Peace in Colombia is a critical moment for Neotropical connectivity and conservation: Save the northern Andes–Amazon biodiversity bridge

Nicola Clerici1 | Camilo Salazar1 | Carolina Pardo-Díaz1 | Chris D. Jiggins2 | James E. Richardson1 | Mauricio Linares1

INTRODUCTION

Relative to land area, Colombia is the most biodiverse country in the world (Gonzalez-Salazar, Venturini, Poganietz, Finkenrath, & Leal, 2017). It heads the list of countries with the greatest number of bird species, while boasting the second highest number of amphibians and freshwater fishes (Moreno, Andrade, & Ruiz-Contreras, 2017). A recent checklist indicated about 28,000 species of plants and lichens (Bernal, Gradstein, & Celis, 2015) approximately 10% of the world's total, within a single medium-sized country. The biodiversity of Colombia hence represents a natural capital of immense importance to the planet.

Regrettably, Colombia has experienced extensive deforestation and habitat fragmentation in the past few decades, due primarily to agricultural expansion through cattle raising, development of linear infrastructure, and illegal cropping (Armenteras, Rodriguez, Retana, & Morales, 2011; Etter,
EXAMPLES OF RECENT ANDEAN–AMAZONIAN DISPERALS INCLUDE OLINGOS AND BATS. SHORT-TAILED FRUIT BATS OF THE SPECIES *CAROLLA PERSPICILLATA*, WHICH LIKELY AROSE IN THE ATLANTIC COASTAL FOREST OF BRAZIL, HAVE RECENTLY CROSSED THE ANDES TO ENTER AND EXPAND INTO CENTRAL AMERICA, AND POPULATIONS OF THIS SPECIES CURRENTLY OCCURRING IN CLOUD FORESTS ON BOTH SIDES OF THE ANDES HAVE LOW DIFFERENTIATION (>2%), WHICH IS CONSISTENT WITH ACTIVE OR RECENT GENE FLOW AMONG THEM (HOFFMANN & BAKER, 2003). ON THE OTHER HAND, THE OLINGO *BASSARICYON ALLIENS*, WHICH IS ENDEMIC TO THE AMAZON, ARRIVED INTO THIS REGION IN THE PLEISTOCENE (~1–2 MYA) IN A LIKELY DISPERSAL EVENT OF ITS ANCESTOR ACROSS THE NORTHERN ANDES (HELGEN ET AL., 2013).

In the emblematic *Heliconius* butterflies, the establishment of red wing mimicry between *Heliconius erato* and *Heliconius melpomene* throughout their distribution involved dispersal from the Andes into the Amazon and vice versa. Genealogies of the transcription factor *optix*, responsible for red wing variation in these two species, revealed that Andean red-band phenotypes were ancestral in *H. erato* and then spread in an eastward manner, thus originating the derived Amazonian orange-ray phenotype. In contrast, migration of the red phenotypes in *H. melpomene* likely followed a westward pattern from the Amazon into the Andes (Hines et al., 2011) and, once there, these red adaptive alleles introgressed into the ancestor of the submontane forest species *H. timareta*, (~10 MYA) and *Godrys* (4–5 MYA) (Chazot et al., 2016). In the opposite direction, “clearwing” butterflies of the genera *Ithomia* and *Napeogenes* originated and diversified at mid-elevations in the Andes during the Middle Miocene and then colonised the lowlands (~7 MYA), where *Napeogenes* diversified (Elias et al., 2009). Similarly, the Andean rodent genus *Calomys* invaded the lowlands about 9 MYA, where it underwent substantial radiation (Haag et al., 2007).

Such Andean–Amazonian species dispersals did not stop with the final uplift of the Northern Andes (~5–2 MYA). Instead, during the past 5 million years, there have been species dispersal events from one region into the other, with some populations maintaining gene flow. Recent studies in birds suggest that dispersals across the Andes after the uplift was completed have played a major role in avian speciation in the Neotropics. For instance, lowlands *Dendrocincla* woodcreepers colonized the Andes twice (2 and 0.9 MYA), resulting in the endemic trans-Andean species *Dendrocincla anabatina* and *Dendrocincla fuliginosa ridgwayi* (Weir & Price, 2011). Similarly, the lowland forest flycatcher *Mionectes oleaginosus* has experienced at least two post-Andean uplift dispersal events 1.0 and 0.2 MYA, from the Amazon into montane habitats in the Andes and established populations that have maintained gene flow (Miller et al., 2008). After uplift dispersal across the Andes has been suggested in plants, for example in *Theobroma* (Malvaceae; Richardson, Whitlock, Meerow, & Madriñán, 2015).

Examples of recent Andean–Amazonian dispersals include olingos and bats. Short-tailed fruit bats of the species *Carollia perspicillata*, which likely arose in the Atlantic coastal forest of Brazil, have recently crossed the Andes to enter and expand into Central America, and populations of this species currently occurring in cloud forests on both sides of the Andes have low differentiation (>2%), which is consistent with active or recent gene flow among them (Hoffmann & Baker, 2003). On the other hand, the olingo *Bassaricyon alliens*, which is endemic to the Amazon, arrived into this region in the Pleistocene (~1–2 MYA) in a likely dispersal event of its ancestor across the Northern Andes (Helgen et al., 2013).

In the emblematic *Heliconius* butterflies, the establishment of red wing mimicry between *Heliconius erato* and *Heliconius melpomene* throughout their distribution involved dispersal from the Andes into the Amazon and vice versa. Genealogies of the transcription factor *optix*, responsible for red wing variation in these two species, revealed that Andean red-band phenotypes were ancestral in *H. erato* and then spread in an eastward manner, thus originating the derived Amazonian orange-ray phenotype. In contrast, migration of the red phenotypes in *H. melpomene* likely followed a westward pattern from the Amazon into the Andes (Hines et al., 2011) and, once there, these red adaptive alleles introgressed into the ancestor of the submontane forest species *H. timareta*, (~10 MYA) and *Godrys* (4–5 MYA) (Chazot et al., 2016). In the opposite direction, “clearwing” butterflies of the genera *Ithomia* and *Napeogenes* originated and diversified at mid-elevations in the Andes during the Middle Miocene and then colonised the lowlands (~7 MYA), where *Napeogenes* diversified (Elias et al., 2009). Similarly, the Andean rodent genus *Calomys* invaded the lowlands about 9 MYA, where it underwent substantial radiation (Haag et al., 2007).

Such Andean–Amazonian species dispersals did not stop with the final uplift of the Northern Andes (~5–2 MYA). Instead, during the past 5 million years, there have been species dispersal events from one region into the other, with some populations maintaining gene flow. Recent studies in birds suggest that dispersals across the Andes after the uplift was completed have played a major role in avian speciation in the Neotropics. For instance, lowlands *Dendrocincla* woodcreepers colonized the Andes twice (2 and 0.9 MYA), resulting in the endemic trans-Andean species *Dendrocincla anabatina* and *Dendrocincla fuliginosa ridgwayi* (Weir & Price, 2011). Similarly, the lowland forest flycatcher *Mionectes oleaginosus* has experienced at least two post-Andean uplift dispersal events 1.0 and 0.2 MYA, from the Amazon into montane habitats in the Andes and established populations that have maintained gene flow (Miller et al., 2008). After uplift dispersal across the Andes has been suggested in plants, for example in *Theobroma* (Malvaceae; Richardson, Whitlock, Meerow, & Madriñán, 2015).

Examples of recent Andean–Amazonian dispersals include olingos and bats. Short-tailed fruit bats of the species *Carollia perspicillata*, which likely arose in the Atlantic coastal forest of Brazil, have recently crossed the Andes to enter and expand into Central America, and populations of this species currently occurring in cloud forests on both sides of the Andes have low differentiation (>2%), which is consistent with active or recent gene flow among them (Hoffmann & Baker, 2003). On the other hand, the olingo *Bassaricyon alliens*, which is endemic to the Amazon, arrived into this region in the Pleistocene (~1–2 MYA) in a likely dispersal event of its ancestor across the Northern Andes (Helgen et al., 2013).

In the emblematic *Heliconius* butterflies, the establishment of red wing mimicry between *Heliconius erato* and *Heliconius melpomene* throughout their distribution involved dispersal from the Andes into the Amazon and vice versa. Genealogies of the transcription factor *optix*, responsible for red wing variation in these two species, revealed that Andean red-band phenotypes were ancestral in *H. erato* and then spread in an eastward manner, thus originating the derived Amazonian orange-ray phenotype. In contrast, migration of the red phenotypes in *H. melpomene* likely followed a westward pattern from the Amazon into the Andes (Hines et al., 2011) and, once there, these red adaptive alleles introgressed into the ancestor of the submontane forest species *H. timareta*, (~10 MYA) and *Godrys* (4–5 MYA) (Chazot et al., 2016). In the opposite direction, “clearwing” butterflies of the genera *Ithomia* and *Napeogenes* originated and diversified at mid-elevations in the Andes during the Middle Miocene and then colonised the lowlands (~7 MYA), where *Napeogenes* diversified (Elias et al., 2009). Similarly, the Andean rodent genus *Calomys* invaded the lowlands about 9 MYA, where it underwent substantial radiation (Haag et al., 2007).
triggering its diversification and leapfrog distribution along the Eastern Andes.

Contemporary species movement and gene flow across forest corridors connecting the Andes and the Amazon remain poorly studied. This is especially true in Colombia, where there is a lack of studies testing dispersal events and their implications for genetic connectivity and diversification. Nonetheless, extant hybrid zones in *Heliconius* provide evidence of active gene flow between these regions. In the southern Colombian department of Putumayo, crossing the Andes and the Amazon, it is frequent to find individuals with hybrid wing patterns resulting from hybridisation between the Andean species *H. melpomene bellula* and *H. erato dignus* with their respective Amazonian conspecifics, namely *H. melpomene malleti* and *H. erato lativitta* (Figure 1; Vargas & Salazar, 2007; ML, CJ, CS, and CPD, personal observation).

2 | THE PICACHOS–TINIGUA–SIERRA DE LA MACARENA–CHIRIBIQUETE CORRIDOR

The most extensive Colombian region that acts as a natural corridor is represented by three contiguous National Natural Parks (NNP): Cordillera de los Picachos, Tinigua, and the Sierra de la Macarena. This group of national parks, established respectively in 1977, 1989, and 1971, aims to protect a unique highly biodiverse and endemic rich region globally, and covers one of the last key connections between Andean ecosystems and the humid lowland regions of Colombia. Following the biogeographic regionalization of the Neotropical region proposed by Morrone (2014), these parks represent an ecological connection between the mountainous Páramo province in the South American Transition Zone and the Imerí province in the Boreal Brazilian dominion (Figure 2). These three protected areas constitute a landscape continuum beginning in the Eastern Andean Cordillera with páramo and tropical montane forests ecosystems, continuing south-east through an ecological gradient that reaches lowland wet forest and through unprotected areas that finally connect to the large NNP Serranía del Chiribiquete, the heart of the Colombian Amazon (4, in Figure 2). The whole of this region is the Picachos–Tinigua–Sierra de la Macarena–Chiribiquete megacorridor.

Regrettably, illegal armed and nonarmed groups have been exploiting new land for coca cropping and cattle expansion by hiring colonos, farmers often displaced by violence that represent the initial perpetrators of deforestation. In combination with a widespread lack of state governance, this resulted in rapid forest conversion within and around these parks. In the case of coca, it is also worth noting the unpredictable nature of its cultivation, with much temporal and spatial variation of coca-driven deforestation in the region (Rincón Ruiz, Pascual, & Romero, 2013).

Using the Hansen et al.’s (2013) Global Forest Change dataset ver.1.3, we calculated 634 km² of forest loss (about 4.9% of the overall protected surface) detected in the years 2000–2015 inside the three NNPs, and 1,152 km² of loss in a 10-km buffer zone around them in the same period. This demonstrates massive human mediated habitat conversion and ineffective park management in this protected region. From 1990, the Colombian Forest and Carbon Monitoring system (IDEAM 2017b) also provides historic forest–no forest data for the country. Forest loss estimations using this dataset for the study area are uncertain due to the presence of cloud-coverage in the mountainous region. Despite this, the data provide a unique 26-year picture of the dynamics of forest loss and landscape fragmentation in the region. The IDEAM forest–no forest temporal series shows increasing isolation of the park’s complex due to the rapid increase in deforestation from both the western (Caquetá Department) and the eastern (Meta and Guaviare) sides (see Supporting Information). The natural continuation of the protected corridor to the south of the NNP Sierra de la Macarena in the Amazon biogeographical region, once a homogeneous and pristine forest landscape, has been severely eroded, and reduced to forest patches dispersed through a matrix of large cattle ranches, rapidly appearing in State-owned vacant lands (Figure 3). Large-scale landowners feed the conversion process by acquiring cheap cleared land from the colonos with the prospect of claiming land possession from the State. Additionally, such dynamics occur in a region characterized by extensive native savannas, natural gaps in forest cover that can enhance the effect of deforestation for forest dependent species. By observing historical and recent trends, in a business as usual scenario, these dynamics will inevitably lead to a regional disconnection of the forest continuum between the Colombian biogeographical Andes and the Amazon, separating source and receiver regions of this extensive and critical corridor of genetic and biodiversity exchange.

A further additional threat is also rapidly materializing in the region. A large segment of road connecting the town of San José del Guaviare with San Vicente del Caguán (Figure 3) is planned by the Colombian Government. The total 381 km of the Marginal Jungle Road would provide the country connectivity to Ecuador and Venezuela, but at the cost of facilitating access to further uncontrolled colonization, which would eventually boost natural habitat conversion and reduce corridors connectivity.

3 | CONCLUDING REMARKS

The postconflict era in Colombia will undoubtedly bring immense positive impacts, but it is important that these are
felt by all sectors of society and in an environmentally sustainable manner. Colombia is now experiencing the consequences of the power vacuum left by the FARC over large parts of its territory (Clerici et al., 2016). Armed groups including FARC dissidents, paramilitaries, and other organized crime groups are now using this unique opportunity to expand illegal activities into new uncontrolled areas. These include protected areas, whose State control and management in some Colombian regions is still extremely difficult. Additionally, in unprotected land the widespread inefficiency of government territorial control makes the action of colonos in pristine vacant lands an extensive phenomenon, supported economically by large landowners.

The disruption of primary tropical forests is a major threat to global biodiversity (Gibson et al., 2011). In systematic conservation planning, regional connectivity is a major factor to take into account within multiscale socioecological systems (Cumming et al., 2015; Hodgson, Thomas, Wintle, & Moilanen, 2009) in order to maintain genetic exchange, species dispersal, support metapopulations resilience, and ecosystem services provision. The Picachos–Tinigua–Macarena–Chiribiquete megacorridor and its role in connecting two megadiverse biogeographical regions has not received the attention it deserves. The recent proposed expansion of the NPP Serranía de Chiribiquete by the government, if implemented, will help maintain the interconnectivity in the region and within this protected areas system. However, the remaining unprotected land in the corridor is experiencing rapid habitat conversion and fragmentation that needs to be prevented. To this end we appeal for the attention of international conservation organizations and governmental organs to funnel both research and development funds and resources to promote and nourish projects focused on the preservation and sustainable management of this strategic Andes–Amazon bridge in its protected and unprotected land. Farmers, colonos, and local communities should be active participants in this process, by encouraging them to change their activities and work in a manner that is better aligned with the objectives of Natural Parks and sustainable unprotected land management, toward a protection de facto versus current protection de jure. This much-needed effort would help the country achieve its 2020 zero-deforestation targets, and be aligned with Aichi Target 11, and the recent governmental interest in the Andes–Amazon–Atlantic transnational corridor. In the postconflict era Colombia has a unique opportunity to create a new social and economic paradigm based on sustainable
FIGURE 3  Upper figure: stable forest, stable no forest (natural and non natural), and forest loss in the study region (1990–2016). Lower figure: corridor erosion due to forest loss and landscape fragmentation (South of NNP Sierra de la Macarena). Source: (IDEAM 2017b). Inset map: location of the megacorridor within Colombia

Landscapes and more equitable sharing of wealth in the long term. We believe improved management and conservation efforts for the Picachos–Tinigua–Macarena–Chiribiquete megacorridor would demonstrate a collective will in helping to achieve this goal. On a general level, we stress the importance of acquiring improved scientific information on multispecies regional genetic flows, and of monitoring and ensuring its maintenance, especially in rapidly changing geopolitical landscapes. Finally, during the postconflict recovery period, effective control of protected and unprotected land by the state should be guaranteed not only by a reinforced physical presence but also by the rapid implementation of rural development programs where local involvement in conservation of biodiversity rich areas and management of the natural capital is a primary objective. We hope that Colombia can learn from other postconflict zones, such as in Guatemala, where a strategy of local community engagement in the management of forest resources contributed in large regions to effective conservation, while providing significant income streams to resident stakeholders (e.g., Multiple-Use Zones of the Maya Biosphere Reserve; Radachowsky, Ramos, McNab, Baur, & Kazakov, 2012). We also hope that the experience Colombia gains will result in it contributing to improved chances of recovery in other regions that are currently experiencing conflict.

ORCID
Nicola Clerici http://orcid.org/0000-0003-4547-7606
Camilo Salazar http://orcid.org/0000-0001-9217-6588
Carolina Pardo-Díaz http://orcid.org/0000-0002-7259-1183
Chris D. Jiggins http://orcid.org/0000-0002-7809-062X
James E. Richardson http://orcid.org/0000-0001-9014-4865
Mauricio Linares http://orcid.org/0000-0002-1021-0226
REFERENCES

Armenteras, D., Rodriguez, N., Retana, J., & Morales, M. (2011). Understanding deforestation in montane and lowland forests of the Colombian Andes. Regional Environmental Change, 11, 693–705.

Bernal, R., Gradstein, R., & Celis, M. E. (2015). Catálogo de las plantas y líquenes de Colombia. Bogotá, Colombia: Universidad Nacional de Colombia.

Chazot, N., Willmott, K. R., Condamine, F. L., De-Silva, D. L., Freitas, A. V., Lamas, G., ... Elias, M. (2016). Into the Andes: Multiple independent colonizations drive montane diversity in the Neotropical clearing butterflies Godyridina. Molecular Ecology, 25, 5765–5784.

Clerici, N., Richardson, J. E., Escobedo, F. J., Posada, J. M., Linares, M., Sanchez, A., & Vargas, J. F. (2016). Colombia: Dealing in conservation. Science, 354, 190.

Cumming, G. S., Allen, C. R., Ban, N. C., Biggs, D., Biggs, H. C., Cumming, D. H., ... Schoon, M. (2015). Understanding protected area resilience: A multi-scale, social-ecological approach. Ecological Applications, 25, 299–319.

Elias, M., Joron, M., Willmott, K., Silva-Brandão, K. L., Kaiser, V., Arias, C. F., ... Jiggins, C. D. (2009). Out of the Andes: Patterns of diversification in clearing butterflies. Molecular Ecology, 18, 1716–1729.

Etter, A., McAlpine, C., Wilson, K., Phinn, S., & Possingham, H. (2006). Regional patterns of agricultural land use and deforestation in Colombia. Agriculture, Ecosystems & Environment, 114, 369–386.

Gibson, L., Lee, T. M., Koh, L. P., Brook, B. W., Gardner, T. A., Barlow, J., ... Sodhi, N. S. (2011). Primary forests are irreplaceable for sustaining tropical biodiversity. Nature, 478, 378–381.

Gonzalez-Salazar, M. A., Venturini, M., Poganietz, W. R., Finkenrath, M., & Leal, M. R. L. V. (2017). Combining an accelerated deployment of bioenergy and land use strategies: Review and insights for a post-conflict scenario in Colombia. Renewable and Sustainable Energy Reviews, 73, 159–177.

Haag, T., Muschner, V. C., Freitas, L. B., Oliveira, L. F. B., Langguth, A. R., & Mattevi, M. S. (2007). Phylogenetic relationships among species of the genus Calomys with emphasis on South American short-tailed bats (Carollia: Phyllostomidae). Journal of Mammalogy, 88, 769–776.

Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S. A., Tyukavina, A., ... Townshend, J. R. (2013) High-resolution global maps of 21st-century forest cover change. Science, 342(6160), 850–853.

Helgen, K. M., Pinto, C. M., Kays, R., Helgen, L. E., Tsuchiya, M. T. N., Quinn, A., ... Maldonado, J. E. (2013). Taxonomic revision of the olingos (Bassaricyon), with description of a new species, the Olinguito. ZooKeys, 1–83.

Hines, H. M., Counterman, B. A., Papa, R., Albuquerque de Moura, P., Cardoso, M. Z., & Linares, M. (2011). Wing patterning gene refines the mimetic history of Heliconius butterflies. Proceedings of the National Academy of Sciences of the United States of America, 108, 19666–19671.

Hodgson, J. A., Thomas, C. D., Wintle, B. A., & Moilanen, A. (2009). Climate change, connectivity and conservation decision making: Back to basics. Journal of Applied Ecology, 46, 964–969.

Hoffmann, F. G., & Baker, R. J. (2003). Comparative phylogeography of short-tailed bats (Carollia: Phyllostomidae). Molecular Ecology, 12, 3403–3414.

Hoorn, C., Wesselingh, F. P., ter Steege, H., Bermudez, M. A., Mora, A., Sevink, J., ... Antonell, A. (2010). Amazonia through time: Andean uplift, climate change, landscape evolution, and biodiversity. Science, 330, 927–931.

IDEAM. (2017a). Mapa de Cambio de Bosque Colombia—Área Continental (Escala Fina LANDSAT) Periodo 2015–2016. Instituto de Hidrología, Meteorología y Estudios Ambientales. Retrieved from https://capacitacion.siac.ideal.gov.co/SIAC/imagenes/mapas_JPG/biodiversidad/DCCB_SMBYCB_CBBQ_V7_2015_2016.pdf

IDEAM. (2017b). Sistema de Monitoreo de Bosques y Carbono (SMBYCB). Meteorología y Estudios Ambientales: Instituto de Hidrología. Retrieved from https://www.smbyc.ideal.gov.co/

IGAC. (2015). Suelos y Tierras de Colombia. Subdirección de Agrología, Bogotá, Colombia: Instituto Geográfico Agustín Codazzi.

IUCN UNEP-WCMC. (2017). The World Database on Protected Areas (WDPA). Cambridge (UK): UNEP World Conservation Monitoring Centre. Retrieved from https://www.protectedplanet.net.

McGuire, J. A., Witt, C. C., Remsen, J. V., Corli, A., Rabosky, D. L., Altshuler, D. L., & Dudley, R. (2014). Molecular phylogenetics and the diversification of hummingbirds. Current Biology, 24, 910–916.

Miller, M. J., Bermingham, E., Klicka, J., Escalante, P., do Amaral, F. S., Weir, J. T., & Winker, K. (2008). Out of Amazonia again and again: Episodic crossing of the Andes promotes diversification in a lowland forest flycatcher. Proceedings of the Royal Society B: Biological Sciences, 275, 1133–1142.

Minambiente. (2017). Estrategia Integral de Control a la deforestación y gestión de los bosques (EICDBG). Working paper. Bogotá. Retrieved from https://www.minambiente.gov.co/images/EICDBG_1.0_AGOSTO_9_2017.pdf.

Moreno, L. A., Andrade, G. I., & Ruiz-Contreras, L. F. E. (2017). Biodiversidad 2016. Estado y tendencias de la biodiversidad continental de Colombia. Bogotá, D.C., Colombia: Instituto de Investigación de Recursos Biológicos Alexander von Humboldt.

Morrone, J. J. (2014). Biogeographical regionalisation of the Neotropical region. Zootaxa, 3782, 1–110.

Radachowsky, J., Ramos, V. H., McNab, R., Baur, E. H., & Kazakova, N. (2012). Forest concessions in the Maya Biosphere Reserve, Guatemala: A decade after. Forest Ecology and Management, 268, 18–28.

Richardson, J. E., Whitlock, B. A., Meerow, A. W., & Madrinián, S. (2015). The age of chocolate: A diversification history of Theobroma and Malvaceae. Frontiers in Genetics, 3, 120.

Rincón Ruiz, A. R., Pascual, U., & Romero, M. (2013). An exploratory spatial analysis of illegal coca cultivation in Colombia using local indicators of spatial association and socioecological variables. Ecological Indicators, 34, 103–112.
SIAC. (2017). Sistema de Información Ambiental de Colombia. Retrieved from https://181.225.72.78/Portal-SIAC-web/faces/Dashboard/Biodiversidad2/bosques/estadoCifrasBosques.xhtml?tematica=Cambio+de+superficie&anio=2016&entidad=IDEAM&instituto=IDEAM.

Vargas, J. I., & Salazar, J. A. (2007). Mariposas colombianas IX: Hibridación natural de Heliconius erato dignus (stichel) × Heliconius erato lativitta (butler) en el piedemonte surooriental de Colombia (Lep: Nymphalidae: Heliconiinae). Boletín Científico del Centro de Museos, 11, 293–299.

Weir, J. T., & Price, M. (2011). Andean uplift promotes lowland speciation through vicariance and dispersal in Dendrocincla woodcreepers. Molecular Ecology, 20, 4550–4563.

**SUPPORTING INFORMATION**

Additional supporting information may be found online in the Supporting Information section at the end of the article.

**How to cite this article:** Clerici N, Salazar C, Pardo-Díaz C, Jiggins CD, Richardson JE, Linares M. Peace in Colombia is a critical moment for Neotropical connectivity and conservation: Save the northern Andes–Amazon biodiversity bridge. *Conservation Letters*. 2019;12:e12594. [https://doi.org/10.1111/conl.12594](https://doi.org/10.1111/conl.12594)