ESSEX RIVER

MASSACHUSETTS

SURVEY
(REVIEW OF REPORTS)

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

(0)

SURVEY (REVIEW OF REPORTS)
ESSEX RIVER, MASSACHUSETTS

SYLLABUS

The Division Engineer finds that prospective benefits to commercial fishing and recreational boating would be sufficient to justify improvement of the Essex River, Massachusetts. The improvement would consist of; deepening the existing 4-foot channel to 6 feet, with widening at the bends, and providing a 5-acre anchorage, 6 feet deep at the upper end, all at an estimated cost of construction of $520,000. He further finds that the benefits to be realized are 66 percent general and 34 percent local. In view of this he considers that; as an item of required local cooperation local interests should contribute in cash 34 percent of the first cost of construction, presently estimated at $177,000. Town officials have indicated that the Town is unwilling to participate in any expenditure of money for the proposed improvement. Therefore, the Division Engineer recommends no further improvement.

TABLE OF CONTENTS

407-670A

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASS. 02154

NEDED-R 2 October 1964

SUBJECT: Survey (Review of Reports) Essex River, Essex, Massachusetts

TO: Chief of Engineers
ATTN: ENGCW-P
Department of the Army
Washington, D. C.

AUTHORITY

1. This report is submitted in compliance with a resolution, adopted 16 July 1958, by the Committee on Public Works of the House of Representatives, United States. The resolution reads as follows:

> "RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE HOUSE OF REPRESENTATIVES, UNITED STATES, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on Essex River, Massachusetts, published as a survey report in the Annual Report of the Chief of Engineers for 1891, with a view to determining if it is advisable to modify the existing project in any way at this time."

2. By letter, dated 28 July 1958, the Chief of Engineers assigned a review report to the Division Engineer, New England. Funds were allotted in Fiscal Year 1963 for completion of the study.

PURPOSE AND EXTENT OF STUDY

3. The study was made to determine the economic justification of modifying the existing navigation project, as desired by local interests. Prior to economic studies, detailed field investigations were undertaken. Hydrographic surveys, consisting of soundings and probings, were made to determine the amount and character of materials to be removed in any plan of improvement. Available maps, charts, aerial photographs, and other data have been studied. A public hearing was held in Essex, Massachusetts on 15 May 1962. The information

obtained from that hearing is described later in this report in the section on "Improvements Desired". The information obtained from the public hearing has been further supplemented by subsequent contacts with local interests. All phases of the requested improvements have been considered in the report.

DESCRIPTION OF NAVIGATION CONDITIONS

4. The Essex River originates in the Chebacco Lake system, which is located in the southwestern portion of the Town of Essex and the adjacent Town of Hamilton, Massachusetts. It flows generally in a northeasterly direction, discharging through Essex Bay into Ipswich Bay, north of Cape Ann. The navigable portion of the river is about 5 miles long.

5. Navigation of the waterway is gained by means of a natural channel which extends from Ipswich Bay through Essex Bay. This channel, 2-1/2 miles long, terminates at Cross Island near the mouth of the river. Depths in this part of the waterway range from 5 to 38 feet, with the greater portion of it ranging from 14 to 16 feet. From the mouth the river meanders through salt marshes for a distance of about 2-1/4 miles to a fixed highway bridge at Essex. This portion of the waterway contains the 60-foot wide and 4-foot deep existing project channel. Controlling depth in 1963 was 0.2 feet.

6. All depths mentioned in this report refer to the plane of mean low water as established by the U. S. Coast and Geodetic Survey for the locality. The mean tidal range is 8.8 feet and the spring range 10 feet. The locality is shown on U. S. C. & G. S. Chart No. 1206, on U. S. Army Map Service Quad. sheets, "Gloucester" and "Ipswich, Massachusetts", and on the map accompanying this report.

TRIBUTARY AREA

7. The immediate tributary area lies entirely within the town of Essex, the only municipality on the navigable portion of the waterway. However, the waterway is used extensively by people who live in other sections of New England and maintain summer residences either in Essex or adjacent towns. Considerable boat traffic is derived also from trailer mounted boats which are launched at the ramps for a day's outing. These boats are all based outside the immediate tributary area.

8. The town is chiefly residential, having a population of 2,238 in 1960, and an assessed property valuation of $11,507,075 in 1962. The population is augmented in the summer season by a considerable number of visitors and about 1,000 permanent summer residents. Manufacturing is unimportant. Statistics prepared by the Massachusetts Department of Commerce showed 9 persons engaged in manufacturing in 1961. Service industries include a shipyard engaged in the storage and repair of recreational and commercial craft of 50 foot maximum size. The firm also engages in custom boat building. In addition there are 3 marinas which provide summer mooring space and store boats over the winter season. Extensive clam flats in the town provide for another commercial activity. About 25 persons are engaged in digging and marketing the clams on a full-time basis and an additional 100 persons on a part-time basis.

9. The nearest railroad connection is in the adjacent town of Manchester, 25 miles from Boston. The area is served by a network of highways and secondary roads over which trucks and buses serve the communities needs.

BRIDGES

10. One bridge crosses the waterway in its navigable section. It is a fixed highway bridge, plans for which were approved on June 26, 1902 by the War Department. The bridge has a channel span of 30 feet and a vertical clearance of 14.1 feet above mean high water. It is located immediately above the area in which navigation improvement is desired.

PRIOR REPORTS

11. There have been three prior reports on Essex River, Massachusetts. The first, a survey reported dated 14 May 1891 was published in the Chief of Engineers Annual Report for 1891. This report is the bais of the existing project adopted by the River and Harbor Act of 13 July 1892. The second report, dated 23 May 1905 and published in House Document No. 68, 59th Congesss, 1st Session, was unfavorable to further improvement. The third report, dated 9 December 1946, was unfavorable to improvement. It has not been published.

EXISTING CORPS OF ENGINEERS PROJECT

12. The existing Federal project was authorized by the River and Harbor Act of 13 July 1892. It provided for a channel 60 feet wide and 4 feet deep, from the mouth of the river to an existing railroad bridge in Essex. In the interval between authorization and construction, local interests requested and were granted permission to build a fixed highway bridge downstream of the railroad bridge. The project was modified on 23 March 1899, limiting improvement to the channel below the highway bridge. Construction was completed in 1901. Costs for new work were $21,759.21. The project was last maintained in 1948 at a cost of $46,965.90. Total maintenance costs to date are $60,759.21.

LOCAL COOPERATION ON EXISTING & PRIOR PROJECTS

13. The River and Harbor Act of 2 March 1907 authorized expenditures of $5,000 for restoration of the channel in Essex River subject to the requirement that the Commonwealth of Massachusetts, or other agency, place $5,000 at the disposal of the Secretary of War to be spent on the project at his discretion. The Commonwealth complied with the request.

OTHER IMPROVEMENTS

14. In 1922 and 1923, the Commonwealth of Massachusetts expended $71,304.33 to dredge the 60-foot wide existing channel to a depth of 6 feet for its entire length. In 1947 the town of Essex constructed a 40-foot T-head wharf on the right bank at the upper end of the river. First cost of this facility was $9,000. An additional sum of $5,000 has been expended for maintenance.

TERMINAL AND TRANSFER FACILITIES

15. The Town Wharf is constructed of wood pile and timber and has an asphalt deck. This wharf is open to all on equal terms. There is also a town landing, or ramp, for the launching or landing of trailer craft, most of which consist of various sizes of outboard motor craft, and some inboard boats.

16. There are also 3 marinas and 2 boatyards in the town. All of these installations have wood pile and timber wharves, and are equipped with marine railways capable of handling boats 50 feet long. The Dyer marina initiated construction in 1961 and had a capacity of 50 boats in 1963. The owner forecasts an ultimate capacity of 300 boats in wet

slips and 300 on trailers, which can be launched as necessary from ramps. The Story Shipyard constructs custom built boats. It also repairs, services and stores boats during the off-season. Fuel and water are available at this location. All of these facilities are grouped around the upper end of the project. The yacht club is located near Conomo Point. It has a marginal stone bulkhead wharf with a ramp and float. Supplies, fuel and water are available at this location.

IMPROVEMENTS DESIRED

17. For the purpose of determining the nature and extent of local desire for navigational improvement, a public hearing was held in Essex, Massachusetts on 15 May 1962. The hearing was attended by 111 interested persons. Among those present were representatives of State and Municipal governments, boatyard and marina owners, yacht club interests and town residents.

18. A detailed plan of improvement was submitted by a town organization known as the Essex River Dredging and Improvement Committee. Requested channel improvement would provide for a channel 5 feet deep and 80 feet wide throughout the entire length of the river. In addition to channel improvement a turning basin at the upper end of the channel, two anchorages, one on either side of the channel, and aids to navigation at a critical bend in the channel were also requested.

19. As justification for improvement local interests cited the present navigational difficulties experienced in the existing project. Channel difficulties result from inadequate depths and widths. Local interests state that passing in the present channel with its restrictive bends is hazardous, particularly at low tide. As a result, numerous groundings have occurred with consequent damage to propellors, and in some cases, to boat hulls. Local interests claim that the extra width requested would serve to alleviate the present hazardous condition in this respect. This request is considered reasonable assa large number of boats using the waterway are transient outboards launched for a single day's usage. As these boats proceed down the waterway at speeds in excess of larger boats they need more room to navigate the bends. In addition, should improvement be undertaken, boating interests claimed that larger boats will be attracted to the area. These boats would need more than the existing 60-foot channel width. The turning basin in the upper end of the project was requested to ease the congested conditions existing in that area. Congestion is caused primarily by activity at the marinas and boat yards which are in close

proximity at the upper end of the waterway. The marinas are usually filled to capacity and the overflow boats moor in the channel and contiguous areas. In the areas outside the channel, most of the moored boats ground out at low water periods. Therefore boat owners moor in the channel if possible. This produces a condition which often restricts navigation, forcing boats to wait for high water before proceeding outbound. It was stated that if a turning basin were provided, with supplementary anchorage areas downstream, the congestion would be relieved and provide for unrestricted navigation of the waterway. In addition it was claimed that the additional anchorage areas would provide more room for prospective boat owners who would acquire boats and use the waterway.

20. In general, all interested persons were in accord with improvement as outlined by the harbor committee. The only exception to improvement, as outlined, came from individuals who claimed that conditions were presently so bad that maintenance of the existing project would serve to ease in some degree the present inadequate navigational conditions.

EXISTING AND PROSPECTIVE COMMERCE

21. Commerce on the river is confined to 3 lobster boats and about 15 to 25 boats engaged in the clam industry. The lobster boats are about 25 feet long and draw 2 to 3 feet. Outboard motor-powered skiffs are usually used in the clam industry. Apart from the congested conditions and the difficulty of navigation at low tidal periods, no other navigational difficulties are experienced by these boats.

22. Total commerce for the clam industry, as reported by local interests, was 15,659 bushels of clams in 1961. Estimated lobster commerce for the 3 boats is about 37,500 lbs. annually for a fishing season of 150 days. A large portion of this commerce is distributed locally to the restaurants, hotels, and retail markets in the town. The remainder is distributed in Boston and adjacent areas.

VESSEL TRAFFIC

23. There are no statistics on vessel trips in the waterway. However on the basis of the locally reported fleet of 432 recreational boats, plus the fishing boats, mentioned previously, it is estimated that an average of 30,000 vessel trips are made annually. It should be noted that

of this total, somewhat more than 50 percent originate at Conomo Point and would not be affected to the same degree as the boats in the upper portion by present conditions.

24. Local interests claim that 1033 boats will be added to the existing recreational fleet in the event of improvement. Materialization of this fleet would add considerably to the annual number of vessel trips.

DIFFICULTIES ATTENDING NAVIGATION

25. The principal navigational difficulties in the waterway are those which evolve from inadequate widths and depths. At low tide navigation is very difficult for all but the smaller boats. The channel has narrowed to such an extent that passing is hazardous often forcing boats to go around with resultant propellor or shaft damage. In addition, there is a lack of space in the upper end of the channel where boats could be moored. Consequently boats anchor in the channel causing congested conditons, which detracts from the safety of navigation in these areas.

AIDS TO NAVIGATION

26. The United States Coast Guard has been consulted relative to the need for additional aids to navigation should improvement be effected, and has advised that no additional aids are considered necessary.

WATER POWER AND OTHER SPECIAL SUBJECTS

27. The waterway is tidal. Flood control, water power and other related subjects are not pertinent to this report. The U.S. Fish and Wildlife Service has been consulted on the effects of improvement. In a preliminary report the Service indicated that the Essex River wetlands, marshes and intertidal flats are some of the more important waterfowl wetland areas in the State. It also indicated that the intertidal flats and shoals of the area contain significant soft shell clam resources which support a valuable commercial shellfishery. The Service stated that although improvement of the channel along its present alignment would have no adverse effect on wildlife, the channel realignment or provision of additional anchorage should be coordinated with it and similar State agencies, in order to minimize

the loss of natural resources. Comments on the proposed plan of improvement are included in Appendix "B".

SHORELINE CHANGES

28. This waterway is almost completely landlocked, and is naturally protected from wind and ocean waves. Channel deepening, within existing limits would have no adverse effect on the existing shore. The anchorage would be placed near the settled portion of town in an existing salt marsh. No damage other than the loss of marsh area necessary for provision of the anchorage would be involved.

PLAN OF IMPROVEMENT

29. The plan of improvement, desired by local interests entails widening the existing channel from 60 to 80 feet, and increasing the existing project depth. In addition to channel improvements, an anchorage basin near the Town Wharf and a turning basin at the upstream end of the project were requested. Consideration was given to several plans of improvement. Each plan included a minimum project depth of 6 feet. Any lesser depth would not provide for adequate navigational facilities at all tidal periods, and any greater depth would not be required for the boats using or expected to use the waterway during project life. Details of the selected plan are given in Appendix "A".

30. Local interests requested a widening of the channel from its existing 60-foot width to a minimum of 80 feet. Investigation of this aspect revealed the chief navigational difficulty occurs to boats passing at the sharp bends. This difficulty can be eased by appropriate widening of the more critical bends in the 60-foot wide channel. Therefore a 60-foot wide channel with appropriate widening of the bends was selected as the most economical and feasible improvement. This width would provide amply for the present and prospective fleets during project life.

31. The desire of local interests for anchorage near the upper end of the project was examined. It was found that this portion of the river did not provide sufficient room for boats awaiting repairs at the boatyard, or for access to the marina. Consequently, boats anchor in the channel causing considerable congestion and accidents due to collisions. Additional anchorage should be provided in the area, to eliminate such damage. A 5-acre anchorage is considered sufficient

for this purpose. This anchorage would accommodate 60 to 70 boats moored fore and aft.

32. The selected plan of improvement would provide a 6-foot deep channel within existing project limits, enlarged at critical bends and at the upstream end to form a small turning basin. A 6-foot deep anchorage about 5 acres in area would be located near the upper end of the project.

ESTIMATES OF FIRST COST

33. Estimates of first costs have been prepared for the selected plan of improvement. Probings taken in 1963 indicate the bottom materials to be mud, clay, sand and gravel. Quantities are in terms of in-place measurement and include a 1-foot allowance for overdepth dredging. Allowable side slopes are 1 vertical on 3 horizontal. Dredging costs are based on recent experience in similar areas and reflect prices current in April 1964. The selected plan is detailed below:

DREDGING

60' x 6' channel	$260,000
5 acre anchorage (6' deep)	147,000
	407,000
Contingencies (15%)	61,000
	468,000
Engineering & Design	28,000
Supervision & Administration	24,000
Total Costs	$520,000

ESTIMATES OF ANNUAL CHARGES

34. The annual charges have been computed on the basis that local interests will contribute in cash 34 percent of the cost of construction. An assumed project life of 50 years has been used in all computations. Interest rates of 3 percent have been used for both Federal and local annual charges. Annual charges include an estimate for additional maintenance of the project. The estimate is based on past maintenance records with allowances made for the increased areas in the improvement.

Federal Annual Charges
(50 year life)

Federal Investment $343,000

Interest $343,000 x .03	$10,400
Amortization 343,000 x 0.008866	3,100
Additional annual maintenance	4,500
	$18,000

Non-Federal Annual Charges

Non-Federal Investment $177,000

Interest $177,000 x .03	$ 5,300
Amortization 177,000 x 0.008866	1,600
	$6,900

Total charges (Federal & Non-Federal)	$24,900

ESTIMATES OF BENEFITS

35. Benefits to be realized from improvement of the waterway would be chiefly recreational. Local interests report a total of 432 recreational boats in the local fleet. Of this total 30 are rowboats and 315 are outboards. The remaining 87 boats are classified as cruisers, auxiliary sail, and sailboats.

36. Commercial benefits in the harbor could be realized from small shallow draft commercial fishing boats which spend a day or two on the fishing grounds and return to land their catch. Local interests pointed out that the Town Wharf was constructed in 1947 to accomodate the then existing herring fleet. This fleet has since departed to other ports as the waterway became inadequate. Return of this type of craft was not indicated. Commercial fishing boats now operating out of the harbor consist of 3 lobster boats. These boats are about 25 feet long and draw 2 to 3 feet.

37. It was stated that if improvement were accomplished, a total of 20 new boats would be added to the existing lobster boat fleet. This estimate is considered optimistic because it is believed that the potentialities of the fishing grounds, where these boats would

operate, could not support such an increase. However, the locality is a summer recreational area with seasonal population increases and several restaurants and markets dealing in seafood specialties. A large part of the seafood used by these establishments is brought in from other ports. As the boats could land their catches more economically in an improved Essex Harbor than the existing fleet can now land them, it is considered that the local claim of additional new boats is reasonable. However, it is also believed that the fishing grounds could support only the addition of 5 new boats to the fishing fleet.

38. Benefits were computed for the new boats. From previous studies of other New England Harbors, it has been determined that a full time lobsterman will average 12,500 lbs. per season of 150 days. This estimate is based on a 7-day week, 5 month season, with non-fishing allowance of 25 days for bad weather, maintenance and repairs. For the 5 new boats a total of 62,500 lbs. would be landed annually. The ex-vessel price of lobsters in this vicinity averages $0.55 per pound. Thus the gross value of these additional landings would be 62,500 x 0.55 or $34,375. The net value of the shellfish, with allowances made for wages, fuel, gear, etc., is estimated to be 40 percent of the gross. Thus the net value of the lobsters would be $13,750, a general benefit to be realized from improvement.

39. Benfits for recreational boats have been computed on the basis of the amount of net annual return to the owners, if the boats were for hire. In general, the net return of a boat varies with its type and size, and is expressed in terms of a percentage of its average depreciated value. The ideal net return is the maximum that could be obtained with full unrestricted use of the harbor. For this harbor the ideal net return varies from 12 percent for the smaller boats to 9 percent for the larger boats. Computation of benefits considered the difference between the net return now received, with the net return that can be achieved after improvement. The present value of the net return entailed consideration of such factors as, lack of adequate anchorage, shallow depths at low water, insufficient room in the channel for passing, and lack of adequate space for expansion of the existing fleet. Future value of the net return was based on the reduction of these deficiencies, made possible by improvement. Table I shows estimated benefits for the existing fleet.

40. Reportedly, considerable annual damages are incurred by the inadequate navigational conditions of the waterway. In great part the damages result from groundings during low tidal stages and occur most frequently while passhing other boats. The inadequacy of existing project widths, plus extensive shoaling on the banks, are blamed for these accidents. Repairs are necessary after such accidents and involve propellor, shaft, and frequently hull overhaul. No listing of the total accidents is available, although boat owners reported suhh repairs to have involved from $25.00 to $1500. for a single accident. In addition, one boatyard and repair shop reported thousands of dollars annually for repair. The claim of boat damages in the waterway is considered reasonable and a conservative estimate per boat for such damages is $28 annually. For the existing fleet of 86 recreational boats, excluding outboards, the annual damages that could be eliminated by improvement is estimated at $2400, a recreational benefit. No benefits for damages were evaluated for the 3 lobster boats. It was considered that their annual damage would be minor.

41. The harbor is now too congested to permit annual increases in recreational boating that are now prevailing in similar New England waterways. The increases are mainly attributable to such factors as population increases and recent trends toward standardization of boat manufacture, which tends to make recreational boating less expensive. Should improvement be effected, it is estimated conservatively that at least 3 boats per year would be added to the local fleet during the anticipated project life. Expressed as a percentage factor this increase represents an average annual increase of about 3.4 percent over the present fleet of 87 boats, exclusive of outboard motors. This estimate of average annual increase is less than indicated by the most recent compilations of authoritative yachting publications, which show the national average annual increase to be 6 boats per 10,000 of population. The increases are assumed to be uniform annually so that the benefits for this increase are based on a straight line growth from 0 to 150 boats in the final year of project life and reduced to an average annual equivalent. Table No. II shows the composition of this fleet, and Table No. III shows estimated benefits for the transient fleet.

TABLE 1 BENEFITS TO RECREATIONAL BOATING

HARBOR: Essex River, Mass.

Existing Locally Based Fleet

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	Depreciated Value		Percent Return					On Cruise		
			Average $	Total $	Ideal %	% of Ideal Pres.	% of Ideal Future	Gain %	Value $	Avg. Days	% of season	Value $
RECREATIONAL FLEET												
Outboards	10-20	315	1200	378,000	-	-	-	-	-			
Inboards	10-20	31	1500	46,500	12	80	100	2.4	1116			
Cruisers	15-30	30	3500	105,000	9	70	100	2.7	2835	5	5	285
	31-50	5	5000	25,000	9	60	100	3.6	900	10	10	90
	51-60											
Aux. Sail	15-30											
	31-40	2	10,000	20,000	9	60	100	3.6	720	10	10	70
	41-60											
Sailboats	10-20	18	500	9,000	11							
	21-30											
	31-40											
	41-60											
CHARTER BOATS												
Cruisers	21-35		•									
	36-50											
	51-100											
TOTALS									4851			$345

Net Benefits $4,857 - $345 = $4512, Say $4,500

TABLE II BENEFITS TO RECREATIONAL BOATING

HARBOR: Essex River, Mass.

New Boats

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	Depreciated Value			Percent Return				On Cruise		
			Average $	Total $	Ideal	% of Ideal		Gain %	Value $	Avg. days	% of season	Value $
						Pres.	Future					
RECREATIONAL FLEET												
Outboards	10-20											
Inboards	10-20	40	1,500	60,000	12	-	100	12	7,200	-	-	-
Cruisers	15-30	50	3,500	175,000	9	-	100	9	15,750	20	20	3,575
	31-50	20	15,000	300,000	9	-	100	9	27,000	20	20	5,400
	51-60											
Aux. Sail	15-30	10	3,500	35,000	9	-	100	9	3,150	10	10	315
	31-40	5	5,000	25,000	9	-	100	9	2,250	10	10	225
	41-60											
Sailboats	10-20	10	500	5,000	11	-	100	11	550			
	21-30	10	2,500	25,000	10	-	100	10	2,500			
	31-40											
	41-60											
CHARTER BOATS												
Cruisers	21-35	5	5,000	25,000	14	-	100	14	3,500	-	-	-
	36-50											
	51-100											
TOTALS		150							$61,900			$7,515

Net Benefits = 61,900 - 7,515 = $54,385

Annual Av. Equivalent = $54,385 x 0.39115 = $21,272 Say $21,300

TABLE III BENEFITS TO RECREATIONAL BOATING

HARBOR: Essex River — Transient Fleet

TYPE OF CRAFT	LENGTH (feet)	No. of Boats	Depreciated Value Average $	Depreciated Value Total $	Ideal	Percent Return % of Ideal Pres.	Percent Return % of Ideal Future	Gain %	Value $	On Cruise Avg. days	On Cruise % of season	On Cruise Value $
RECREATIONAL FLEET												
Outboards	10-20											
Inboards	10-20											
Cruisers	15-30 31-50 51-60	10	7,000	70,000	8	85	100	1.2	840	-	-	-
Aux. Sail	15-30 31-40 41-60											
Sailboats	10-20 21-30 31-40 41-60											
CHARTER BOATS												
cruisers	21-35 36-50 51-100											
TOTALS									840			

Net Benefits $840, Say $800

SUMMARY OF BENEFITS

Source	General	Local	Total
Commercial fleet additions	$ 13,750	-	$ 13,750
Recreational Fleet			
Elimination of Damages	1,200	1,200	2,400
Increased Use, Existing Fleet	2,250	2,250	4,500
Transient Fleet	400	400	800
Average Growth	10,650	10,650	21,300
	$ 28,250	$14,500	$42,750

COORDINATION WITH OTHER AGENCIES

42. All Federal, State and local agencies having interest in improvement of Essex River were notified of the public hearing held in Essex, Massachusetts on 15 May 1962. The U. S. Fish and Wildlife Service, and related State agencies, the Massachusetts Division of Fisheries and Game, and Division of Marine Fisheries, The U. S. Coast Guard and the Town of Essex were consulted during the study. The Fish and Wildlife Reports are detailed in Appendix "B". The Coast Guard has furnished information on navigation aids.

APPORTIONMENT OF COSTS AMONG INTERESTS

43. The benefits expected to accrue through improvement are partly general and partly local in nature. General benefits comprise 66 percent of total benefits and the remaining 34 percent local. First costs of construction are therefore apportioned on the same ratio. The local share would be in the form of a cash contribution to construction of the project. First costs follow.

FEDERAL INVESTMENT

General Navigation Facilities (0.66) ($520,000)	$343,000*
Aids to Navigation	-, -
Total Federal Cost	$343,000

NON-FEDERAL INVESTMENT

Local Cash Contribution (0.34) ($520,000)	$177,000
Total Project Cost	$520,000*

*Excluding $12,000 pre-authorization studies.

COMPARISON OF BENEFITS AND COSTS

44. The total benefits, evaluated at $42,750 compare with annual charges of $24,900 for a B/C Ratio of 1.7.

PROPOSED LOCAL COOPERATION

45. In the event of improvement, local interests should provide, without cost to the United States, all lands, easements, and rights-of-way necessary for construction and maintenance of the project, when and as required. Local interests should also hold and save the United States free from damages that may result from the construction works or subsequent maintenance.

46. At this time there is a town-owned wharf and a paved small boat launching ramp. The wharf has suitable supply facilities and is available, together with the launching ramp, as public landing facilities. It is therefore considered that additional public landings are not necessary at this time. However, local interests should provide, without cost to the United States, all necessary mooring facilities in the anchorage area.

47. As the nature of the benefits to be derived from improvement are partly general and partly local, it is considered that local interests should share in construction costs in the proportion as the benefits are received. Since local benefits are 34 percent of the total benefits, the local share of construction costs should be 34 percent of $520,000 or $177,000 in the form of a cash contribution. This sum excludes costs of navigation aids which are considered a Federal responsibility.

48. By letter of 1 June 1964, local interests were advised of the above requirements of local cooperation and requested to comment on the probability of fulfillment of such requirements, should

improvement be authorized. The Board of Selectmen reported, by letter of 29 June 1964, that the Town was not willing to participate in any expenditure of money for the proposed project in Essex River.

DISCUSSION

49. Essex River is a small partly tidal stream, the greater part of which is located in the Town of Essex, Massachusetts. The mouth of the river is about 10 miles north of Cape Ann, Massachusetts. The Town of Essex, located along the coast adjacent to Essex Bay, Plum Island Sound, and the Gulf of Maine, attracts numerous summer residents annually. For these visitors one of the chief attractions is the opportunity to engage in recreational boating. Local interests claim full realization of the potentialities of this activity is denied by inadequate navigational facilities in the river. They also claim that these conditions hamper not only the existing fleet but preclude its expansion.

50. Examination of the waterway's condition substantiated the claim of local interests and the need for navigational improvement. Several plans of improvement were considered. Of these plans the one considered most economical and sufficient for the needs of the existing and prospective fleets, consists of deepening the existing 4-foot channel to 6 feet, widening of critical bends and at the upper limit to form a turning basin area, and providing a 5-acre anchorage near the Town Wharf. First costs of construction of this plan are estimated at $520,000.

51. Benefits evaluated for improvement total $42,750, of which 66 percent were considered general and 34 percent local. Construction costs were pro-rated in proportion to the percentage of benefits to be obtained. Thus it was determined that the Federal share of construction costs would be 66 percent, or $343,000, and the local share $177,000. Federal annual charges are estimated at $18,000, including additional annual maintenance, and local annual charges of $6,900 for a total of $24,900. This total compared with annual benefits of $42,750 results in a benefit-cost ratio of 1.7 indicating economic justification of the project. The Town of Essex, Massachusetts has indicated its unwillingness to participate in any cash contribution toward construction of the improvement.

CONCLUSIONS AND RECOMMENDATION

52. Although sufficient benefits to fishing and recreational boating are available for improvement of Essex River, Massachusetts, local interest in improvement has dwindled to the point where the requirement of a cash contribution toward initial construction of the improvement would not be fulfilled. Therefore, the Division Engineer recommends no further navigational improvement of Essex River at this time.

P. C. HYZER
Brigadier General, USA
Division Engineer

CORPS OF ENGINEERS

U. S. ARMY

DESIRED IMPROVEMENT NOT RECOMMENDED

Channel 60 Feet wide – 6 Feet deep

Anchorage 5 Acres, 6 Feet deep

LOWE ISLAND

BULL I.

CROSS ISLAND

ESSEX BAY

ESSEX RIVER

EXISTING PROJECT 60'X4' CHANNEL

MARKER (LIGHTED)

PRIVATE MARKER (LIGHTED)

MARKER (LIGHTED)

MARKER (LIGHTED)

TOWER

CONOMO POINT

TOMMY ISLAND

Soginese Creek

Lufkin Creek

Ebben Creek

Walker Creek

EXISTING CHANNEL

PROPOSED CHANNEL RELOCATION

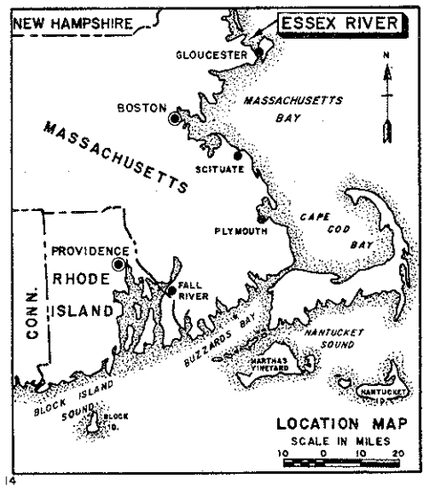
For Enlargement of Marina Area, see Inset

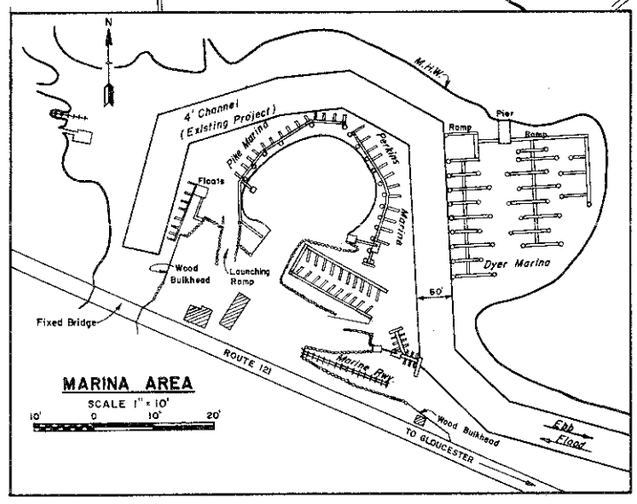
TOWN OF ESSEX

GENERAL NOTES:

Soundings are in feet and are referred to the plane of Mean Low Water.

Hydrography and Topography from enlargement of U.S.C.&G.S. Chart No. 1206.





MARINA AREA

SCALE 1" = 10'

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

ESSEX RIVER, MASSACHUSETTS

SHEET 1 OF 1 — SCALE IN FEET (500 0 500 1000) — SEPT. 1964

APPROVED: — CHIEF, ENGINEERING DIVISION

SUBMITTED: — CHIEF, PLANNING AND REPORTS BRANCH

CHIEF, RIVER AND HARBOR SECTION — DR. BY:

PROJECT ENGINEER — TR. BY: A.J.N. — CH. BY:

TO ACCOMPANY SURVEY REPORT DATED OCT. 2, 1964

FILE NO.

SURVEY OF ESSEX RIVER, MASSACHUSETTS

APPENDIX A

ESTIMATES OF FIRST COST

1. Estimates of first cost have been prepared for the considered plan of improvement. The plan consists of; deepening the existing 4-foot channel to 8 feet, widening it at critical bends, and providing a 5-acre anchorage, 6 feet deep, near the upstream end of the project.

2. Probings taken in 1963 indicate the bottom materials to be mud, clay, sand, and gravel. Dredging quantities have been estimated in terms of in-place measurement and include an allowance of 1 foot for overdepth dredging. Allowable side slopes are 1 vertical on 3 horizontal. The estimate of costs for the plan selected as the most feasible is detailed as follows:

PROJECT COST ESTIMATE

Cost Account Number		Cost Estimate
09	Channels	
	Dredging 6' channel	
	162,300 cubic yards of	
	mud, clay, sand & gravel @$1.60	$260,000
	5-Acre Anchorage (6' deep)	
	92,000 c.y. of mud, sand, clay	
	and gravel @ $1.60	147,000
		407,000
	Contingencies (15%)	61,000
		$468,000
	Engineering & Design $28,000	
	Supervision & Administration 24,000	
		52,000
	Total Costs (Federal & Non-Federal)	$520,000*

*Excluding Pre-Authorization Costs of $9,000

Summary of Costs

Federal (520,000 x 0.66)	$343,000
Non-Federal cash contribution ($520,000 x 0.34)	177,000
	$520,000

APPENDIX B

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
59 Temple Place
Boston, Massachusetts 02111

July 21, 1964

Division Engineer
New England Division
U. S. Army Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Dear Sir:

This is our conservation and development report on the possible effects of proposed navigation improvement of Essex River, Town of Essex, Essex County, Massachusetts. Your study was done under authority of Resolution, House Public Works Committee, adopted July 16, 1958. Our study was made under authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-666 inc.), in cooperation with the Massachusetts Division of Marine Fisheries and the Division of Fisheries and Game, and has their concurrence as indicated by letters dated July 6, 1964 and June 19, 1964, respectively.

We understand that your plan of improvement consists of widening the existing channel from 60 to 80 feet and deepening the channel from four to six feet at mean low water. In addition, a six-foot deep anchorage area of about five acres near the upper end of the waterway, and a turning basin at the upstream limit, would also be provided. Spoil disposal from these improvements would be in the Ebben Creek area.

There are significant soft clam resources in the intertidal flats and shoals of the project area. About 25 full time and about 100 summer commercial clam diggers harvest clams there. The area is not polluted. Recreational digging is fairly heavy. Waterfowl and shorebird use of the marshes and intertidal flats is high. These wetlands are some of the most important waterfowl wetlands in the State.

Widening and deepening the existing channel will cause no significant damage to fish and wildlife habitat. Dredging the anchorage will remove some tidal marshland but we conclude that the benefits here will exceed the minor damages caused. Channel improvement will provide minor benefits for sport fishermen.

Your proposal for spoil disposal on the Ebben Creek area would result in some marsh destruction. We have selected two alternate spoil areas which would not cause significant damage to fish and wildlife resources. One is the upland area northeast of Spring Street; the other is a marsh south of Main Street along the main stem Essex River which has already been downgraded by the existing refuse dump. The spoil areas should be suitably diked to prevent return of materials to the waterway.

We recommend therefore--

1. That spoil area on Ebben Creek not be used.

2. That alternate spoil areas on Essex River south of Main Street and on upland northeast of Spring Street be used.

3. That suitable diking be used to prevent return of spoil materials to the waterway.

Sincerely yours,

Fred L. Jacobson

Fred L. Jacobson
Acting Regional Director
Bureau of Sport Fisheries and
Wildlife

John T. Gharrett

John T. Gharrett
Regional Director
Bureau of Commercial Fisheries

ESSEX RIVER, MASSACHUSETTS

Information Called for by Senate Resolution 148, 85th Congress, Adopted 28 January 1958

1. Navigation Problem. - Essex River is a small winding stream, the mouth of which lies about 9 miles northwest of Cape Ann, Massachusetts. The navigable portion of the river is about 5 miles long and extends from Ipswich Bay through Essex Bay to the head of navigation in the town of Essex, Massachusetts.

2. At the present time navigation of the waterway is hampered by several abrupt channel bends and insufficient channel depth at low tidal periods. In addition, a lack of space in the upper portion of the waterway results in boats mooring either along the sides of or in the channel itself. In the first case the boats go aground at low water, thus restricting their use, and in the second case cause channel congestion and resultant navigational difficulties.

3. Improvements Considered, Costs and Local Cooperation. - The selected plan of improvement, one of several studied, would provide for additional channel depth, widening of critical bends, and additional anchorage space in the upper portion of the waterway. Specifically the plan would provide for deepening the existing channel from 4 to 6 feet, widening 6 bends and dredging a 5-acre area to a depth of 6 feet. The estimated costs of improvement total $520,000. As the improvement would, in large part, benefit recreational boating, first costs of construction were apportioned on the ratio of general to local benefits. Computed average annual benefits totaled $42,750 of which $28,250 or 66 percent were general and $14,500 or 34 percent were local. Therefore, as part of local cooperation, local interests would be required to contribute in cash, 34 percent of the first costs of construction, sand contribution estimated at $177,000 (1964). In addition, local interests would be required to; maintain existing public landings open to all on equal terms; provide without cost to the United States, all necessary mooring facilities in the anchorage; provide, without cost to the United States, all lands, easement, and rights-of-ways necessary for construction and maintenance of the project; hold and save the United States free from damages that may result from construction and maintenance of the project; and, agree to furnish spoil disposal areas, upon request of the Chief of Engineers, if it be determined after detailed studies that such areas are necessary, and

furnish such dikes, bulkheads, and embankments as may be necessary for initial construction and maintenance of the project. Local interests were advised of these requirements by letter dated 1 June 1964. By letter dated 29 June 1964 the Chairman, Board of Selectmen, Essex, Massachusetts advised the Division Engineer that the Town of Essex at this time was unwilling to participate in any expenditure of money for the proposed project.

4. Discussion. - The navigation study revealed the inadequacy of the waterway for existing and prospective boating, both recreational and commercial. The recommended improvement would eliminate the present inadequacy and provide for expansion of the existing fleets. The Town of Essex is not in a position to finance its share of improvement. Therefore, the Division Engineer recommends no navigational improvement in Essex River, Massachusetts, at this time.