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Semblanzas Ictiológicas Iberoamericanas
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y
Justina Ponte Gómez

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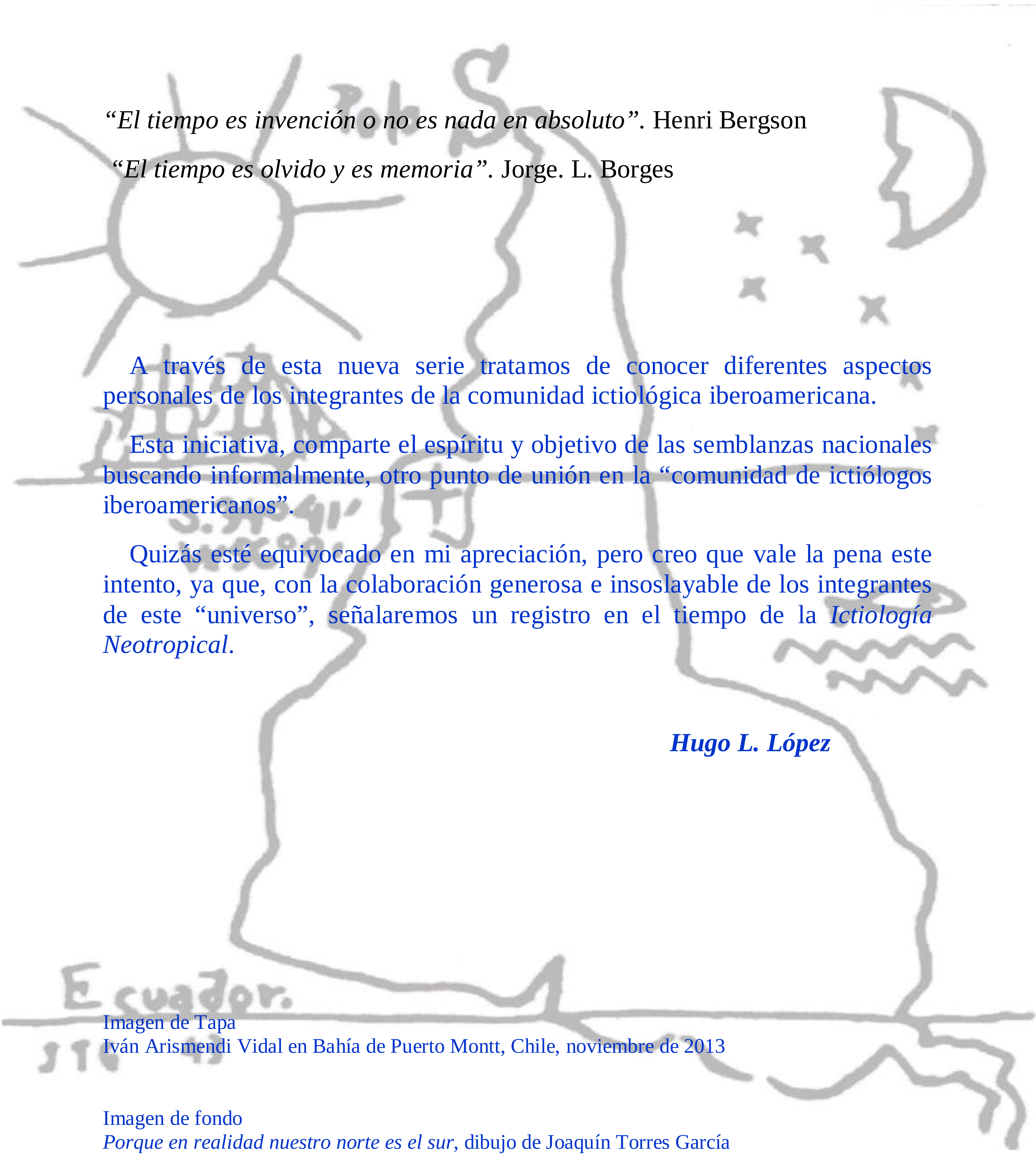

“El tiempo es invención o no es nada en absoluto”. Henri Bergson

“El tiempo es olvido y es memoria”. Jorge. L. Borges

A través de esta nueva serie tratamos de conocer diferentes aspectos personales de los integrantes de la comunidad ictiológica iberoamericana.

Esta iniciativa, comparte el espíritu y objetivo de las semblanzas nacionales buscando informalmente, otro punto de unión en la “comunidad de ictiólogos iberoamericanos”.

Quizás esté equivocado en mi apreciación, pero creo que vale la pena este intento, ya que, con la colaboración generosa e insoslayable de los integrantes de este “universo”, señalaremos un registro en el tiempo de la *Ictiología Neotropical*.

Hugo L. López

Imagen de Tapa
Iván Arismendi Vidal en Bahía de Puerto Montt, Chile, noviembre de 2013

Imagen de fondo
Porque en realidad nuestro norte es el sur, dibujo de Joaquín Torres García

Semblanzas Ictiológicas Iberoamericanas

Iván Danilo Arismendi Vidal

H. J. Andrews Experimental Forest, Oregón, mayo de 2012

Hugo L. López y Justina Ponte Gómez

ProBiota
División Zoología Vertebrados
Museo de La Plata
FCNyM, UNLP

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Cuestionario

-**Un libro**: *20 Poemas de Amor y una canción desesperada* de Pablo Neruda
-**Una película**: *El Padrino*
-**Un tema musical**: *Manifiesto* de Víctor Jara
-**Un artista**: Violeta Parra
-**Un deporte**: futbol
-**Un color**: rojo
-**Una comida**: pho
-**Un animal**: puye, *Galaxias maculatus*
-**Una palabra**: persistencia
-**Un número**: 3
-**Una imagen**: mi familia reunida en un asado
-**Un lugar**: Isla de Chiloé
-**Una estación del año**: primavera
-**Un nombre**: Hazel Amaia
-**Un hombre**: Leonardo Da Vinci
-**Una mujer**: mi esposa Brooke
-**Un personaje de ficción**: Don Quijote de la Mancha
-**Un superhéroe**: Centella

Iván Arismendi Vidal con su esposa Brooke Penaluna, Whitefish, Montana, USA, enero de 2007

Iván Arismendi Vidal con su hija Amaia Violeta, ríos artificiales en Oregón, USA, julio de 2009

Freshwater Biology (2009) **54**, 1135–1147 doi:10.1111/j.1365-2427.2008.02157.x

APPLIED ISSUES

Aquaculture, non-native salmonid invasions and associated declines of native fishes in Northern Patagonian lakes

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SUMMARY

1. Even though intensive aquaculture production of salmonids in lakes occurs in many locations around the world published studies on the survival and reproductive success of escaped cultured salmonids in freshwater ecosystems are not common. A recent expansion of aquaculture in Chile has led it to become the world's second largest producer of cultured salmonids.

2. We document the recent history of escaped and self-sustaining salmonid populations over a wide spatial scale and a long temporal scale in Chilean Patagonian lakes. Our hypotheses are that salmonid density in lakes will be higher where there is intensive aquaculture, due to greater numbers of potential escapees. Secondly, if non-native salmonids have adverse impacts on native fishes, increases in the abundance of non-native species should be associated with decreases in relative abundance of native species. Finally, if the first two hypotheses are correct we anticipate that diets of salmonids may show evidence of predation on native fishes, diet overlap with native species, and evidence of the influence of feed from aquaculture operations in the diets of salmonids and native fishes.

3. We sampled six lakes with gill nets from 1992 to 2001. Our results show that the relative abundance of free-living salmonids is closely related to the level of fish farming production. Salmonids are the top predators and in lakes with fish farming the main prey item is native fishes. The relative abundance of native fishes has decreased, most likely due to predation by salmonids.

4. Our study contributes to the understanding of the effects of non-native salmonids in oligotrophic lakes, and it provides a starting point to judge the establishment of new fish farming sites in lakes around the world.

Keywords: gillnet, oligotrophic lakes, predation, salmon farming, stomach analysis

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GEOPHYSICAL RESEARCH LETTERS, VOL. 39, L10401, doi:10.1029/2012GL051448, 2012

The paradox of cooling streams in a warming world: Regional climate trends do not parallel variable local trends in stream temperature in the Pacific continental United States

Ivan Arismendi,[1] Sherri L. Johnson,[2] Jason B. Dunham,[3] Roy Haggerty,[1] and David Hockman-Wert[3]

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[1] Temperature is a fundamentally important driver of ecosystem processes in streams. Recent warming of terrestrial climates around the globe has motivated concern about consequent increases in stream temperature. More specifically, observed trends of increasing air temperature and declining stream flow are widely believed to result in corresponding increases in stream temperature. Here, we examined the evidence for this using long-term stream temperature data from minimally and highly human-impacted sites located across the Pacific continental United States. Based on hypothesized climate impacts, we predicted that we should find warming trends in the maximum, mean and minimum temperatures, as well as increasing variability over time. These predictions were not fully realized. Warming trends were most prevalent in a small subset of locations with longer time series beginning in the 1950s. More recent series of observations (1987–2009) exhibited fewer warming trends and more cooling trends in both minimally and highly human-influenced systems. Trends in variability were much less evident, regardless of the length of time series. Based on these findings, we conclude that our perspective of climate impacts on stream temperatures is clouded considerably by a lack of long-term data on minimally impacted streams, and biased spatio-temporal representation of existing time series. Overall our results highlight the need to develop more mechanistic, process-based understanding of linkages between climate change, other human impacts and stream temperature, and to deploy sensor networks that will provide better information on trends in stream temperatures in the future. **Citation:** Arismendi, I., S. L. Johnson, J. B. Dunham, R. Haggerty, and D. Hockman-Wert (2012), The paradox of cooling streams in a warming world: Regional climate trends do not parallel variable local trends in stream temperature in the Pacific continental United States, *Geophys. Res. Lett.*, *39*, L10401, doi:10.1029/2012GL051448.

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0094-8276/12/2012GL051448

1. Introduction

[2] Temperature is a fundamental driver of processes affecting aquatic ecosystems [*Magnuson et al.*, 1979]; therefore, the implications of climate impacts on stream temperature are of increasing concern [*Intergovernmental Panel on Climate Change*, 2007; *Webb et al.*, 2008; *Schneider and Hook*, 2010]. In recent decades, studies of responses to climate change in western North America have shown increases in air temperature [*Hamlet et al.*, 2005; *Mote et al.*, 2005; *Regonda et al.*, 2005; *Hansen et al.*, 2006], declines in snowpack [*Mote et al.*, 2005; *Regonda et al.*, 2005; *Nolin and Daly*, 2006] and increasing variability in precipitation [*Hamlet et al.*, 2005; *Regonda et al.*, 2005]. Concurrently, stream discharges have shown changes in timing and magnitude related to earlier peak flow in spring [*Regonda et al.*, 2005; *Barnett et al.*, 2008] as well as declines and increasing variability of low flow [*Luce and Holden*, 2009]. Moreover, the increases in air temperature and an earlier spring snowmelt have been associated with increased frequency of large wildfires [*Westerling et al.*, 2006], which can lead to loss of riparian shade and increased heating of streams by shortwave radiation [*Dunham et al.*, 2007].

[3] Observed warming in air temperature (between 0.8 to 2.1°C for the first half-decade of the 21st century relative to the period 1950–1980) [*Hansen et al.*, 2006] and changes *in streamflow timing and magnitude* [*Mote et al.*, 2005; *Regonda et al.*, 2005; *Luce and Holden*, 2009] have been hypothesized to lead to increases in the magnitude and variability of stream temperature (Figure 1a). Several studies have noted increasing temperature of streams. However, these have been based on data from streams that include those altered by human influences, including impoundments and water withdrawals [*Kaushal et al.*, 2010; *Mantua et al.*, 2010], or through inferences and correlations derived from air-water relationships [*Mantua et al.*, 2010; *Isaak et al.*, 2011].

[4] Here, we conduct a comprehensive evaluation of historical trends in stream temperatures, contrasting trends in both highly impacted and minimally human influenced streams to evaluate temperature responses to hypothesized climate impacts. We analyzed stream temperature time series at 63 sites in the Pacific continental United States (Figure S1 and Tables S1 and S2 in the auxiliary material).[1] Eighteen of these sites represented forested watersheds with minimal human influence [*Falcone et al.*, 2010], which allowed us to evaluate trends in the absence of confounding impacts

[1]Auxiliary materials are available in the HTML. doi:10.1029/2012GL051448.

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Piscivory and diet overlap between two non-native fishes in southern Chilean streams

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Abstract Trophic relations among introduced species may induce highly variable and complex effects in communities and ecosystems. However, studies that identify the potential impacts for invaded systems and illuminate mechanisms of coexistence with native species are scarce. Here, we examined trophic relations between two introduced fishes in streams of NW Patagonia, rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*). These species originate from different regions of the Northern Hemisphere but they now coexist as invading species over the world. We used gastric contents and stable isotopes analysis to compare the diets of two size-classes of these two invaders in three localities of southern Chile. Both species displayed similar ontogenic diet shifts with smaller trout consuming mostly invertebrates and larger trout being more piscivorous and epibenthic feeders. However, piscivory was more prevalent in brown trout than in rainbow trout and highest at the site with the greatest density of native fishes suggesting that the availability of native fishes as trout prey may limit the occurrence of trout piscivory. We found an elevated dietary overlap between the two trout species at larger sizes while at smaller size a higher intraspecific dietary overlap occurred suggesting a potential interference competition among the two fish invaders especially at larger sizes. Our results highlight that the impacts of invading species on non-native fishes are context specific (i.e. species and ontogenic stages) and thus, difficult to generalize.

Key words: alien species, native species, predation, South America, stable isotope.

INTRODUCTION

Trophic relations among several invading species can induce complex effects in communities and ecosystems (Crowder *et al.* 1997; Shurin 2001; Best & Arcese 2009), most of which are negative (Ross *et al.* 2004; Johnson *et al.* 2009). In particular, multiple top predator invaders may alter the composition, diversity and population dynamics of lower trophic levels through cascading effects (see review by Bruno & Cardinale 2008). However, the magnitude and direction of those cascading effects can be highly variable because factors can be indirect, non-additive and interact with one another (Bruno & Cardinale 2008). Thus, research on the interactions among multiple top invaders is important to identify potential threats in invaded systems.

The invasion and introduction of top predator fishes can affect profoundly freshwater ecosystems in many ways, including local extinction of native fishes (e.g. Kaufman 1992) and changes in their trophic position due to competition (Vander Zanden *et al.* 1999; Simon & Townsend 2003). For instance, rainbow trout (*Oncorhynchus mykiss* Walbaum) and brown trout (*Salmo trutta* L.) are top predators that have been widely introduced to cool-water environments around the world (Elliott 1994; Crawford & Muir 2008), with initial introductions outside of their native range occurring over a century ago (Crawford & Muir 2008), and both species successfully established in lakes (Soto *et al.* 2006; Lattuca *et al.* 2008; Arismendi *et al.* 2009) and streams (Crowl *et al.* 1992; Simon & Townsend 2003; Soto *et al.* 2006). The two species now often coexist (Cada *et al.* 1987; Crowl *et al.* 1992; Soto *et al.* 2006) although they originate from different regions of the Northern Hemisphere; with rainbow trout being native to Pacific Northeastern Asia and the Pacific Northwest of North America and brown trout from the Palearctic. Despite their common coexistence outside their native range, their trophic relationships in sympatry have received little attention in Patagonia or elsewhere (Elliott 1973; Gatz *et al.* 1987; Simon & Townsend 2003; Penaluna *et al.* 2009).

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Tierra del Fuego, lago Lynch, febrero de 2005

Brooke Penaluna e Iván Arismendi Vidal
Muestreo de peces nativos en el río Maullin, Chile, julio de 2006

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ProBiota

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