Response overview

In response to the reviewers' comments, we substantially revised the manuscript by (1) clearly separating the Results and Discussion sections, (2) refining the research scope and title to emphasize a case study evaluating the practicality of high-temporal-resolution Sentinel-2 NDVI within a management-oriented framework, (3) expanding the discussion of bio-hydromorphological theory and broader applicability, and (4) improving figures, captions, and data accessibility.
Below, we address each comment in detail and indicate where revisions were made in the manuscript. Reviewer comments are shown in black, while our responses and corresponding manuscript changes are shown in blue, with revised locations specified by page and line numbers.

Revisions in the manuscript are highlighted in yellow. For partial revisions within an existing section, only the modified text is highlighted. For newly added sections (primarily in the Discussion), only the section headings are highlighted.

Common comment from Reviewer 1 and Reviewer 2: Separation of Results and Discussion

We thank both reviewers for their careful and constructive comments. In response, the Results and Discussion sections have been fully separated and restructured to clearly distinguish empirical findings from their interpretation and broader implications. The revised manuscript is organized as follows:

3. Results (p. 8, L206)
3.1 Spatial-temporal greenness ratio from 2015 to 2024 (p. 8, L207)
3.2 The annual maximum greenness ratio and NDVI along the channel-lateral transect (p. 10, L230)
3.3 Seasonal dynamics of riparian greenness (p. 11, L260)

4. Discussion (p. 11, L272)
4.1 Spatiotemporal Sentinel-2 NDVI response to flood-disturbance and lateral elevation change (p. 11, L273)
4.1.1 Sentinel-2 NDVI response to varying flood magnitudes (p. 11, L274)
4.1.2 Riparian vegetation dynamics along the lateral transect zones (p. 12, L298)
4.2 Practicality of Sentinel-2 NDVI for frequent-disturbed riparian environment (p. 13, L325)
4.3 Management implications: optimizing the "where" and "when" (p. 14, L360)
4.3.1 The timing of vegetation management (p. 14, L364)
4.3.2 Spatial prioritization for management actions (p. 15, L381)

This reorganization ensures that the Results section focuses exclusively on observed patterns and quantitative analyses, while the Discussion section contextualizes these findings within existing bio-hydromorphological theory and management applications.

Reviewer1 (Prof. Kleinhans):

The scope of the paper is not so clear. The 3 research questions are somewhat clear but the earlier stated objectives are too vague. Furthermore, there is no clear answer to the first research question, even though these data clearly allow answering it. The mixture of results and discussion is part of this problem: separation of these sections is needed precisely to make clear what the result of this work are and how this is contextualized by literature.
The literature on channel pattern and channel mobility in interaction with vegetation is ignored. I am thinking of the classic experimental work by Tal and Paola on braided river experiments with vegetation, conceptual work by Gurnell and Corenblit, the modelling by us (van Oorschot et al) and many other works. For review, see papers by Corenblit and by me (e.g. https://doi.org/10.1144/SP540-2022-138, also available as open access through utrecht university on my profile page).

We thank Prof. Kleinhans for the constructive and insightful comments regarding the clarity of the manuscript's scope, theoretical context, and structure. We agree that the scope of the previous version was not sufficiently clear, particularly because the second research question ("What are the distinct phenological characteristics of riparian vegetation as revealed through NDVI analyses?") and the implications for river management were not adequately presented. In response, we conducted the following major revisions to explicitly address these concerns.

First: revising the title to better reflect the management-oriented framework
"Spatiotemporal dynamics of Sentinel-2 NDVI as indicators of bio-hydromorphological interactions: implications for river management"
This revised title emphasizes that the manuscript is a case-study–based evaluation of high-temporal-resolution Sentinel-2 NDVI as a diagnostic and management-support tool, rather than a purely ecological or geomorphological analysis.

Second: reclassifying the motivations of this study (p.2, L69-71)
(1) How does the spatiotemporal Sentinel-2 NDVI respond to flood-disturbance and relative elevation above water level?
(2) Can NDVI effectively indicate bio-hydromorphological interactions within frequent-disturbance system?
(3) How can satellite-derived vegetation metrics be translated into practical strategies for river management?

Third, we expanded the literature review to more comprehensively address vegetation–hydrodynamics interactions, while clarifying how the management-oriented scope of this study complements existing experimental, conceptual, and modeling research. (p.1, L30 – p.2, L52)

Alternatively, one could think of analysis of tolerance limits of the various species to inundation depth, and erosion, and ripping out by high flow velocity. Also in this case that needs comparison to literature, plus analysis of morphological change and possible effects of seasonality and the timing of floods (there is a figure suggesting that bed elevation maps of the river are available for three years).

We fully agree that species-specific tolerance limits to inundation, erosion, and flow velocity are critical for understanding vegetation destruction mechanisms during floods. At our study site, flood events consistently occur in October (p. 4, L20), and therefore seasonal variability in flood timing is limited. However, we acknowledge that the physical mechanisms of vegetation destruction–including uprooting, burial, bending, and shear stress exceedance–cannot be resolved directly from NDVI observations alone. Accordingly, we now explicitly state this limitation in the manuscript (p. 13, L337–339) as follows:

Nevertheless, the specific physical mechanisms of vegetation destruction (e.g., uprooting, burial, bending, or shear stress thresholds) cannot be resolved directly within the current NDVI-based framework and require complementary field or process-based analyses.

The figures need improvement and clarification and some map figures would be much appreciated. Making data available upon request is not acceptable in this day and age anymore. One can easily provide the depth and greenness maps and the timeseries through an online repository. This would be valuable for future analyses of vegetation-river interactions.

We thank the reviewer for these important suggestions and fully agree with the need for improved figure clarity and open data accessibility.
Regarding the figures, we substantially revised and enhanced all map and analysis figures to improve resolution, readability, and interpretability. Additional map figures and enlarged representative areas were included to better illustrate channel morphology, vegetation distribution, and their temporal dynamics. Figure captions were also expanded to be self-contained, with clear definitions of symbols, abbreviations, and spatial–temporal contexts.
Regarding data availability, we have made most datasets used in this study publicly accessible via an online repository. Specifically, Sentinel-2 imagery, NDVI products, water-level records, meteorological data (temperature and precipitation), and vegetation type classifications are now openly available. These datasets enable reproducibility and support future analyses of vegetation–river interactions.
High-resolution topographic datasets (LP and ALB), however, are subject to copyright restrictions imposed by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Japan. Consequently, these datasets cannot be redistributed publicly and are made available upon reasonable request.

DETAILED POINTS (referring to figures and line numbers)
Fig 1 *there is not much to see of the river and its morphology. Please enhance image resolution and consider including another figure with a small section shown much larger as image and as (detrended) bed elevation.* ***Fig 3*** *and the text suggest you have three bed elevation maps and the greenness maps but these are shown nowhere. I strongly suggest showing these for a short stretch of the river as to illustrate the patterns and the dynamics, so that the reader knows what lateral channel dynamics to expect in the data analysis.*

We substantially revised and expanded the figure set to improve the visualization of channel morphology, vegetation patterns, and their temporal dynamics.
Specifically, the resolution of Figure 1 was enhanced, and two representative sub-reaches were added as enlarged panels to clearly illustrate channel cover changes between 2013 and 2020. To address the

availability of bed-elevation data, riverbed elevation maps for 2013 and 2020 corresponding to these representative areas are now explicitly shown in Figure 4 (Figure 3 in the previous version), allowing readers to directly observe lateral morphological changes (p.5).

In addition, time-series Sentinel-2 imagery and NDVI maps from 2016 to 2024 for representative Area 2 were added in Figures 2 (p.4) and Figure 7 (p.8), illustrating the coupled evolution of vegetation and channel morphology. These revisions provide a clearer visual basis for understanding the lateral channel dynamics discussed in the analysis and ensure consistency between the figures and the accompanying text.

***Fig 4** would be more understandable if zoomed out a bit, or if showing more upstream and downstream of the river (make the panel higher)*

The spatial extent of Figure 5 (Figure 4 in the previous version) was expanded to include a larger portion of the upstream and downstream reaches, thereby making levee banks easier to identify (p.7).

***Fig 6** says "10 hours' acuumulated water level" but what is accumulated water level? time-averaged? Two or three panels will do to show the general pattern and then we know what the data underlying the data reduction in later figures is.*

The term "10 h accumulated hourly water level" is now explicitly defined in the manuscript as "a rolling sum of hourly water levels over a 10 h window", rather than a time-averaged value (p. 8, L212). The previously missing legend has been added, and the revised figure (Figure 8) now includes a complete legend and an expanded caption clarifying all symbols and panels (p.9).

***Fig 9** help the reader and state again what h0 is. Combine with **Fig 7** (put the panels together in one multipanel figure at the same scale)*

Figures 7 and 9 have been combined into a single multi-panel figure on a consistent scale (Figure 12, p. 12). The definition of h_0 (the relative elevation at which the greenness ratio equals 0.5) has been added to the figure caption to improve clarity and readability.

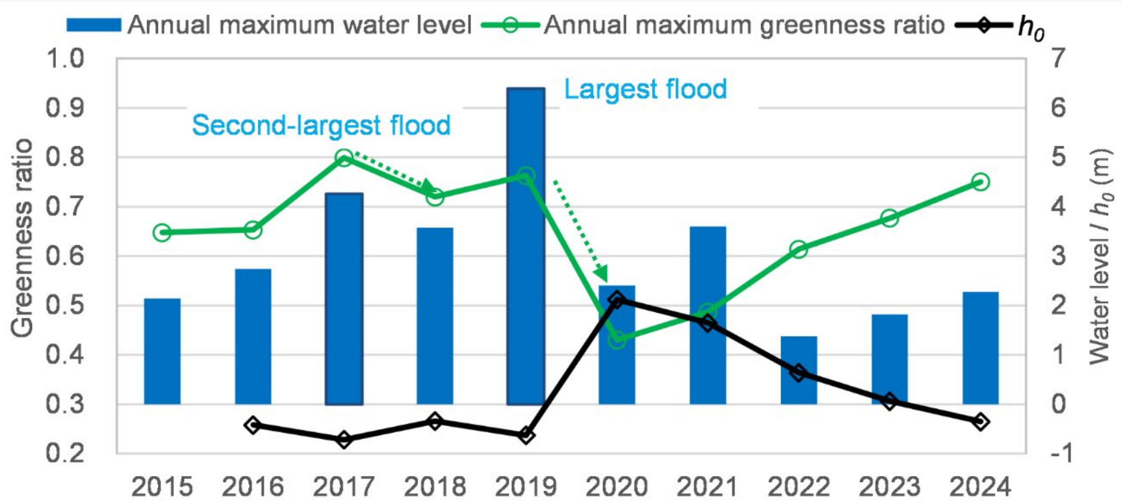

Figure 12: Relationship between annual maximum greenness / h_0 and annual maximum water level (h_0: the relative elevation at which the greenness ratio equals 0.5).

Fig 10 explain RE again in the caption. I suggest that this figure is much more readable if it is turned into a line plot with lines for all the years and RE on the horizontal axis. These will then be much easier compared.

Figure 10 has been revised into a line plot, with relative elevation (RE) shown on the horizontal axis and individual lines representing different years, making interannual comparisons clearer. The figure caption was also updated to redefine "RE". (p.11)

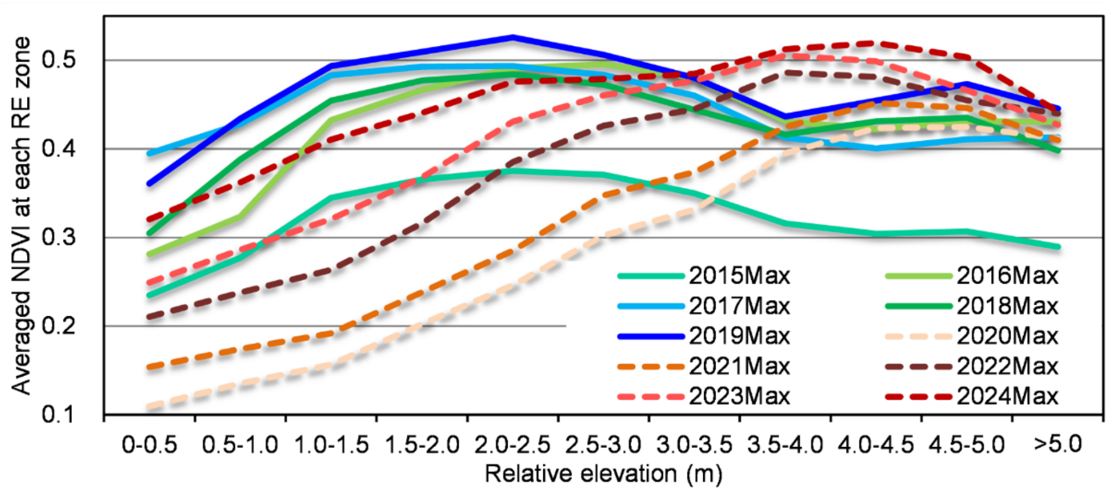

Figure 10: Annual maximum NDVI averaged within each 0.5m relative elevation zone along the transect.

Fig 12 and Fig 13 can also be combined in a multipanel figure with exactly the same x-axis for better analysis by the reader

We agree that combining Figures 12 and 13 improves readability. In the revised manuscript, these figures are merged into a single multi-panel figure with a consistent x-axis to facilitate direct comparison of seasonal patterns (Figure 11, p. 11). Because the purpose of the phenological analysis is to identify the timing ("when") of vegetation cutting to enhance conveyance capacity, we focus on the month of peak NDVI and vegetation cover. To avoid obscuring the paper's scope, we removed the cosine-model fitting included in the previous version.

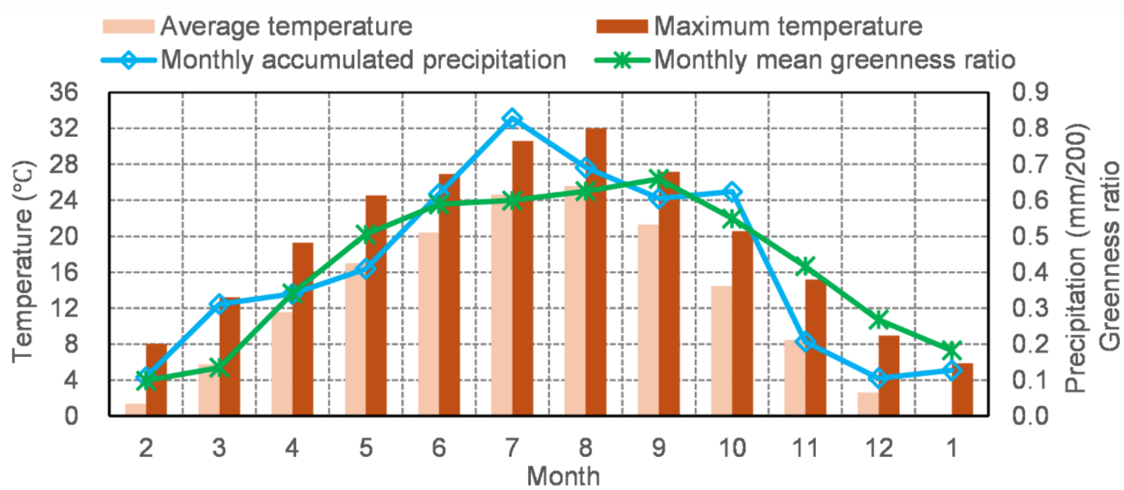

Figure 11: The relationship between seasonal dynamics of greenness ratio and temperature and precipitation.

Reviewer2:

Review for: Spatiotemporal dynamics of riparian vegetation NDVI as indicators of bio-hydromorphological interactions
This manuscript analyzes the relation between flooding interval, magnitude, and vegetation dynamics across a riparian elevation gradient. The authors briefly discuss the management implications of their findings, however, the broader scope and applicability of their analysis is unclear. The title suggests a broadly applicable novel methodology and discussion of this topic on a large scale, yet I was left wanting more depth to this discussion and questioned whether this 20km stretch of river can be seen as representative of other rivers in Japan or in other countries. The manuscript would benefit from having a standalone discussion section to address how other these findings pertain to other rivers or even to other sections of this same river, as well as different management scenarios. There are several interesting and promising findings presented in the manuscript, but the discussion of these findings needs greater depth.

We sincerely appreciate the time you have taken to review this paper and for providing constructive, detailed suggestions.

Major Comments:
Why was this 20 km stretch of river chosen as the study area, and would the study have benefited from examining additional stretches of the river and/or additional study sites? If this stretch of river is the only portion where it changes course, has steep banks, and extensive woody encroachment, please openly state this. Overall, I am curious about the decision to include this specific 20 km area in the study and why other stretches of the river were not included (e.g., limited by availability of gauges, topographic data, etc.).
I wonder how the authors view the broader scale applicability of this study and study area, e.g., if other rivers might behave the same or differently in general? I would like this addressed in greater depth in Section 2.1 or in the discussion of broader applicability for management decisions.

While this is a single case study of a 20-km reach, this specific segment was selected because it represents a high-complexity "bio-geomorphic segment" characterized by frequent disturbances and high vegetation density. This reach differs from its upstream and downstream segments: the upstream segment has significantly lower vegetation coverage, and the downstream segment experiences relatively lower flood-disturbance intensity due to a gentler slope. The selected reach enabled analysis of bio-hydromorphological interactions under two contrasting regimes: (i) a phase characterized by frequent, high-magnitude disturbances (2016–2021) and (ii) a subsequent period dominated by relatively stable successional recovery (2021–2024). Because the Sentinel-2 NDVI framework was able to capture these large-amplitude dynamics in a high-energy setting, it is likely transferable to less dynamic environments, including downstream reaches of the Chikuma River and other gravel-bed rivers.

The following contents were added to the manuscript.
(1) Selection of the study site (p. 4, L91–95).

The rationale for selecting the 89–109 km reach has been added to Section 2.1 "Study site"

(2) Applicability for management decisions
To clarify how the proposed framework and results can inform management decisions and be applied to other rivers, we added a dedicated section, "Practicality of Sentinel-2 NDVI for frequently disturbed riparian environments" (p. 13, L325 – p. 14, L359). In addition, we further strengthened Section 4.3 "Management implications: optimizing the 'where' and 'when'" by expanding comparisons with previous studies. This revised discussion explicitly outlines the practical implications of Sentinel-2 NDVI–based monitoring for adaptive vegetation management and clarifies key limitations (e.g., spatial-resolution constraints) when interpreting bio-hydromorphological dynamics from NDVI.

Similarly, I was hoping for a more definitive discussion about how flooding magnitude and interval influence or are influenced by vegetation coverage/type and elevation. Are these metrics correlated or linked to each other in any conclusive way? How may these correlations differ for other river and vegetation types?

We thank the reviewer for this important suggestion. We agree that, in the previous version, the combined Results and Discussion made the relationships among flood magnitude/interval, vegetation coverage/type, and relative elevation difficult to interpret. In the revised manuscript, we separated the Results and Discussion and expanded Section 4.1 "Spatiotemporal Sentinel-2 NDVI response to flood disturbance and lateral elevation change" to provide a more definitive interpretation grounded in established concepts (e.g., the lateral dimension framework and the intermediate disturbance hypothesis).
Specifically, we now clarify that these metrics are linked in a consistent, interpretable way in our dataset: high-magnitude floods produced widespread decreases in greenness ratio/NDVI across elevation bands (a "resetting" response), whereas smaller and more frequent floods caused more limited disturbance and were often followed by rapid regrowth. Relative elevation organizes the spatial pattern of vegetation dynamics along the lateral transect, and the observed NDVI peaks partly reflect differences in vegetation type (e.g., tree- vs. grass-dominated zones). We also expanded the comparison with previous studies to discuss how these relationships may differ across river types and vegetation communities. These revisions are provided in Section 4.1 (p. 11, L273–p. 13, L324) and Section 4.2 (p.13, L325-359).

Since the overall aim of this study seems to be coming from a management viewpoint, I was also hoping for more analysis and discussion of how different management decisions may influence flooding magnitude and frequency.

We agree with the reviewer on the discussion of different management decisions on river management. The following contents have been added to the revised manuscript. (p.15, L402-408)

From a river-management perspective, efficient and cost-effective strategies are essential. Vegetation cutting in low relative-elevation zones may be economically inefficient because vegetation in these areas is frequently removed by natural flood disturbances. In contrast, interventions in stable, high-elevation zones may also have limited efficiency, as vegetation there is affected primarily during extreme floods and contributes less to conveyance under more frequent events. The framework developed in this study (integrating spatiotemporal NDVI dynamics with flood disturbances and relative elevation) therefore provides a practical basis for prioritizing where and when vegetation management should be implemented to maximize benefits while minimizing unnecessary costs.

Each figure includes a caption that only contains essentially a figure title. It would benefit the reader to include more detail in the figure captions. For example, in the Fig. 6 caption, the abbreviation RE could be defined, and in Fig. 8 h_0 could be defined.

We revised the figure captions to be more informative and self-contained, including definitions of key abbreviations and metrics.

Figure 8 (Fig. 6 in previous version): Spatiotemporal vegetation greenness and hydro-morphological dynamics (RE0-1, RE1-2, RE2-3, RE3-4, RE4-5, and RE5~ denote relative elevation classes of 0–1 m, 1–2 m, 2–3 m, 3–4 m, 4–5 m, and ≥5 m, respectively. “10-hour accumulated water level” refers to the water level accumulated over a 10-hour period).
Figure 10 (Fig. 9 in previous version): Annual maximum NDVI averaged within each 0.5m relative elevation zone along the transect. (The revised figure is provided on p. 5 of this response file.)

Minor and Technical Comments:

L4: Capitalize author’s affiliation

The affiliation has been revised.

Were 200 images obtained at multiple time steps (once or more than once per year)? Were images obtained on the same day of the year? Were images from different days used to create the stitched composite images in Fig. 1 (Section 2.3)?

The 200 Sentinel-2 scenes were acquired at multiple time steps across 2015–2024 (i.e., not limited to one image per year), and scenes were not restricted to the same day of year; instead, images were selected based on cloud-free conditions to allow consistent observation of vegetation and channel dynamics. We also clarify that Figure 1 does not use Sentinel-2 imagery: it shows aerial photographs from the 2013 and 2020 laser-profile (LP) surveys, and these panels are not stitched composites derived from multiple Sentinel-2 dates.
The following explanation was added to the manuscript (p. 4, L107–111):

In total, 200 Sentinel-2 images were downloaded from Copernicus and processed to compute the NDVI. Imagery was selected based on cloud-free conditions to ensure reliable observation of spatiotemporal vegetation and channel dynamics over the period 2015–2024. Figure 2 presents representative Sentinel-2 imagery (2016–2024) for Area 2. Moderate and pronounced vegetation mortality and channel shifts, are evident in the 2018 and 2020 images (highlighted by red circles in Fig. 2), corresponding to the second-largest and largest flood events during the study period, respectively.

Figure 1: The map extent in 1a can be focused on only Japan. All parts of the figure need to be better resolution. I would suggest trimming the images in a way that looks less mosaic and zooming in more so the river can be seen in better detail. Maybe consider restructuring the figure panels so the river runs vertically, instead of from right to left, to maximize the page space and reduce the amount of whitespace in panels c-e.

We adjusted Figure 1 as your suggestion, and two representative Areas were zoomed in to show the river channel dynamics. (p.3)

L78-80: Section 2.2 font size looks larger than rest of text.
L85: can remove comma after 200
L89: Use full name for MLIT at first mention here (instead of L106), and also in Fig. 1.
Figure 2, Section 2.2.2: Perhaps provide the exact dates of the first and second floods in the figure, figure caption, or text.

We thank the reviewer for these detailed editorial suggestions. All revisions have been implemented as follows:
L78–80 (Section 2.2): The font size inconsistency was corrected (p. 4, L100–103).
L85: The comma after “200” was removed (p. 4, L107).
L89 / Fig. 1: The full name of MLIT (Ministry of Land, Infrastructure, Transport and Tourism, Japan) is now provided at first mention in the text and in Figure 1 (p. 3, Figure 1).
Figure 2 / Section 2.2.2: The exact occurrence dates of the largest and second-largest floods were added to the revised figure (p. 5, Figure 3; Figure 2 in the previous version).

L179-180: Use full name for Ueda at first mention here. Can this data source be cited in a more permanent way and included in the references section rather than a temporary URL in the text? On that topic, can the data be made accessible to the reader?

We thank the reviewer for this suggestion. Ueda is the official name of the meteorological station (Japan Meteorological Agency; JMA) and is used consistently in the revised manuscript. To provide a more permanent and citable data source, we have replaced the temporary URL in the text with a Zenodo DOI. In addition, the temperature and precipitation data used in this study are now publicly accessible via the following repository:
https://doi.org/10.5281/zenodo.18092794 (ZHOU, 2025)

Figure 6: “Accumulated” is spelt incorrectly in the figure (accumulated over what time period?). Legend does not indicate what the light green circles represent (legend has 6 symbols but 7 panels). Also, unclear what RE5~ represents (what range of relative elevation is this? Or is RE representing “return interval”…this should be specified in the caption and/or text) …should this read RE50 or RE5 instead? Perhaps the figure caption can be used to describe the legend and panels in greater detail. Also in panels 2, 3, and 5, the axis title “Ratio” overlaps with the axis labels (and suggest spelling out “Greenness ratio”). Also consider using “hydro-morphological dynamics” rather than “hydro-morphology dynamics”.

We thank the reviewer for these detailed figure comments. We corrected the spelling of "accumulated" and clarified that the "10 h accumulated hourly water level" is a rolling sum of hourly water level over a 10 h window (p. 8, L210–214).
We also revised Figure 6 to (i) correct and fully describe RE in the caption (RE denotes relative elevation above water level; RE≥5 represents ≥5 m), (ii) fix the legend so that all symbols (including the light green circles) are defined. In addition, we improved axis formatting by changing "Ratio" to "Greenness ratio" and preventing label overlap and revised the wording to "hydro-morphological dynamics." (p.9, Figure 8)
We are sincerely sorry for our mistakes. There is one panel in previous version that refers to vegetation distribution below the water level calculated using the Nays2DH model, which is neglected from this study, as the pixels of NDVI > 0.2 distributed at zone are very few.

Figure 7 is interesting but I feel like it would be better presented as a scatterplot or line graph rather than a bar graph. Having the water level – which should be 2 separate words in the figure to match its spelling in the caption and elsewhere in the text – as downward bars does not make it easy for the reader to easily compare these quantities to each other. Also "greenness" is spelt incorrectly in the figure legend. I suggest making both the water level and greenness axes read from the bottom up. If the authors chose to keep bars instead of points, I suggest having the blue water level bars next to the greenness bars for each year.

We thank the reviewer for these suggestions. In the revised manuscript, Figure 7 (previous version) was restructured and merged with Figure 9 into a single multi-panel figure (following reviewer's recommendations). The annual maximum greenness ratio is now presented as a line plot, improving readability and comparing hydrological conditions. We also corrected figure text and spelling, including changing "waterlevel" to "water level" and fixing the misspelling of "greenness." The revised figure is provided on p. 4 of this response file.

L223-224: This statement is helpful for the reader and would be even more useful earlier in the text before the figures that utilize the greenness ratio, perhaps in section 2.3.1.

We agree with your suggestion, and we moved the following content from Section 3.2 to Section 2.3.1.

During the floods period, vegetation cover is most fully developed and NDVI values above 0.2 reliably correspond to active green vegetation, making NDVI > 0.2 (Drori et al., 2020) a suitable threshold for estimating vegetation cover. (p.6, L147-148)

L230: Perhaps spell out Figure here instead of shortening to Fig.
Figure 8: In Y-axis title, every word is capitalized, but in other figures only the first word is capitalized. Make sure all axes titles consistently follow the journal's guidelines.

"Fig." was changed to "Figure" (p. 10, L241)
The y-axis title capitalization was revised Figure 9 (Figure 8 in previous version).

Figure 9: "waterlevel" change to "water level" in legend and also h0 should include the subscript.

The legend in Figure 12 (Figure 9 in the previous version) was revised by changing "waterlevel" to "water level" and formatting h_0 with the proper subscript throughout the figure and caption. The revised figure is provided on p. 4 of this response file.

Figure 10: Again, a more descriptive caption would be helpful, for example, explicitly state what the blue circles are indicating.

Figure 10 was revised into a line plot. The caption was expanded to explicitly explain.
The revised figure is provided on p. 5 of this response file.

L265-266 and Figure 11: Italicize Latin names.

We implemented this correction. The Latin name *Robinia pseudoacacia* has been italicized in the manuscript and Figure 13 (Figure 11 in previous version). (p.14)

L289-290: Would help to include the dates/number of years averaged to create Fig. 12.

We added the averaging period and data volume used for Figure 12: "We computed the monthly mean greenness ratio for January 2016–November 2024 using NDVI values extracted from approximately 200 Sentinel-2 images" (p. 11, L261–262).

Figure 12: Cosine is capitalized but vegetation is not. Keep consistent for all figures.
Section 3.2: This secondary growth phase later in summer is characteristic in many species. Perhaps more definitive and less speculative reasoning (using literature citations) can be implemented early in the section to describe why this phenomenon occurs. The authors' explanation for how seasonal trends may affect flooding is well-reasoned and interesting. The use of the cosine curve model roughly conforms to the seasonal trend observed, however, the text discusses how the fitted model overpredicts the greenness ratio during the early growing season and underpredicts during mid-summer. Therefore, this model seems overly simplified because it does not seem to predict the dampened peaks observed during the summer. Does this limitation affect any of the results?

We thank the reviewer for these helpful comments. We corrected capitalization inconsistencies in figure text to ensure consistent formatting across all figures. Regarding the seasonal analysis, we agree that the previous description of the secondary growth phase was too speculative and that the cosine model was overly simplified and did not reproduce dampened mid-summer peaks.
To improve clarity and maintain a management-oriented scope, we merged Figures 12 and 13 into a single multi-panel figure with a consistent x-axis for direct comparison of seasonal patterns (Figure 11 is provided on p. 5 of this response file). Because the phenological analysis is primarily intended to identify the timing ("when") of vegetation cutting to enhance conveyance capacity, we now focus on the month of peak NDVI and vegetation cover rather than on parametric curve fitting. Accordingly, we removed the cosine-model fitting from the revised manuscript.

Section 3.3: This section suggesting management implications is thought provoking. Perhaps mention of the intermediate disturbance hypothesis deserves mention in this discussion, and whether it is supported by these findings. It may also be helpful if a theoretical example was proposed here; for example, how would management actions at high, low, or intermediate elevations interact with flooding frequency and magnitude, and would this also affect the ecosystem's resistance and/or resilience to flooding, and what other responses would be affected by more targeted control?

We thank the reviewer for these constructive suggestions. In response, we substantially revised the Discussion to explicitly incorporate the Intermediate Disturbance Hypothesis (IDH) and related biogeomorphic frameworks when interpreting our findings. We now discuss whether the observed elevation-dependent vegetation responses and flood-driven "resetting" and recovery dynamics are consistent with IDH expectations in frequently disturbed gravel-bed rivers.

In addition, we added a conceptual management interpretation across elevation zones, describing how interventions at low-, intermediate-, and high-relative-elevation zones may interact with flood frequency and magnitude and potentially influence system resistance and resilience (e.g., frequent-disturbance zones vs. relatively stable zones). This revision is intended to translate the empirical NDVI patterns into a clearer, theory-informed framework for targeted management decisions.

These revisions were incorporated in the revised Discussion (Sections 4.1 (p.11-12) and 4.3 (p.14-15)).

L375-377: Review punctuation for alternatives that would be more direct and improve sentence flow (consider removing commas and semicolon, perhaps using dashes or splitting the sentence up).

We revised the sentence in the Conclusions (p.16, L410–423) by removing unnecessary punctuation and splitting it into shorter sentences to improve clarity and flow.