BEFORE THE NATIONAL GREEN TRIBUNAL SITTING AT CHENNAI

O.A No. 172 of 2020

Association of Deep Sea Going Artisanal Fishermen
Represented by its Vice President, Mr.Selvoriyan. A
Shark Street,
College Road
Thoothoor 629176
Kanyakumari District
Tamilnadu .... **Applicant**

Vs.

1. **The Union of India**
   Rep. by its Secretary
   Ministry of Environment and Forest
   Department of Environment and Forest and wild life
   New Delhi and 6 Others

.... Respondent/s

THE TYPE SET

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Counsel for the applicant

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<u>Objections / Reply to the Joint Committee Report</u>

Reply to the Joint Committee report filed by Adv. Edwin Jerome on behalf of the Applicant is as follows:

1. The application is filed by the applicant for the following relief:
    a. Direct the 2nd, 3rd and 5th respondents not to construct the checkdam at Parakani at **8 °15'10.6"N 77 °09'44.3"E,** which falls under **CRZ-III (NDZ)** of the Coastal Zone Management Plan, Map No.**TN11** Sheet No.**C43*3/SE** in blatant violation of the provisions of the Coastal Regulation Zone Notification 2011 (CRZ), Environment Impact Assessment Notification, 2006 (EIA) and Coastal Regulation Zone Notification 2019(CRZ).

b. Direct the respondents to restore the river to its original condition demolishing and removing the partially constructed illegal checkdam.
c. Any other relief which The Hon. Tribunal may be deem fit and proper to this case and render justice.

2. The Honourable Tribunal has passed an order to constitute a joint committee comprising of

1) the District Collector, Kanyakumari District, or a Senior Officer not below the rank of Assistant Collector or Revenue Divisional Officer, as designated by the District Collector,

2) Senior officer from Ministry of Environment Forests and Climate and Change (MoEF & CC), Regional Office, Chennai,

3) a Senior Officer from State Coastal Zone Management Authority, Chennai

4) The Superintending Engineer of Public Works Department and Water Resources Organisation, who is in charge of that area to inspect the area in question and submit a factual as well as action taken report, if there is any violation found.

3. The committee is directed to go in to the question as to

a. whether there was any violation of any environmental laws and also if there is any damage caused to environment including river bed and surrounding area in the process of constructing the check dam in the river and if so, the committee is directed to assess the environmental compensation as well.

b. The committee is also directed to go into the question regarding the impact on the livelihood of the local fisherman on account of the construction of dam in the river and

c. If there is any damage caused to environment the committee is also directed to suggest the ways and means to restore the

damage caused to the environment and who is responsible to carry out for the same as well.

d. Ministry of Environment Forests and climate Change (MoEF & CC), Regional Office, Chennai will be the nodal agency for co-ordination and for providing all necessary logistics for this purpose.

4. It is humbly submitted that the Joint Committee was constituted comprising the following members based on the Officers deputed / nominated from the Authorities concerned visited the site on 08.12.2020:

(i). Smt. Sharanya Ari, I.A.S, Sub-Collector, Padmanabhapuram, Kanniyakumari District.

(ii). Er. N. Gnanasekar, Superintending Engineer, WRD/PWD, Thamiraparani Basin Circle, Tirunelveli.

(iii). Shri. D. Eswaran, Assistant Conservator of Forests, Department of Environment, Govt. of Tamilnadu.

(iv). Dr. M.T. Karuppiah, Scientist – E, MoEF&CC, Regional Office, Chennai.

5. It is submitted that two joint committee report was submitted before this Honourable Tribunal one Joint Committee report is filed by one of the the member of the committee, Er. N. Gnanasekar, Superintending Engineer, WRD/PWD, Thamiraparani Basin Circle, Tirunelveli on 16.02.2020 and another is filed by the Nodal Officer, Dr. M.T. Karuppiah, Scientist – E, MoEF&CC, Regional Office, Chennai., which is signed by two members of the joint committee.
6. The District Collector, the chairman of the District Coastal zone Management Authority, who has to implement the provisions of the CRZ notifications on letter and spirit and take action against the person, who is violating the provisions of CRZ notifications

deputed Smt. Sharanya Ari, I.A.S, Sub-Collector, Padmanabhapuram, Kanniyakumari District, as the member of the committee. The sub collector neither signed in the joint committee report submitted by the Nodal officer nor dissenting report.

7. The Joint committee report submitted by the Nodal officer, which is signed by the members Shri. D. Eswaran, Assistant Conservator of Forests, Department of Environment, Govt. of Tamilnadu and Dr. M.T. Karuppiah, Scientist – E, MoEF&CC, Regional Office, Chennai, emphasis the following:
    a. “Based on the site visit and approved CZMP available, the Joint Committee confirms that the alleged activity for the construction of Check Dam is in the CRZ area and attracts the provisions of the CRZ Notification. The Coastal Zone Management Plan- Tamilnadu – Map No.TN-11, cross sectional view of Tamiraparani river in the CRZ area”…….
    b. The said project activity (checkdam construction) has been commenced in the CRZ area without obtained requisite prior CRZ clearance from the Competent Authority.
    c. Excavation of river bed has been carried out. Course of river flow is altered during the construction. Thus the damage to the marine environment including river bed has already been occurred due to the ongoing construction.
    d. There is a possible impact on the estuary also due to the construction activity.
    e. Due to the construction of the check Dam in the present location, there is a possibility of saline water ingression in the AVM canal.
    f. In the present case, damages caused to the environment and liability of the responsible party as well as cost thereof are difficult to assess, since the ongoing activity is within the river and CRZ area.
    g. There is no provision for getting ex-post-facto clearance. So, further course of action may be decided by the Hon’ble Tribunal.

h. In the event of restoring the damage, the responsibility lies on the project authority i.e. Public Works Department, Govt. of Tamilnadu. They should bear the entire cost for the restoration.

8. The joint committee report submitted by Er. N. Gnanasekar, Superintending Engineer, WRD/PWD, Thamiraparani Basin Circle, Tirunelveli, is not acceptable as it is stated in the report submitted by the nodal office, he neither discussed with other committee members, nor dissented the report submitted by the joint committee report submitted by the nodal officer. The report is more like the counter affidavit of the 7th respondent. The report, which is submitted by Er. N. Gnanasekar says that:

   a. “The river bed is lower than the Mean Sea Level (-3.25m) this is very essential to arrest the sea water intrusion”. The report is silent about the cause of the river bed level gone gone down upto (-3.25m). The report concealed the fact of uncontrolled sand quarrying.

   b. The report says “The CRZ map was issued on 24.10.2018 only after issue of the G.O dated 24.08.2018 for the work, hence the clearance from the authorities not arisen”. Whereas, the tender was called on 28.12.2018 and the tender was accepted on 23.01.2019 (exhibited in Page No.51 and 52 of the applicants type set), which falls after 24.10.2018 , the date on which CRZ map was issued and failed to consider the Coastal Regulation Zone Notification 1991, the area in which the construction work is going on is already in the CRZ area as per the CRZ notification 1991.

   c. In page 5 para 4 of the report says “misuse of the river and the river bank for the landing of their(fishermen) boat and other purpose beyond harbor area”. Here the member failed to note that the CRZ is created for the protection of fishermen and their livelihood.

d. The writ Petition mentioned in the report W.P.(MD)No.7069 of 2019, Honourable Madras High court seeking issuance of a writ of Mandamus directing to take immediate steps to construct the check dam work. The Honourable High Court has not given any order to construct the check dam without the environment clearance.

e. The another writ petition mentioned in the report as pending before Madurai Bench of Honorable Madras High Court, W.P.(MD)No.27380 of 2019 was withdrawn to facilitate the proceedings in this Hon. Tribunal for speedy disposal.

f. The JC report submitted by Er. N. Gnanasekar, Superintending Engineer, WRD/PWD, Thamiraparani Basin Circle, Tirunelveli, is silent about the action taken by the District Environmental Engineer, TNPCB & Convener-DCZMA vide letter No. DEE/TNPCB/NGL/COMPL/TECH 06/1513/2020 dated 24.8.2020 confirmed the said ongoing construction activity of Check Dam is within the CRZ area and requested the Executive Engineer, Public Works Department, Govt. of Tamilnadu to carryout such activity only after obtaining CRZ clearance from the TSCZMA. Also requested to furnish the project relevant details and action taken report. The report is more likely as an counter affidavit rather than independent report.

9. It is humbly submitted that there was two check dam at Kuzhithurai aru (Tamiraparani) one is at kuzhithurai about 12 Km away from estuary and the another at Mankad about 6 K.M from estuary the Kuzhithurai Check dam was reconstructed in the financial year 2016-17, which allows maximum of 55000 c.ft of water to cross the checkdam. There was a check dam at Mankaud, which was situated in the middle of Kuzhithurai and Erayumanthurai about 6 K.M from Erayumanthurai as well as Kuzhithurai, which was damaged. Instead of reconstruct the damaged check dam at Mankaud this check dam at

Erayumanthurai is under construction violatingenvironment law. All the wells and drinking water sources within the Munchirai Panchayat Union are existing in between Mancaud and Kuzhithurai checkdams. This fact also was suppressed in the report.

10. The Joint committee report filed by the nodal officer rightly pointed out that There is a possible impact on the estuary also due to the construction activity. In support of the impact of check dam on estuary, the research paper published by Smith JA, Handley JC, Dietl GP. 2018 Effects of dams on downstream molluscan predator–prey interactions in the Colorado River estuary. Proc. R. Soc. B 285: 20180724. http://dx.doi.org/10.1098/rspb.2018.0724 is attached.

11. Due to the construction of the check Dam in the present location, there is a possibility of saline water ingression in the AVM canal. If the check dam is constructed , it will affect the irrigation and the drinking water sources of all Coastal villages from Eraiyumanthurai to Poovar and the flow (distribution) of flood in the Tamiraparani river (Kuzhithurayaru) to the AVM Canal.

12. It is humbly submitted that the Art. 21 of our constitution gurantee the Right to live to every citizens of India. The Honourable Apex Court in *Sunil Baitra* Vs. *Delhi Administration* reiterated that “the right to lead healthy life, pure water is the fundamental one and so the government is responsible to protect the same”. The construction of this checkdam will prevent the flow of fresh water into the AVM channel, it will affect whole villages from Erayumanthurai to Poovar of Kerala. The AVM canal, which is scheduled as National Waterway 13 in the National waterways Act, 2016 (Act 17 of 2016) and is published in the gazette on March 26, 2016.

13. The Joint committee report is silent or failed to point out about the wall on both side of the banks of the Kuzhithurayaru (Tamiraparani) as there is no side wall in both the banks of the

river, there is no provision to hold the water (storage of water) after construction of the check damand there is no provision to protect the villages in the bank from flooding.

14. It is further submitted that the National Green Tribunal (WZ) Bench Pune in Application No. 21(THC)/2013(WZ between Mr. Manuel F Rodrigues Vs. State of Goa, The Honourable Tribunal has directed to demolish/ dismantle standing structure in the CRZ stating

"illegal construction shall be zero tolerance …… liable to be immediately dismantled / demolished as the land need to be restored to its original position."

The Honourable Principle Bench of National Green Tribunal in *S.P Muthutaman Vs. Union of India* vide judgment dated 7.05.2015 held that "no defacto clearance can be granted" the same was followed by this Honourable Tribunal in Appeal No. 4 of 2019(SZ).

Hence the Honourable Tribunal may

a. Direct the 2nd, 3rd and 5th respondents not to construct the checkdam at Parakani at **8 °15'10.6"N 77 °09'44.3"E,** which falls under **CRZ-III (NDZ)** of the Coastal Zone Management Plan, Map No.**TN11** Sheet No.**C43*3/SE** in blatant violation of the provisions of the Coastal Regulation Zone Notification 2011 (CRZ), Environment Impact Assessment Notification, 2006 (EIA) and Coastal Regulation Zone Notification 2019(CRZ).
b. Direct the respondents to restore the river to its original condition demolishing and removing the partially constructed illegal checkdam. Or
c. Any other relief which The Hon. Tribunal may be deem fit and proper to this case and render justice.

Dated at Chennai on 26 th day of February 2021

Counsel for the Applicant.

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Research

Cite this article: Smith JA, Handley JC, Dietl GP. 2018 Effects of dams on downstream molluscan predator–prey interactions in the Colorado River estuary. *Proc. R. Soc. B* **285**: 20180724.
http://dx.doi.org/10.1098/rspb.2018.0724

Received: 30 March 2018
Accepted: 8 May 2018

Subject Category:
Palaeobiology

Subject Areas:
ecology, palaeontology

Keywords:
Manly's α, *Mulinia*, Naticidae, predator preference, salinity gradient, shell-drilling predation

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Electronic supplementary material is available online at https://doi.org/10.6084/m9.figshare.c.4102130.

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Effects of dams on downstream molluscan predator–prey interactions in the Colorado River estuary

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River systems worldwide have been modified for human use and the downstream ecological consequences are often poorly understood. In the Colorado River estuary, where upstream water diversions have limited freshwater input during the last century, mollusc remains from the last several hundred years suggest widespread ecological change. The once abundant clam *Mulinia modesta* has undergone population declines of approximately 94% and populations of predators relying on this species as a food source have probably declined, switched to alternative prey species or both. We distinguish between the first two hypotheses using a null model of predation preference to test whether *M. modesta* was preyed upon selectively by the naticid snail, *Neverita reclusiana*, along the estuary's past salinity gradient. To evaluate the third hypothesis, we estimate available prey biomass today and in the past, assuming prey were a limiting resource. Data on the frequency of drill holes—identifiable traces of naticid predation on prey shells—showed several species, including *M. modesta*, were preferred prey. *Neverita reclusiana* was probably able to switch prey. Available prey biomass also declined, suggesting the *N. reclusiana* population probably also declined. These results indicate a substantial change to the structure of the benthic food web. Given the global scale of water management, such changes have probably also occurred in many of the world's estuaries.

1. Introduction

Nearly two-thirds of the world's major rivers have been captured, diverted or otherwise modified for human use [1]. Given the world's growing population, the utilization of riverine resources (e.g. hydroelectric power, potable water) will remain high for the foreseeable future [2–4]. At the same time, the downstream ecological implications (i.e. trade-offs) of upstream water management decisions are not well understood, often for a lack of pre-management data [5–7]. That is, we have an incomplete accounting of how management decisions (e.g. dam construction, water diversions) affect downstream communities and species interactions, particularly in estuaries. In estuarine environments, where sedimentation rates are high and many organisms (e.g. molluscs) have hard skeletal components, pre-management data may still be within reach (e.g. [8–10]).

In the Colorado River estuary (CRE), for example, accumulations of molluscan remains have been used to better understand the community that existed prior to widespread damming and water diversion along the Colorado River during the twentieth century [10–12]. Much of this previous work focused on the once dominant clam *Mulinia modesta* (formerly *M. coloradoensis* [13]). Densities of *M. modesta* exceeded 50 individuals m^{-2} during the pre-dam era—defined as the time period prior to the beginning of dam construction in the 1930s—and are scarce on the tidal flat today [9,10,12,14]. Consequently, *M. modesta* is no longer the most abundant clam in the CRE [9,10], and its role in estuarine carbon cycling has diminished proportionately [7]. Furthermore,

upon examination of the shells of 600 pre-dam era *M. modesta* individuals for traces of predation at Las Isletas (figure 1), Cintra-Buenrostro *et al.* [11] found 23% had drill holes made by predatory snails (naticids and muricids; figure 1*d*), 27% had damage on the margins of their shells consistent with successful crab predation and 34% had repair scars from unsuccessful crab attacks. These results led Cintra-Buenrostro *et al.* [11] to propose three related hypotheses based on the importance of *M. modesta* as a food source for snails and crabs. They hypothesized *M. modesta* population declines probably resulted in corresponding declines in the populations of predatory species (hypothesis 1), switching by predators to alternative prey species (hypothesis 2) or a combination of both effects (hypothesis 3).

Here we evaluate the preference—defined as deviation from a random diet—of the shell-boring naticid *Neverita reclusiana* (figure 1*c*) for *M. modesta*, with respect to potential alternative prey in the pre-dam era molluscan community, to differentiate between these hypotheses. As with many naticid species, *N. reclusiana* use a combination of acidic secretions and a scraping radula to bore characteristic drill holes into the shells of their prey (figure 1*d*) [15]. These trace fossils are readily preserved and record a reliable record of past predator–prey interactions [16]. Although naticid drill holes made by individuals of different species can be challenging to differentiate [17] and two naticid species are present in the CRE today, *N. reclusiana* was probably the only naticid present in the pre-dam era [18]. Thus, using the trace fossil record of *N. reclusiana* and a metric of prey preference by predators (Manly's α [19–21]), we evaluate the potential ecological effects of dam construction and water diversion on predator–prey interactions in the CRE. If *N. reclusiana* disproportionately preyed on *M. modesta* (i.e. a non-random diet composed mainly of *M. modesta*) then the *N. reclusiana* population will probably have declined alongside the *M. modesta* population (hypothesis 1). Alternatively, if *N. reclusiana* selectively consumed other prey, in addition to *M. modesta*, it is more likely that switching from *M. modesta* will have occurred, as *N. reclusiana* compensated for the population decline of *M. modesta* (hypothesis 2). Because support for hypothesis 2 cannot conclusively rule out the possibility of a *N. reclusiana* population decline, we subsequently use estimates of past and present prey densities on the CRE tidal flat to assess whether the potentially supportable population size of *N. reclusiana* has changed (hypothesis 3).

2. Methods

(a) Sampling

Samples were taken from the molluscan death assemblages at three sites in the CRE—Isla Montague, Las Isletas and Campo don Abel—following the north–south salinity gradient that existed prior to widespread damming and water diversions in the Colorado River basin, which began in the 1930s [22] (figure 1). Shells in the death assemblages are time-averaged, but dating via amino acid racemization of *Chionista fluctifraga* has shown that more than three-quarters of shells originated 100–300 years ago, during the pre-dam era [23]. The death assemblage samples were collected from cheniers—sedimentary deposits that are formed through shoreward tidal movement and accumulation of large clasts (e.g. shells) and the removal of smaller clasts (e.g. clays, silts) by longshore currents [24]—at each site. Three samples (approx. 10 l) were collected at Isla Montague and Las Isletas, and five (approx. 2 l) were collected at Campo don Abel. Samples were taken at random at a spacing of approximately 30 m from the top 10 cm of chenier surfaces (approx. 0.25–0.50 m^2), which are well mixed with the subsurface [23]. All samples were wet sieved using a 5 mm mesh in the laboratory, all individuals were identified to the species level, and all predatory drill holes were tallied. Only specimens judged to be at least 85% complete were included and clam count totals were halved to estimate their abundance to account for each individual specimen having two elements (i.e. left and right valves of the shell [25]). For each sample, species with more than 150 specimens were randomly subsampled (see electronic supplementary material, S1). Because drilling predation by species of the snail family Muricidae can be readily confused with naticid drill holes in thin-shelled clam prey [26], all drill holes were measured across their outer diameter and their position on the prey shell recorded to distinguish between predators. Drill holes that were small (less than 1.0 mm in outer diameter) or did not have the characteristic countersunk appearance of a naticid drill hole were not included in the analysis as there is greater likelihood that they were made by a muricid rather than a naticid snail [25,26]. If after this filtering there was still ambiguity as to the origin of the drill hole, the location of the drill hole on the shell was evaluated because naticid predation is highly stereotyped in site selection (e.g. [27])—particularly compared with the most common drilling muricid, *Eupleura limata*, in the CRE (J.A.S. & G.P.D. 2014, personal observation) [26]—such that drill holes are commonly found near the umbo in clam prey (figure 1*d*).

(b) Analysis of preference

We applied the preference metric proposed by Manly *et al.* [19] and further developed by Chesson [20,21] (see also [28])—hereafter referred to as Manly's α—to distinguish between the first two hypotheses. Manly's α incorporates drilling frequency and normalizes species-specific drilling frequencies for the entire community:

$$\alpha_i = \frac{r_i/n_i}{\sum_{j=1}^{m} r_j/n_j}, i = 1, \ldots, m, \tag{2.1}$$

where r_i is the number of prey type i that are drilled, n_i is the number of individuals from species i in the community and m is the number of prey types [29]. To calculate a normalized α, species-specific r_i/n_i (i.e. drilling frequency) is divided by the sum of all species' drilling frequencies [21]. If the predator only consumes prey type i, the value of α_i will be 1, whereas if prey type i is always avoided the value of α_i will be 0. If a predator is not selective, α_i will be equivalent to 1/no. prey types in the community. We applied this non-selective scenario as a null model for predator preference to test the hypothesis that *M. modesta* was the preferred prey of *N. reclusiana* during the pre-dam era in the CRE.

At each site, specimen and drill hole counts for those species that were drilled at least once were used to calculate species-specific Manly's α values according to equation (2.1). As such, the results discussed below provide a conservative estimate of *N. reclusiana* preference because the removal of species not likely to be in the diet of *N. reclusiana* increases the null threshold ($\alpha_i = 1/m$) used to evaluate the preference for each species. Independently at each site, species-specific alphas were compared to the null α value ($\alpha_i = 1/m$) using Bayesian posterior distributions to evaluate the probabilities that naticids exhibited preference for the respective prey species. Additionally, using a Bayesian formulation, each species's α was compared with the *M. modesta* α value to give the probability that *M. modesta* was more greatly preferred than the second species. Low species-specific sample sizes (e.g. $n < 25$), which commonly occur in palaeo-communities and in the CRE dataset, can make

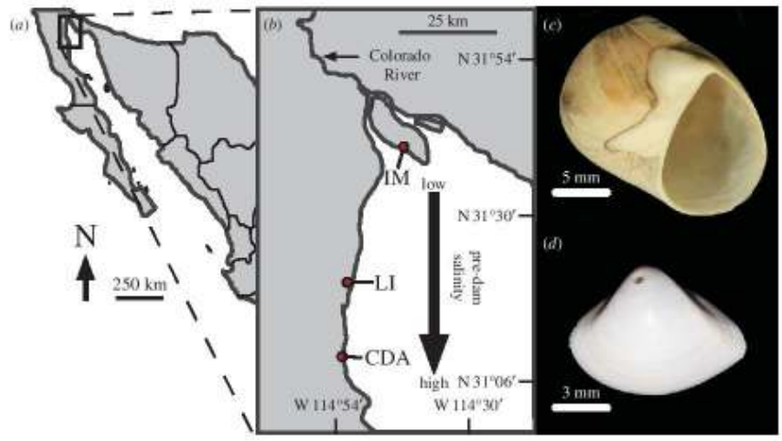

Figure 1. (*a*) Location of the CRE with (*b*) an inset showing the study sites. (*c*,*d*) Specimens of the (*c*) drilling snail *Neverita reclusiana* and (*d*) once-common clam *Mulinia modesta*. Note the predatory drill hole near the umbo of *M. modesta*. IM, Isla Montague; LI, Las Isletas; CDA, Campo don Abel. (Online version in colour.)

interpretations difficult due to the high degree of uncertainty associated with small samples [25]. Although it does not completely alleviate the issue, the Bayesian formulation employed here provides more information than a traditional, frequentist approach, including true probability statements derived from posterior distributions and credibility intervals [30]. Analyses were conducted in R (see [29] for R code and a discussion of practical considerations when applying Manly's α to palaeo-ecological data).

(c) Molluscan biomass in the Colorado River estuary

Estimates of *N. reclusiana* densities have not previously been made for the pre- or post-dam era. Therefore, in order to evaluate hypothesis 3, that *N. reclusiana* switched prey *and* its population declined, we used estimates of prey density on the CRE tidal flat and naticid energetic needs to estimate the maximum sizes of *N. reclusiana* populations that could potentially be supported during the pre- and post-dam eras. We restrict prey here to clams, as data on snails are limited. After accounting for breakage of shells in the cheniers, Kowalewski *et al.* [10] estimated densities of large (greater than 12.5 mm) *M. modesta* in excess of 50 individuals m^{-2} in the pre-dam era. By contrast, today, the density of large clams—predominantly *C. fluctifraga* and *M. modesta* [9]—is approximately 3 individuals m^{-2}. Given that the CRE tidal flat is approximately 1.2×10^8 m^2 [10], a density of 50 clams m^{-2} is equivalent to a population of 6.0×10^9 clams. Comparatively, a density of 3 clams m^{-2} amounts to a population of 3.6×10^8 clams (see electronic supplementary material S2 for associated assumptions).

Using estimates of naticid energetic requirements from the literature for a phylogenetically closely related species, *Neverita duplicata*, it is possible to estimate the number of *N. reclusiana* that could be sustained on those prey populations, assuming prey were a limiting resource and that all other variables (e.g. pathogens; predation on *N. reclusiana*) remained constant. Studying the western Atlantic species *N. duplicata*, Edwards & Huebner [31] estimated annual energetic requirements of approximately 385 kJ for a large individual (approx. 39 mm in maximum diameter) or 218 kJ for a small individual (approx. 25 mm in maximum diameter). Using a prey size of 25 mm in shell length—a prey size both 'small' or 'large' naticids could probably consume—we apply an energetic value of 3.09 kJ per individual for *M. modesta* and 3.31 kJ per individual for *C. fluctifraga* (see electronic supplementary material S2 for calculations and conversion factors) to estimate the size of the *N. reclusiana* population that could be supported during the pre-dam era and today.

3. Results and discussion

(a) Predator preference in the Colorado River estuary

Neverita reclusiana exhibited preferences for multiple prey species at each of the three sites in the pre-dam era CRE and those preferences were variable among sites (figure 2). These results (see electronic supplementary material S3, table S1 for species-specific data) were confirmed when considering all species in the analysis regardless of whether they were drilled (electronic supplementary material S3) and only the subset of species shared between sites (electronic supplementary material S4).

At Isla Montague, which had the lowest average salinities due to its northern position near the mouth of the Colorado River [22], nine species were included in the analysis and *M. modesta* was a preferred prey ($\alpha_{M.m.} = 0.205$; probability $\alpha_{M.m.} > \alpha_0 = 0.827$; $\alpha_0 = 0.111$). Additionally, the Bayesian formulation of α values found that *Euplica livinata* ($\alpha_{E.l.} = 0.209$; probability $\alpha_{E.l.} > \alpha_0 = 0.830$) and *Felaniella sericata* ($\alpha_{F.s.} = 0.386$; probability $\alpha_{F.s.} > \alpha_0 = 0.872$) were preferred (figure 2*a*). The probabilities that *M. modesta* had a higher α value than the latter two species were relatively low (probability $\alpha_{M.m.} > \alpha_{E.l.} = 0.477$; probability $\alpha_{M.m.} > \alpha_{F.s.} = 0.302$), supporting the conclusion that alternative prey species were preferred along with *M. modesta*.

Thirteen species were included in the analysis of *N. reclusiana* preference at the middle site, Las Isletas. Several species were preferred ($\alpha_0 = 0.077$)—*Chionopsis gnidia* ($\alpha_{C.g.} = 0.239$; probability $\alpha_{C.g.} > \alpha_0 > 0.999$), *E. limata* ($\alpha_{E.l.} = 0.123$; probability $\alpha_{E.l.} > \alpha_0 = 0.957$), *Lamelliconcha concinnus* ($\alpha_{L.c.} = 0.137$; probability $\alpha_{L.c.} > \alpha_0 = 0.794$) and *Cosmioconcha palmeri* ($\alpha_{C.p.} = 0.106$; probability $\alpha_{C.p.} > \alpha_0 = 0.780$)—however,

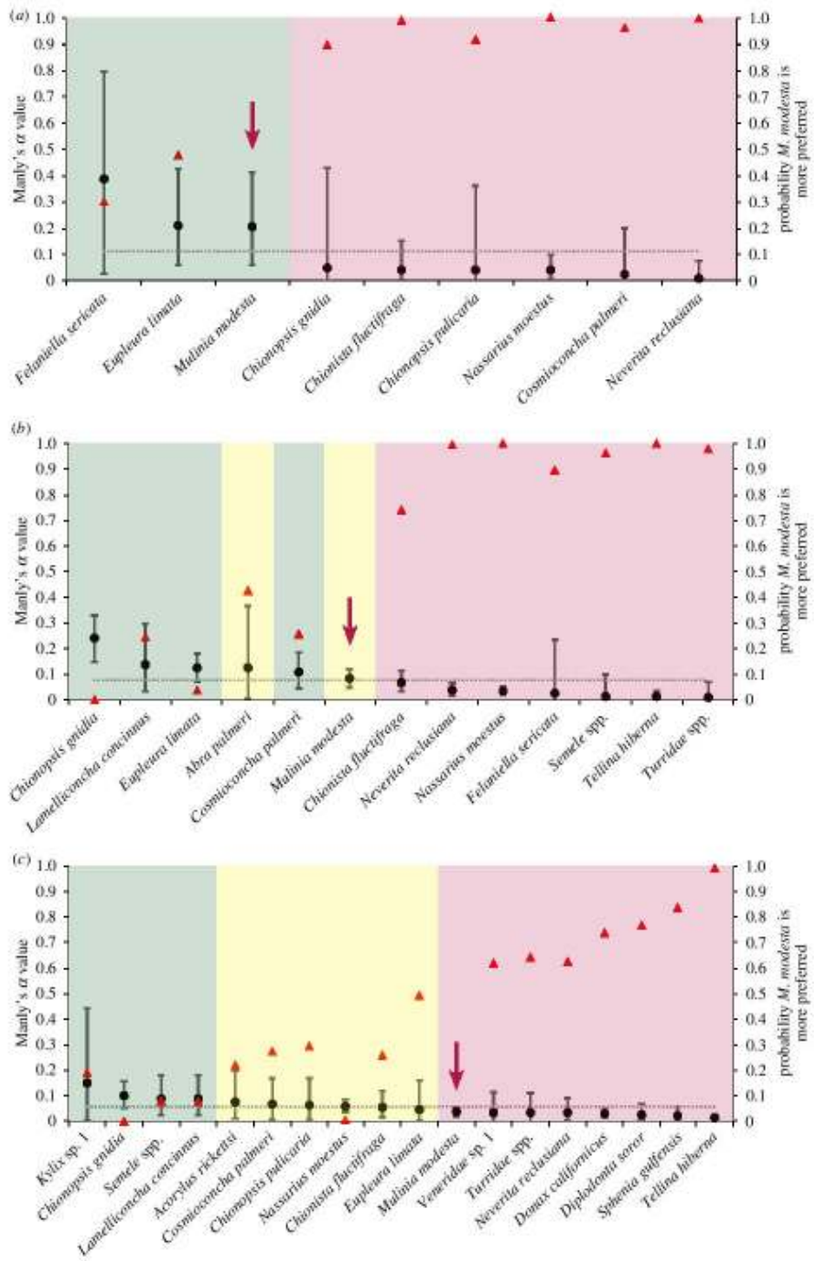

Figure 2. *Neverita reclusiana* preferences (primary axis) for molluscan prey species at (*a*) Isla Montague, (*b*) Las Isletas and (*c*) Campo don Abel, and probabilities that *Mulinia modesta*, indicated by the red arrow in each panel, was more preferred than the other prey species (secondary axis, red triangles). Green shading indicates prey species were likely to be more preferred than predicted by the null condition ($\alpha_i = 1/m$). Yellow shading indicates preference was indistinguishable from the null condition. Red shading indicates prey species were likely to be less preferred than predicted by the null condition. The dashed line in each panel represents the site-specific null α value and the black bars around the estimates of Manly's α give the 95% credibility interval.

M. modesta was not among them ($\alpha_{M.m.} = 0.081$; probability $\alpha_{M.m.} > \alpha_0 = 0.571$; figure 2*b*). Furthermore, all four species were probably more preferred than *M. modesta* by *N. reclusiana*, as probabilities of *M. modesta* having a greater α value were less than 0.001, 0.038, 0.242 and 0.257, respectively. The results from Las Isletas support the second hypothesis that *N. reclusiana* preferred prey species other than *M. modesta*.

Mulinia modesta ($\alpha_{M.m.} = 0.035$; probability $\alpha_{M.m.} > \alpha_0 = 0.017$; $\alpha_0 = 0.056$) was not a preferred prey species of *N. reclusiana* at the southernmost site, Campo don Abel, where salinities during the pre-dam era were approximately normal marine (i.e. 34 psu) during much of the year [22]. Of the remaining 17 prey species, four had α values indicating a greater than 70% probability of being preferred and an additional five species were likely to be preferred over *M. modesta* (figure 2*c*). With respect to the hypothesis being tested here, that *M. modesta* is more preferred than other potential prey species in the community (hypothesis 1), the evidence from these prey species (e.g. *C. gmelin*: $\alpha_{C.g.} = 0.099$, Probability $\alpha_{C.g.} > \alpha_0 = 0.969$, probability $\alpha_{M.m.} > \alpha_{C.g.} < 0.001$; *L. concinnus*: $\alpha_{L.c.} = 0.085$, probability $\alpha_{L.c.} > \alpha_0 = 0.737$, probability $\alpha_{M.m.} > \alpha_{C.g.} = 0.078$) suggests that many other species were preferred over *M. modesta*.

In the pre-dam era CRE, *M. modesta* was one of the only preferred prey species in the north, but was not a preferred prey species at the middle or southern sites (figure 2). The increase in salinity from north to south during the pre-dam era [22] probably explains the observed differences in *N. reclusiana* preference for prey (see electronic supplementary material S4 for discussion and dismissal of alternative explanations of the preference trend).

As described by the estuarine quality paradox [32–34], brackish environments often exclude species because the natural conditions in those environments are physiologically unfavourable [35,36]. Likewise, naticid predation intensity has been shown to decrease as salinities approach brackish conditions (e.g. [37,38]). Accordingly, community-wide drilling frequency and prey species richness in the CRE increased southwards, away from the brackish salinities (figure 3). Drilling frequency on *M. modesta* followed a similar trend but α values for *M. modesta* did not (figure 3). *Mulinia modesta*, like the congeneric Atlantic *M. lateralis* [39], is an opportunistic species that thrives in disturbed habitats, such as the brackish CRE [12], setting it apart from many of the species in the CRE metacommunity that were absent in the north. With the southwardly increasing prey richness and predation intensity, a more complete picture of *N. reclusiana* prey preference presents itself. *Mulinia modesta* was probably preferred in the north due to the scarcity of more highly preferred prey species (i.e. $n < 10$; see electronic supplementary material S3, table S1 [29]). Moving to the southernmost site, *M. modesta* was still abundant in the community (27% [12]), suggesting that it should have been commonly encountered by *N. reclusiana*. Yet, more favourable prey (e.g. more energetically favourable; *sensu* [40]) became available to *N. reclusiana* as the environmental conditions became more amenable to a wider range of prey species. Indeed, the *M. modesta* α value (0.035) indicates that, if all species present in the south were equally abundant, *M. modesta* would only comprise 3.5% of the *N. reclusiana* diet. By contrast, when *N. reclusiana* had fewer species to select from in the north, *M. modesta* would have contributed 20.5% to the *N. reclusiana* diet (figure 3). Based on these results for the preference of *N. reclusiana*, it is likely that this predatory species was able to switch to alternative prey species as the *M. modesta* population declined during the post-dam construction era, supporting hypothesis 2.

(b) Molluscan biomass in the Colorado River estuary

The analysis performed here clearly demonstrates *N. reclusiana* had preferences for a variety of prey species in the pre-dam era and it was probably capable of switching to alternative prey (hypothesis 2). Preference for alternative prey is not, however, sufficient evidence to dismiss the possibility of a concurrent reduction in the *N. reclusiana* population. Using estimates from the literature on clam abundance and energetics (electronic supplementary material S2), we found that a naticid must consume between 66 (all *C. fluctifraga*, small naticid) and 125 (all *M. modesta*, large naticid) prey individuals each year to meet its minimum energetic requirements. Assuming a constant *M. modesta* population (50 individual m^{-2}) and applying these values to the total tidal flat area (1.2×10^8 m^2 [10]) yields a maximum pre-dam era density of 0.40–0.71 naticids m^{-2}, or a standing population of 4.82×10^7–8.51×10^8 individuals. Comparatively, the clam population on the tidal flat today (3 individual m^{-2})—predominantly *C. fluctifraga* and *M. modesta* [9,10]—can only support a maximum density of 0.02–0.05 naticids m^{-2}, or a population of 2.89×10^6–5.47×10^6 naticids. These estimates are only a conservative approximation of the naticid population, as they do not incorporate snail prey species and the parameters used in the calculations were not derived from CRE species. Nonetheless, these estimates demonstrate the potential implications of the decline in clam density in the CRE if prey were a limiting resource. Specifically, it is highly likely that the *N. reclusiana* population has also declined in response to the reduction in clam biomass on the CRE tidal flat, supporting hypothesis 3.

(c) Ecological change in the Colorado River estuary

Our analyses suggest that *N. reclusiana* is very likely to have switched to alternative prey species in the absence of *M. modesta* and its population has probably also declined due to a reduction in biomass of potential clam prey on the CRE tidal flat. With respect to the hypotheses proposed by Cintra-Buenrostro *et al.* [11], it would seem that their third option, 'both effects', has the most support. We have, of course, only evaluated the hypothesis for one of the three groups of predators considered by Cintra-Buenrostro *et al.* [11], with muricid snails and crabs remaining unstudied. The response of the shell-boring *E. limata* is probably most similar to *N. reclusiana* given the mode of predation. The response of other predators—including the shell-grinding muricid, *Hexaplex nigritus*, and shell-crushing or shell-peeling crabs—to the reduction in clam biomass may differ due to differences in predatory behaviours, perhaps with greater effect depending on their prey preferences. As the thick-shelled *C. fluctifraga* has become the most abundant clam in the CRE [9], predatory behaviours that were sufficient for thin-shelled *M. modesta* prey may no longer be effective. Indeed, Smith & Dietl [18] reported the human-induced range expansion of the naticid snail, *Notocochlis chemnitzii*, into the CRE and its novel utilization of edge-drilling behaviour to more efficiently drill thick clam prey at their thinner shell margin rather than through the relatively thick umbonal region. Although none of the species discussed here have

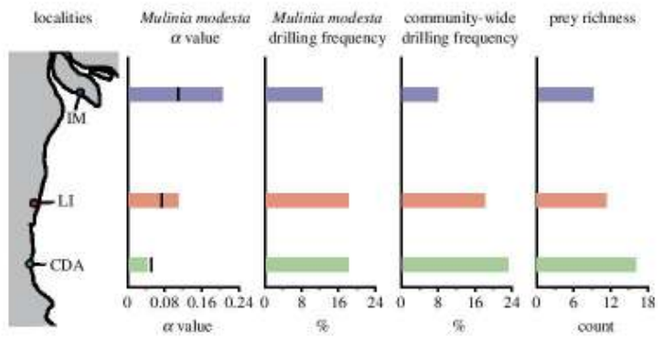

Figure 3. Summary of *Neverita reclusiana* predation on *M. modesta* (α, drilling frequency) compared with community-wide drilling frequency and richness of prey species along north–south salinity gradient in the CRE. Vertical black bars indicate the null condition for α values at each site. (Online version in colour.)

become locally extinct since the pre-dam era, their relative abundances and strengths of interactions in the CRE have undeniably changed. Given the importance of snail and crab predators in the benthos [38,41–44], it is highly likely that the entire food web has been affected.

4. A tangled web of altered estuarine interactions for the world's major river systems

Just as upstream water management decisions along the Colorado River have altered species interactions and food web dynamics in the downstream CRE, there have probably been substantial ecological consequences in the estuaries of other major rivers that have been altered for human use [6]. As with the CRE, pre-impact ecological data were not recorded in most estuaries but are probably attainable through the utilization of the geohistorical data recoverable from molluscan remains [8,9]. Given that estuaries tend to be highly productive ecosystems and are consequently of economic importance [45], understanding shifts in estuarine food web dynamics resulting from past, present and future water management decisions may have profound implications for the people relying on estuarine ecosystems for goods (e.g. shellfisheries for food) and services (e.g. nutrient cycling). If, in the future, society chooses to attempt the restoration of these estuarine ecosystems, or elects to alter them further, species interactions, not just species abundances and distributions, must be considered.

Data accessibility. The datasets supporting this article have been uploaded as part of the electronic supplementary material.

Authors' contributions. J.A.S. collected field data, carried out the sample processing, participated in the conception and design of the study, and drafted the manuscript; J.C.H. carried out the statistical analyses; G.P.D. collected field data; participated in the conception and design of the study, and helped draft the manuscript. All authors gave final approval for publication.

Competing interests. We have no competing interests.

Funding. This work was supported by funding to G.P.D. (National Science Foundation EAR 1420978) and J.A.S. (Cornell University's Atkinson Center for a Sustainable Future; Geological Society of America; Paleontological Society; Sigma Xi).

Acknowledgements. We thank Evan Jones and Neil Adams for their assistance with sample processing, as well as Hector Zamora, Allen Weik, Stephen Durham, David Goodwin and Karl Flessa for their assistance with fieldwork and logistics. We thank Nelson Hairston, Warren Allmon, Vicky Wang and two anonymous reviewers for their helpful comments that improved earlier versions of this manuscript.

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BEFORE THE MADURAI BENCH OF MADRAS HIGH COURT

DATED: **01.04.2019**

CORAM:

THE HONOURABLE MR.JUSTICE N.KIRUBAKARAN
AND
THE HONOURABLE MR.JUSTICE S.S.SUNDAR

W.P(MD)NO.7069 OF 2019

B.Paulraj :Petitioner

.vs.

1.The Principal Secretary,
Public Works Department,
Fort St.George,
Chennai – 600 009.

2.The District Collector,
Office of the District Collector,
Kanyakumari District.

3.The Executive Engineer,
Tamil Nadu Water Supply and Drainage Board,
Nagercoil,
Kanyakumari District.

4.The Assistant Executive Engineer,
WRD/PWD.,
Kotaiyar Basin Sub-Division,
Cheruppaloor,
Kanyakumari District. : Respondents

PRAYER: Writ Petition filed under Article 226 of the Constitution of India, praying this Court to issue a Writ of Mandamus directing the respondents 1 to 4 to take immediate steps to construct a Check Dam in the Parakkani(Irayumanthurai) Area at Vilavancode Taluk in Kanyakumari District to obstruct the sea water intrusion between Mangadu to Thengaipattanam of

Thamiraparani(Kuzhithurai) River based on G.o(3D) No.26, P.W(W. 1) Dept/dated 24..8.2018 issued by the Department of P.W.D, Tamil Nadu within the time frame fixed by this Court.

For Petitioner :Mr.S.Vanchinathan

For Respondents :Mr.A.Muthukaruppan
Addl. Govt.Pleader

ORDER

****

[Order of the Court was made by **S.S.SUNDAR, J.**]

The Petitioner has come forward with this Writ Petition seeking issuance of a Writ of Mandamus directing the respondents 1 to 4 to take immediate steps to construct a Check Dam in the Parakkani(Irayumanthurai) Area at Vilavancode Taluk in Kanyakumari District to obstruct the sea water intrusion between Mangadu to Thengaipattanam of Thamirapareani(Kuzhithurai) River based on G.o(3D) No.26, P.W(W.1) Dept/dated 24..8.2018 issued by the Department of P.W.D, Tamil Nadu within the time frame fixed by this Court.

2.Heard the learned counsel appearing on either side and perused the materials placed before this Court.

3.The Thamiraparani river which flows from Thirparapu-Kuzhithurai-Thengaipattinam, finally ends up in Arabian Sea. It is

stated that from Mangadu to Thengaipattinam, there are seven villages and thousands of families are living on the banks of the river to a stretch of seven kilometers. It is also stated that the said river water is the main source of ground water, agriculture and drinking water, for all the people who are living in that stretch for about seven kilometers.

4.The grievance of the Petitioner is that sea water is mixing with the river water of Tamiraparani and due to intrusion of saline water into the Thamiraparani(Kuzhithurai) river, water is not suitable for drinking or irrigation purpose. It is also stated that increase in salinity in river water is likely to cause other environmental issues and health hazards. It is in these circumstances, the Petitioner has come forward with this Writ Petition for the relief, as stated supra.

5.It is also stated that despite passing of Government Order sanctioning and approving the scheme, construction of check dam has not been commenced.

6.The learned Additional Government Pleader appearing for the respondents, on instructions, submitted that the construction work namely construction of Check Dam in the appropriate place

has been given to a Contractor, after following the tender process. Further, for construction of Check Dam, a sum of Rs.14,58,76,181/- has been approved and sanctioned by the Government. It is further stated that the work is likely to be commenced. It appears that the Contractor had also deposited the security deposit as per the tender conditions. It is further submitted that after appointment of Contractor and execution of contract, the Contractor has commenced the civil work.

7.The learned Additional Government Pleader appearing for the respondents also submitted that the respondents will ensure that the work is executed within the time stipulated in the agreement, without any delay.

8.Having regard to the nature of work undertaken by the respondents, the official respondents shall ensure that the construction of Check Dam is completed before the rainy season, so that there will not be any obstruction of the work and further inconvenience to the public can be prevented.

9.With the above direction, the Writ Petition is closed. No costs.

[N.K.K.,J.] & [S.S.S.R.,J.]
01.04.2019

Index:Yes/No
Internet:Yes/No
vsn

To

1.The Principal Secretary,
Public Works Department,
Fort St.George,
Chennai – 600 009.

2.The District Collector,
Office of the District Collector,
Kanyakumari District.

3.The Executive Engineer,
Tamil Nadu Water Supply and Drainage Board,
Nagercoil,
Kanyakumari District.

4.The Assistant Executive Engineer,
WRD/PWD.,
Kotaiyar Basin Sub-Division,
Cheruppaloor,
Kanyakumari District.

N.KIRUBAKARAN, J.
AND
S.S.SUNDAR, J.

vsn

ORDER MADE IN
W.P(MD)No.7069 of 2019

01.04.2019

रजिस्ट्री सं० डी० एल०—(एन)04/0007/2003—16 REGISTERED NO. DL—(N)04/0007/2003—16

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY
भाग II — खण्ड 1
PART II — Section 1
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं० 18] नई दिल्ली, शनिवार, मार्च 26, 2016/चैत्र 6, 1938 (शक)
No. 18] NEW DELHI, SATURDAY, MARCH 26, 2016/CHAITRA 6, 1938 (SAKA)

इस भाग में भिन्न पृष्ठ संख्या दी जाती है जिससे कि यह अलग संकलन के रूप में रखा जा सके।
Separate paging is given to this Part in order that it may be filed as a separate compilation.

MINISTRY OF LAW AND JUSTICE

(Legislative Department)

New Delhi, the 26th March, 2016/*Chaitra* 6, 1938 (*Saka*)

The following Act of Parliament received the assent of the President on the 25th March, 2016, and is hereby published for general information:—

THE NATIONAL WATERWAYS ACT, 2016

No. 17 OF 2016

[25th *March*, 2016.]

An Act to make provisions for existing national waterways and to provide for the declaration of certain inland waterways to be national waterways and also to provide for the regulation and development of the said waterways for the purposes of shipping and navigation and for matters connected therewith or incidental thereto.

BE it enacted by Parliament in the Sixty-seventh Year of the Republic of India as follows:—

Short title and commencement.

1. *(1)* This Act may be called the National Waterways Act, 2016.

(2) It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint.

Existing national waterways and declaration of certain inland waterways as national waterways.

2. *(1)* The existing national waterways specified at serial numbers 1 to 5 in the Schedule along with their limits given in column (3) thereof, which have been declared as such under the Acts referred to in sub-section (*1*) of section 5, shall, subject to the modifications made under this Act, continue to be national waterways for the purposes of shipping and navigation under this Act.

(2) The regulation and development of the waterways referred to in sub-section (*1*) which have been under the control of the Central Government shall continue, as if the said waterways are declared as national waterways under the provisions of this Act.

(3) The inland waterways specified at serial numbers 6 to 111 in the Schedule along with their limits given in column (3) thereof are hereby declared to be national waterways for the purposes of shipping and navigation.

Declaration as to expediency of control and development by Union of waterways specified in Schedule for certain purposes.

3. Save as provided in sub-sections (*1*) and (*2*) of section 2, it is hereby declared that it is expedient in the public interest that the Union should take under its control the regulation and development of the waterways specified in the Schedule for the purposes of shipping and navigation to the extent provided in the Inland Waterways Authority of India Act, 1985. 82 of 1985.

Amendment of section 2 of Act 82 of 1985.

4. In the Inland Waterways Authority of India Act, 1985, in section 2, for clause (*h*), the following clause shall be substituted, namely:—

'*(h)* "national waterway" means the inland waterway declared by section 2 of the National Waterways Act, 2016, to be a national waterway.

Explanation.— If Parliament declares by law any other waterway to be a national waterway, then, from the date on which such declaration takes effect, such other waterway—

(i) shall also be deemed to be a national waterway within the meaning of this clause; and

(ii) the provisions of this Act shall, with necessary modifications (including modification for construing any reference to the commencement of this Act as a reference to the date aforesaid), apply to such national waterway;'.

Repeal of certain enactments and saving.

5. *(1)* The following Acts, namely:—

(a) the National Waterway (Allahabad-Haldia Stretch of the Ganga Bhagirathi-Hooghly River) Act, 1982; 49 of 1982.

(b) the National Waterway (Sadiya-Dhubri Stretch of Brahmaputra River) Act, 1988; 40 of 1988.

(c) the National Waterway (Kollam-Kottapuram Stretch of West Coast Canal and Champakara and Udyogmandal Canals) Act, 1992; 25 of 1992.

(d) the National Waterway (Talcher-Dhamra Stretch of Rivers, Geonkhali-Charbatia Stretch of East Coast Canal, Charbatia-Dhamra Stretch of Matai River and Mahanadi Delta Rivers) Act, 2008; and 23 of 2008.

(e) the National Waterway (Kakinada-Puducherry Stretch of Canals and the Kaluvelly Tank, Bhadrachalam-Rajahmundry Stretch of River Godavari and Wazirabad-Vijayawada Stretch of River Krishna) Act, 2008, 24 of 2008.

are hereby repealed.

(2) Notwithstanding such repeal, anything done or any action taken under the Acts referred to in sub-section (*1*), in so far as they are in conformity with the provisions of this Act, shall be deemed to have been done or omitted to be done or taken or not taken under the provisions of this Act.

THE SCHEDULE

(See section 2*)*

Sl.No.	National Waterways	Limits of the National Waterways
(1)	(2)	(3)
1.	National Waterway 1	Allahabad-Haldia Stretch of the Ganga—Bhagirathi-Hooghly Rivers with the following limits, namely:— From road bridge at Allahabad across the river Ganga, about 2 kilometres upstream of the confluence of the rivers Ganga and Yamuna at Triveni to the inland waterway limit on the tidal waters of the river Hooghly from a line drawn between No.1 Refuge house at the entrance to Beratola river commonly called channel creek, to a position 2.5 kilometres due south of Saugor lighthouse, and then connected to the right or south bank at the entrance to the Hijili or Russulpore river, through river Ganga, lock canal and feeder canal at Farakka, river Bhagirathi and river Hooghly.
2.	National Waterway 2	Sadiya-Dhubri Stretch of Brahmaputra River with the following limits, namely:— From a line drawn across the Brahmaputra river from the point on the north bank of the Kundil river at its confluence with the Brahmaputra river near Sadiya to the beginning of the river island Majuli and therefrom through all the channels of the Brahmaputra river on either side of the river island Majuli up to the end of the river island Majuli and then up to the international border down stream of Dhubri.
3.	National Waterway 3	Kollam-Kozhikode Stretch of West Coast Canal and Champakara and Udyogmandal Canals with the following limits, namely:— The northern limit of the West Coast Canal shall be Kozhikode at Lat 11°13'39"N, Lon 75°46'44"E and the southern limit shall be a line drawn across the Ashtamudi Kayal at a distance of 100 metres south of Kollam jetty. The Champakara Canal starting from the confluence with the West Coast Canal and ending at the railway bridge (railway siding for Cochin Oil Refinery) near Fertilisers and Chemicals Travancore Limited, boat basin. The Udyogmandal Canal starting from the confluence with West Coast Canal and ending at the Padalam road bridge (Eloor-Edayar).

(1)	(2)	(3)
4.	National Waterway 4	Kakinada-Puducherry Stretch of Canals and the Kaluvelly Tank, Nashik-Bhadrachalam-Rajahmundry Stretch of River Godavari and Bridge near village Galagali-Wazirabad-Vijayawada Stretch of River Krishna with the following limits, namely:— *Kakinada-Puducherry canal* (Canal system consisting of Kakinada canal, Eluru canal, Commamur canal and North Buckingham canal, portion of the Coovum river linking North and South Buckingham canals, South Buckingham canal and Kaluvelly tank) Northern limit: A line drawn across the Kakinada canal parallel to the Jagannadhapuram road bridge, Kakinada at a distance of 500 metres down stream at Lat 16° 56' 24" N, Lon 82° 14'20"E; Southern limit: Junction of East Coast Highway and Chinnakalawari-Kanakachettikulam road at Kanakachettikulam which is the end point of the artificial canal link to Kaluvelly tank at Lat 20° 0' 07" N, Lon 79° 52' 12" E. *River Godavari* Western limit: Road bridge on Mumbai-Agra Highway at Nashik across river Godavari at Lat 20°0' 07" N, Lon 73°48' 12" E; Eastern limit: Sir Arthur Cotton barrage across river Godavari at Dowlaiswaram, Rajahmundry at Lat 16° 56' 05" N, Lon 81° 45' 32" E. *River Krishna* Western limit: Bridge near village Galagali Lat 16° 25' 28" N, Lon 75° 26'19" E. Eastern limit: Prakasam barrage across river Krishna at Vijayawada at Lat 16° 30' 18" N, Lon 80° 36' 23" E.
5.	National Waterway 5	Talcher-Dhamra Stretch of Brahmani-Kharsua-Tantighai-Pandua Nala-Dudhei Nala-Kani Dhamra-river system, Geonkhali-Charbatia Stretch of East Coast Canal, Charbatia-Dhamra Stretch of Matai River and Mahanadi Delta Rivers with the following limits, namely:— *East Coast Canal and Matai river* (Consisting of old Hijli tidal canal, Orissa coast canal and Matai river) Northern limit: Confluence point of Hooghly river and Hijli tidal canal at Geonkhali at Lat 22° 12' 20" N, Lon 88° 03' 07" E; Southern limit: Confluence of Matai river and Dhamra river near Dhamra Fishing harbour at Lat 20° 47' 42" N, Lon 86° 53' 03" E. *Brahmani-Kharsua-Dhamra river system* (Consisting of Brahmani-Kharsua-Tantighai-Pandua Nala-Dudhei Nala-Kani-Dhamra rivers)

(1)	(2)	(3)
		North-Western limit: Samal barrage across river Brahmani, Talcher at Lat 21° 04' 26" N, Lon 86° 08'05" E;
		South-Eastern limit: An imaginary line drawn across Dhamra river at East Point of Kalibhanj Dian Reserved Forest near Chandnipal at Lat 20° 46' 26" N, Lon 86° 57' 15" E.
		Mahanadi delta rivers (Consisting of Hansua river, Atharabanki Creek, Nuna nala, Gobri nala, Kharnasi river and Mahanadi river)
		(Alternate route-Hansua river enters into Bay of Bengal through northern point of False point bay, then enters river Kharnasi at southern end of False point bay, river Atharabanki, a northernly distributory of river Mahanadi)
		Northern limit: Confluence of Kharsua river with Brahmani river at Ramchandrapur at Lat 20° 36' 55"N, Lon 86° 45' 05" E;
		Southern limit: An imaginary line in continuation to the Northern break water structure across the entrance channel at Paradip Port at Lat 20° 15' 38"N, Long 86° 40'55" E.
6.	National Waterway 6	*Aai River:*
		Upstream of Bridge at Adalguri No.3 at Lat 26°33'32"N, Lon 90°34'01"E to confluence with Brahmaputra river at Lat 26°12'50"N, Lon 90°36'24"E (4.7km upstream of Naranarayan Setu at Jogighopa).
7.	National Waterway 7	*Ajoy (Ajay) River:*
		Bridge on Morgram-Panagarh State Highway No. 14 at Illambazar Lat 23°36'56"N, Lon 87°31'58"E to confluence of river Ajoy with river Bhagirathi at Lat 23°39'23"N, Lon 88° 07'57"E at Katwa.
8.	National Waterway 8	*Alappuzha-Changanassery Canal:*
		Boat Jetty, Alappuzha at Lat 9°30'03"N, Lon 76°20'37"E to Changanassery Jetty at Lat 9°26'42"N, Lon 76°31'42"E.
9.	National Waterway 9	*Alappuzha-Kottayam Athirampuzha Canal:*
		Boat Jetty, Alappuzha at Lat 9°30'03"N, Lon 76°20'37"E to Athirampuzha market Lat 9°40'04"N, Lon 76°31'54"E.
10.	National Waterway 10	*Amba River:*
		Arabian Sea, Dharamtaar creed near village Revas at Lat 18°50'15"N, Lon 72°56'31"E to a Bridge near Nagothane ST Stand at Lat 18°32'20"N, Lon 73°08'0"E.
11.	National Waterway 11	*Arunawati Aran River System:*
		Bridge on State Highway No. 211 at Lat 20°13'33"N, Lon 77°33'23"E to confluence of Arunawati and Aran rivers near Ratanapur village at Lat 19°59'31"N, Lon 78°09'38"E to confluence of Aran and Penganga rivers near Chimata village at Lat 19°54'08"N, Lon 78°12'36"E.

(1)	(2)	(3)
12.	National Waterway 12	*Asi River:* Ganga river confluence at Assi Ghat, Varanasi at Lat 25°17'19"N, Lon 83° 0'25"E to near Newada, Varanasi at Lat 25°16'37"N, Lon 82° 58'18"E.
13.	National Waterway 13	*AVM Canal:* Poovar Beach at Lat 8°18'30"N, Lon 77°04'45"E to Erayumanthurai Bus Stop at Lat 8°14'54"N, Lon 77°09'34"E.
14.	National Waterway 14	*Baitarni River:* Dattapur village at Lat 20°51'45"N, Lon 86° 33'30"E to confluence with Dhamra river near Laxmiprasad Dia at Lat 20°45'13'N, Lon 86° 49'15"E.
15.	National Waterway 15	*Bakreswar Mayurakshi River System:* Bakreswar river from Nil Nirjan Dam at Lat 23°49'31"N, Lon 87°24'59"E to confluence of Bakreswar and Mayurakshi rivers near Talgram village at Lat 23° 51'58"N, Lon 88°02'21"E. Mayurakshi river from Talgram village to confluence with Dwarka river near Dakshin Hijal village at Lat 23° 58'22"N, Lon 88°09'21"E.
16.	National Waterway 16	*Barak River:* Lakhipur Ferry Ghat Lat 24°47'18"N, Lon 93°01'16"E to Tuker Gram Lat 24°52'34"N, Lon 92°29'21"E.
17.	National Waterway 17	*Beas River:* Talwara Barrage at Lat 31°57'22"N, Lon 75°53'37"E to confluence of Beas and Sutlej rivers near Harike at Lat 31°09'09"N, Lon 74°58'08"E.
18.	National Waterway 18	*Beki River:* Elenagamari Lat 26°38'37"N, Lon 90°59'02"E to Brahmaputra confluence at Lat 26°14'24"N, Lon 90°47 21"E.
19.	National Waterway 19	*Betwa River:* Ritwa Buzurg Dariya at Lat 25°54'17"N, Lon 79°45'06"E to confluence of Betwa and Yamuna rivers near Merapur Daria village at Lat 25°55'11"N, Lon 80°13'08"E.
20.	National Waterway 20	*Bhavani River:* Bhavani Sagar Dam, Sathyamangalam at Lat 11°28'16"N, Lon 77°06'49"E to confluence of Bhavani and Kaveri rivers at Kaveri river bridge on Salem-Coimbatore Highway: "National Highway-47 Lat 11°25'54"N, Lon 77°41'02"E.
21.	National Waterway 21	*Bheema River:* Barrage (approx 1 km from Hippargi village) at Lat 17°09'05"N, Lon 76°46'34"E to confluence of Bheema and Krishna rivers at Gundloor Lat 16°24'28"N, Lon 77°17'13"E.
22.	National Waterway 22	*Birupa Badi Genguti Brahmani River System:*

(1)	(2)	(3)
		Birupa Barrage at Choudwar at Lat 20°30'49"N, Lon 85°55'20"E to Confluence of Birupa and Brahmani rivers near Upperkai Pada village at Lat 20°37'36"N, Lon 86°24'19"E including alternative route from, Samaspur village Lat 20°35'41"N, Lon 86°06'32"E to near Kharagpur village Lat 20°38' 28"N, Lon 86°17'32"E.
		Bramani river from confluence of Birupa and Brhmani rivers near Upperkai Pada village at Lat 20°37'36"N, Lon 86°24'19"E to Bramani river at Katana Lat 20°39'26"N, Lon 86°44'53"E.
23.	National Waterway 23	*Budha Balanga River:* Barrage (approx 300m from Patalipura village) at Lat 21°38'13"N, Lon 86°50'53"E to confluence of Budha Balanga river with Bay of Bengal at Chandipur Fishing Port Lat 21°28'12"N, Lon 87°04'12"E.
24.	National Waterway 24	*Chambal River:* Chambal road bridge on National Highway-92 Lat 26°41'56"N, Lon 78°56'09"E to confluence of Chambal and Yamuna rivers at Charakpura village Lat 26°29'30"N, Lon 79°15'01"E.
25.	National Waterway 25	*Chapora River:* Bride at State Highway No. 124 (1Km from Maneri village) Lat 15°42'47"N. Lon 73°57'23"E to Confluence of Chapora river with Arabian Sea at Morjim Lat 15°36'33"N, Lon 73°44'01"E.
26.	National Waterway 26	*Chenab River:* Chenab road bridge at Lat 33°05'07"N, Lon 74°48'06"E to Bridge near Bhardakalan at Lat 32°48'12"N, Lon 74°34'53"E.
27.	National Waterway 27	*Cumberjua River:* Confluence of Cumberjua and Zuvari rivers near Cortalim ferry terminal Lat 15°24'40"N, Lon 73°54'48"E to confluence of Cumberjua and Mandovi rivers near Sao Martias Vidhan Parishad Lat 15°31'26"N, Lon 73°55'34"E.
28.	National Waterway 28	*Dabhol Creek Vashishti River:* Arabian Sea at Dabhol Lat 17°34'51"N, Lon 73°09'18"E to bridge at Pedhe Lat 17°32'39"N, Lon 73°30'36"E.
29.	National Waterway 29	*Damodar River:* Krishak Setu, Bardhman on State Highway No. 8 at Lat 23°12'40"N, Lon 87°50'54"E to confluence with Hooghly river near Purbba Basudebpur at Lat 22°21'01"N, Lon 88°05'19"E.
30.	National Waterway 30	*Dehing River:* Rail Bridge at Merbil Majuli No. 1 Lat 27°19'25"N, Lon 95°18'45"E to confluence of Dehing and Brahmaputra rivers near village Lachan at Lat 27°15'10"N, Lon 94°40'01"E.
31.	National Waterway 31	*Dhansiri/Chathe River:* Bridge near Morongi T.E. village Lat 26°24'41"N, Lon 93°53'47"E to Numaligarh Lat 26°42'01"N, Lon 93°35'15"E.

(1)	(2)	(3)
32.	National Waterway 32	*Dikhu River:* Bridge at Nazira on State Highway No 1 Lat 26°55'18"N, Lon 94°44'27"E to confluence of Dikhu and Brahmaputra rivers at Lat 26°59'58"N, Lon 94°27'42"E.
33.	National Waterway 33	*Doyans River:* Bridge near Sialmari Lat 26°10'47"N, Lon 93°59'10"E to confluence of Doyans and Subansiri rivers at Lat 26°26'53"N, Lon 93°57'12"E.
34.	National Waterway 34	*DVC Canal:* Durgapur Barrage Lat 23°28'47"N, Lon 87°18'19"E to Confluence point of DVC canal with Hoogly river near Tribeni Lat 23°0'31"N, Lon 88°24'55"E.
35.	National Waterway 35	*Dwarakeswar River:* Bridge near Abantika Lat 23°06'55"N, Lon 87°18'47"E to confluence of Dwarakeswar and Silai rivers at Pratappur Lat 22°40'17"N, Lon 87°46'43"E.
36.	National Waterway 36	*Dwarka River:* Bridge at Tarapith at Lat 24°06'58"N, Lon 87°47'51"E to confluence with Bhagirathi river near Maugram village at Lat 23°43'53"N, Lon 88°10'51"E.
37.	National Waterway 37	*Gandak River:* Bhaisalotal Barrage near Triveni Ghat at Lat 27°26'22"N, Lon 83°54'24"E to Gandak and Ganga rivers confluence at Hajipur Lat 25 39°18'N, Lon 85°10'28"E.
38.	National Waterway 38	*Gangadhar River:* Pakriguri Bridge on National Highway-31C at Lat 26°27'30"N, Lon 89°51'25"E to Bangladesh Border at Binnachara Point III Lat 26°0'32"N, Lon 89°49'57"E.
39.	National Waterway 39	*Ganol River:* Bangladesh Border at Mankachar Lat 25°31'47"N, Lon 89°51'24"E to bridge near Dolbari at Lat 25°34'20"N, Lon 90°03'46"E.
40.	National Waterway 40	*Ghaghra River:* Faizabad at Lat 26°47'51"N, Lon 82°06'46"E to Ghaghra and Ganga river confluence at Manjhi Ghat Lat 25°44'13"N, Lon 84°42'03"E.
41.	National Waterway 41	*Ghataprabha River:* Barrage near Malali Lat 16°20'01"N, Lon 75°11'23"E to confluence with river Krishna at Chicksangam Lat 16°20'13"N, Lon 75°47'54"E.
42.	National Waterway 42	*Gomti River:* Bara Imambera, Lucknow Lat 26°52'21"N, Lon 80°54'58"E to confluence of Gomti with river Ganga Lat 25°30'31"N, Lon 83°10'17"E.
43.	National Waterway 43	*Gurupur River:* Confluence of Netravathi river at Lat 12°50'44"N, Lon 74°49'45"E to confluence of Mangalore Port Bridge at Lat 12°55'35"N, Lon 74°49'37"E.

(1)	(2)	(3)
44.	National Waterway 44	*Ichamati River:* Bridge on Border Main Road at Gobra near Bangladesh Border at Lat 22°53'50"N, Lon 88°53'49"E to near Bangladesh Border at Bansjhari Mallikpur Lat 22°39'07"N, Lon 88°55'35"E.
45.	National Waterway 45	*Indira Gandhi Canal:* Harike Barrage at Lat 31°08'33"N, Lon 74°56'57"E to near Mohangarh Lat 27°18'37"N, Lon 71°09'10"E.
46.	National Waterway 46	*Indus River:* Bridge on highway at Upshi village Lat 33°49'43"N, Lon 77°48'56"E to Bridge on Shey-Chuchot road near Shey village Lat 34°03'35"N, Lon 77°38'33"E.
47.	National Waterway 47	*Jalangi River:* Bridge on State Highway No. 14 near Plashipara at Lat 23°47'47"N, Lon 88°27'09"E to confluence of Jalangi with Hooghly/Bhagirathi rivers at Nabadwip Lat 23°24'39"N, Lon 88°22'48"E.
48.	National Waterway 48	*Jawai-Luni Rivers and Rann of Kutch:* Jawai river from Jalore at Lat 25°20'37"N, Lon 72°41'09"E to Luni river near Gandhav village to Rann of Kutchh at Lat 23°32'54"N, Lon 68°22'27"E.
49.	National Waterway 49	*Jhelum River:* Bridge on highway at Lat 33°49'26"N, Lon 75°03'50"E to Wuler lake, Srinagar at Lat 34°21'37"N, Lon 74°36'36"E.
50.	National Waterway 50	*Jinjiram River:* Confluence with Brahmaputra river at Tumni Lat 25°51'51"N, Lon 89°58'57"E to Fulerchar Point. III at Brahmaputra river Lat 25°44'15"N, Lon 89°52'53"E.
51.	National Waterway 51	*Kabini River:* Kabini Dam Lat 11°58'25"N, Lon 76°21'10"E to Beerambelli at Lat 11°56'10"N, Lon 76°14'18"E.
52.	National Waterway 52	*Kali River:* Kodasalli Dam Lat 14°55'08"N, Lon 74°32'07"E to confluence of Kali river with Arabian Sea near Sadashivgad bridge at Lat 14°50'31"N, Lon 74°07'21"E.
53.	National Waterway 53	*Kalyan-Thane-Mumbai Waterway, Vasai Creek and Ulhas River:* Arabian Sea at Navi Mumbai Lat 18°55'50"N, Lon 72°53'22"E *via* Ulhas river to bridge on State Highway No. 76 near Malegaon T. Waredi Lat 19°02'38"N, Lon 73°19'54"E; Bridge on Kalyan-Badlapur road near Kalyan railway yard at Kalyan Lat 19°14'06"N, Lon 73°08'49"E to Kalyan Lat 19°15'35"N, Lon 73°09'28"E; Vasai Creek from Lat 19°18'54"N to Lon 72°47'30"E to Kasheli at Lat 19°13'23"N, Lon 73°0'21"E.

(1)	(2)	(3)
54.	National Waterway 54	*Karamnasa River:* Bridge at Kakarait Lat 25°18'11"N, Lon 83°31'38"E to confluence of Karamnasa and Ganga rivers at Kutubpur Lat 25°31'06"N, Lon 83°52'47"E.
55.	National Waterway 55	*Kaveri Kollidam River:* Uratchikottai Barrage at Lat 11°29'03"N, Lon 77°42'14"E to confluence of river Kollidam with Bay of Bengal at Pazhaiyar Lat 11°21'38"N, Lon 79°49'53"E.
56.	National Waterway 56	*Kherkai River:* Dam near Gangia village at Lat 22°45'12"N, Lon 86°05'09"E to confluence with Subarnrekha river at Jamshedpur Lat 22°50'13"N, Lon 86°09'37"E.
57.	National Waterway 57	*Kopili River:* Bridge at Banthai Gaon Tinali Bus Stop at Lat 26°10'41"N, Lon 92°13'05"E to confluence with Brahmaputra river at Chandrapur No. 2 Lat 26°15'07"N, Lon 91°56'49"E.
58.	National Waterway 58	*Kosi River:* Kosi Barrage at Hanuman Nagar Lat 26°31'40"N, Lon 86°55'29"E to Confluence of Kosi with Ganga river at Kursela Lat 25°24'40"N, Lon 87°15'14"E.
59.	National Waterway 59	*Kottayam-Vaikom Canal:* Kottayam, near Kodimatha at Lat 9°34'39"N, Lon 76°31'08"E to Vechoor joining National Waterway No. 3 at Lat 9°40'0"N, Lon 76°24'11"E.
60.	National Waterway 60	*Kumari River:* Dam near Amruhasa village at Lat 23°06'37"N, Lon 86°15'51"E to Mukutmanipur Dam at Chiada Lat 22°57'18"N, Lon 86°44'43"E.
61.	National Waterway 61	*Kynshi River:* Bangladesh Border near Mawpyllum Lat 25°12'07"N, Lon 91°15'21"E to bridge on Nonghyllam-Maweit road at Lat 25°19'35"N, Lon 91°04'07"E.
62.	National Waterway 62	*Lohit River:* Parasuram Kund at 27°52'40"N, Lon 96°21'40"E to Saikhowa Ghat, Sadiya Lat 27°47'49"N, Lon 95°38'14"E.
63.	National Waterway 63	*Luni River:* Dam at Jaswantpura Lat 26°13'35"N, Lon 73°41'20"E to Barrage near Malipura Lat 24°57'04"N, Lon 71°38'02"E.
64.	National Waterway 64	*Mahanadi River:* Sambalpur Barrage at Lat 21°27'34"N, Lon 83°57'50"E to Paradip at Lat 20°19'38"N, Lon 86°40'17"E.
65.	National Waterway 65	*Mahananda River:* Bridge near Gosaipur at Lat 25°26'41"N, Lon 88°05'26"E to Bangladesh Border near Adampur at Lat 24°57'17"N, Lon 88°10'59"E.

(1)	(2)	(3)
78.	National Waterway 78	*Penganga Wardha River System:* Confluence of Aran and Penganga rivers near Chimata village at Lat 19°54'08"N, Lon 78°12'36"E to the confluence of Wardha and Pranahita rivers near Ravalli village at Lat 19°33'59"N, Lon 79°49'0"E.
79.	National Waterway 79	*Pennar River:* Penna Barrage, Pothireddypalem at Lat 14°28'08"N, Lon 79°59'09"E to confluence with Bay of Bengal near Kudithipalem at Lat 14°35'37"N, Lon 80°11'31"E.
80.	National Waterway 80	*Ponniyar River:* Sathanur Dam at Lat 12°11'0"N, Lon 78°51'01"E to Cuddalore at confluence of Bay of Bengal at Lat 11°46'22"N, Lon 79°47'42"E.
81.	National Waterway 81	*Punpun River:* Bridge on National Highway-83 near Pakri village Lat 25°29'50"N, Lon 85°06'19"E to confluence with river Ganga at Fatuha Lat 25°30'50"N, Lon 85°18'17"E.
82.	National Waterway 82	*Puthimari River:* Bridge on National Highway-31 near village Ghopla at Lat 26°22'01"N, Lon 91°39'11"E to confluence with Brahmaputra river near Bamunbori at Lat 26°15'28"N, Lon 91°20'35"E.".
83.	National Waterway 83	*Rajpuri Creek:* Arabian Sea at Rajpuri Lat 18°18'03"N, Lon 72°56'43"E to Mhasala at Lat 18°08'15"N, Lon 73°06'45"E.
84.	National Waterway 84	*Ravi River:* Dam at Gandhiar Lat 32°35'51"N, Lon 75°59'05"E to Ranjeet Sagar Dam at Basoli Lat 32°26'36"N, Lon 75°43'45"E.
85.	National Waterway 85	*Revadanda Creek Kundalika River System:* Arabian Sea at Revadanda Lat 18°32'20"N, Lon 72°55'33"E to bridge on Roha-Astami Road near Roha Nagar Lat 18°26'32"N, Lon 73°07'11"E.
86.	National Waterway 86	*Rupnarayan River:* Confluence of Dwarakeswar and Silai rivers at Pratappur Lat 22°40'17"N, Lon 87°46'43"E to confluence with Hooghly river at Geonkhali Lat 22°12'42"N, Lon 88°03'14"E.
87.	National Waterway 87	*Sabarmati River:* Barrage near Sadoliya Lat 23°26'50"N, Lon 72°48'35"E to confluence with Gulf of Khambhat near Khambhat Lat 22°09'18"N, Lon 72°27'28"E.
88.	National Waterway 88	*Sal River:* Orlim Deusa Bridge Lat 15°13'11"N, Lon 73°57'30"E to confluence with Arabian Sea at Mobor Lat 15°08'32"N, Lon 73°57'0"E.

(1)	(2)	(3)
89.	National Waterway 89	*Savitri River (Bankot Creek):* Bridge near Sape at Lat 18°05'54"N, Lon 73°20'09"E to Arabian Sea at Bankot Lat 17°58'47"N, Lon 73°01'45"E.
90.	National Waterway 90	*Sharavati River:* Honnavar Port Sea Mouth at Lat 14°17'56"N, Lon 74°25'27" E to link at highway at Gersoppa Lat 14°14'15"N, Lon 74°39'06"E.
91.	National Waterway 91	*Shastri River Jaigad Creek:* Sangmeshwar at Lat 17°11'16"N, Lon 73°33'03"E to confluence with Arabian Sea at Jaigad Lat 17°19'12"N, Lon 73°12'39"E.
92.	National Waterway 92	*Silabati River:* Barrage near Shimulia village at Lat 22°34'53" N, Lon 87°38'31"E to confluence of Dwarakeswar and Silai rivers at Pratappur Lat 22°40'17"N, Lon 87°46'43"E.
93.	National Waterway 93	*Simsang River:* Bangladesh Border at Lat 25°11'05"N, Lon 90°39'25"E to bridge on National Highway-62 near Nongalbibra Lat 25°27'20"N, Lon 90°42'22"E.
94.	National Waterway 94	*Sone River:* Sone Barrage near Dehri at Lat 24°50'14" N, Lon 84°08'03"E to confluence of Sone and Ganga rivers at Lat 25°42'15"N, Lon 84°52'02"E.
95.	National Waterway 95	*Subansiri River:* Gerukamukh Lat 27°27'03" N, Lon 94°15'16"E to Brahmaputra confluence at Lat 26°52'25"N, Lon 93°54'31"E.
96.	National Waterway 96	*Subarnrekha River:* Chandil Dam at Lat 22°58'29" N, Lon 86°01'14"E to confluence with Bay of Bengal at Lat 21°33'29"N, Lon 87°22'59"E.
97.	National Waterway 97	*Sunderbans Waterways:* (i) Namkhana at Lat 21°45'46" N, Lon 88°13'06"E to Athara Banki Khal Lat 21°56'57"N, Lon 89°05'32"E; (ii) *Bidya River:* Lot No. 124 at Lat 21°54'43" N, Lon 88°41'08"E to near Uttar Danga at Lat 22°11'48"N, Lon 88°51'55"E; (iii) *Chhota Kalagachi(Chhoto Kalergachi) River:* Near Rajani ferry ghat Lat 22°19'57" N, Lon 88°54'21"E to near Nazat at Lat 22°26'05"N, Lon 88°50'12"E; (iv) *Gomar River:* Near Ramkrishnapur Lat 22°11'53" N, Lon 88°44'42"E to near Gosaba Kheya ghat at Lat 22°10'05"N, Lon 88°47'37"E; (v) *Haribhanga River:* Bangladesh Border Lat 21°53'19" N, Lon 89°01'24"E to confluence with Jhila river at Lat 21°58'18"N, Lon 88°55'08"E;

(1)	(2)	(3)
		(vi) *Hogla(Holgal)-Pathankhali River:* Near Parandar Lat 22°12'22" N, Lon 88°40'43"E to near Sandeshkhai Ferry Ghat at Lat 22°21'12"N, Lon 88°52'48"E;
		(vii) *Kalindi (Kalandi) River:* Bangladesh Border at Hingalganj Lat 22°28'08" N, Lon 88°59'46"E to Bangladesh Border near Khosbash at Lat 22°24'41"N, Lon 88°58'21"E;
		(viii) *Katakhali River:* Bangladesh Border near Barunhat Lat 22°30'31" N, Lon 88°58'25"E to Lebukhali ferry at Lat 22°21'45"N, Lon 88°57'30"E;
		(ix) *Matla River:* Bay of Bengal at Lat 21°33'04" N, Lon 88°38'26"E to Canning ferry ghat at Lat 22°18'39"N, Lon 88°40'43"E;
		(x) *Muri Ganga (Baratala) River:* Bay of Bengal near Bisalakshmipur Lat 21°37'52" N, Lon 88°10'0"E to near Kakdwip at Lat 21°52'17"N, Lon 88°09'08"E;
		(xi) *Raimangal River:* Hemnagar at Lat 22°11'41" N, Lon 88°58'01"E to Rajnagar at Lat 22°33'57"N, Lon 88°56'17"E;
		(xii) *Sahibkhali (Sahebkhali) River:* Near Ramapur Lat 22°17'52" N, Lon 88°56'35"E to Bangladesh Border near Khosbash at Lat 22°24'41"N, Lon 88°58'21"E;
		(xiii) *Saptamukhi River:* Bay of Bengal at Henry Island Lat 21°34'57" N, Lon 88°19'08"E to near Chintamanipur at Lat 21°51'14"N, Lon 88°18'41"E;
		(xiv) *Thakurran River:* Bay of Bengal at Lat 21°33'32" N, Lon 88°27'45"E to Madhabpur at Lat 22°02'52"N, Lon 88°33'28"E;
98.	National Waterway 98	*Sutlej River:* Sunni Road Bridge at Lat 31°14'45" N, Lon 77°07'34"E to Harike Dam at Lat 31°08'33"N, Lon 74°56'57"E.
99.	National Waterway 99	*Tamaraparani River:* Sulochana Mudalir bridge, Tirunelveli Lat 8°43'43" N, Lon 77°42'54"E to confluence with Bay of Bengal near Punnaikayal at Lat 8°38'25"N, Lon 78°07'38"E.
100.	National Waterway 100	*Tapi River:* Hatnur Dam Near Mangalwadi Lat 21°04'22"N, Lon75°56'45"E to Gulf of Khambhat (Arabian Sea) at Lat 21°02'16"N, Lon 72°39'30"E.
101.	National Waterway 101	*Tizu and Zungki Rivers:* Longmatra at Lat 25°46'12"N, Lon 94°44'35"E to Avanghku at Myanmar border Lat 25°35'03"N, Lon 94°53'06"E and in Zungki river from bridge at Lat 25°48'26"N, Lon 94°46'36"E to confluence of Zungki and Tizu rivers at Lat 25°46'58"N, Lon 94°45'21"E.

(1)	(2)	(3)
102.	National Waterway 102	*Tlwang (Dhaleswari River):* Khamrang near National Highway-54 Lat 23°55'22"N, Lon 92°39'08"E to Bridge on National Highway-154 at Ghamura Lat 24°17'19"N, Lon 92°31'0"E.
103.	National Waterway 103	*Tons River:* Bridge on National Highway-27 near Chakghat at Lat 25°02'05"N, Lon 81°43'45"E to Ganga confluence at Sirsa Lat 25°16'32"N, Lon 82°05'0"E.
104.	National Waterway 104	*Tungabhadra River:* Bridge on State Highway No. 29 near Chikka Jantakal village at Lat 15°24'33"N, Lon 76°35'13"E to confluence with river Krishna near village Murva Konda at Lat 15°57'20"N, Lon 78°14'30"E.
105.	National Waterway 105	*Udayavara River:* Arabian Sea Mouth at Malpe Lat 13°20'57"N, Lon 74°41'28"E to Bridge near Manipura Lat 13°17'33"N, Lon 74°46'26"E.
106.	National Waterway 106	*Umngot (Dwaki) River:* Bangladesh Border near Larbamon Lat 25°11'07"N Lon 92°0'54"E to Nongryngkoh at Lat 25°19'05"N, Lon 92°02'20"E.
107.	National Waterway 107	*Vaigai River:* Barrage near Anai Patti at Lat 10°05'19"N, Lon 77°51'10"E to Viragnoor Dam at Lat 9°53'52"N, Lon 78°10'34"E.
108.	National Waterway 108	*Varuna River:* Road bridge near Kuru at Lat 25°23'15"N, Lon 82°44'07"E to Ganga confluence at Saray Mohana, Varanasi Lat 25°19'45"N, Lon 83°02'41"E.
109.	National Waterway 109	*Wainganga Pranahita River System:* Bridge near Chandapur village at Lat 20°0'30"N, Lon 79°47'08"E to confluence of river Godavari at Kaleshwaram Lat 18°49'33"N, Lon 79°54'33"E.
110.	National Waterway 110	*Yamuna River:* Jagatpur (6km upstream of Wazirabad Barrage) Delhi Lat 28°45'28"N, Lon 77°13'50"E to confluence of Yamuna and Ganga rivers at Sangam, Allahabad at Lat 25°25'24"N, Lon 81°53'20"E.
111.	National Waterway 111	*Zuari River:* Sanvordem bridge Lat 15°16'15"N, Lon 74°07'11"E to Marmugao Port Lat 15°25'55"N, Lon 73°48'13"E.

DR. REETA VASISHTA,
Additional Secy. to the Govt. of India.

PRINTED BY THE GENERAL MANAGER, GOVERNMENT OF INDIA PRESS, MINTO ROAD, NEW DELHI AND PUBLISHED BY THE CONTROLLER OF PUBLICATIONS, DELHI—2016.

GMGIPMRND—532SG(S3)—26-03-2016.

BEFORE THE MADURAI BENCH OF MADRAS HIGH COURT

DATED : 29.01.2021

CORAM:

THE HONOURABLE MR.JUSTICE **M.M.SUNDRESH**

AND

THE HONOURABLE MRS.JUSTICE **S.ANANTHI**

W.P.(MD)No.27380 of 2019
and
W.M.P.(MD)Nos.23643, 23645 of 2019 & 4150, 14023 of 2020

A.Sesadimai : Petitioner

Vs.

1.The Union of India,
Rep. by its Secretary,
Ministry of Environment and Forest,
Department of Environment, Forest and Wild Life,
Paryavaran Bhavan,
Jorbag Road, New Delhi.

2.The State of Tamil Nadu,
Rep. by its Principal Secretary,
Public Works Department,
Fort St. George, Chennai.

3.The District Collector,
Kanyakumari District at
Nagercoil.

4.The Director,
Fisheries Department,
Nagercoil.

5.The Joint Director,
Fisheries Department,
Nagercoil.

6.The Executive Engineer,
Public Works Department (WRO),
Planning and Design,
Nagercoil,
Kanyakumari District.

7.The Assistant Executive Engineer,
Public Works Department (WRO),
Planning and Design,
Nagercoil,
Kanyakumari District.

8.The Executive Engineer,
Fishing Harbour Project,
Nagercoil,
Kanyakumari District.

9.The Executive Engineer,
Water Resource Organization,
Public Works Department,
Kothaiyaru Irrigation System,
Nagercoil,
Kanyakumari District.

10.The Assistant Executive Engineer,
Water Resource Organization,
Public Works Department,
Kothaiyaru Irrigation System,
Nagercoil.

11.Punitha Pandian : Respondents

PRAYER: Writ Petition filed under Article 226 of the Constitution of India seeking a Writ of Mandamus directing the 1st respondent to conduct an enquiry regarding the malpractices committed by the 3rd respondent and other erring officials of the 3rd respondent village panchayat and take action against them, by considering the petitioner's representation dated 24.10.2020.

For Petitioner : Ms.J.Anandhavalli

For Respondents : Mr.P.Subbiah,
Central Government Standing Counsel
for R.1

Mr.K.P.Krishnadoss,
Special Government Pleader
for R.2 to R.10

Mr.B.Brijesh Kishore for R.11

*****

ORDER

(Order of the Court was made by **M.M.SUNDRESH, J.)**

When the matter is taken up for hearing, the learned Counsel appearing for the petitioner sought permission of this Court to withdraw the writ petition. She has also submitted a letter dated 20.01.2021, in this regard, to the Registry.

2. In view of the above submission and the letter dated 20.01.2021, this writ petition stands dismissed as withdrawn. No costs. Consequently, connected miscellaneous petitions are closed.

Index : Yes / No
Internet : Yes
gk

[M.M.S.,J.] [S.A.I.,J.]
29.01.2021

Note:

Registry is to issue order copy and upload a copy of the order in the official website, by today (**29.01.2021**) itself.

To

1.The Secretary to Government,
Union of India,
Ministry of Environment and Forest,
Department of Environment, Forest and Wild Life,
Paryavaran Bhavan,
Jorbag Road, New Delhi.

2.The Principal Secretary to Government,
State of Tamil Nadu,
Public Works Department,
Fort St. George, Chennai.

3.The District Collector,
Kanyakumari District at
Nagercoil.

M.M.SUNDRESH, J.

AND

S.ANANTHI, J.

gk

W.P.(MD)No.27380 of 2019

29.01.2021