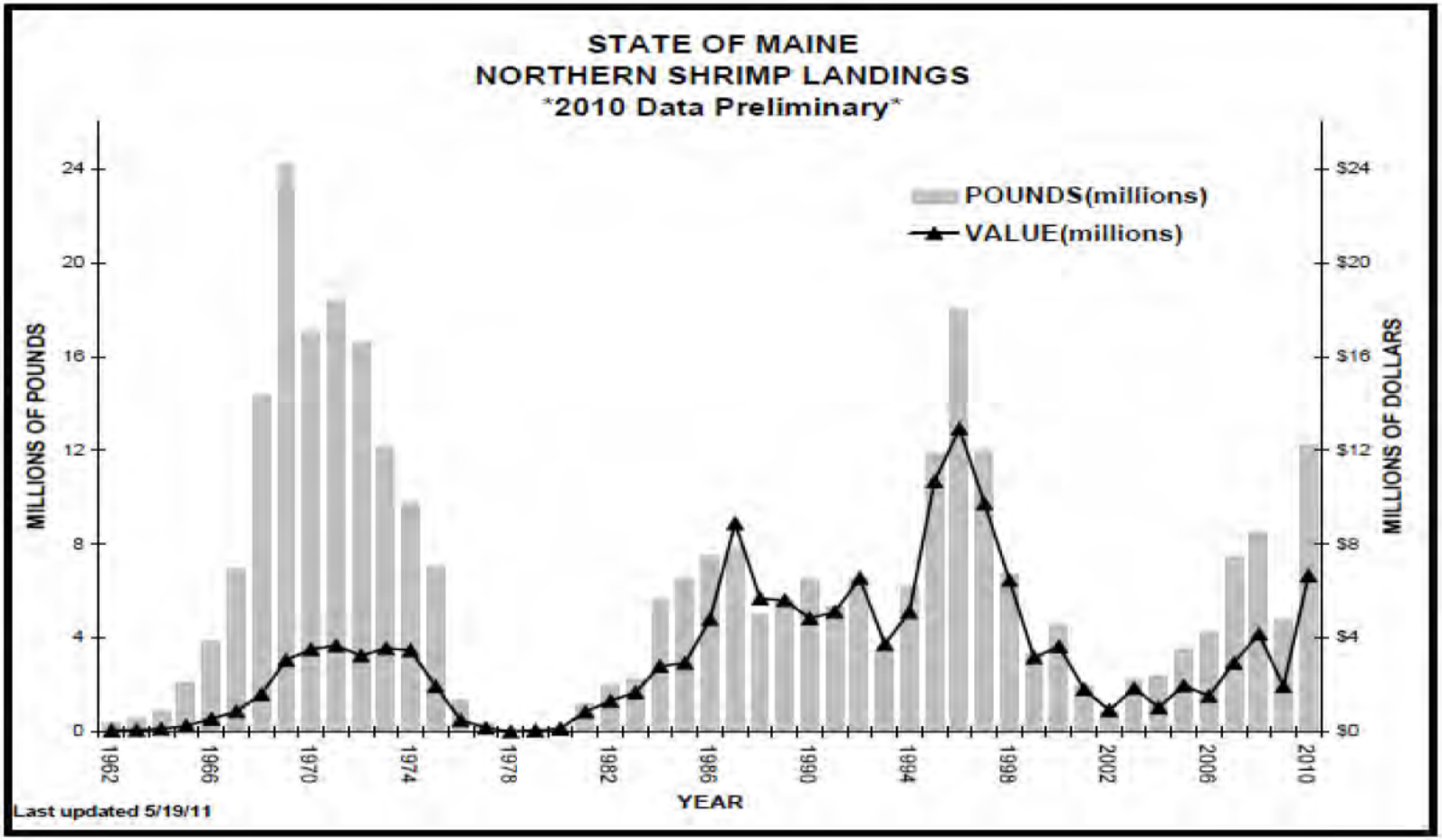
Source: Department of Marine Resources

Graph 2: Seaweed



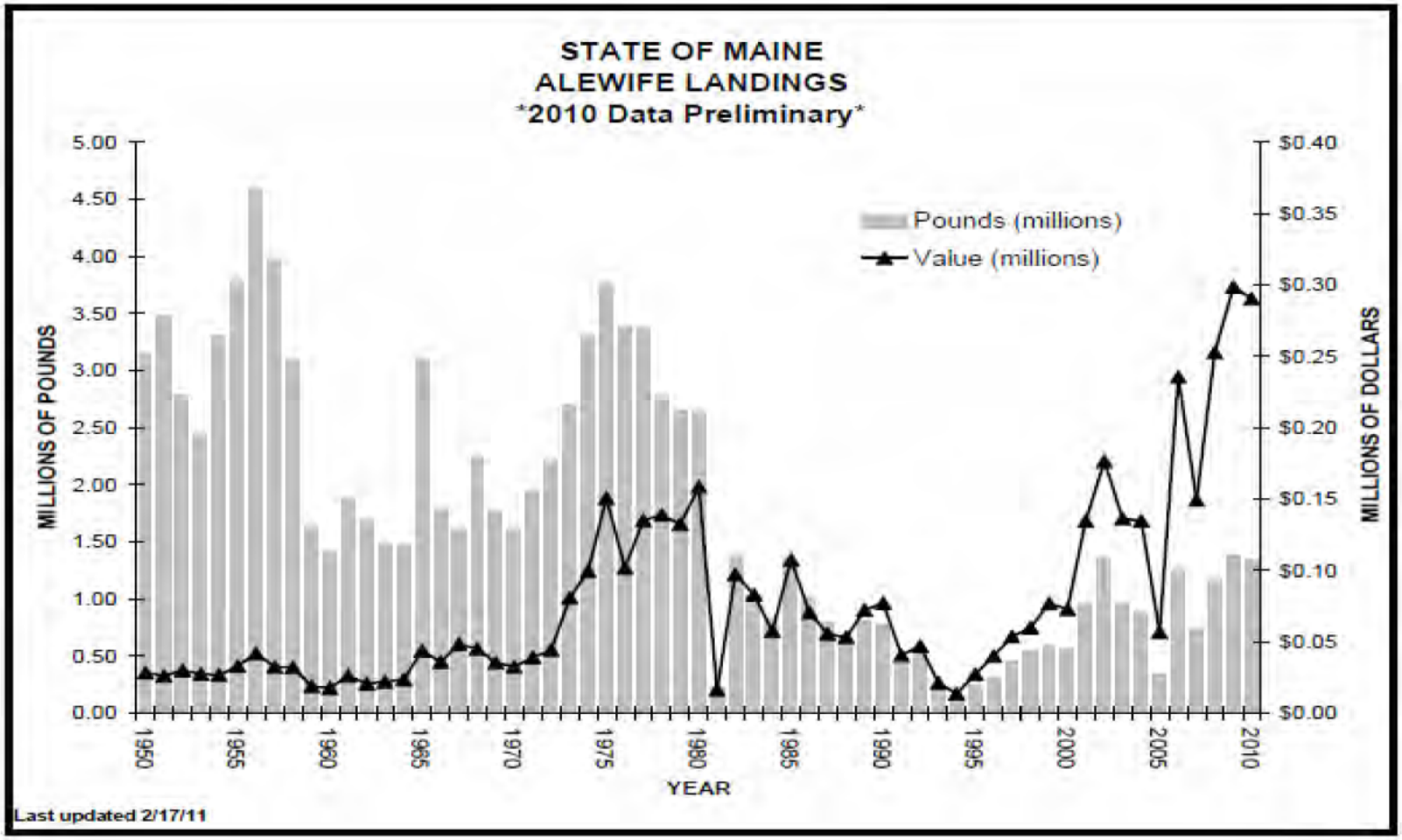
Source: Department of Marine Resources

Graph 3: Northern Shrimp



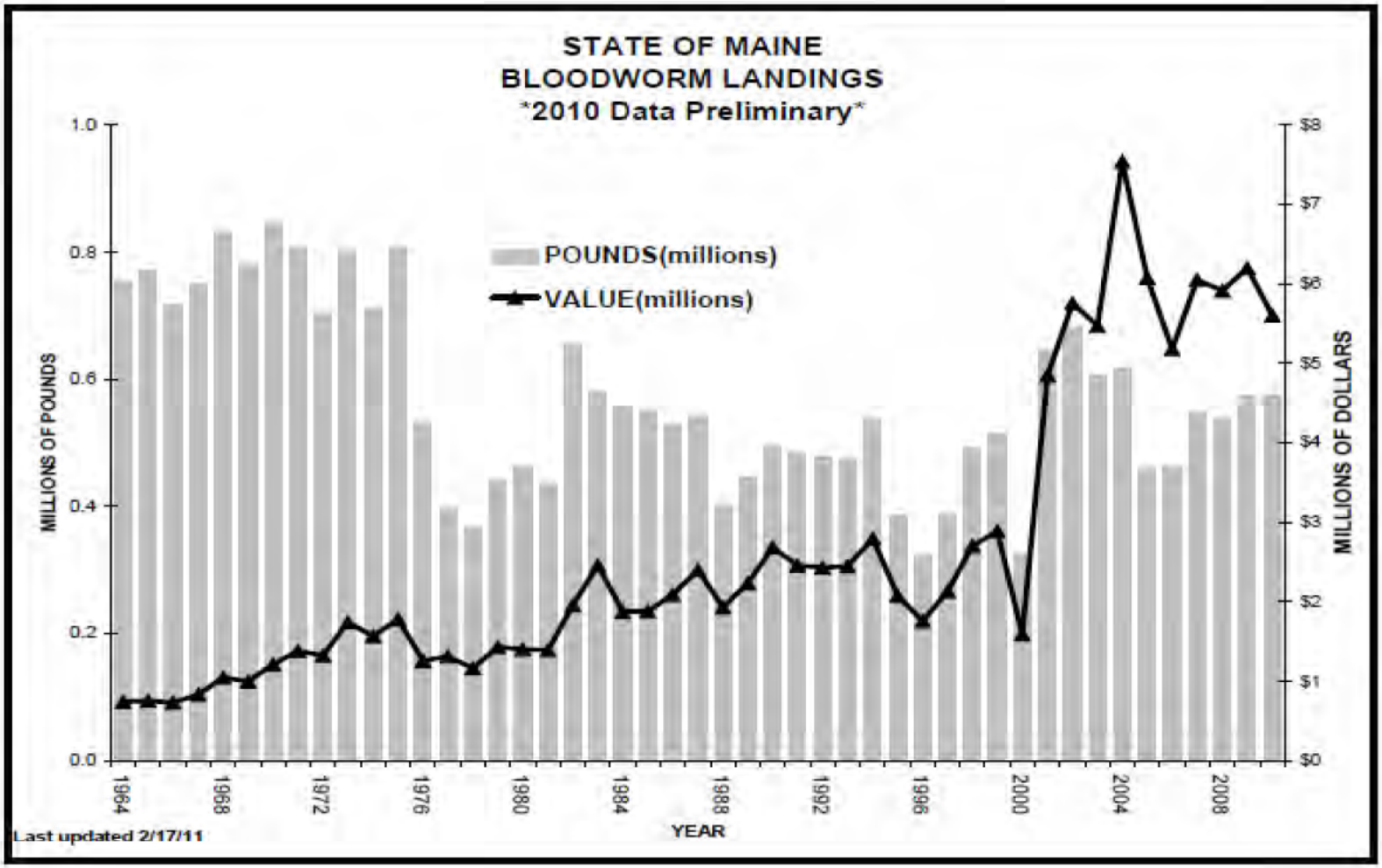
Source: Department of Marine Resources

Graph 4: Alewife



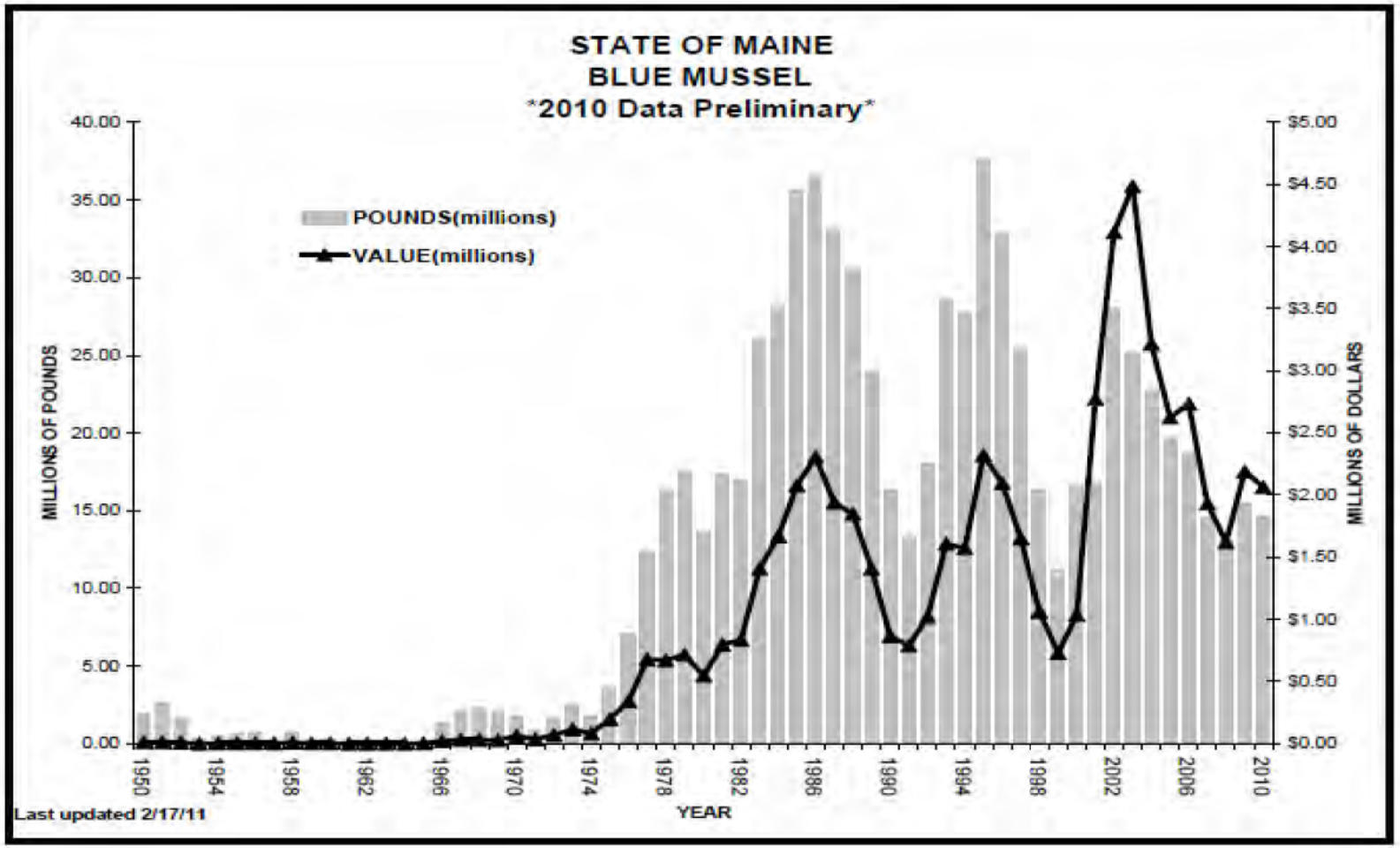
Source: Department of Marine Resources

Graph 5: Bloodworm



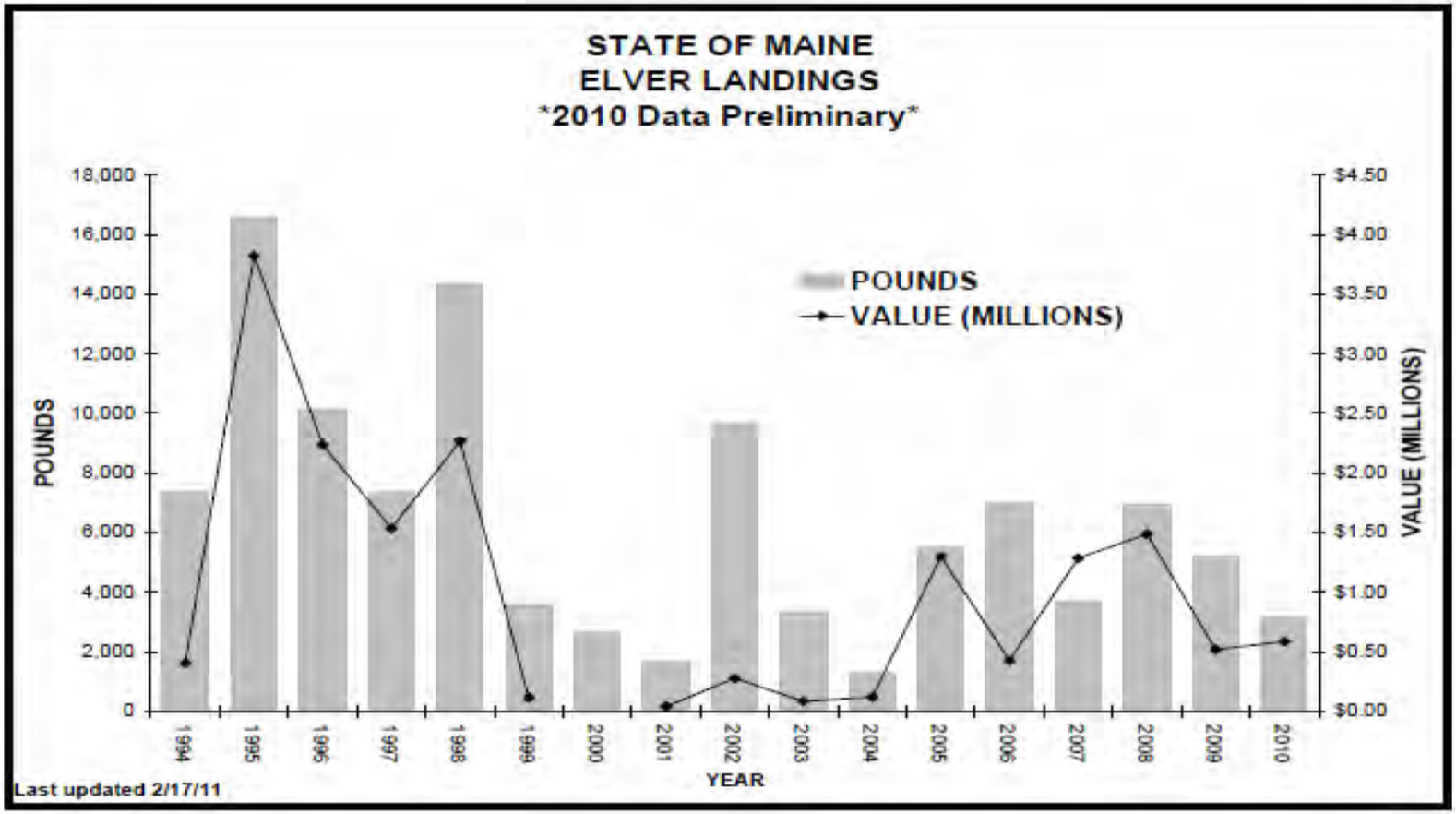
Source: Department of Marine Resources

Graph 6: Blue Mussels



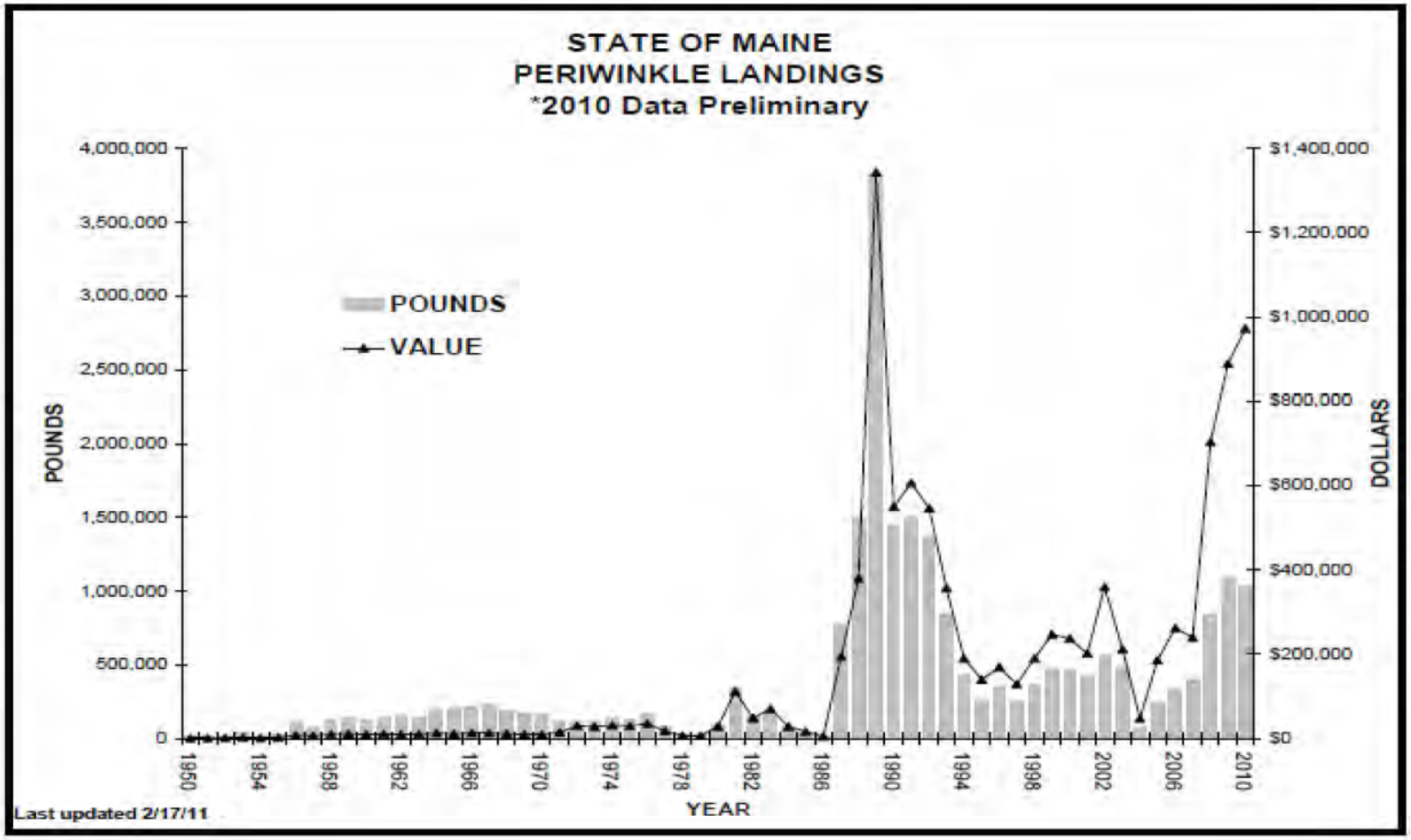
Source: Department of Marine Resources

Graph 7: Elver's



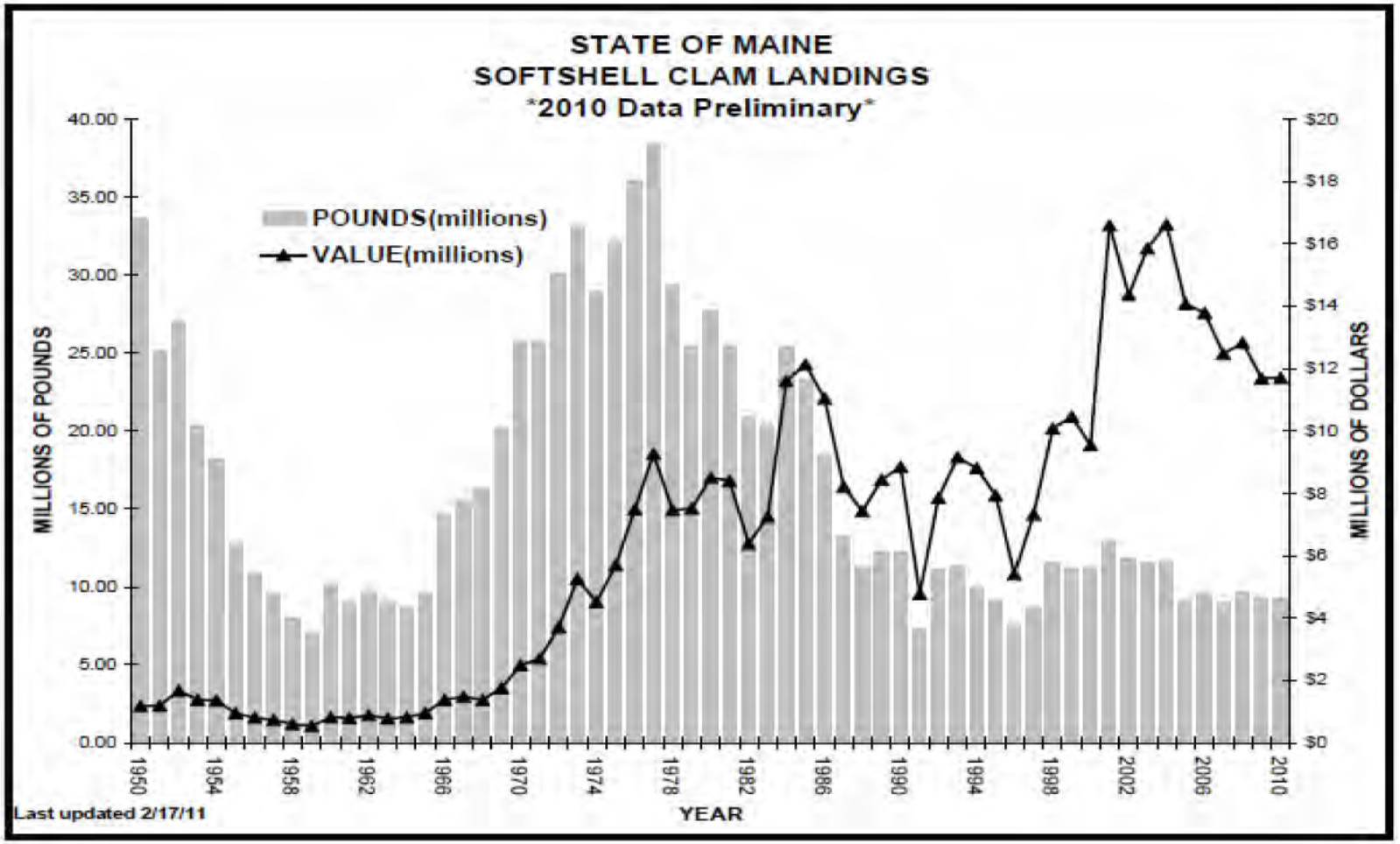
Source: Department of Marine Resources

Graph 8: Periwinkles



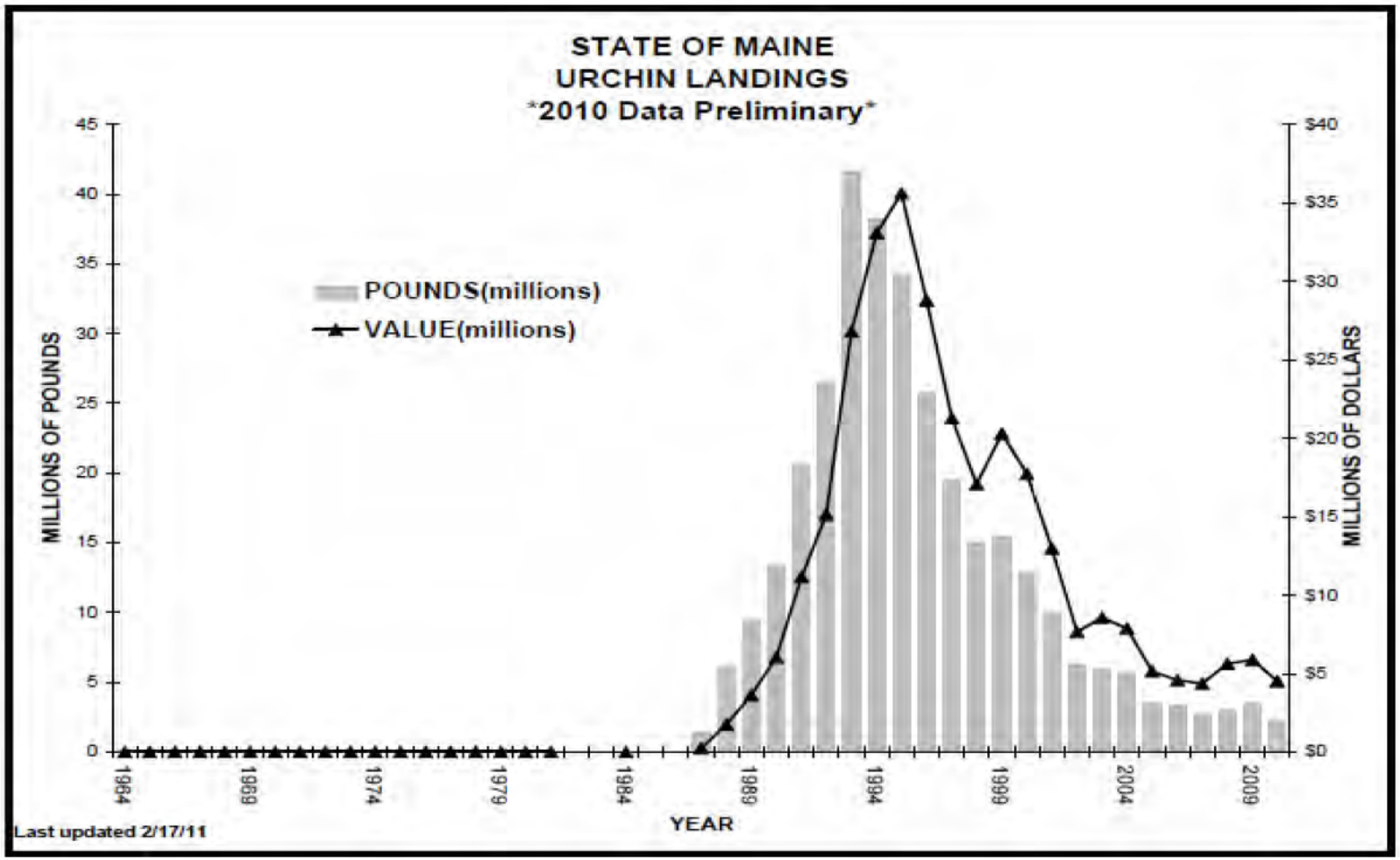
Source: Department of Marine Resources

Graph 9: Softshell Clams



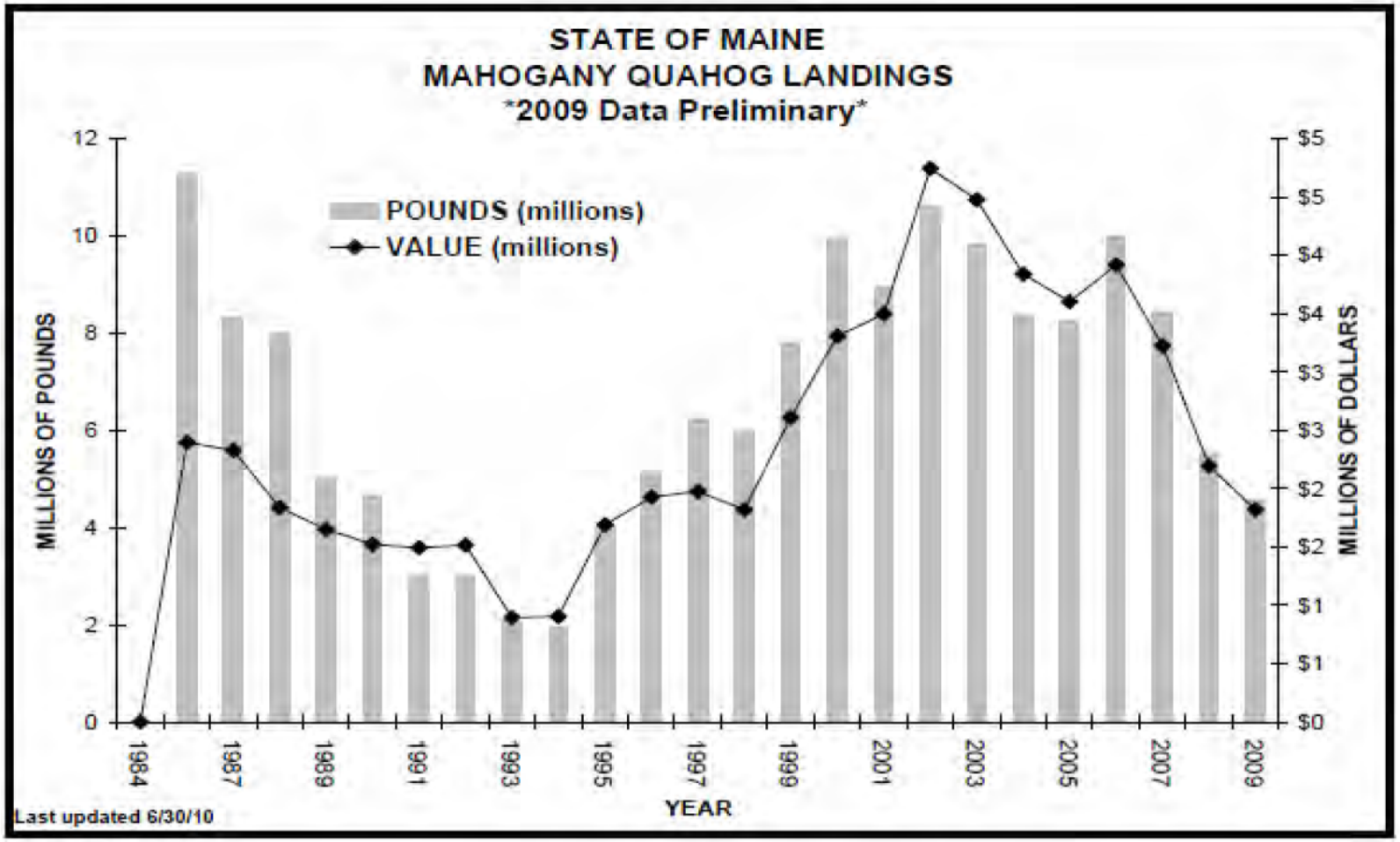
Source: Department of Marine Resources

Graph 10: Sea Urchins



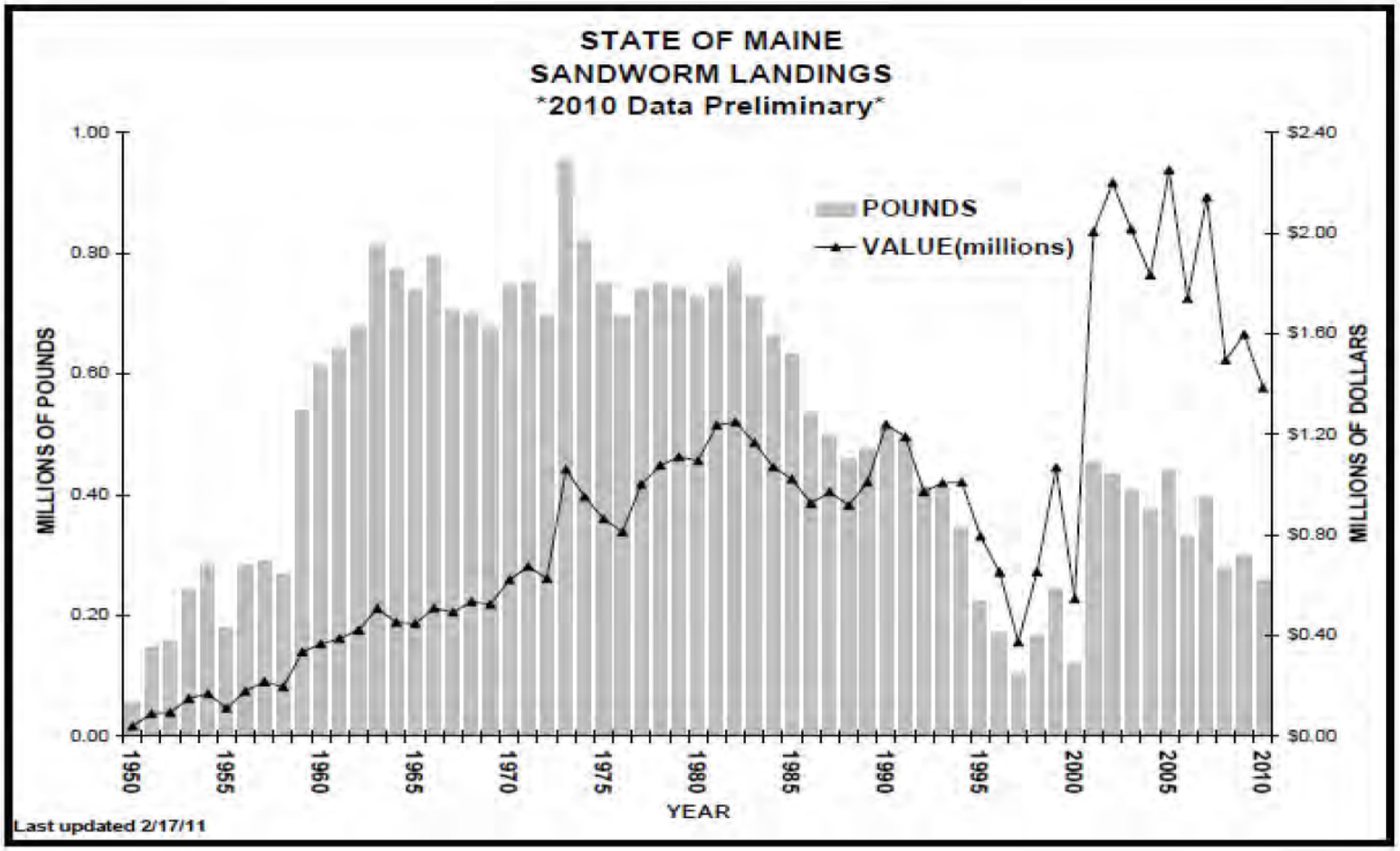
Source: Department of Marine Resources

Graph 11: Mahogany Quahogs



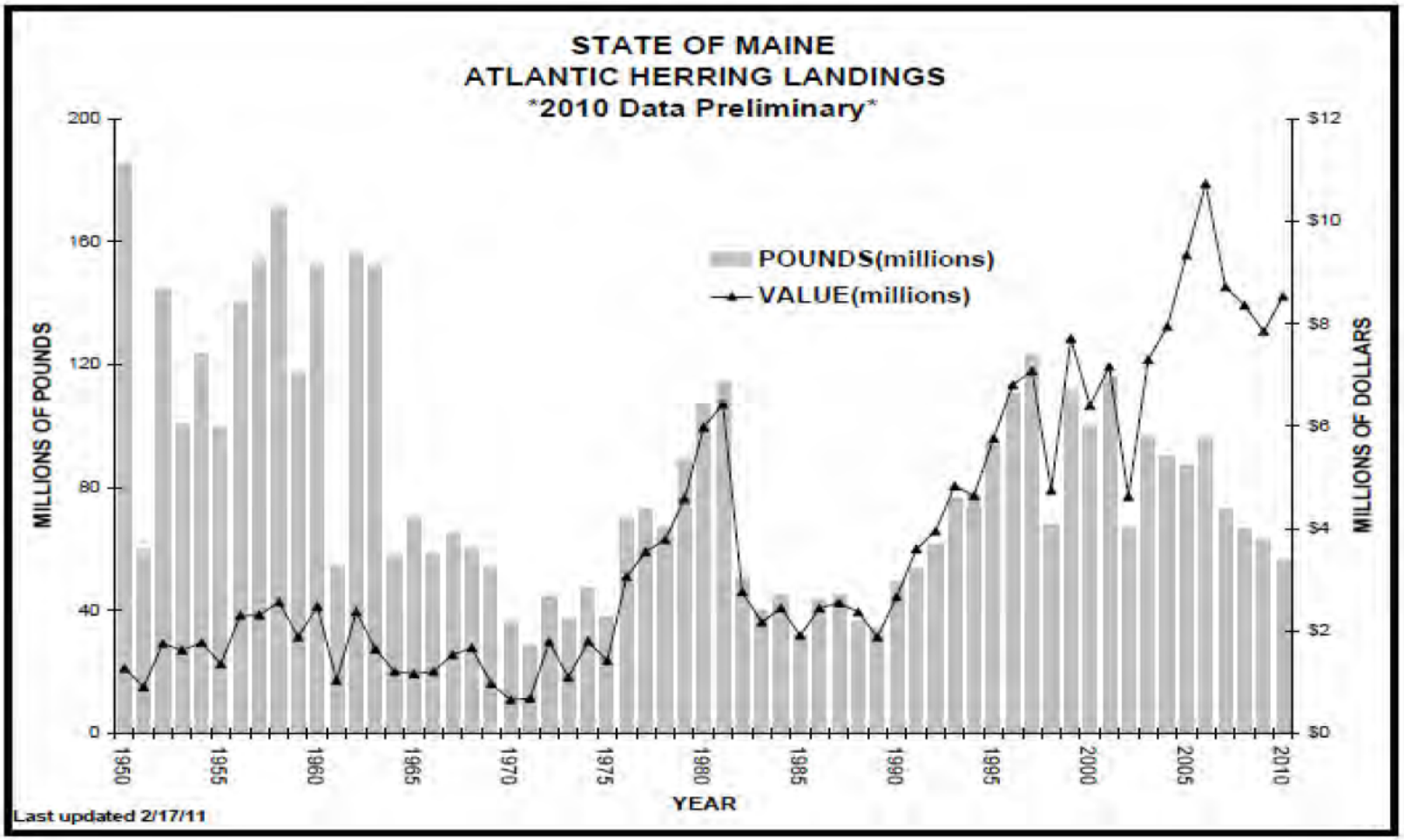
Source: Department of Marine Resources

Graph 12: Sandworms



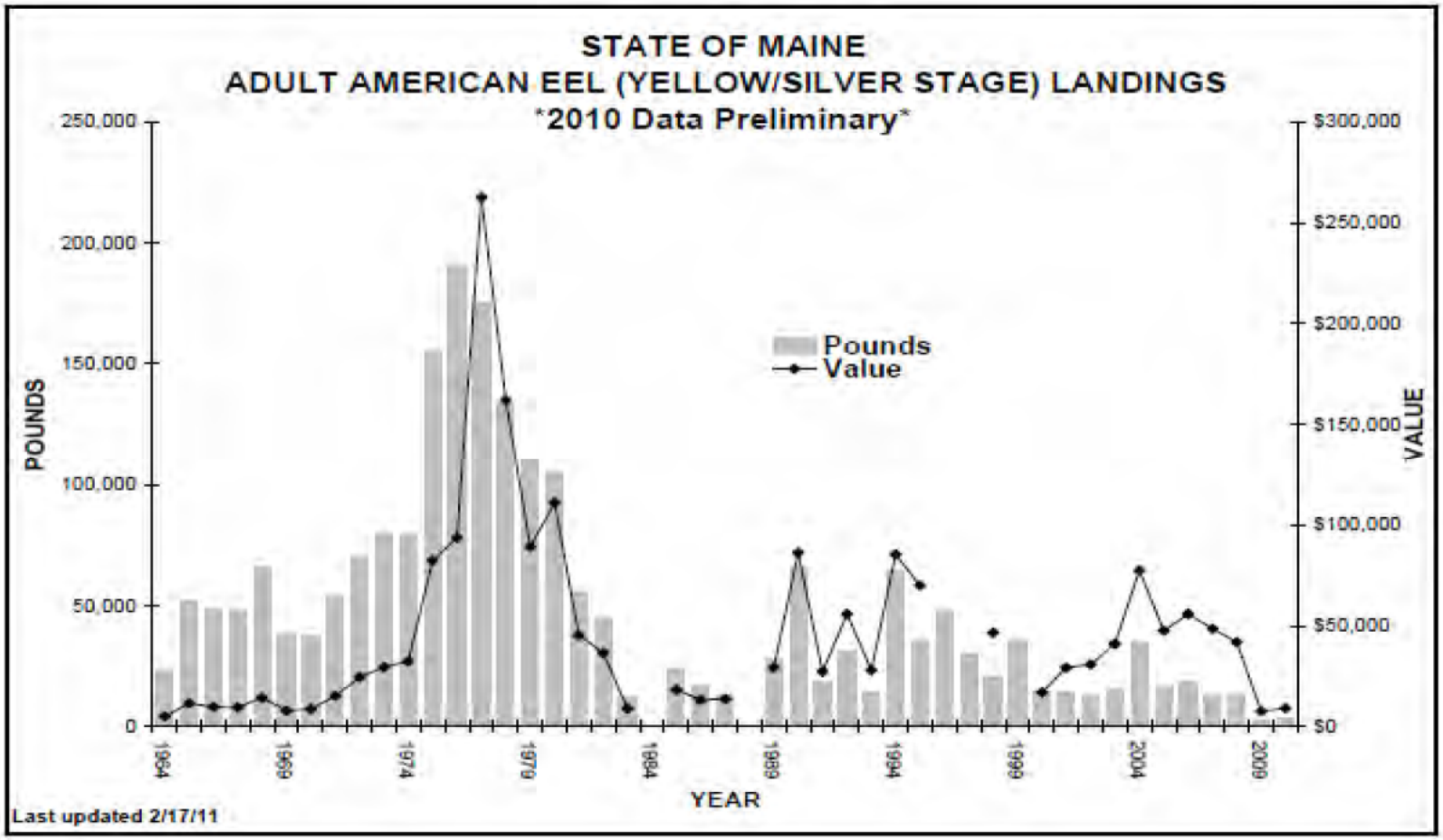
Source: Department of Marine Resources

Graph 13: Sea Herring



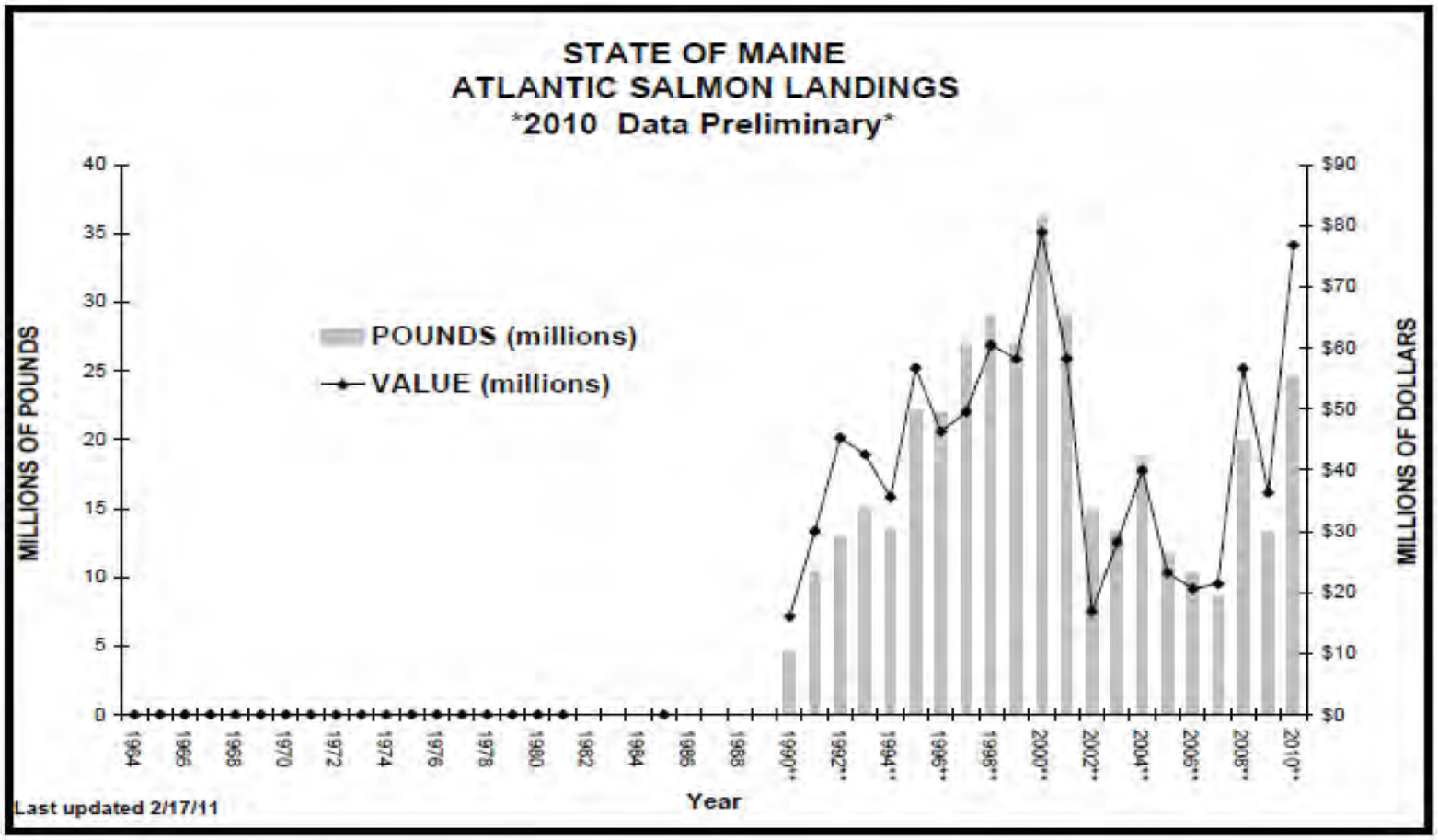
Source: Department of Marine Resources

Graph 14: Yellow Eel



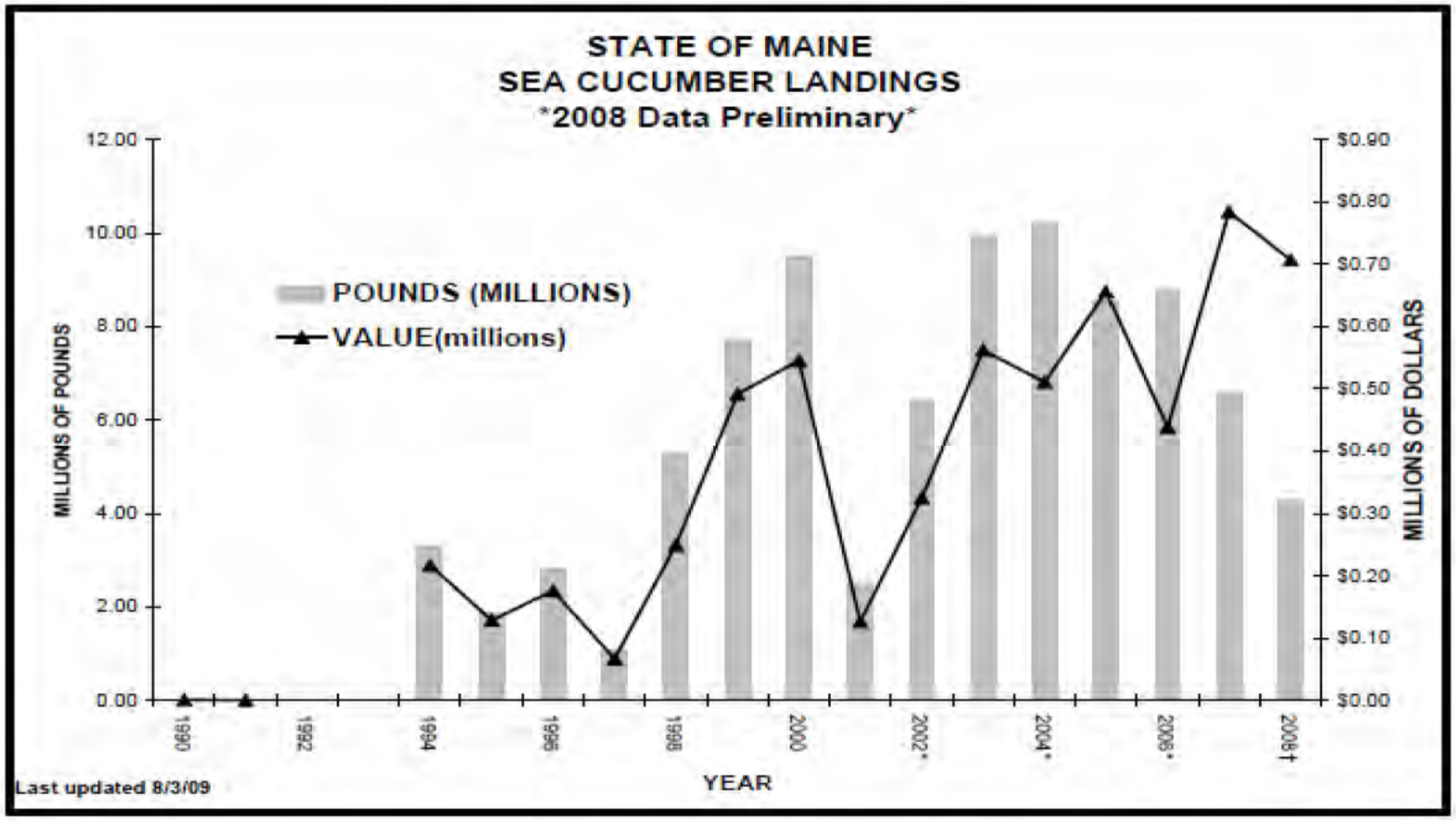
Source: Department of Marine Resources

Graph 15: Atlantic Salmon Aquaculture



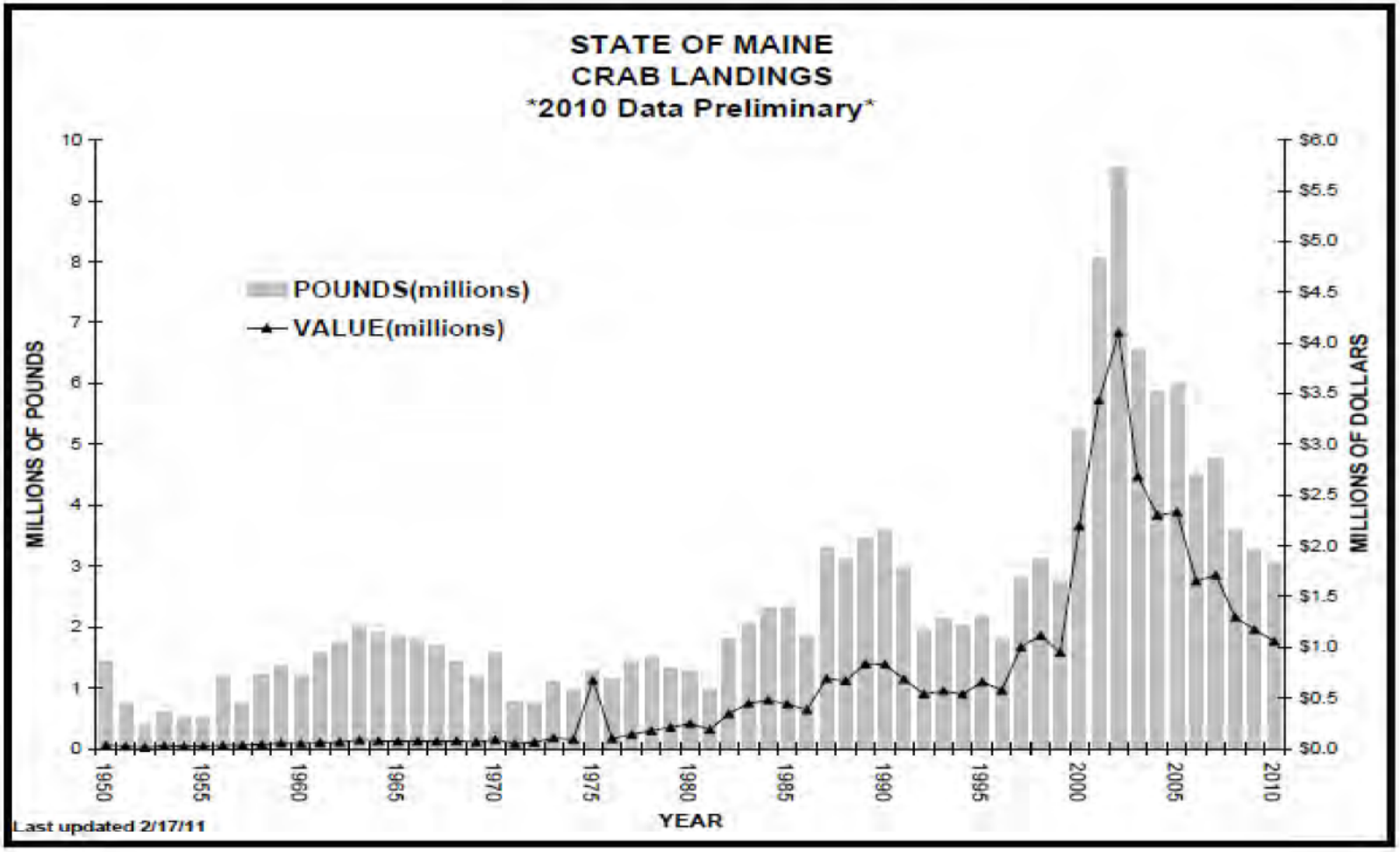
Source: Department of Marine Resources

Graph 16: Sea Cucumber



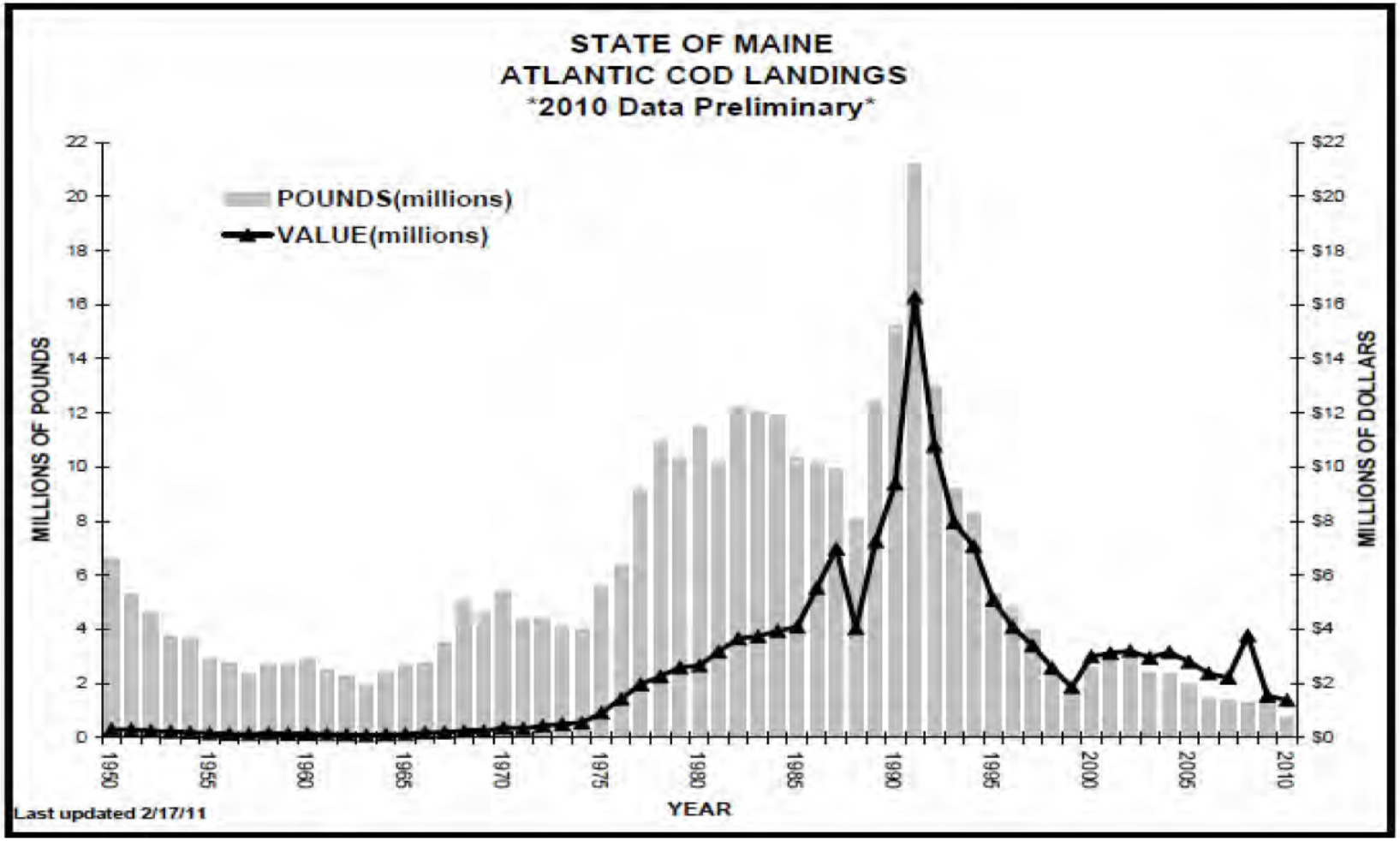
Source: Department of Marine Resources

Graph 17: Crab



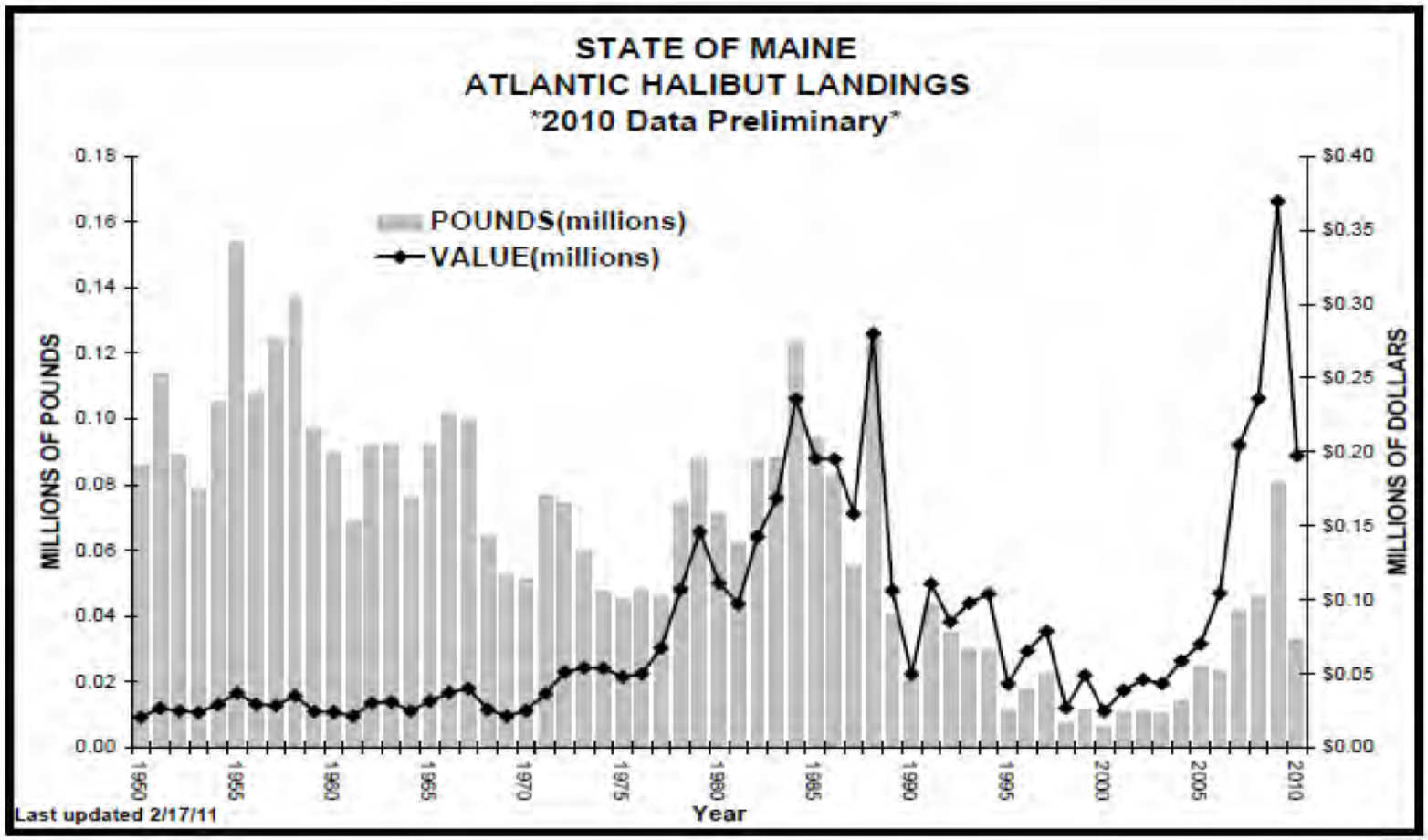
Source: Department of Marine Resources

Graph 18: Cod



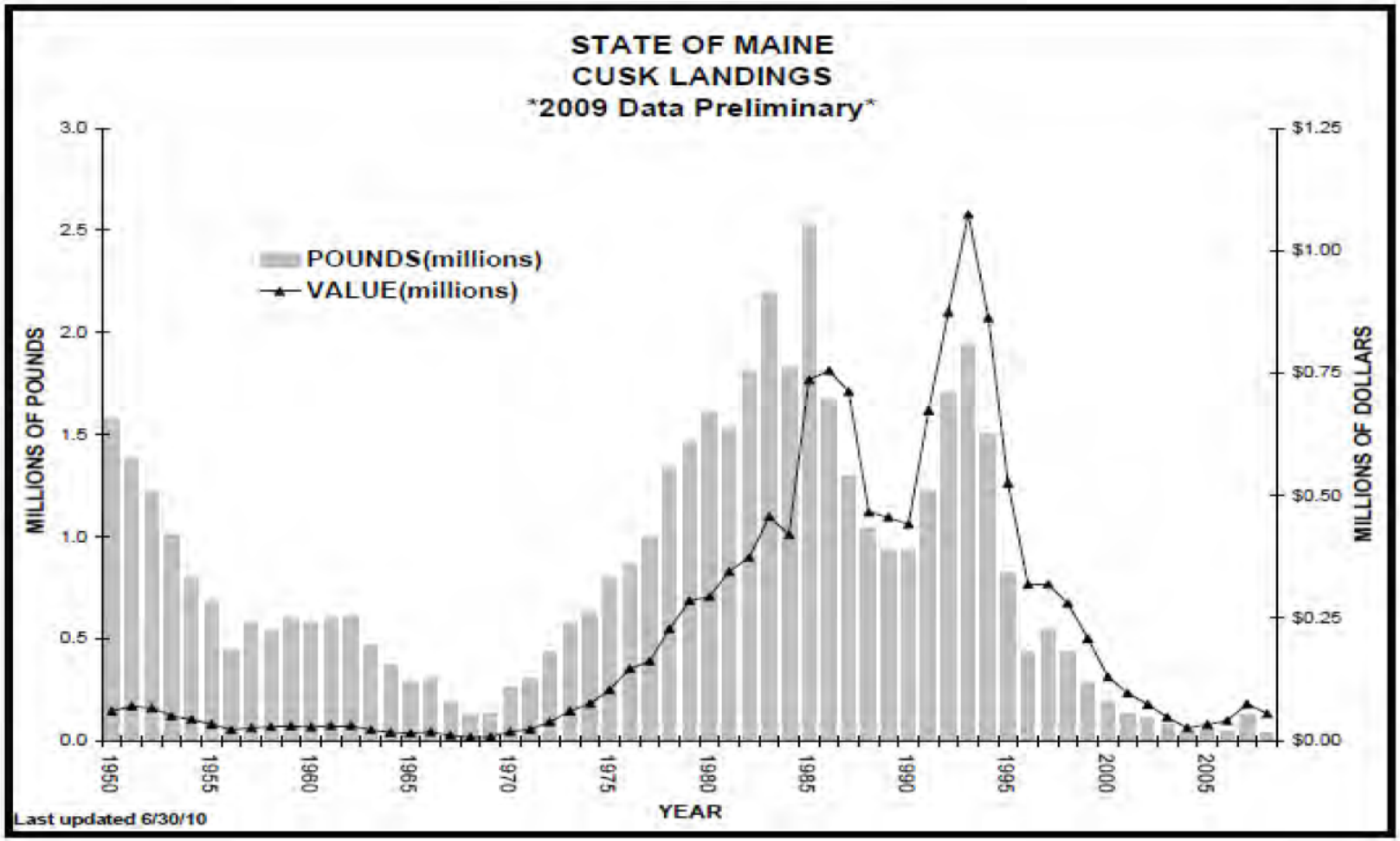
Source: Department of Marine Resources

Graph 19: Halibut



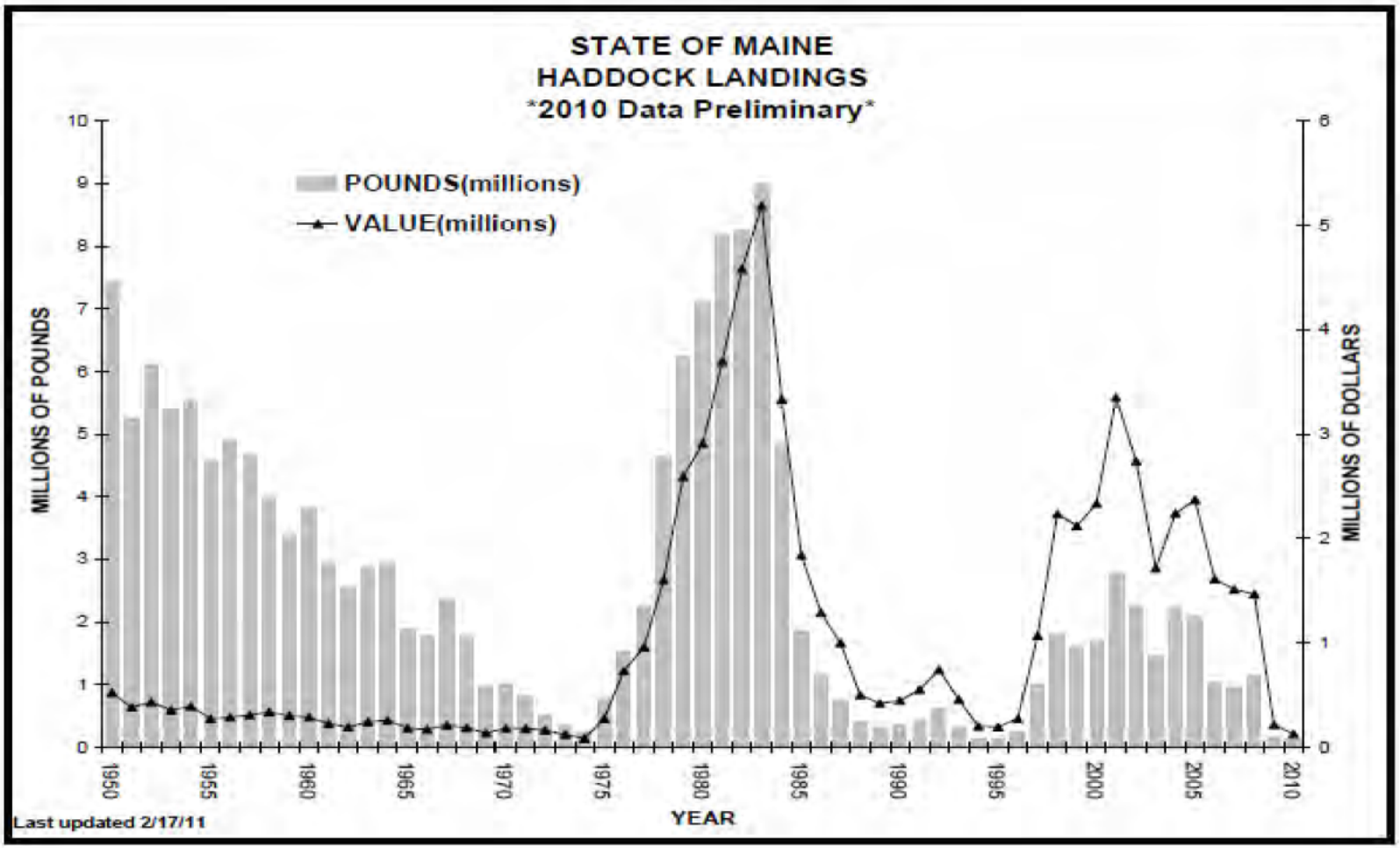
Source: Department of Marine Resources

Graph 20: Cusk



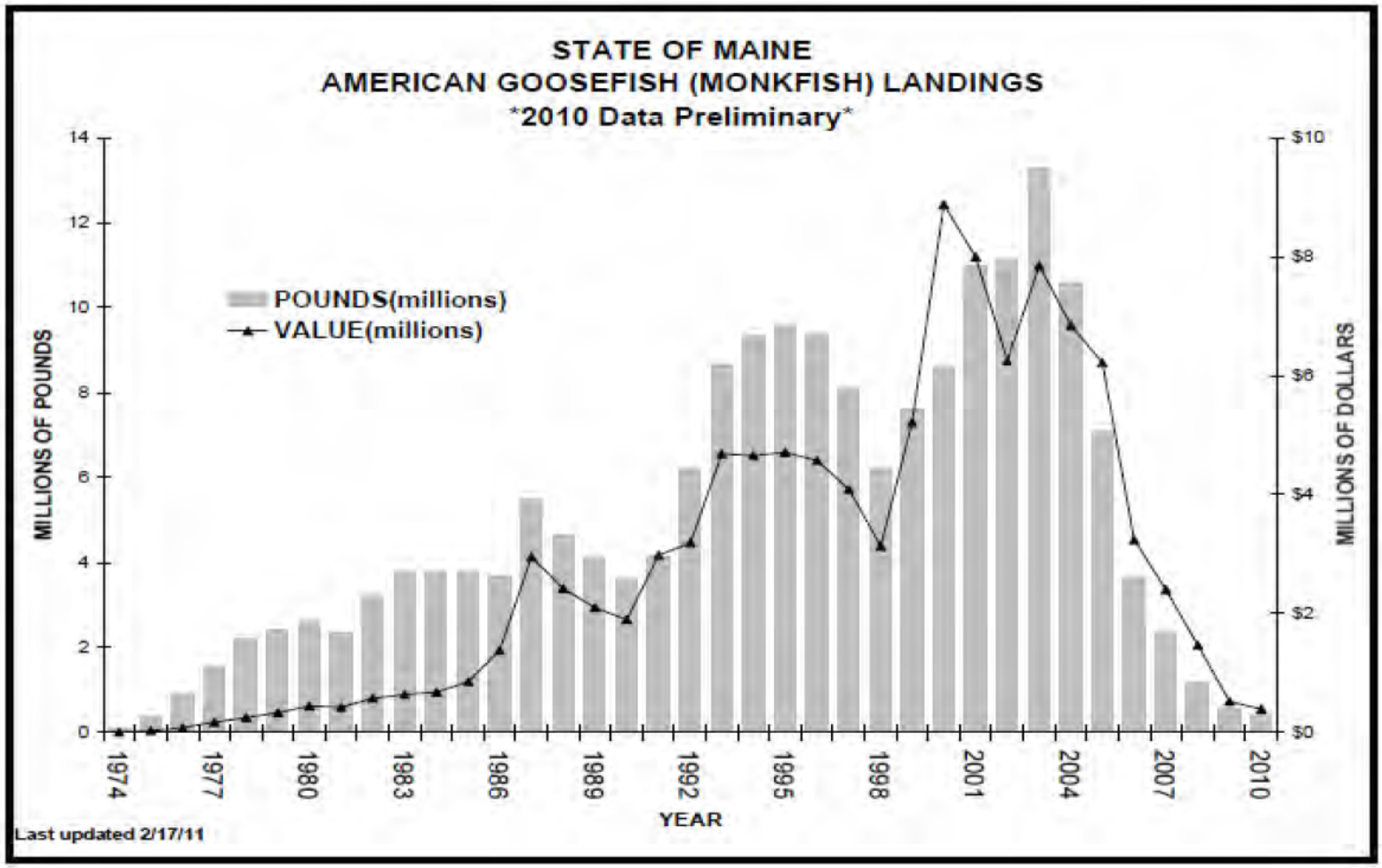
Source: Department of Marine Resources

Graph 21: Haddock



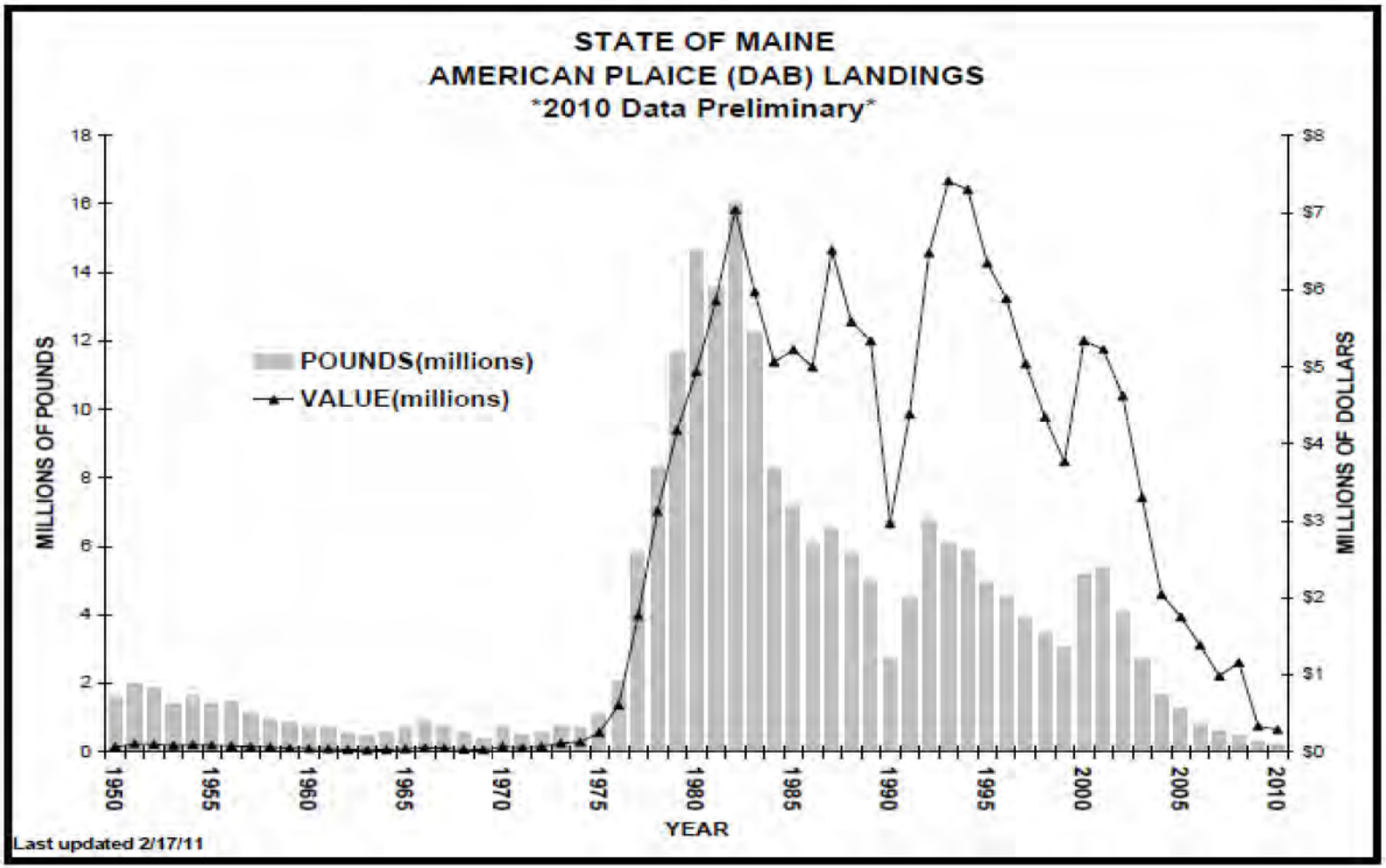
Source: Department of Marine Resources

Graph 22: Monkfish



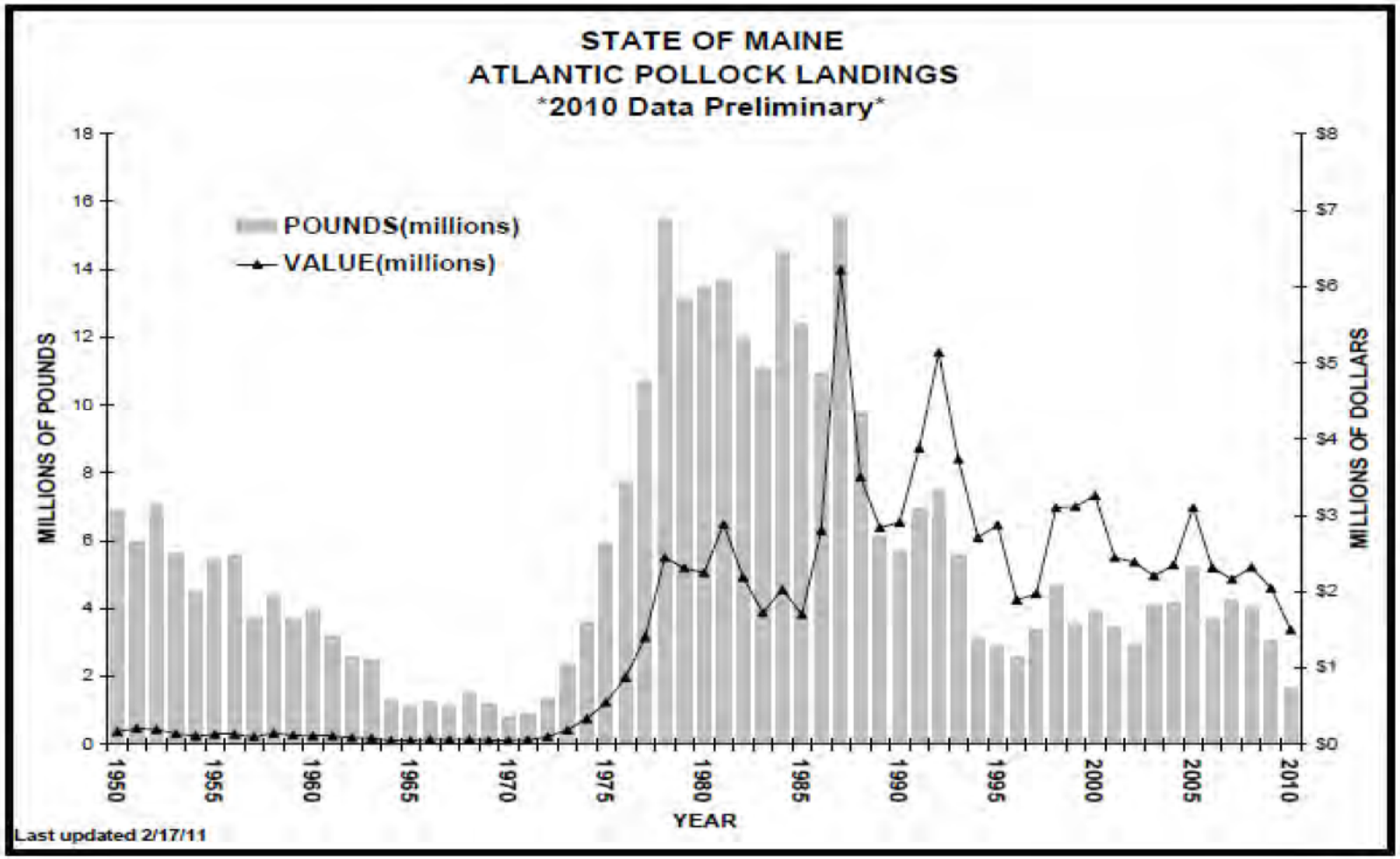
Source: Department of Marine Resources

Graph 23: Plaice



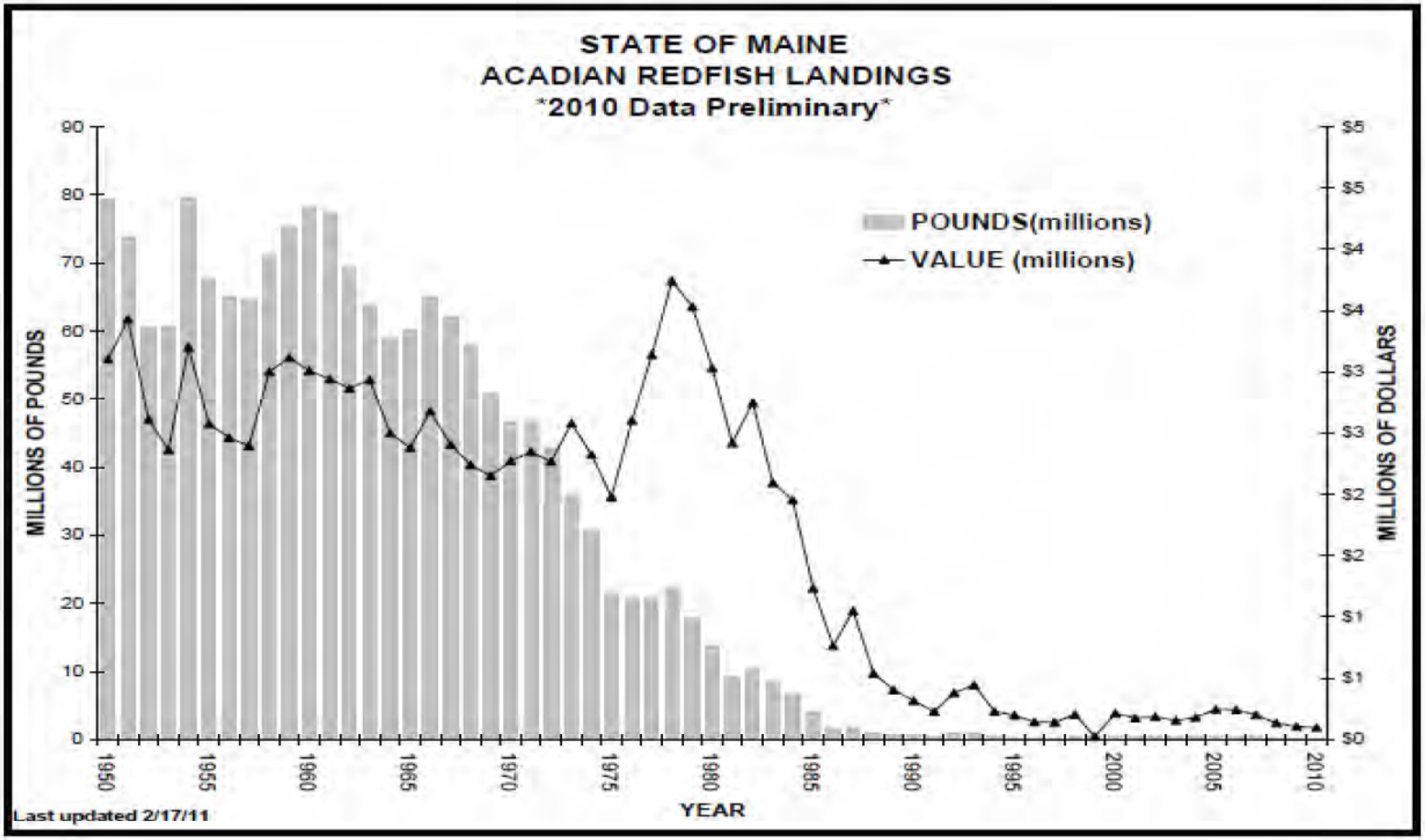
Source: Department of Marine Resources

Graph 24: Pollock



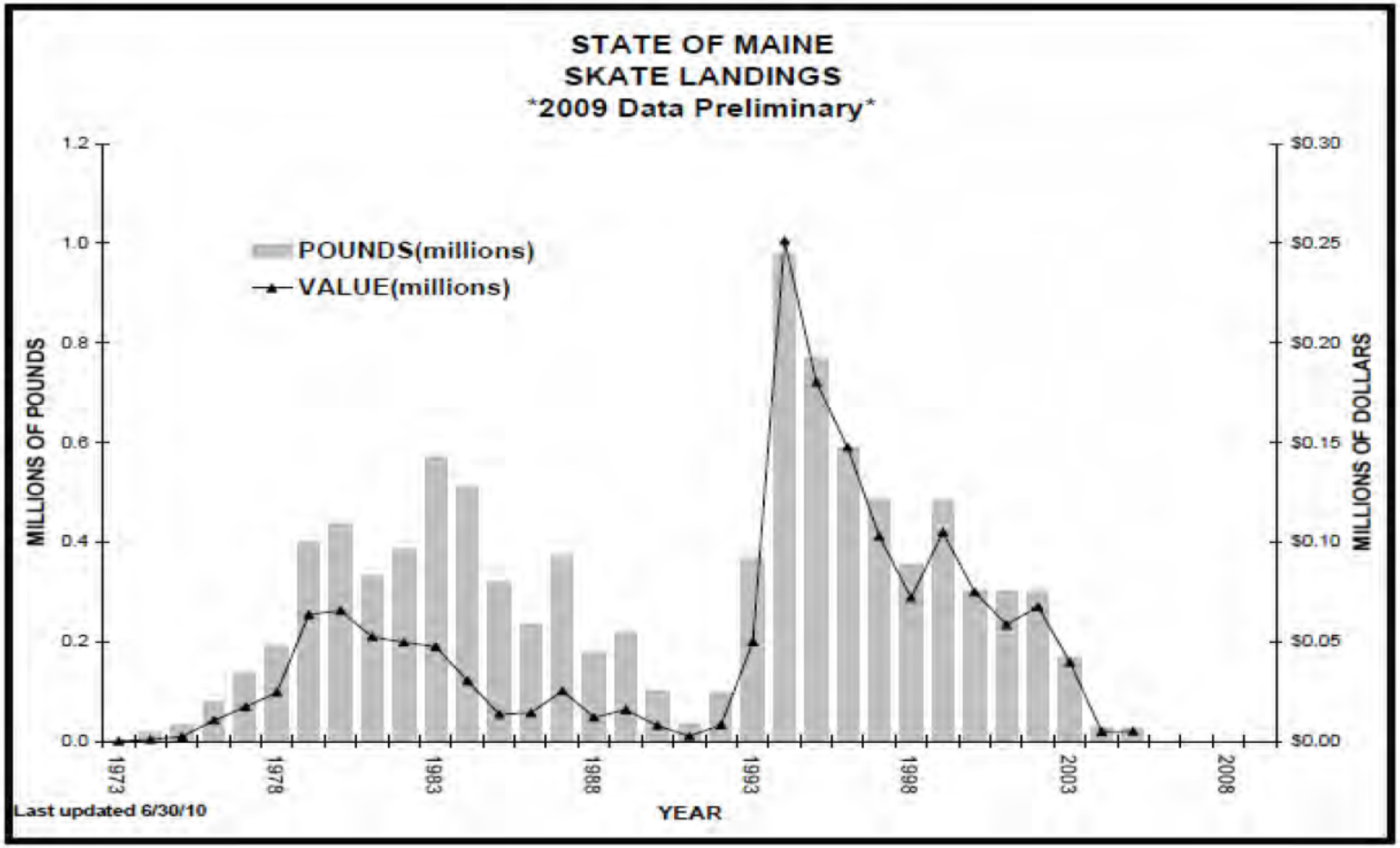
Source: Department of Marine Resources

Graph 25: Redfish



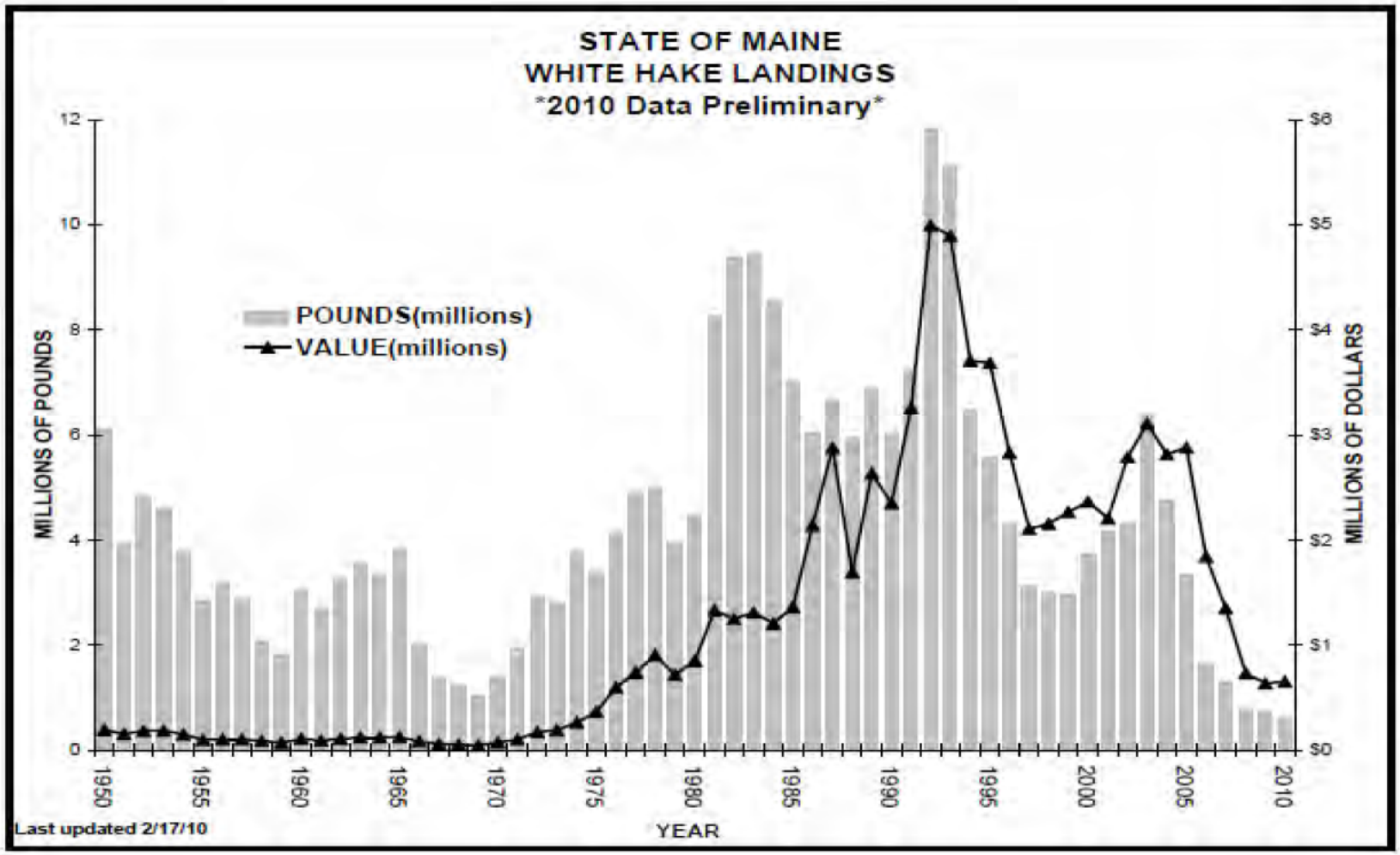
Source: Department of Marine Resources

Graph 26: Skates



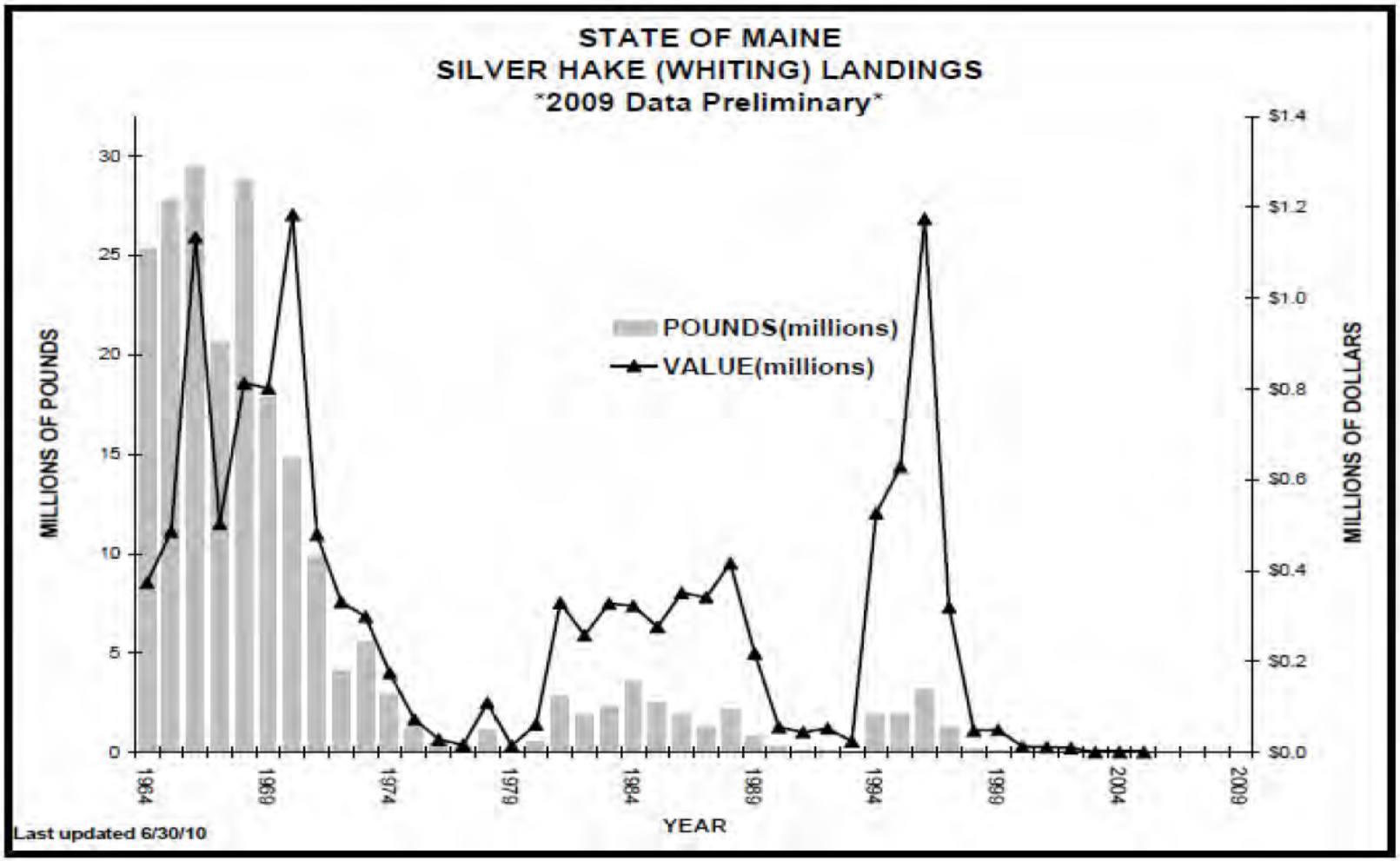
Source: Department of Marine Resources

Graph 27: White Hake



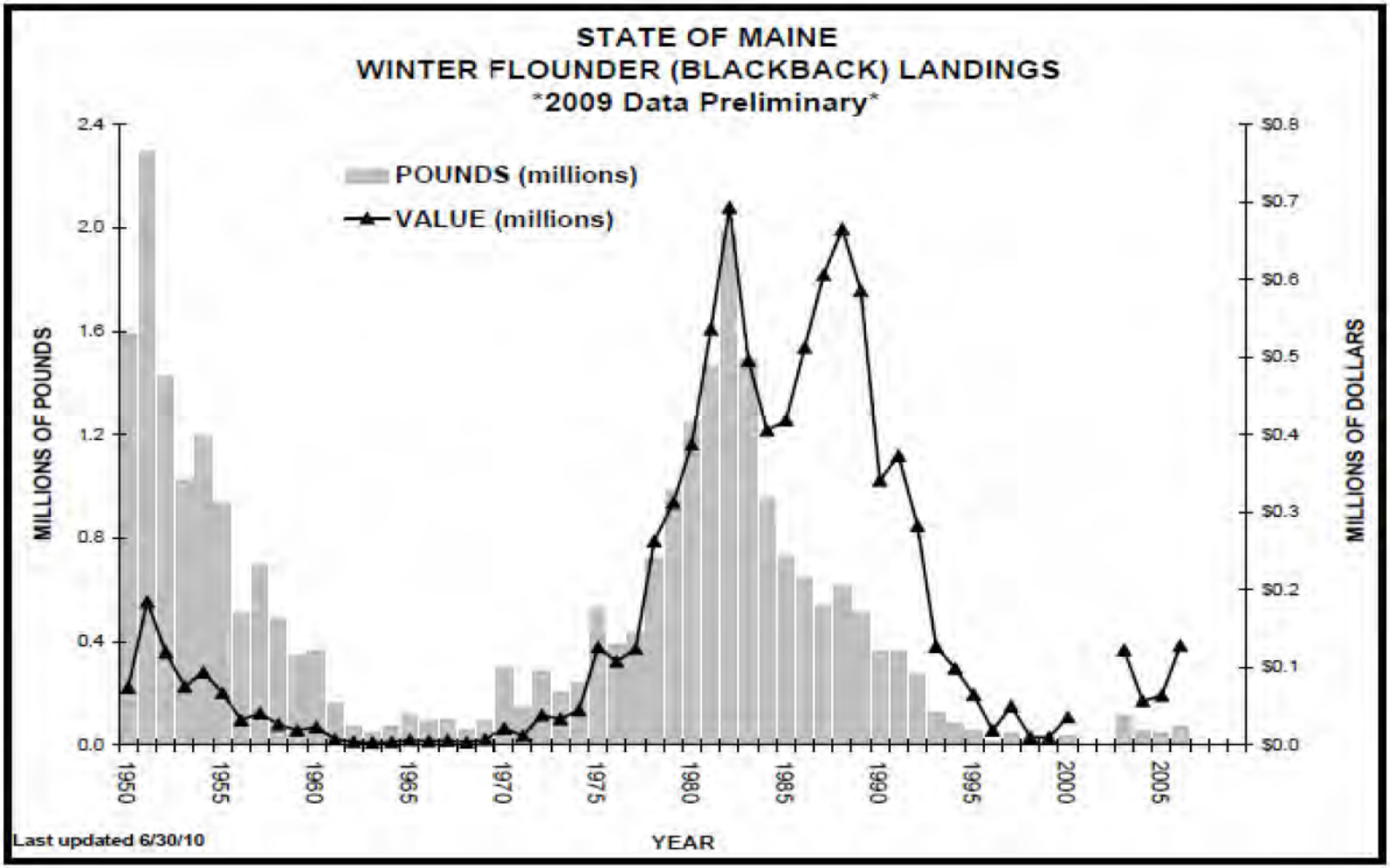
Source: Department of Marine Resources

Graph 28: Silver Hake



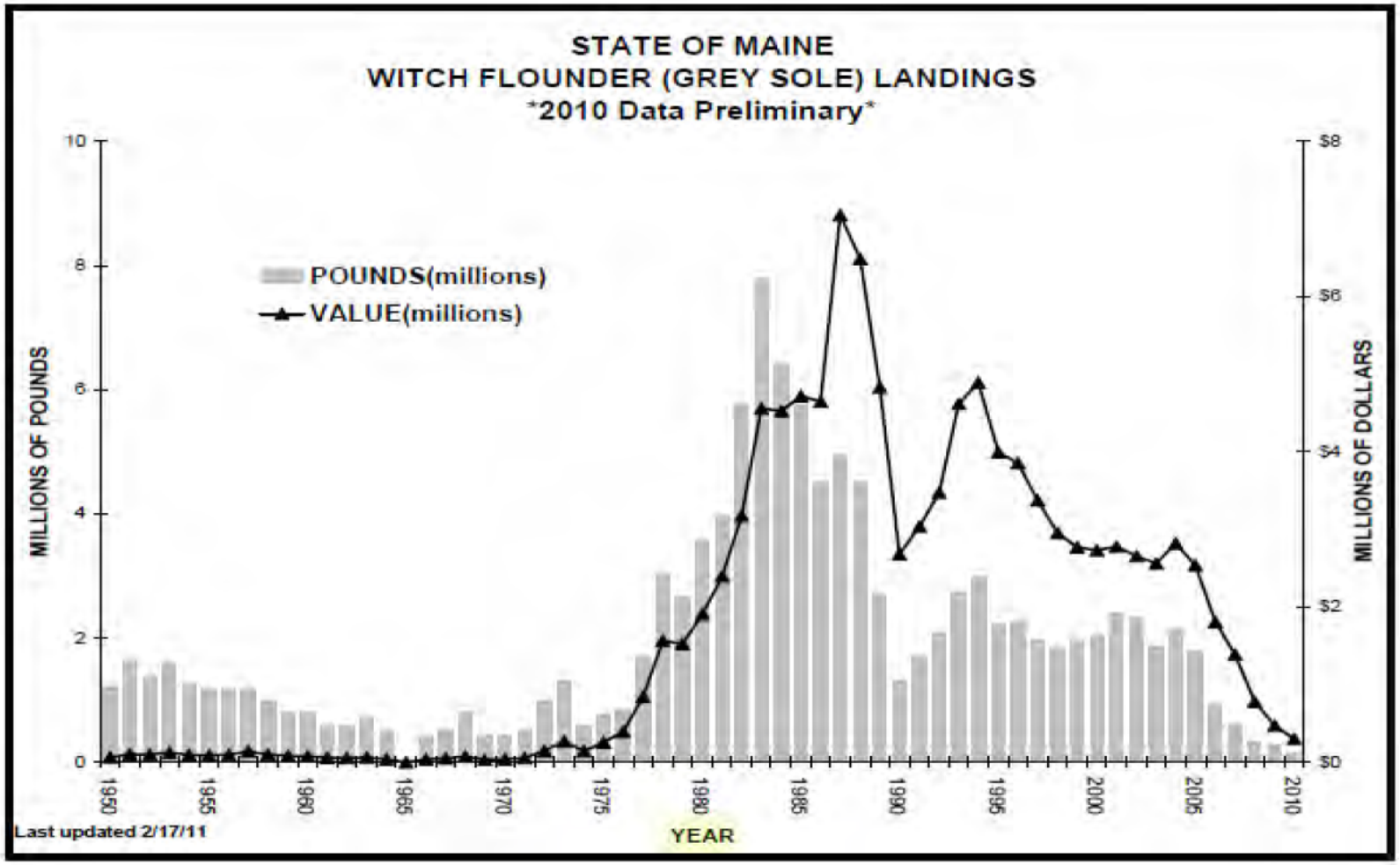
Source: Department of Marine Resources

Graph 29: Winter Flounder



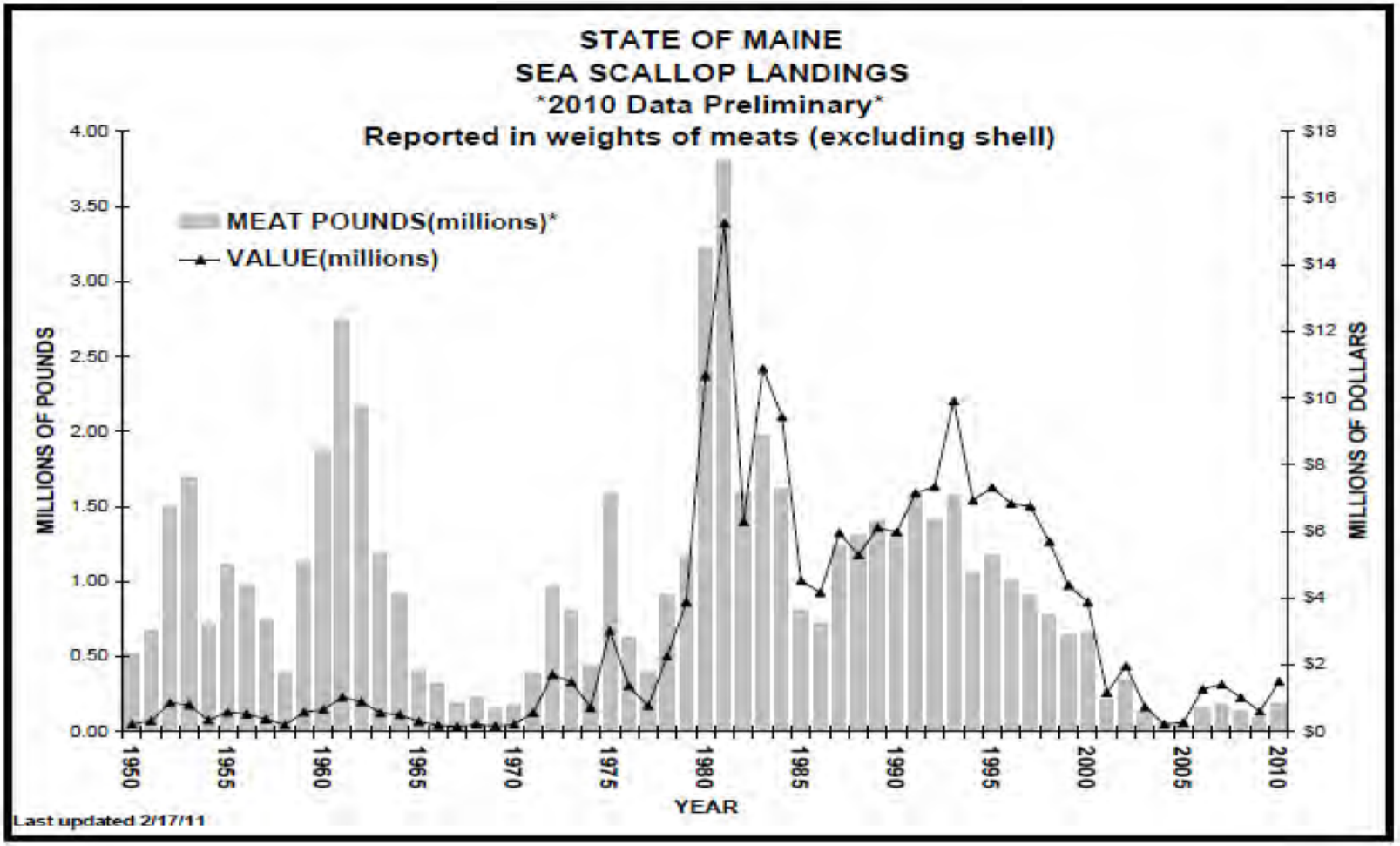
Source: Department of Marine Resources

Graph 30: Witch Flounder



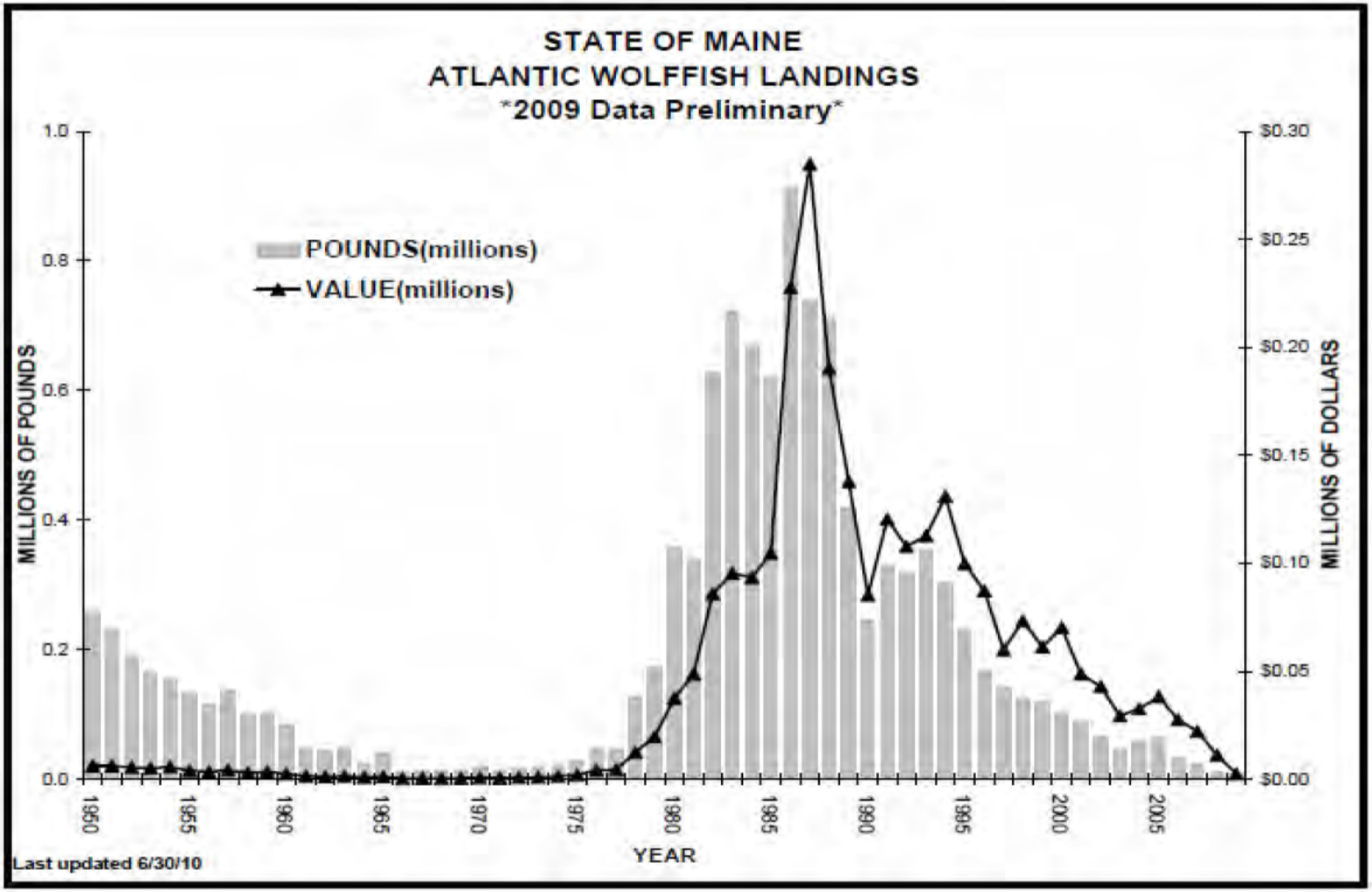
Source: Department of Marine Resources

Graph 31: Sea Scallops



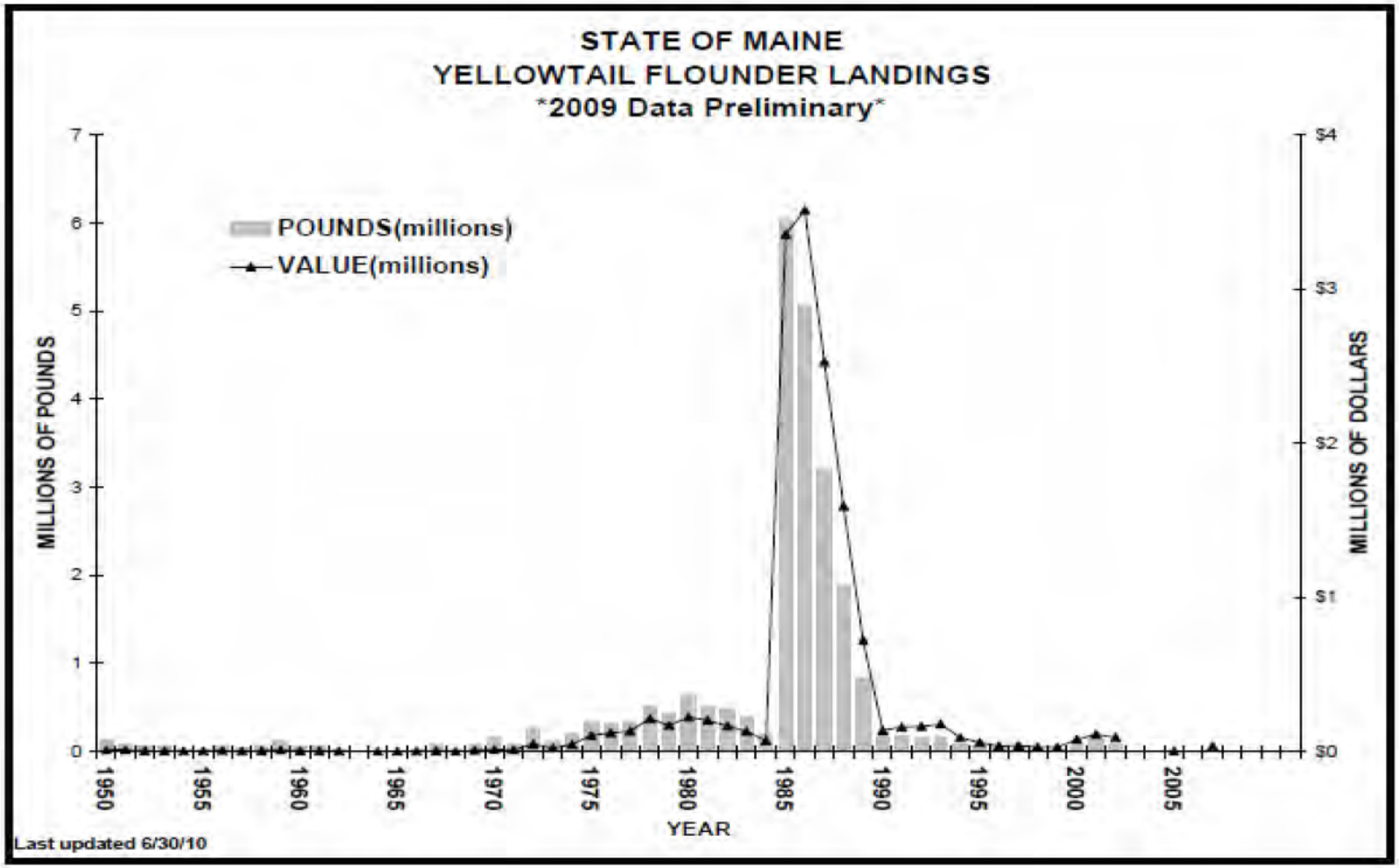
Source: Department of Marine Resources

Graph 32: Wolfish



Source: Department of Marine Resources

Graph 33: Yellowtail Flounder



Source: Department of Marine Resources