Submission date. 18/07/2025

Associate editor's decision after peer review (28/09/2025).
Dear Dr. Menezes:
Manuscript ID NI-2025-0130 entitled "Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil's reservoir" which you submitted to the Neotropical Ichthyology, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter.
The reviewer(s) have recommended publication, but also suggest some revisions to your manuscript. Therefore, I invite you to respond to the reviewer(s)' comments and revise your manuscript.
Editor comments
It would be important to emphasise more strongly the importance and novelty of the results found. Gill nets are mentioned as the least invasive from a microenvironment point of view, however, what happens if you consider the damage to the fish, if you are doing work where you may release individuals or are looking for certain individuals or species? Gill nets can prove to be the most invasive as they tend to cause the highest fish mortality. I recommend balancing a bit the concept that it is a non-invasive fishing gear.
To revise your manuscript, log into https://mc04.manuscriptcentral.com/ni-scielo and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.
You may also click the below link to start the revision process (or continue the process if you have already started your revision) for your manuscript. If you use the below link you will not be required to login to ScholarOne Manuscripts.
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https://mc04.manuscriptcentral.com/ni-scielo?URL_MASK=9821f6f1e6ac44e9abea1fe875681dc8
You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using the track changes mode in MS Word or by using bold or colored text. Once the revised manuscript is prepared, upload BOTH versions (the tracked and a clean) and submit them through your Author Center. When submitting your revised manuscript, you will be able to respond to the comments in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please reply POINT TO POINT all the suggestions of the reviewers and be as specific as possible in your response to the comments. IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission. Because we are trying to facilitate timely publication of manuscripts submitted to the Neotropical Ichthyology, your revised manuscript should be submitted before 25-Nov-2025. If it is not possible for you to submit your revision by this date, we may have to consider your paper as a new submission. Once again, thank you for submitting your manuscript to the Neotropical Ichthyology and I look forward to receiving your revision. Sincerely, Dr. Franco Teixeira de Mello
Associate Editor, Neotropical Ichthyology
frantei@fcien.edu.uy

Anonymous reviewer #1
Recommendation. Major Revision
Comments. The comments are broken down by section of the manuscript:
ABSTRACT:
Mentions "capture species richness and diversity." What does it mean by diversity? Richness is an indicator of diversity, so I suggest clarifying this sentence.
In "Although gill nets are
often considered less invasive, this passive method was more selective for larger individuals." Is this true? Gill nets cause high mortality rates (depending on the time of day and whether sampling is done during the day or night). I suggest softening this sentence a bit.
INTRODUCTION

"One advantage of passive traps is that they
cause less interference in the environment" References for this?
"These factors can be natural and/or induced by anthropogenic activities, such as seasonal variations in temperature, water nutrients and oxygen, extreme drought or rainfall events, climate change, eutrophication, variability in resource availability in the environment, interspecific competition, predation, overfishing, and the introduction of exotic species (Agostinho et al.,2004; Latini, Petrere, 2004; Menezes et al., 2015, 2012). " Very long sentence, I suggest breaking it up. MATERIAL AND METHODS "The reservoirs were sampled four times, twice at the end of the dry season and twice at the end of the rainy season, between the years 2018 and 2022, and are located along the watersheds of the upper and middle courses of the Paraíba, Curimataú, and Mamanguape rivers" Specify the dates of each sampling. "Three sampling methods were used to capture fish: (i) one set of manual trawls (one 10 m long trawl with a 20 mm mesh and another 4 meter long with a 5 mm mesh size; both 1.5 m in height); (ii) a set of cast nets (15 mm mesh size); and (iii) two sets of gill nets, each 30 m long and 1.5 m high, with meshes of 20, 40, 50, 60, 100, and 120 mm, respectively. In each reservoir sampled, 2 hauls with the 4 m and 10 m nets and 6 cast net throws were conducted. The hauls and casts were conducted in 3 different littoral zones of each reservoir. The two sets of gillnets were set in the littoral zone (near aquatic macrophyte banks, if present) at approximately 3 m depth. The gillnets were left set for four hours." At what time of day were the nets set? Was a standardization used to later compare methods? For example, CPUE? "We employed generalized linear models (GLMs) to assess the effectiveness of each sampling method" Indicate value of α (0.05?). "For count data, we initially fitted Poisson models and then evaluated overdispersion; in cases where overdispersion was detected, we refitted the models using the quasi-Poisson family to obtain robust standard errors. For normally distributed response variables, we used the Gaussian family with an identity link. These analyses were conducted using the stats package in R, employing the glm function (R Core Team, 2025). Given the count-based nature of the data, the models incorporated Poisson and quasi-Poisson error distributions." Were the distributions of the response variables pre-tested (e.g. using fitdistrplus) or were the models fitted directly? This is not clear. "The categorical predictors included two (Season: rainy and dry) or three levels (Sampling methods: cast, gill and trawl nets) and were modeled as a factor, with one level automatically set as the reference category" No interaction between these explanatory variables was tested? Why were models fitted with only simple effects? "To test whether species composition varied between collection methods and between dry and rainy seasons, we used a permutational multivariate analysis of variance (PERMANOVA) with 1,000 randomizations using Jaccard (for presence-absence data) and Bray-Curtis (for counting and weight data) as the dissimilarity measure (Anderson, 2001)." Indicate value of α (0.05?)

DISCUSSION The discussion remains more methodological (which is correct), but it would be useful to briefly discuss how this can be applied to long-term monitoring or fisheries management. For example, what could you say about recommendations for monitoring programs (frequency, primary method, and complementary methods), how to optimize resources in areas with logistical constraints, and so on.
Anonymous reviewer #2
Recommendation. Minor Revision
Comments. (There are no comments.)

Author's Rebuttal Letter (03/12/2025).
Dear Editor,
We received the reviews of our manuscript, "Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil's reservoirs" (ID NI-2025-0130), and we are very grateful for all the comments, which have undoubtedly improved our work. We appreciate all the suggestions made by the reviewer, and indeed, they have significantly improved our manuscript. We carefully considered all recommendations, accepting almost all the suggested changes directly in the annotated manuscript or providing a justification for those that were not accepted. All modifications are highlighted in the revised version, and we have also submitted a clean version of the manuscript. Below, we provide detailed responses to the reviewer's comments, with the comments shown in black and our replies in blue. We hope that the manuscript will be considered suitable for publication in this journal following this revision. With our compliments, Rosemberg F. de Menezes on behalf of the other co-authors. Dear Dr. Menezes: Manuscript ID NI-2025-0130 entitled "Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil's reservoirs" which you submitted to the Neotropical Ichthyology, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter. The reviewer(s) have recommended publication, but also suggest some revisions to your manuscript. Therefore, I invite you to respond to the reviewer(s)' comments and revise your manuscript. Editor comments It would be important to emphasizse more strongly the importance and novelty of the results found. Gill nets are mentioned as the least invasive from a microenvironment point of view, however, what happens if you consider the damage to the fish, if you are doing work where you may release individuals or are looking for certain individuals or species? Gill nets can prove to be the most invasive as they tend to cause the highest fish mortality. I recommend balancing a bit the concept that it is a non-invasive fishing gear.
Response: Thank you very much for you comment. Indeed, gill nets can be very invasive and we agree with the referees that our statement were too much optimistic concerning the impacts they can cause on fish assemblages in a long-term perspective. We adjusted our text to smooth this point of view. Detailed Responses to Reviewer Entire Scoresheet: Reviewer: 1 Recommendation: Major Revision Responses to reviewer #1 Comments: The comments are broken down by section of the manuscript: ABSTRACT:
Mentions "capture species richness and diversity." What does it mean by diversity? Richness is an indicator of diversity, so I suggest clarifying this sentence.
Response: Thanks for the comment. We decided to remove the word diversity from the abstract since we did not calculate species diversity for this study.
In "Although gill nets are often considered less invasive, this passive method was more selective for larger individuals." Is this true? Gill nets cause high mortality rates (depending on the time of day and whether sampling is done during the day or night). I suggest softening this sentence a bit.
Response: Thanks for the comment. We adjusted the sentence as recommended. Now it reads as: 'Gill nets tended to be more selective for larger individuals.'

INTRODUCTION

"One advantage of passive traps is that they cause less interference in the environment" References for this?

Response: We decided to remove this statement, since we could not find any support from the literature.

"These factors can be natural and/or induced by anthropogenic activities, such as seasonal variations in temperature, water nutrients and oxygen, extreme drought or rainfall events, climate change,eutrophication, variability in resource availability in the environment, interspecific competition, predation, overfishing, and the introduction of exotic species (Agostinho et al.,2004; Latini, Petrere, 2004; Menezes et al., 2015, 2012). " Very long sentence, I suggest breaking it up.

Response: Thanks for the suggestion, we adjusted the text as recommended. Now it reads as: 'These factors can be natural and/or induced by anthropogenic activities. Natural drivers include seasonal variations in temperature, nutrients, and dissolved oxygen; extreme drought or rainfall events; climate change; and variability in resource availability and biological interactions. Anthropogenic drivers include eutrophication, overfishing, and the introduction of exotic species (Agostinho et al., 2004; Latini, Petrere, 2004; Menezes et al., 2015, 2012).

MATERIAL AND METHODS

"The reservoirs were sampled four times, twice at the end of the dry season and twice at the end of the rainy season, between the years 2018 and 2022, and are located along the watersheds of the upper and middle courses of the Paraíba, Curimataú, and Mamanguape rivers" Specify the dates of each sampling.

Response: Thanks for the suggestion we adjusted the text as suggested. Now it reads as: 'The reservoirs were sampled four times: twice at the end of the dry season (February 2019 and January 2020) and twice at the end of the rainy season (May and July of 2018 and May and July of 2022). They are located along the watersheds of the upper and middle courses of the Paraíba, Curimataú, and Mamanguape rivers (Figure 1; Table 1).' "Three sampling methods were used to capture fish: (i) one set of manual trawls (one 10 m long trawl with a 20 mm mesh and another 4 meter long with a 5 mm mesh size; both 1.5 m in height); (ii) a set of cast nets (15 mm mesh size); and (iii) two sets of gill nets, each 30 m long and 1.5 m high, with meshes of 20, 40, 50, 60, 100, and 120 mm, respectively. In each reservoir sampled, 2 hauls with the 4 m and 10 m nets and 6 cast net throws were conducted. The hauls and casts were conducted in 3 different littoral zones of each reservoir. The two sets of gillnets were set in the littoral zone (near aquatic macrophyte banks, if present) at approximately 3 m depth. The gillnets were left set for four hours." At what time of day were the nets set? Was a standardization used to later compare methods? For example, CPUE? Response: The nets were set during the daytime (between 08:00 and 16:00), always respecting the four-hour limit. Since the sampling time and effort used to catch the fish were standardized by using the same number of nets and hauls and the same sampling duration, there was no need to calculate CPUE. We have adjusted the text to make this clear. Now the text reads as: "Three sampling methods were used to capture fish: (i) one set of manual trawls (one 10 m long trawl with a 20 mm mesh and another 4 meter long with a 5 mm mesh size; both 1.5 m in height); (ii) a set of cast nets (15 mm mesh size); and (iii) two sets of gill nets, each 30 m long and 1.5 m high, with meshes of 20, 40, 50, 60, 100, and 120 mm, respectively. In each reservoir, sampling effort was standardized: 2 hauls with the 4 m and 10 m nets and 6 cast net throws were conducted. The hauls and casts were conducted in 3 different littoral zones of each reservoir. The two sets of gillnets were set in the littoral zone (near aquatic macrophyte beds, when present) at approximately 3 m depth Each deployment lasted four hours during the day (08:00–16:00).

Thus, all reservoirs were sampled with the same fishing gear, effort, and exposure

time, irrespective of reservoir size, so that each reservoir was represented by a standardized sample; although this design does not scale effort to area, it ensures that comparisons of fish assemblage structure among reservoirs are not confounded by differences in sampling effort."
"We employed generalized linear models (GLMs) to assess the effectiveness of each sampling method" Indicate value of α (0.05?).
Response: The text has been adjusted as suggested.
"For count data, we initially fitted Poisson models and then evaluated overdispersion; in cases where overdispersion was detected, we refitted the models using the quasi-Poisson family to obtain robust standard errors. For normally distributed response variables, we used the Gaussian family with an identity link. These analyses were conducted using the stats package in R, employing the glm function (R Core Team, 2025). Given the count-based nature of the data, the models incorporated Poisson and quasi-Poisson error distributions." Were the distributions of the response variables pre-tested (e.g. using fitdistrplus) or were the models fitted directly? This is not clear.
Response: Thanks for your comments. For cases in which we are interested in quantifying a discrete variable—that is, a positive variable represented by integers and containing a finite number of possible values—we should use the Poisson distribution. However, our count data (fish richness and abundances) showed clear overdispersion (the variance substantially exceeded the mean), so we used a quasi-Poisson error distribution in the GLM to obtain more reliable standard errors and significance tests, while retaining the log-link structure of the Poisson model.
We have adjusted the text to make this clear. Now the text reads as: " We employed generalized linear models (GLMs) to assess the effectiveness of each sampling method (cast, gill and trawl nets) on richness and fish abundance (based on both individual counts and fresh weight) between and within the seasons. For count data, we initially fitted Poisson models and then evaluated overdispersion; in cases where overdispersion was detected, we refitted the models using the quasi-Poisson family to obtain robust standard errors and significance tests, while retaining the log-link structure of the Poisson model. Overdispersion in Poisson models was evaluated using the ratios of residual deviance and of squared Pearson residuals to the residual degrees of freedom. Ratios substantially greater than 1.5 indicated overdispersion, in which case a quasi-Poisson error distribution was used to obtain more reliable standard errors and significance tests. For normally distributed response variables, we used the Gaussian family with an identity link. The significance level used was 0.05 (5%). These analyses were conducted using the stats package in R, employing the glm function (R Core Team, 2025)."
"The categorical predictors included two (Season: rainy and dry) or three levels (Sampling methods: cast, gill and trawl nets) and were modeled as a factor, with one level automatically set as the reference category" No interaction between these explanatory variables was tested? Why were models fitted with only simple effects?
Response: Thanks for your comments. There was no effect of season when interaction effects were taken into account for richness, total numbers of individuals and total fish weight. We have adjusted the text to make this clear. Now the text reads as: "The categorical predictors included two (Season: rainy and dry) or three levels (Sampling methods: cast, gill and trawl nets) and were modeled as a factor, with one level automatically set as the reference category. No significant interaction effects were detected in the tested models, so interactions were removed and a reduced model with additive effects were used for inference (for models including interaction terms, see Table S1)."
"To test whether species composition varied between collection methods and between dry and rainy seasons, we used a permutational multivariate analysis of variance (PERMANOVA) with 1,000 randomizations using Jaccard (for presence-absence data)

and Bray-Curtis (for counting and weight data) as the dissimilarity measure (Anderson, 2001)." Indicate value of α (0.05?)
Response: Thanks for the suggestion, the text has been adjusted as suggested.
DISCUSSION
The discussion remains more methodological (which is correct), but it would be useful to briefly discuss how this can be applied to long-term monitoring or fisheries management. For example, what could you say about recommendations for monitoring programs (frequency, primary method, and complementary methods), how to optimize resources in areas with logistical constraints, and so on.
Response: Thank you for your valuable comments. We have followed your suggestions and believe that the structure you proposed has greatly improved our manuscript. The discussion has been reorganized, and a new paragraph was added to address the referees' recommendations.
Reviewer: 2
Reviewer Report – Manuscript ID NI-2025-0130 Title: Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil's reservoir
General Comments The manuscript presents a study on the efficiency of different fish sampling methods in reservoirs of the Northeastern semiarid region. This topic is always relevant both to community ecology and to applications in monitoring and fisheries management. The writing is clear, and the methodology is well detailed. The study systematically compares three sampling methods (two active and one passive) across different seasons, providing evidence on efficiency, selectivity, and complementarity. The results are consistent, well analyzed, and supported by up-to-date literature. However, the study does not present something new, and the main conclusion is somewhat obvious: that multiple capture gear are necessary for community structure studies.
Therefore, if the editor decides in favor of publication, only minor revisions are needed (clarity, conciseness, and presentation adjustments).
Response: We respectfully disagree with the assertion that our study does not present anything new and that its main conclusion is simply that multiple capture gears are necessary for community structure studies. While we recognize that the general recommendation to use more than one sampling method is well established in the literature, our work adds novel and regionally relevant evidence and translates it into practical guidance for long-term monitoring and fisheries management.
First, our study is based on a standardized dataset collected in 14 public reservoirs over four sampling campaigns conducted in both dry and rainy seasons. This design generated information that is directly applicable to the management and long-term monitoring of semiarid reservoirs. To our knowledge, there are no published studies that systematically compare fish sampling methods across seasons in reservoirs of Northeastern Brazil. This temporal component is particularly important in tropical semiarid regions, where strong hydrological seasonality can shape fish assemblages and potentially affect the performance of different sampling gears.
Second, the closest study to our approach, Medeiros et al. (2010), compared methods using data from both streams and reservoirs and explicitly did not evaluate seasonal differences due to design limitations. In contrast, our study focuses exclusively on public reservoirs ("açudes") and was designed to test how three common sampling methods perform across dry and rainy seasons. In addition, we used beta-diversity partitioning to investigate whether changes in species composition among methods are driven by species turnover or nestedness. This moves beyond simple comparisons of richness and abundance and provides a more detailed view of how each gear samples the variation in community structure.
Finally, the discussion now explicitly links these results to the design of monitoring programs, including recommendations on the primary method (trawls), the

complementary role of cast and gill nets, and how sampling frequency and gear combinations can be adjusted under different logistical and budgetary scenarios. We believe that this combination of (i) a standardized, regionally focused dataset, (ii) an explicit evaluation of seasonal effects and beta-diversity responses to gear performance, and (iii) direct implications for optimizing long-term monitoring and management offers information that is both novel in this regional context and highly useful for applications in similar semiarid reservoir systems.

Specific Comments

Abstract

The English abstract is clear but could include the total number of species recorded.

The Portuguese version should align terminology with the English one (e.g., “rede de arrasto” vs. “manual trawl net”).

It is suggested to conclude the abstract with a sentence highlighting the practical applicability of the findings in monitoring programs.

Response: The text has been adjusted as suggested.

Introduction

The introduction covers sampling methods well but is excessively long in some sections and includes repetitions.

It is recommended to synthesize the part on techniques not applied in this study (eDNA, explosives, etc.), keeping the focus on the three methods evaluated.

The transition to the objectives could be more straightforward.

Response: Thanks for your comment. The text has been revised as recommended, and we have eliminated redundancies throughout the introduction to improve readability.

Methodology

Provides a detailed description of the study area and procedures.

The statistical analysis section is overly technical; it is recommended to simplify explanations (e.g., briefly clarifying the rationale of PERMANOVA and beta diversity partitioning).

Clarify how sampling effort was standardized across reservoirs (was it proportional to waterbody size?).

Response: Thanks for the comments. The fish sampling was not scaled to reservoir area, and we now acknowledge this limitation of our sampling design. However, all reservoirs were sampled with the same standardized protocol, regardless of their size. The text now reads as: “Three sampling methods were used to capture fish: (i) one set of manual trawls (one 10 m long trawl with a 20 mm mesh and another 4 meter long with a 5 mm mesh size; both 1.5 m in height); (ii) a set of cast nets (15 mm mesh size); and (iii) two sets of gill nets, each 30 m long and 1.5 m high, with meshes of 20, 40, 50, 60, 100, and 120 mm, respectively. In each reservoir, sampling effort was standardized: 2 hauls with the 4 m and 10 m nets and 6 cast net throws were conducted. The hauls and casts were conducted in 3 different littoral zones of each reservoir. The two sets of gillnets were set in the littoral zone (near aquatic macrophyte beds, when present) at approximately 3 m depth Each deployment lasted four hours during the day (08:00–16:00).Thus, all reservoirs were sampled with the same fishing gear, effort, and exposure time, irrespective of reservoir size, so that each reservoir was represented by a standardized sample; although this design does not scale effort to area, it ensures that comparisons of fish assemblage structure among reservoirs are not confounded by differences in sampling effort. ”

A table or flowchart summarizing the methods and analyses would facilitate understanding.

Response: A flow chart was added to the supplementary material.

Results

Results are clear and well supported by visual material (tables/figures).

Some redundancy exists between text and figures, particularly in the description of relative abundances.

Response: Thanks for your comments. Some redundancy between the figures and the text is intentional, as it helps readers interpret the results more easily.
The section on species exclusive to each method could be further emphasized, as it is central to the discussion on complementarity.
Response: Thanks for your comment. We consider that the species exclusively captured to each method were emphasized in the last paragraph of the results.
The presentation of seasonal effects should focus only on significant results.
Response: Thanks for your comment. The text now reads as: “Overall, there was a tendency to capture more species and individuals during the dry season, although this pattern was not reflected in significant seasonal differences when richness, total number of individuals, and total fresh weight were considered across all methods combined (Fig. 3A–C; Tab. 2). Cast nets, however, captured significantly more individuals in the dry season (Fig. 5B; Tab. 2). Seasonal analyses also showed that, in both dry and rainy seasons, trawl nets consistently captured more individuals than the other methods (Fig. 4; Tab. 3), and during the rainy season they also captured more species. Fresh weight tended to be higher with gill nets, but differences among methods were not statistically significant (Figs. 3–4).”
Discussion
A consistent discussion that relates findings to the existing literature.
Some sections repeat results already described. It is suggested to reorganize as follows:
1. Highlight the main findings (method efficiency, seasonal effect).
2. Relate them to the literature.
3. Advance toward practical monitoring recommendations.
The discussion could go further into costs, logistics, and applicability in long-term monitoring programs.
Response: Thanks for your valuable comments. We have followed your suggestions, and we believe that the structure you proposed has greatly improved our manuscript.
Conclusion
Conclusions are aligned with the objectives but currently function more as a summary of the discussion.
It is recommended to make them more concise and impactful, highlighting three central points: (i) the most efficient method, (ii) the importance of combining methods, (iii) the low influence of seasonality.
Response: Thanks for your valuable comments. We have followed your suggestions and have revised the structure of the paper’s conclusions accordingly.
Recommendation: Minor Revision
Comments:(There are no comments.)

Associate editor’s decision after peer review (23/01/2026).
Dear Dr. Menezes:
Manuscript ID NI-2025-0130.R1 entitled "Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil’s reservoirs" which you submitted to the Neotropical Ichthyology, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter.
The reviewer(s) have recommended publication, but also suggest some revisions to your manuscript. Therefore, I invite you to respond to the reviewer(s)' comments and revise your manuscript.
To revise your manuscript, log into https://mc04.manuscriptcentral.com/ni-scielo and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.
You may also click the below link to start the revision process (or continue the process if you have already started your revision) for your manuscript. If you use the below

link you will not be required to login to ScholarOne Manuscripts.
*** PLEASE NOTE: This is a two-step process. After clicking on the link, you will be directed to a webpage to confirm. ***
https://mc04.manuscriptcentral.com/ni-scielo?URL_MASK=9bf4101587514f619972e5b093ae4aba
You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using the track changes mode in MS Word or by using bold or colored text. Once the revised manuscript is prepared, upload BOTH versions (the tracked and a clean) and submit them through your Author Center.
When submitting your revised manuscript, you will be able to respond to the comments in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please reply POINT TO POINT all the suggestions of the reviewers and be as specific as possible in your response to the comments.
IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.
Because we are trying to facilitate timely publication of manuscripts submitted to the Neotropical Ichthyology, your revised manuscript should be submitted before 25-Mar-2026. If it is not possible for you to submit your revision by this date, we may have to consider your paper as a new submission.
Once again, thank you for submitting your manuscript to the Neotropical Ichthyology and I look forward to receiving your revision.
Sincerely,
Dr. Franco Teixeira de Mello
Associate Editor, Neotropical Ichthyology
frantei@fcien.edu.uy

Anonymous reviewer #1
Recommendation. Accept
Comments. (There are no comments.)

Anonymous reviewer #2
Recommendation. Major Revision
Comments.
Dear authors
First, I would like to congratulate the authors for carry out this work, which is highly necessary for the proper sampling of fish in the complex and threatened systems of the Neotropical region. In this sense, the manuscript “Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil’s reservoirs” represent a well-conceived and competently executed study that evaluates the efficacy of three common fishing gears (manual trawl, cast net, gill net) for assessing fish communities in 14 semi-arid reservoirs of Northeastern Brazil. The manuscript is generally well-written, the statistical analyses are appropriate and clearly described, and the findings are relevant for researchers and monitoring programmes working in similar lentic systems. The core conclusion is robust and well-supported by the data. Before publication, some revisions are required to enhance clarity, methodological transparency, interpretive depth, and graphical presentation.
Abstract
The phrase "cost-effective assessments" is slightly vague. Consider rephrasing to something like "to obtain more accurate and comprehensive assessments, while optimizing logistical and financial effort.

Introduction
The introduction effectively establishes the research problem and its implications. However, it somewhat neglects the background concerning the methods and techniques employed for ichthyofaunal surveys in environments analogous to those examined in the present study. It is recommended that this topic be briefly developed within the introduction to prevent its abrupt appearance in the objectives paragraph. Furthermore, this aggregate could be strengthened by briefly acknowledging the relevance and limitations of other contemporary techniques mentioned (electrofishing, eDNA metabarcoding) specifically for Neotropical reservoir systems.
Page 4, Line 6 to 10: it would be interesting to provide examples of how these variables affect ichthyofaunal composition
Page 4, Line 10 to 13: the term 'eutrophication' can be replaced with 'water pollution' to generalise the concept, and that 'habitat fragmentation' can be added to the list of anthropogenic pressures. Furthermore, it would be beneficial to briefly explain how these forces modulate fish assemblages. For instance, stating that these factors act as environmental filters, selectively removing sensitive species while favouring more tolerant ones, thereby altering species richness and restructuring the community in terms of relative abundances.
Page 4, Line 14 to 18: You could develop the changes in fish assemblages associated with seasonal variations.
Page 3, Line 25: please check repeated comma
Page 3, Line 51: please change “this method” by “active methods”
Page 3, Line 53: please check the spaces along the entire MS
Page 3, Line 56: research objectives?
Page 4, Line 4: the sentence “These factors can be natural and/or induced by anthropogenic activities” can be removed.
Material and methods
The subsection is titled "Sampling sites," but its content describes the broader study area rather than the specific reservoirs examined. The title should therefore be amended to "Study Area" or similar. Furthermore, this section seems currently excessively long and descriptive. It would be pertinent to condense it, retaining only the essential geographical context and system dynamics relevant to the study, as much of the information provided does not underpin subsequent aspects of the discussion. Given that the efficiency of fishing gears is inherently dependent on the specific characteristics of the study system (as mentioned in the introduction), it could be beneficial to include photographs of the studied systems in Figure 1 (Study Area). This visual context would enhance the reader's understanding of the physical environment that influences the sampling methodology. Although the characteristics of the gear used are detailed, it would be beneficial for the interpretation and methodological reproducibility of the study to include photographs or images of the evaluated fishing gears (maybe as Supplementary material) Consider moving Table 1 to the Supplementary Material. Results Page 7, Line 52 to 60: The value of 'S' in parentheses is ambiguous. While it likely stands for 'Specimens', this usage can cause confusion, as 'S' is the standard ecological symbol for 'Species Richness'. To avoid misinterpretation, please check its meaning throughout the manuscript and use an unambiguous notation Page 7, Line 22: please remove “, p. 200” In Figures 3 and 4, statistically significant differences are denoted with asterisks. This convention is not maintained in Figure 5. To ensure graphical consistency and clarity across the manuscript, please apply the same notation to Figure 5. The green and blue colours in Figure 6 are difficult to distinguish. Please improve this aspect to ensure clarity. Consider using distinct colours to differentiate between dry/rainy seasons and the fishing gears. Maintain this consistency across all figures. For instance, Figure 3 currently mixes colour assignments. In response to the previous comment, please also select high-

contrast colours to ensure the figures are easily interpretable. The stress value associated with the two-dimensional representation of abundance and biomass nestedness appears to be somewhat high in the NMDS ordination. It is recommended to include a brief commentary on this. The presentation of significance levels for the GLM and PERMANOVA results is inconsistent, with some denoted by asterisks and others by explicit p-values. Please unify the notation across all results for clarity and standardisation. Discussion One of the key findings is the presence of invasive exotic fish species, such as Oreochromis niloticus, which exhibited high frequency, abundance, and biomass across all evaluated fishing gears. Given that the introduction identifies invasive species as a significant anthropogenic driver of changes in fish assemblage composition, it would be pertinent to include a paragraph in the discussion explicitly addressing these findings. This section should explore the ecological implications of such a dominant invasive population, its potential impacts on native species and ecosystem functioning, and how this evidence reinforces the role of biological invasions as a critical factor shaping the studied reservoirs. While the introduction notes several established fishing methods, contemporary freshwater fish ecology in the Neotropics increasingly employs techniques such as electrofishing and DNA metabarcoding. It would be valuable to briefly address these in the discussion. A short paragraph could acknowledge the practical or logistical limitations of applying such methods within the specific reservoir systems studied. Following this, it would be pertinent to offer a forward-looking perspective on how these complementary techniques could be integrated into future biomonitoring programmes to enhance data resolution, detect cryptic species, or improve non-invasive assessment.

Author's Rebuttal Letter (28/02/2026).
Dear Editor,
We received the reviews of our manuscript, "Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil's reservoirs" (ID NI-2025-0130), and we are very grateful for all the comments, which have undoubtedly improved our work. We appreciate all the suggestions made by the reviewers, and indeed, they have significantly improved our manuscript. We carefully considered all recommendations, accepting almost all the suggested changes directly in the annotated manuscript or providing a justification for those that were not accepted. All modifications are highlighted in the revised version, and we have also submitted a clean version of the manuscript. Below, we provide detailed responses to the reviewer's comments, with the comments shown in black and our replies in blue. We hope that the manuscript will be considered suitable for publication in this journal following this revision. With our compliments, Rosemberg F. de Menezes on behalf of the other co-authors. Dear Dr. Menezes: Manuscript ID NI-2025-0130.R1 entitled "Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil's reservoirs" which you submitted to the Neotropical Ichthyology, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter. The reviewer(s) have recommended publication, but also suggest some revisions to your manuscript. Therefore, I invite you to respond to the reviewer(s)' comments and revise your manuscript. To revise your manuscript, log into https://mc04.manuscriptcentral.com/ni-scielo and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision. You may also click the below link to start the revision process (or continue the process if you have already started your revision) for your manuscript. If you use the below link you will not be required to login to ScholarOne Manuscripts. *** PLEASE NOTE: This is a two-step process. After clicking on the link, you will be directed to a webpage to confirm. ***

https://mc04.manuscriptcentral.com/ni-scielo?URL_MASK=9bf4101587514f619972e5b093ae4aba
You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document by using the track changes mode in MS Word or by using bold or colored text. Once the revised manuscript is prepared, upload BOTH versions (the tracked and a clean) and submit them through your Author Center. When submitting your revised manuscript, you will be able to respond to the comments in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please reply POINT TO POINT all the suggestions of the reviewers and be as specific as possible in your response to the comments. IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission. Because we are trying to facilitate timely publication of manuscripts submitted to the Neotropical Ichthyology, your revised manuscript should be submitted before 25-Mar-2026. If it is not possible for you to submit your revision by this date, we may have to consider your paper as a new submission. Once again, thank you for submitting your manuscript to the Neotropical Ichthyology and I look forward to receiving your revision. Sincerely, Dr. Franco Teixeira de Mello
Associate Editor, Neotropical Ichthyology
frantei@fcien.edu.uy
Entire Scoresheet:
Reviewer: 1
Recommendation: Accept
Comments:
(There are no comments.)
Reviewer: 2
Recommendation: Major Revision
Comments:
Dear authors
First, I would like to congratulate the authors for carry out this work, which is highly necessary for the proper sampling of fish in the complex and threatened systems of the Neotropical region. In this sense, the manuscript “Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil’s reservoirs” represent a well-conceived and competently executed study that evaluates the efficacy of three common fishing gears (manual trawl, cast net, gill net) for assessing fish communities in 14 semi-arid reservoirs of Northeastern Brazil. The manuscript is generally well-written, the statistical analyses are appropriate and clearly described, and the findings are relevant for researchers and monitoring programmes working in similar lentic systems. The core conclusion is robust and well-supported by the data. Before publication, some revisions are required to enhance clarity, methodological transparency, interpretive depth, and graphical presentation. Response: Thank you for your positive comments. We have revised the manuscript as thoroughly as possible to address the reviewer’s suggestions, and we acknowledge that most of them have substantially improved the quality of our work. We carefully considered all recommendations, incorporating the suggested changes directly into the revised manuscript or providing justification for those that were not adopted.
Abstract
The phrase "cost-effective assessments" is slightly vague. Consider rephrasing to something like "to obtain more accurate and comprehensive assessments, while optimizing logistical and financial effort.

PEER REVIEW FILE

Response: Thank you for the suggestion. The text has been revised as recommended.
Introduction
The introduction effectively establishes the research problem and its implications. However, it somewhat neglects the background concerning the methods and techniques employed for ichthyofaunal surveys in environments analogous to those examined in the present study. It is recommended that this topic be briefly developed within the introduction to prevent its abrupt appearance in the objectives paragraph. Furthermore, this aggregate could be strengthened by briefly acknowledging the relevance and limitations of other contemporary techniques mentioned (electrofishing, eDNA metabarcoding) specifically for Neotropical reservoir systems. Response: Thank you for the suggestion. The text has been revised as recommended. Page 4, Line 6 to 10: it would be interesting to provide examples of how these variables affect ichthyofaunal composition Response: Thanks for your comment. The text now reads as: “These environmental and anthropogenic drivers act as environmental filters that regulate fish community structure by selectively excluding species with narrow physiological tolerances while favoring more tolerant and opportunistic taxa (Jeppesen et al. 2000). In reservoirs and regulated systems, changes in oxygen availability, temperature, and nutrient concentrations often reduce habitat suitability for sensitive species, resulting in declines in species richness and shifts in relative abundance patterns toward tolerant generalists (Jeppesen et al. 2000; Menezes et al. 2015). Consequently, these processes alter community composition, functional structure, and ecological interactions, ultimately reshaping fish assemblages across environmental gradients. In tropical freshwater ecosystems, seasonal hydrological fluctuations strongly influence fish assemblages by altering habitat availability, resource distribution, and environmental conditions (Duarte et al. 2022; Orsi et al. 2018). Periods of increased water levels expand habitat connectivity, enabling dispersal among lentic and lotic systems and access to feeding and spawning areas, which can enhance species richness and facilitate coexistence (Kong et al. 2016). Conversely, low-water periods restrict habitats, concentrate individuals, and intensify biotic interactions, often resulting in shifts in dominance and relative abundance (Röpke et al. 2016). Seasonal dynamics also regulate migration, growth, and reproductive cycles, leading to predictable temporal restructuring of assemblages (Cox-Fernandes 1997). Consequently, Neotropical fish communities frequently exhibit marked seasonal changes driven by hydrological variability. “ Page 4, Line 10 to 13: the term 'eutrophication' can be replaced with 'water pollution' to generalise the concept, and that 'habitat fragmentation' can be added to the list of anthropogenic pressures. Furthermore, it would be beneficial to briefly explain how these forces modulate fish assemblages. For instance, stating that these factors act as environmental filters, selectively removing sensitive species while favouring more tolerant ones, thereby altering species richness and restructuring the community in terms of relative abundances.
Response: Thank you for your comment. The text has been revised accordingly. Please refer to our response to the previous comment.
Page 4, Line 14 to 18: You could develop the changes in fish assemblages associated with seasonal variations.
Response: Thank you for your comment. The text has been revised accordingly. Please refer to our response to the previous comment.
Page 3, Line 25: please check repeated comma
Response: The text has been revised accordingly.
Page 3, Line 51: please change “this method” by “active methods”
Response: The text has been revised accordingly.
Page 3, Line 53: please check the spaces along the entire MS
Response: The text has been revised accordingly.

Page 3, Line 56: research objectives?
Response: The text has been revised accordingly.
Page 4, Line 4: the sentence “These factors can be natural and/or induced by anthropogenic activities” can be removed.
Response: The text has been removed.
Material and methods
The subsection is titled "Sampling sites," but its content describes the broader study area rather than the specific reservoirs examined. The title should therefore be amended to "Study Area" or similar. Furthermore, this section seems currently excessively long and descriptive. It would be pertinent to condense it, retaining only the essential geographical context and system dynamics relevant to the study, as much of the information provided does not underpin subsequent aspects of the discussion.
Response: Thank you for your comment. The text has been revised accordingly.
Given that the efficiency of fishing gears is inherently dependent on the specific characteristics of the study system (as mentioned in the introduction), it could be beneficial to include photographs of the studied systems in Figure 1 (Study Area). This visual context would enhance the reader's understanding of the physical environment that influences the sampling methodology.
Response: Thank you for this suggestion. Figure 1 was modified as suggested.
Although the characteristics of the gear used are detailed, it would be beneficial for the interpretation and methodological reproducibility of the study to include photographs or images of the evaluated fishing gears (maybe as Supplementary material)
Response: Thank you for your suggestion, We have added to the supplementary material (Figure S1) a new figure with images of the evaluated fishing gears.
Consider moving Table 1 to the Supplementary Material.
Response: Thank you for this suggestion. However, we decided to keep Table 1 in the main text to provide readers with a clear overview of the sampling sites and study area, as the reservoirs in this region are not well studied. We have, however, added photographs of the fishing gears to the supplementary material.
Results
Page 7, Line 52 to 60: The value of 'S' in parentheses is ambiguous. While it likely stands for 'Specimens', this usage can cause confusion, as 'S' is the standard ecological symbol for 'Species Richness'. To avoid misinterpretation, please check its meaning throughout the manuscript and use an unambiguous notation
Response: Thank you for this suggestion. The text has been revised accordingly. We replaced the letter ‘S’ by the letter ‘N’ to avoid misinterpretation.
Page 7, Line 22: please remove “, p. 200”
Response: The text has been revised accordingly.
In Figures 3 and 4, statistically significant differences are denoted with asterisks. This convention is not maintained in Figure 5. To ensure graphical consistency and clarity across the manuscript, please apply the same notation to Figure 5.
The green and blue colours in Figure 6 are difficult to distinguish. Please improve this aspect to ensure clarity.
Response: Thank you for this suggestion. Figure 5 was revised accordingly.
Consider using distinct colours to differentiate between dry/rainy seasons and the fishing gears. Maintain this consistency across all figures. For instance, Figure 3 currently mixes colour assignments. In response to the previous comment, please also select high-contrast colours to ensure the figures are easily interpretable.
Response: Thank you for the suggestion. We decided to keep the same format, as there was no seasonal effect on fish composition. However, we have changed the colours to improve contrast among the levels used in the NMDS.
The colours used in all the figures were selected from the Okabe–Ito palette because it is specifically designed to ensure accessibility and accurate interpretation for

individuals with colour vision deficiencies, including deuteranopia and protanopia. This palette maximizes perceptual contrast by combining differences in hue, luminance, and chromatic intensity, allowing clear discrimination among groups and reducing ambiguity in graphical elements such as boxplots and ordination plots. Additionally, these colours remain distinguishable when printed in grayscale or viewed under different display conditions, ensuring accessibility in both digital and print formats. The selected colours (#0072B2, #E69F00, #009E73, #D55E00, and #CC79A7) improve figure readability, interpretability, and inclusivity, and their use represents best practice in scientific visualization.

References:

Okabe, M., & Ito, K. (2008). Colour Universal Design (CUD): How to make figures and presentations that are friendly to colourblind people. Link: https://jfly.uni-koeln.de/color/

Wong, B. (2011). Points of view: Colour blindness. Nature Publishing Group Methods, 8, 441.

The stress value associated with the two-dimensional representation of abundance and biomass nestedness appears to be somewhat high in the NMDS ordination. It is recommended to include a brief commentary on this.

Response: Thank you for your comment. However, the high stress values observed in our NMDS also indicate the non-significance of the PERMANOVAs.

The presentation of significance levels for the GLM and PERMANOVA results is inconsistent, with some denoted by asterisks and others by explicit p-values. Please unify the notation across all results for clarity and standardisation.

Response: Thank you for your comment. The text has been revised accordingly.

Discussion

One of the key findings is the presence of invasive exotic fish species, such as Oreochromis niloticus, which exhibited high frequency, abundance, and biomass across all evaluated fishing gears. Given that the introduction identifies invasive species as a significant anthropogenic driver of changes in fish assemblage composition, it would be pertinent to include a paragraph in the discussion explicitly addressing these findings. This section should explore the ecological implications of such a dominant invasive population, its potential impacts on native species and ecosystem functioning, and how this evidence reinforces the role of biological invasions as a critical factor shaping the studied reservoirs.

Response: Thank you for your thoughtful comment. We agree that the dominance of Nile tilapia (Oreochromis niloticus) in lakes and reservoirs is an important ecological issue, as many reservoirs in Northeastern Brazil—both public and private—have historically received exotic species (a well-documented phenomenon in the region; see references below). This represents a significant environmental concern, particularly because these species can spread into perennial and intermittent rivers and potentially impact native communities. Nevertheless, we believe that a detailed discussion of biological invasions and their broader ecological implications falls beyond the primary focus of our manuscript. Therefore, we have maintained the discussion in its current form, while adding a brief statement in the second paragraph of the Discussion to emphasize that O. niloticus was the dominant species regardless of the sampling method used in our study.

Attayde, J. L., J. Brasil, & R. A. Menescal, 2011. Impacts of introducing Nile tilapia on the fisheries of a tropicalreservoir in North-eastern Brazil. Fisheries Managementand Ecology 18 (6) 437-443.

Lazzaro et al. 2003. Do fish regulate phytoplankton in shallow eutrophic Northeast Brazilian reservoirs? Freshwater Biology, 48, 649-668.

While the introduction notes several established fishing methods, contemporary freshwater fish ecology in the Neotropics increasingly employs techniques such as

electrofishing and DNA metabarcoding. It would be valuable to briefly address these in the discussion. A short paragraph could acknowledge the practical or logistical limitations of applying such methods within the specific reservoir systems studied. Following this, it would be pertinent to offer a forward-looking perspective on how these complementary techniques could be integrated into future biomonitoring programmes to enhance data resolution, detect cryptic species, or improve non-invasive assessment.
Response: Thank you for your suggestion. We have added a new paragraph to the Discussion to briefly address this recommendation. The text added is as follows:
"In addition to traditional sampling gears, contemporary freshwater fish ecology in the Neotropics increasingly employs methods such as electrofishing (Junqueira et al. 2020) and DNA metabarcoding (Milan et al. 2020), which can provide higher taxonomic resolution and allow detection of cryptic or rare species. However, in semiarid reservoirs, practical and logistical constraints—such as shallow water areas, limited accessibility, and intermittent hydrology—can restrict the applicability of these approaches. Nonetheless, these complementary techniques hold great potential for future monitoring programs, either as targeted surveys in specific habitats or as non-invasive tools to enhance long-term datasets. Integrating electrofishing and environmental DNA approaches alongside conventional nets could improve detection of elusive species, refine community assessments, and ultimately support more informed management and conservation decisions."

Associate editor's decision after peer review (22/03/2026).
Dear Dr. Menezes:
It is a pleasure to accept your manuscript entitled "Evaluating sampling methods for fish diversity and composition across seasons in Northeastern Brazil's reservoirs" in its current form for publication in the Neotropical Ichthyology.
Congratulations for the acceptance of your article, and be aware on the following topics:
1. Publication Fee
NI will charge a publication fee if none of the co-authors is an active SBI member. This measure is essential to strengthen SBI and thus ensure the continuity of our journal, scientific society, and biannual meetings. SBI is not limited to Brazilians but is open to anyone interested in freshwater and marine Neotropical fishes. More details on SBI are available at https://www.sbi.bio.br/. Please email tesouraria.sbi@gmail.com to confirm whether any of your co-authors is a current SBI member and to activate your SBI membership if needed. Otherwise, if you will cover the publication fee of R$1.000, please inform us at the same email. For authors outside Brazil, the fee will be converted to US dollars based on the official exchange rate on the date of payment. The only exceptions to this fee are invited articles.
2. Science Communication and Social Media NI actively promotes published articles to both academic colleagues and the general public, including science journalists. To support this, we create social media posts and require images and/or videos of fish related to your work. If your article does not include such images, please send a photo of a representative fish species, preferably alive in its natural habitat. If you do not have your own photo, you may provide a link to an online image, along with the source, author, and, if applicable, authorization for its use. We also publish video summaries of articles in Portuguese on our Instagram (@neoichth). We ask you to designate one author to record a short video using a mobile phone, following the attached instructions. The video should include visual materials (photos, graphics) and a script for subtitles to enhance accessibility. Please email the completed material to our Social Media Editor, Igor Souto-Santos, at icass.ufrj@gmail.com within 30 days.
Additionally, if your article is taxonomic in nature and has been submitted to

Zoobank, it is your responsibility to update the manuscript's status on Zoobank once it has been published.
All of the above information and materials are mandatory for the publication of your article, including the scientific dissemination component, which is crucial in the current climate of science denial and misinformation. If you have any questions, please feel free to contact us at neoichth@nupelia.uem.br.
Please send an e-mail to neoichth@nupelia.uem.br within five working days to let us know you are aware of all the important points mentioned above.
Thank you for your fine contribution. On behalf of the Editors of the Neotropical Ichthyology, we look forward to your continued contributions to the Journal.
Sincerely,
Dr. Franco Teixeira de Mello
Associate Editor, Neotropical Ichthyology
frantei@fcien.edu.uy

Neotropical Ichthyology

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SBI Official Journal of the Sociedade Brasileira de Ictiologia