Newsletter of the International Network for Conservation Paleobiology

Issue #34
March 2026

INCP Newsletter

International Network for Conservation Paleobiology

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Resource Reminder: Newsletter Archive

Did you know that you can access all past issues of the network's newsletters on our website: https://conservationpaleorcn.org/? These past issues are a valuable educational and networking tool, containing research highlights, practitioner perspectives, paleo proxies, postcards from the field, and other content related to conservation paleobiology.

Many of our members (you!) have contributed to the newsletters over the years, so this archive reflects a team effort by our network. If you would like to contribute content or have suggestions for a future newsletter issue, please contact us at **incp@conservationpaleorcn.org**.

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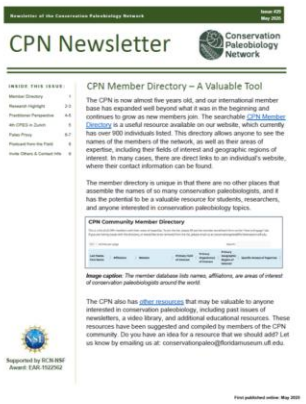

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First published online: March 2026

Conservation Paleobiology Research Highlight

By Chloe Griffiths, Natural History Museum, London, England

Slimehead Size Through Time: Testing the Temperature–Size Relationship in Late Cretaceous Trachichthyidae

As global temperatures rise, fishes are predicted to become smaller. Body size is a fundamental trait that significantly impacts many aspects of an animal's life history and ecology. Understanding how climate change may affect body size in particular groups is therefore critical.

Trachichthyidae (also known as 'Slimeheads') are a family of fish including several commercially important species. However, their deep-dwelling, long life spans, and slow reproduction mean that directly testing the temperature–size relationship in this family is challenging. Fortunately, Trachichthyidae have a long evolutionary history dating back to the Cretaceous, and their fossil record provides empirical data on their response to past climate change events.

"Our study demonstrates the importance of utilising the fossil record as an alternative source of data"

In this study, we leveraged extensive fossil collections of the Late Cretaceous trachichthyid genus *Hoplopteryx* from the British Chalk Group of southern England, United Kingdom. We combined morphometric measurements of fossil specimens with geochemical analysis of their surrounding chalk matrix to test whether they were smaller at higher temperatures.

Analyses revealed that estimated seawater temperature, derived from oxygen stable isotope values ($\delta^{18}O$), was a significant negative predictor of body size in the most common species, *Hoplopteryx lewesiensis*. This supports the prediction that higher temperatures lead to smaller fishes.

Carbon stable isotope values ($\delta^{13}C$) also significantly negatively predicted the body size of *Hoplopteryx* spp., suggesting that other environmental factors, such as primary productivity and/or the burial of organic matter, influenced the body size of these fish during the Late Cretaceous.

Our study demonstrates the importance of utilising the fossil record as an alternative source of data to explore the temperature-size relationship in groups that are difficult to study, such as deep-sea fishes.

***Image caption**: Chloe Griffiths measuring some fossil Hoplopteryx.*

For more information, see: ***Griffiths, Chloe V., et al. "Slimehead Size Through Time: Testing the Temperature–Size Relationship in Late Cretaceous Trachichthyidae." Ecology and Evolution 15.10 (2025): e72026.***

https://doi.org/10.1002/ece3.72026

First published online: March 2026

Practitioner Perspective *By Lucia Snyderman*

Linnéa Jägrud – Sturgeon Reintroduction Team Leader in Sweden

***Image caption**: Linnéa Jägrud with a sturgeon.*

1. How would you introduce yourself to our readers?

I am a passionate limnologist currently leading the re-introduction program of sturgeons in Sweden. I love ecology and am highly fascinated by historical ecosystems. I love these cool oddly looking fishes that survived millions and millions of years. I also love aquatic ecosystems in a landscape perspective. In my spare time, I sail, write books, feed my nature grassland-grazing sheep and take my kids out in nature.

2. Tell us about your work on sturgeon reintroduction in Sweden. How are historical data being used and applied?

The introduction was highly based upon the preserved specimens at the museum. Without those specimens, that clearly showed the former occurrence of juvenile sturgeons up in the river Göta, the approval for releasing sturgeons would not have been achieved. Since the project is run by an NGO without the massive support from an authority, we need to include the authorities in the dialogue about the future population. This is challenging when it comes to financial support as well.

First published online: March 2026

Practitioner Perspective Continued

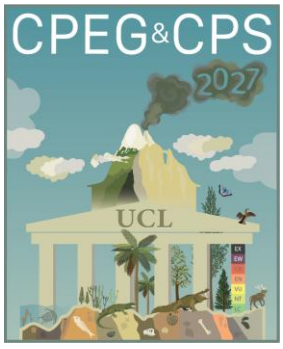
The museum of Natural history in Gothenburg had a number of preserved juveniles, and since the sturgeon are unable to pass ocean water when it is very young, this serves as proof for spawning in the river. We are currently mapping the historical abundance of Atlantic sturgeon in Sweden and planning to publish this in a near future. The introduction has so far released 240 juvenile sturgeons in the river Göta during 2024 and 2025. The survival has been very good and since the fishes are tagged with acoustic telemetry, the migration pattern can be detected and the understanding of the river can give information for future restoration efforts.

3. What would you say to scientists who are hoping to apply their research directly to conservation? To students who hope to get involved in conservation work?

Work together! There needs to be one or two really engaging persons that push the work forward, and if that is the case, the research team can join in. The solution here was to have an NGO having a dedicated project leader and the research institutions supporting with documents, information and dialogue with authorities. The researchers are so important, this would not have happened without the universities. Overall this must be treated as a teamwork! To students: engage yourself in an NGO. To researchers: don't be afraid to share information!

Upcoming Conference Reminders

Crossing the Palaeontological–Ecological Gap



The next joint Crossing the Palaeontological–Ecological Gap (CPEG) meeting and Conservation Paleobiology Symposium will take place at University College London in early August 2027. This follows last year's joint meeting in Zurich:

More information can be found HERE.

23rd Annual Meeting of the European Association of Vertebrate Palaeontologists (EAVP)

The 23rd Annual Meeting of the European Association of Vertebrate Palaeontologists will be held in Lithuania from 29 June to 5 July 2026.

More information can be found HERE.

Paleo Proxy Spotlight – Ostracod Analysis

By Olga Schmitz & Peter Frenzel, Max Planck Institute of Geoanthropology and Friedrich-Schiller University of Jena, Germany

Many types of paleo-proxies depend on taxonomic or complex chemical information. Among the most versatile are **ostracods**, tiny bivalved crustaceans whose calcitic shells can record environmental change in remarkable detail. Here we explore how ostracods can be used for paleoenvironmental reconstruction including anthropogenic impacts.

What are ostracods?

Ostracods are small (typically less than 1 mm) crustaceans which can be found in all types of past or present aquatic environments: marine, brackish, and freshwater settings including lagoons, lakes, temporary ponds, caves or groundwater. Their shells, or carapaces, are made of low-magnesium calcite and preserve very well in the sediment. Originating in the Ordovician and belonging to the abundant group of microfossils, ostracods have the best fossil record of metazoans what makes them versatile tools in geosciences, especially for biostratigraphy and palaeoecology.

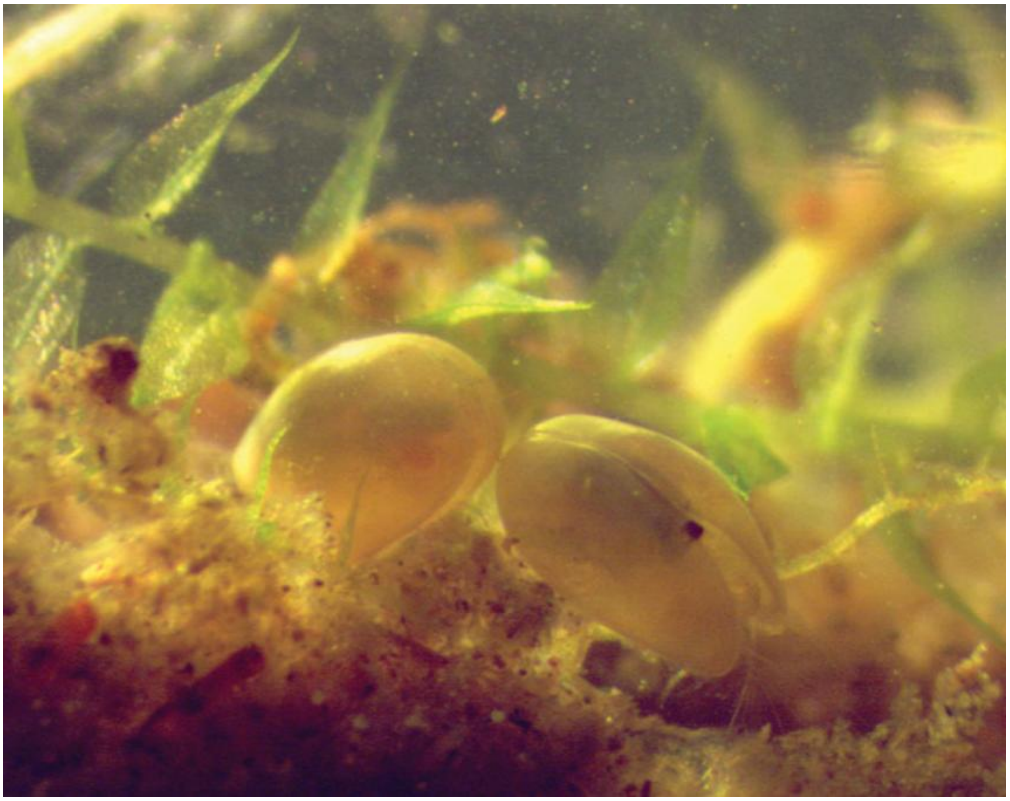


***Image caption**: Two individuals of Heterocypris incongruens, a cosmopolitan freshwater species of about 1.5 mm length. The right individual shows its eye and antennas through the slightly opened valves. Photo credit: Renate Matzke-Karasz.*

First published online: March 2026

Paleo Proxy Continued

How can ostracods be used as a paleo-proxy?

Ostracod shells preserve both **biological** and **chemical** signals of the water in which they formed.

Ecological proxies: Because ostracod species occupy distinct ecological niches, the composition of living or fossil assemblages can reveal past to present environmental conditions. Thus, they can indicate salinity, water depth, oxygen levels, turbulence, pH, temperature, or pollution. Environmental factors can be assessed and reconstructed by using indicator species, the proportion of ecological groups or transfer functions.

MOTR method (Mutual Ostracod Temperature Range): Beyond individual isotope and species signals, ostracods can be used to reconstruct air temperature through the **Mutual Climatic Range (MCR)** framework. The **MOTR method** (Horne, 2007) extends this by using all ostracod species in a fossil assemblage (both those that co-occur today and non-analogue combinations) to infer past temperatures. Calibrations based on modern European and North American datasets allow estimation of mean July and January air temperatures, or mean annual air temperature, from Quaternary non-marine deposits. MOTR results are generally consistent with other independent proxies such as beetle-based MCR methods, making it a robust terrestrial palaeotemperature indicator. Mutual ranges can be identified for other factors as well, e.g. salinity.

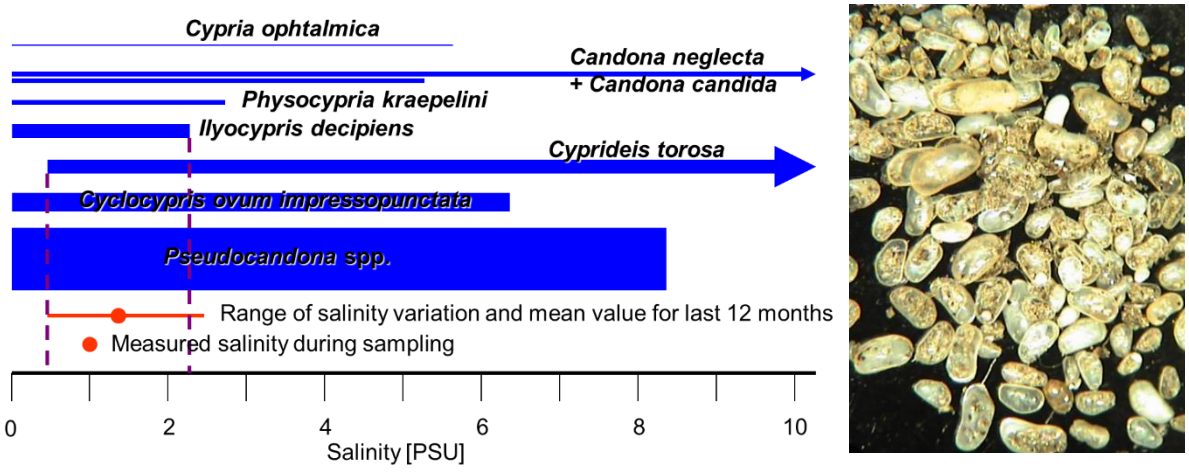


***Image caption**: Ostracod-based salinity estimation for a surface sample (photo) taken from Oder lagoon, NE Germany. The mutual range of salinity tolerances taken from literature (blue bars; cf. Frenzel et al., 2010) allows an estimation of 0.4-2.3 psu (broken lines) for the last few years until sampling. This estimation matches the salinity variation given in a water quality monitoring report for the site (red line, the red dot gives the average value). From Frenzel et al., 2005, modified; photo by Peter Frenzel.*

First published online: March 2026

Paleo Proxy Continued

Morphological proxies: Valve size, ornamentation and sieve pore shapes can respond to stress factors such as salinity, turbulence or temperature changes.

Taphonomic proxies: The preservation state of ostracod valves provides additional information about depositional energy, estimation of transport distance and deposition, and “post-mortem” fossil diagenesis. For example, high fragmentation and corrosion can indicate turbulent settings or prolonged exposure on the sediment surface, whereas pristine, articulated carapaces often signal quiet, low-energy environments with rapid burial. Because ostracods grow by moulting, they produce a set of valves from instars to adults. Thus, the ratio between ontogenetic stages of an association documents effects of transport, dominating adults indicates turbulent waters because juvenile valves are carried away. Where the latter sink to the sediment, adults are than missing what indicates an allochthonous association. Assessing valve preservation or adult-juvenile ratios thus helps to distinguish local habitat signals from reworked or transported material and improves the reliability of ecological and isotopic interpretations.

Geochemical proxies: Ratios of oxygen and carbon isotopes ($\delta^{18}O$, $\delta^{13}C$) record water temperature, salinity, and hydrological balance. Trace-element ratios (such as Mg/Ca or Sr/Ca) can refine these estimates. More recently, clumped-isotope (Δ_{47}) thermometry has been applied to ostracod shells, allowing direct reconstruction of formation temperature independent of the isotopic composition of water. This method reduces uncertainty in paleotemperature estimates and is particularly useful where both $\delta^{18}O$ and salinity vary.

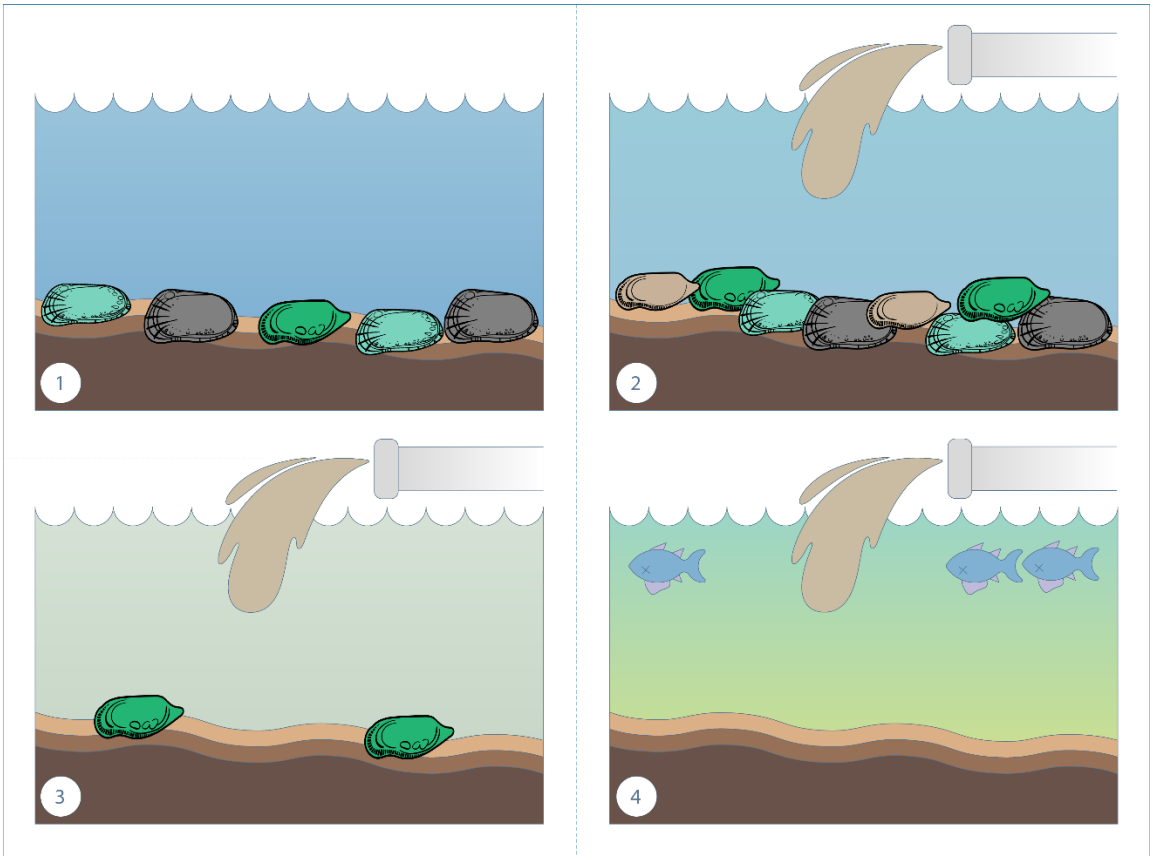


***Image caption**: Stages of pollution impact on ostracod associations: (1) Oligotrophic waters show high diversity with many sensitive species. (2) Moderate organic input increases diversity and abundance. (3) Eutrophication reduces richness, leaving only tolerant species. (4) Anoxia causes total mortality, with no ostracods or only empty shells. From Schmitz et al., 2025.*

Paleo Proxy continued

Why does ostracod analysis matter?

Ostracod-based data help scientists linking ecological and chemical evidence of environmental change over long-time scales (Schmitz et al., 2025). These microfossils document how aquatic systems respond to fluctuations in climate, sea and lake level, as well as human activities (Frenzel and Boomer, 2005; Frenzel et al., 2010). The latter field includes applications in conservation palaeobiology and geoarchaeology (Gildeeva et al., 2021; Quante et al., 2022; Schmitz et al., 2024, Schmitz et al., 2025).

Because they are abundant, widely distributed, and well preserved, ostracods provide a crucial bridge between biological monitoring and geochemical reconstruction, what is offering insight into both past and present ecosystem dynamics.

References:

Frenzel, P. and Boomer, I., 2005. The use of ostracods from marginal marine, brackish waters as bioindicators of modern and Quaternary environmental change. Palaeogeography, Palaeoclimatology, Palaeoecology, 225(1-4), pp.68-92.

Frenzel, P., Henkel, D., Siccha, M. and Tschendel, L., 2005. Do ostracod associations reflect macrophyte communities? A case study from the brackish water of the southern Baltic Sea coast. Aquatic Sciences, 67(2), pp.142-155.

Frenzel, P., Keyser, D. and Viehberg, F.A., 2010. An illustrated key and (palaeo) ecological primer for Postglacial to Recent Ostracoda (Crustacea) of the Baltic Sea. Boreas, 39(3), pp.567-575.

Gildeeva, O., Akita, L.G., Biehler, J., Frenzel, P. and Alivernini, M., 2021. Recent brackish water Foraminifera and Ostracoda from two estuaries in Ghana, and their potential as (palaeo) environmental indicators. Estuarine, Coastal and Shelf Science, 256, p.107270.

Horne, D.J., 2007. A mutual temperature range method for Quaternary palaeoclimatic analysis using European nonmarine Ostracoda. Quaternary Science Reviews, 26(9-10), pp.1398-1415.

Quante, E., Pint, A. and Frenzel, P., 2022. Nonmarine Ostracoda as proxies in (geo-) archaeology—A review. Geoarchaeology, 37(5), pp.711-732.

Schmitz, O., Alivernini, M., Yasuhara, M. and Frenzel, P., 2025. Ostracoda (Crustacea) as indicators of anthropogenic impacts–A review. Earth-Science Reviews, p.105049.

Schmitz, O., Mehlhorn, P., Finch, J., Haberzettl, T., Hahn, A., Hill, T., Kretschmer, K. and Frenzel, P., 2024. Ostracoda and Foraminifera as bioindicators of (aquatic) pollution in the protected area of uMlalazi estuary, South Africa. Revue de Micropaléontologie, 83, p.100771.

First published online: March 2026

Postcards from the Field

In this feature of our newsletter, we showcase members' research in the field, lab, or other settings. Please submit your "postcards" with approximately 100 words of text to us at incp@conservationpaleorcn.org

Shrishti Kulshrestha- Birbal Sahni Institution of Palaeosciences and Krantiguru Shyamji Krishna Verma Kachchh University, India

I am Shrishti Kulshrestha, a Ph.D. Scholar at Birbal Sahni Institution of Palaeosciences, Lucknow registered under Krantiguru Shyamji Krishna Verma Kachchh University, Gujarat, India. My research emphasis is human footprints in the mangrove ecosystem of the Gulf of Kachchh to understand spatial patterns of mangrove ecosystems, late Holocene mangrove dynamics through an integrated analysis of biotic and abiotic proxies, along with anthropogenic drivers of mangrove degradation. The study's expected outcome will contribute to understanding mangrove environment linkage, provide high resolution reconstruction of late Holocene dynamics, distinguishing natural drivers such as sea- level and monsoon variability from anthropogenic impacts.

First published online: March 2026

International Network for Conservation Paleobiology

Are you interested in:

…contributing to **Postcards from the Field**?
…sharing a recent publication as a **Research Highlight**?
…being featured in a **Practitioner's Perspective** piece?
…providing other content suggestions for this newsletter?

If yes, please email us at incp@conservationpaleorcn.org

Invite Your Colleagues to Join our Network!

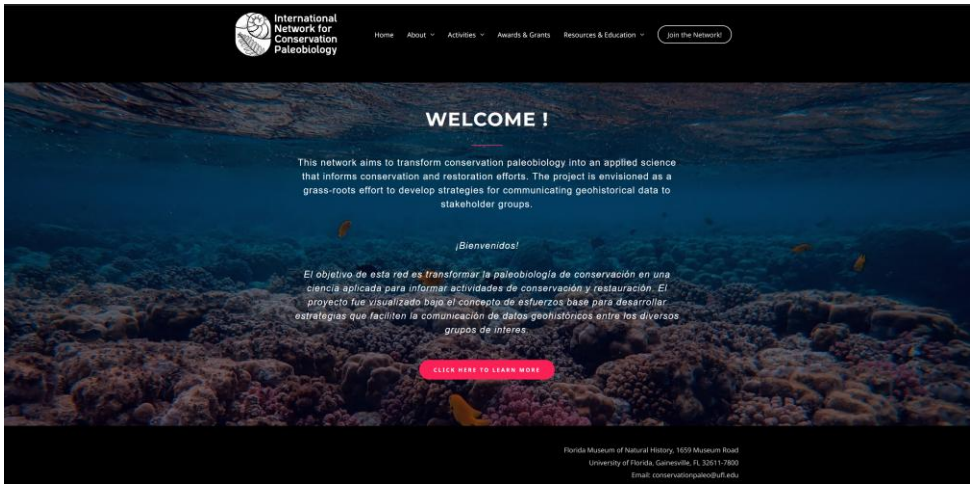
If you know people who might be interested in our network, please invite them to join. You can use the link below to extend your invitation on behalf of our network.

By joining the network, you become a member of our Community of Practice. The membership does not impose any obligations, but enables participants to engage fully in network activities. Members will be able to:

1. Participate in the mailing list
2. Nominate and self-nominate for committees and panels
3. Submit announcements for publication in the INCP Newsletter
4. Apply to participate in the network activities
5. View webinars and submit proposals for webinar modules

To join please go to our website and select "Join the Network"

Visit the website! https://conservationpaleorcn.org/



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First published online: March 2026