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Fire Ecology

CORRECTION

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Correction: Fire severity influences large wood and stream ecosystem responses in western Oregon watersheds

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Correction: Fire Ecol 19, 34 (2023)
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When analysing subsequent years of fish and amphibian data, the authors identified an error in some of the reach area calculations that affected vertebrate densities for some sites (density and biomass density for fish and amphibians). Specifically, the formula for reach area in some cells (5 sites) referenced wetted width from an adjacent site instead of the correct site. Because this error did not occur across all cells (sites) and because abundance data were not affected this calculation error was not readily apparent. This error affected densities for fish and amphibians at some sites, including 2 of the most severely burned sites, and therefore affects the individual fish and amphibian responses reported in Fig. 7 a, b. For consistency, Fig. 5 (PCA) has also been updated to reflect these changes.

This correction affects only the fish and amphibian density and biomass density results (Fig. 5, Fig. 7 panel a and b), with minimal edits to the text. However, this small adjustment does not affect the overall conclusions or interpretation of the article, which focuses on the response of in-stream large wood and riparian coarse wood to wildfire.

The original article (Coble et al. 1) has been corrected.

The corrected figures can be found below with a table of corrections that have been implemented in the original article.

The original article can be found online at https://doi.org/10.1186/s42408-023-00192-5.

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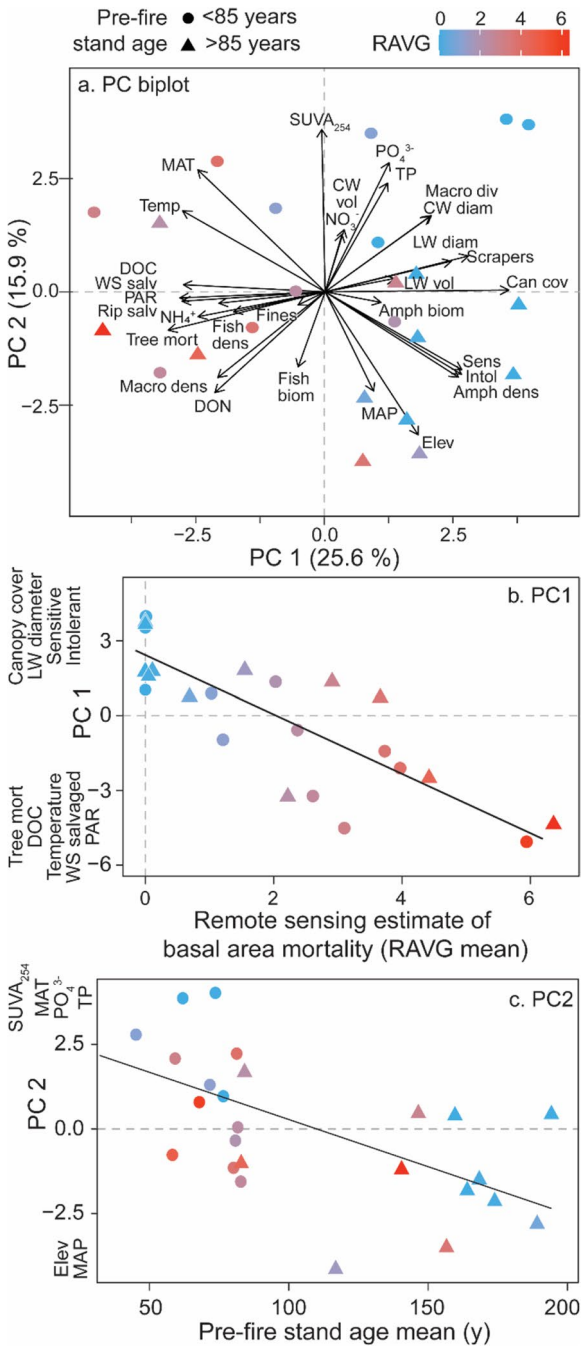

Fig. 5 Principal components analysis (PCA) and relationships of axes with fire severity and pre-fire stand age. **a** PCA with scores and loadings of physical, chemical, biological, and watershed characteristics. **b** Principal component 1 (PC1) varied as a function of fire severity as RAVG mean. **c** Principal component 2 (PC2) varied as a function of pre-fire stand age

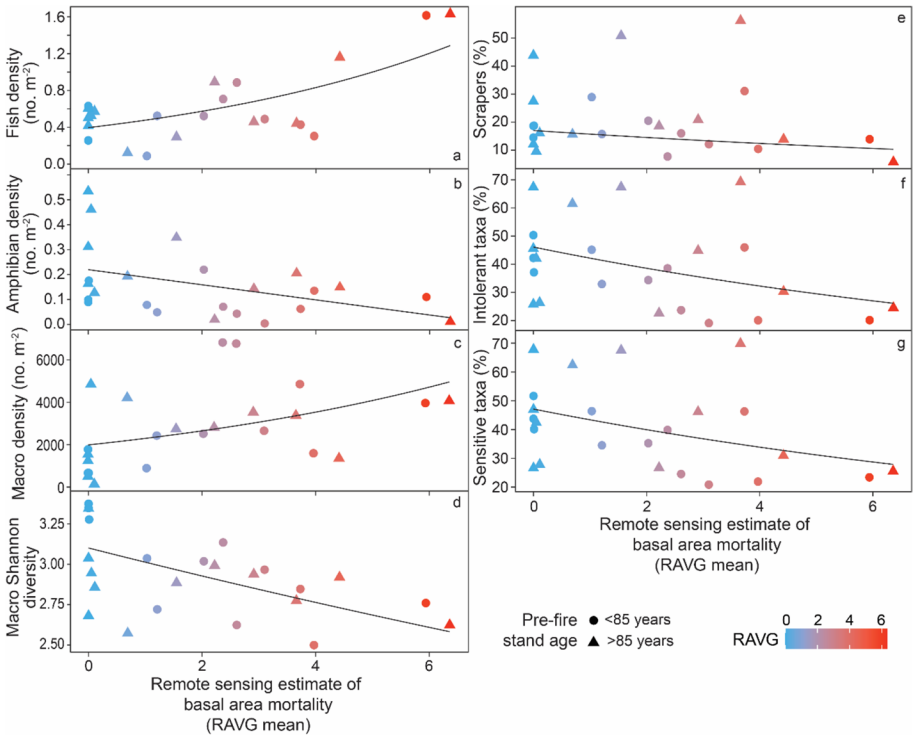

Fig. 7 Biological responses that varied as a function of fire severity (RAVG). Biological responses included: **a** fish density (no m^{-2}); b fish biomass density (g m^{-2}); **c** macroinvertebrate density (no m^{-2}); **d** macroinvertebrate Shannon–Weaver diversity (Shannon diversity); **e** scrapers (%); **f** intolerant taxa (%); and (**g**) sensitive taxa

Table of corrections

Section	Originally published text	Corrected text
Abstract Results section	At higher fire severities, riparian tree mortality, salvage logging, light, and dissolved organic matter (DOM) concentrations were higher, whereas canopy cover, LW diameter, macroinvertebrate diversity, and fish density were lower	At higher fire severities, riparian tree mortality, salvage logging, light, and dissolved organic matter (DOM) concentrations, **and fish densities** were higher, whereas canopy cover, LW diameter, macroinvertebrate diversity, and **amphibian** density were lower
Abstract Conclusions section	Severe fires burn more overstory riparian vegetation, leading to increased light, DOM concentrations, and macroinvertebrate densities, along with reduced canopy cover, LW diameter, macroinvertebrate diversity, and fish densities	Severe fires burn more overstory riparian vegetation, leading to increased light, DOM concentrations, and macroinvertebrate **and fish** densities, along with reduced canopy cover, LW diameter, macroinvertebrate diversity, and **amphibian** densities
Principal components analysis section First paragraph	Principal component 1 (PC1) explained 26.1% of the variation and was positively related to canopy cover, LW diameter geometric mean, and macroinvertebrate sensitive and intolerant taxa, and negatively related to overstory tree mortality, PAR, watershed salvage logging, DOC, and stream temperature (Fig. 5a). Principal component 2 (PC2) explained 15.7% of the variation and was positively related to $SUVA_{254}$, MAT, PO_4^{3-}, and TP, but negatively related to MAP and elevation	Principal component 1 (PC1) explained **25.6%** of the variation and was positively related to canopy cover, LW diameter geometric mean, and macroinvertebrate sensitive and intolerant taxa, and negatively related to overstory tree mortality, PAR, watershed salvage logging, DOC, and stream temperature (Fig. 5a). Principal component 2 (PC2) explained **15.9%** of the variation and was positively related to $SUVA_{254}$, MAT, PO_4^{3-}, and TP, but negatively related to MAP and elevation
Principal components analysis section Second paragraph	Fire severity was a significant predictor of PC1 revealing more severely burned watersheds had greater tree mortality, salvage logging, light availability, DOC, DON, NH_4^+, and stream temperature, and had lower canopy cover, fish density, sensitive and intolerant macroinvertebrate taxa, percent scrapers, and smaller diameter wood in streams and riparian areas (Fig. 5b; Additional File 2)	Fire severity was a significant predictor of PC1 revealing more severely burned watersheds had greater tree mortality, salvage logging, light availability, DOC, DON, NH_4^+, **fish density**, and stream temperature, and had lower canopy cover, sensitive and intolerant macroinvertebrate taxa, percent scrapers, and smaller-diameter wood in streams and riparian areas (Fig. 5b; Additional File 2)
Covariate response to fire severity or pre-fire stand age section Fifth paragraph	We hypothesized that stream biota would respond negatively to streams exposed to greater fire severity, and our results are consistent with this hypothesis for some top predators. Of top predators (fish or amphibians), we found that only fish density and fish biomass density varied with fire severity and pre-fire stand age, whereas amphibian density and amphibian biomass density did not vary with any predictors (Fig. 5). We observed a significant interaction of fish density to fire severity and pre-fire stand age, and to their individual main effects. Fish biomass density varied with fire severity, but not pre-fire stand age or their interaction. Fish density and fish biomass density were lower in more severely burned watersheds, but fish density was greater in watersheds draining younger pre-fire stand ages	We hypothesized that stream biota would respond negatively to streams exposed to greater fire severity, and our results are consistent with this hypothesis **for amphibians, but not fish. Amphibian density varied with fire severity and pre-fire stand age, whereas fish density varied with fire severity. Fish biomass density and amphibian biomass density did not vary with any predictors (**Fig. 5**). We did not observe a significant interaction of amphibian density to fire severity and pre-fire stand age, but their individual main effects were significant with greater amphibian densities occurring in less severely burned watersheds and in older pre-fire stand ages. Fish density was greater in more severely burned watersheds**
Fire severity and pre-fire stand age influence aquatic ecosystems section First paragraph	In watersheds that burned at higher severity, overstory mortality, light availability, DOM concentrations, salvage logging, and stream temperature increased whereas canopy cover, LW diameter, sensitive and intolerant macroinvertebrate taxa, functional feeding group of scrapers, fish density, and fish biomass density decreased	In watersheds that burned at higher severity, overstory mortality, light availability, DOM concentrations, salvage logging, stream temperature, **and fish density** increased whereas canopy cover, LW diameter, sensitive and intolerant macroinvertebrate taxa, functional feeding group of scrapers, and **amphibian density decreased**
Fire severity and pre-fire stand age influence aquatic ecosystems section Sixth paragraph	We found that fish density and biomass density decreased in more severely burned watersheds across our study area, which includes 24 sites and multiple fires	We found **that fish density increased and amphibian density decreased** in more severely burned watersheds across our study area, which includes 24 sites and multiple fires

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Fire severity and pre-fire stand age influence aquatic ecosystems section Sixth paragraph	These changes likely collectively contributed to declines in fish density and fish biomass density. Despite immediate declines observed in our study, these native populations are expected to recover quickly (Rieman and Clayton 1997; Dunham et al. 2003; Rieman et al. 2012; Gomez Isaza et al. 2022), and ongoing monitoring will aid in our understanding of recovery across a range of fire severity across sites from different fires	These changes likely collectively contributed to **greater fish density and lower amphibian density. Despite mixed predator responses observed** in our study, these native populations are expected to recover quickly (Rieman and Clayton 1997; Dunham et al. 2003; Rieman et al. 2012; Gomez Isaza et al. 2022), and ongoing monitoring will aid in our understanding of recovery across a range of fire severity across sites from different fires
Conclusions	Within the first 8 to 11 months after western Cascades mega-fires, we found more severe fires burned more overstory riparian vegetation, leading to increased light, DOM concentrations, and macroinvertebrate densities, along with reduced canopy cover, LW diameter, macroinvertebrate diversity, and fish densities	Within the first 8 to 11 months after western Cascades mega-fires, we found more severe fires burned more overstory riparian vegetation, leading to increased light, DOM concentrations, and macroinvertebrate **and fish densities**, along with reduced canopy cover, LW diameter, macroinvertebrate diversity, **and amphibian densities**
Additional file 5	Biological variables as a function of pre-fire stand age (y). Variables included: a) Ash-free dry mass (g m^{-2}), b) Collector-filterer (%), c) Shredders (%), d) EPT (%), e) Amphibian density (no. m^{-2}), and f) Amphibian biomass density (g m^{-2})	Biological variables as a function of pre-fire stand age (y) **and fire severity (RAVG)**. Variables included: a) Ash-free dry mass (g m^{-2}), b) Collector-filterer (%), c) Shredders (%), d) EPT (%), e) **Fish biomass** density **(g m^{-2})**, and f) Amphibian biomass density (g m^{-2})

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Reference

1. Coble, A.A., Penaluna, B.E., Six, L.J. et al. Fire severity influences large wood and stream ecosystem responses in western Oregon watersheds. Fire Ecol 19, 34 (2023). https://doi.org/10.1186/s42408-023-00192-5.