





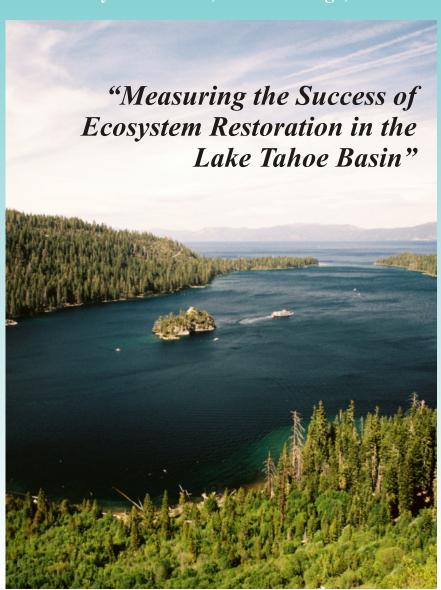






5th Biennial Lake Tahoe Basin Science Conference March 16 & 17, 2010

Tahoe Center for Environmental Sciences Sierra Nevada College Campus 291 Country Club Drive, Incline Village, Nevada.



5TH BIENNIAL CONFERENCE: Measuring the Success of Ecosystem Restoration in the Lake Tahoe Basin **2010 Tahoe Conference Sponsors**

Effective management and restoration of the Lake Tahoe Basin is a continuing focus of agency representatives, scientists, stakeholders and decision-makers. This three-day conference will allow individuals involved in the science and management of the Basin to learn about and discuss the latest relevant scientific information and results. This conference brings together professionals involved in the Lake Tahoe Basin, providing an excellent opportunity for networking, education, and the exchange of ideas and information.

The success of the conference would not be possible without the support of our generous sponsors. Thank you for your support and dedication to the continued work at the Lake Tahoe Basin.



Conference logistics and organization provided by Nevada Water Resources Association.

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5TH BIENNIAL CONFERENCE: Measuring the Success of Ecosystem Restoration in the Lake Tahoe Basin Welcome

Dear Attendees -

Welcome to the 5th Biennial Lake Tahoe Basin Science Conference: Measuring the Success of Ecosystem Restoration in the Lake Tahoe Basin. The 2010 Science Conference provides a forum where individuals involved in the science and management of the Lake Tahoe Basin can learn about and discuss the latest relevant scientific information and results. This conference will bring together agency, academic, and stakeholder representatives, and will provide the opportunity for networking, education, and the exchange of new ideas and information. The conference will feature 84 oral presentations and 23 poster presentations covering a variety of topic areas.

We are again holding this biennial Science Conference at the Tahoe Center for Environmental Sciences (TCES). This building is the hub for state-of-the-art science in the Tahoe Basin. The TCES represents an exciting collaboration among the University of California Tahoe Environmental Research Center, Sierra Nevada College, the University of Nevada Academy for the Environment, and the Desert Research Institute. We are grateful to these organizations for making the TCES available.

I hope the many discussions you have during the conference increase your knowledge of the Tahoe Basin, enhance your current professional relationships, and allow you to start new relationships that last throughout your career. I look forward to seeing you at the Conference!

Sincerely,

Zach Hymanson

Executive Director.

Tahoe Science Consortium

5th Biennial Conference:

Measuring the Success of Ecosystem Restoration in the Lake Tahoe Basin Planning Committee

Sudeep Chandra

University of Nevada, Reno

Michael Collopy

UNR, Academy for the Environment

Jill Falman

University of California, Davis, Tahoe Environmental Research Center/Tahoe Science Consortium

Mark E. Grismer

University of California, Davis

Alan Heyvaert

Desert Research Institute

Zach Hymanson

Tahoe Science Consortium

Susie Kocher

UCCE - El Dorado County

Jonathan W. Long

USDA Forest Service, Pacific Southwest Research Station

John Reuter

University of California, Davis, Tahoe Environmental Research Center

J. Shane Romsos

Tahoe Regional Planning Agency

Tim Rowe

USGS Nevada Water Science Center

Geoffrey Schladow

University of California, Davis, Tahoe Environmental Research Center

Peter Stine

USDA Forest Service, Pacific Southwest Research Station

Jim Thomas

Desert Research Institute

Tina Triplett

Nevada Water Resources Association

Marion Wittmann

University of California, Davis, Tahoe Environmental Research Center

Tricia York

California Tahoe Conservancy/University of California, Davis, Tahoe Environmental Research Center

5th Biennial Conference: Measuring the Success of Ecosystem Restoration in the Lake Tahoe Basin Tuesday, March 16 — Day 1

7:00-8:15	Registration
8:15-8:30	Welcome & Introductory Remarks (Rooms 139 & 141)
8:30-9:30	Keynote Speaker (Rooms 139 & 141) Dr. Daniel Schindler, Professor, University of Washington; Aquatic & Fishery Sciences; Department of Biology
9:30-9:45	Break

9:45-12:00 Plenary Session: Invasive Species Panel (Rooms 139 & 141)

Moderators: **Dr. Sudeep Chandra,** University of Nevada, Reno; Aquatic Ecosystems Analysis Laboratory **Marion Wittmann, Ph.D.,** UC Davis; Tahoe Environmental Research Center

Carla D'Antonio, Professor, University of California, Santa Barbara; Ecology, Evolution, and Marine Biology

Jonathan Bossenbroek, Assistant Professor of Ecology, University of Toledo; Department of Environmental Sciences

Dr. Michael Marchetti, Associate Professor of Biology, California State University, Chico; Department of Biological Sciences

Chris Dionigi, Acting Executive Director of National Invasive Species Council, U.S. Department of the Interior; Office of the Secretary

12:00-1:00 Lunch Break (First Level)

5th Biennial Conference: Measuring the Success of Ecosystem Restoration in the Lake Tahoe Basin Tuesday, March 16 — Day 1

1:00-2:40 Concurrent Session 1

Room 139 Room 141 Room 106

Invasive Mollusks & Benthic Habitats.

The first of two sessions focused on nonnative aquatic species in the Lake Tahoe Basin, this session features research on Asian clam, quagga mussel, and benthic habitats.

Moderator: Marion Wittman, Ph.D., UC Davis; Tahoe Environmental Research Center

- 1:00 Marion Wittmann The Asian Clam Invasion in Lake Tahoe: The Ecology of an Invasive Bivalve in an Oligotrophic Lake
- 1:20 Marianne Denton Life History Strategies of the Asian clam, Corbicula fluminea, in Lake Tahoe
- 1:40 Marion Wittmann The management of Asian clam in Lake Tahoe: Bottom barriers and diver assisted suction removal
- 2:00 Sudeep Chandra Risk of invasion or really no problem? An experiment test of quagga mussel survival and reproductive status using Lake Tahoe water
- 2:20 Andrea Caires Risk of invasion or really no problem? An experiment test of quagga mussel survival and reproductive status using Lake Tahoe water

Erosion Modeling in the Lake Tahoe Basin using WEPP.

The first of two sessions focused on soil erosion research, this session highlights results from several research projects that apply erosion modeling tools, specifically the Water Erosion Prediction Project (WEPP), to assess erosion risks and rates associated with various aspects of forest management and roads.

Moderator: William J. Elliot, Rocky Mountain Research Station

- 1:00 William J. Elliot The development of a site-specific Tahoe Basin erosion interface
- 1:20 Erin Brooks Development and Assessment of the WEPP model in the Tahoe Basin
- 1:40 **Drea Traeumer** Nutrient and Sediment Loading Predictions for Prescribed Fire Using Optimized WEPP Model
- 2:00 Randy Foltz Improving Erosion Modeling on Forest Roads in the Lake Tahoe Basin
- 2:20 James (Andy) Efta BMP-SA A tool for planning road Best Management Practices at a watershed scale

Frameworks for Adaptive Management and Planning.

This session focuses on several projects that describe frameworks for targeting and tracking efforts to restore the environment in the Tahoe Basin.

Moderator: Jeremy Sokulsky, Environmental Incentives

- 1:00 Shane Romsos An Adaptive Management System to Monitor The Status and Trend of Tahoe Basin Environmental and Socioeconomic Conditions
- 1:20 Chad Praul Performance Measures to Quantify the Activity and Benefits of the Lake Tahoe Environmental Improvement Program
- 1:40 Jeremy Sokulsky Lake Clarity Crediting Program: Linking Policy to Science
- 2:00 Maggie Mathias BMP RAM Tool: Documenting and Tracking Treatment BMP Condition in Lake Tahoe
- 2:20 Adam Lewandowski California Essential Habitat Connectivity Project: Implications for the Tahoe Basin

2:40-3:00 Break (First Floor)

3:00-4:40 Concurrent Session 2

Room 139 Room 141 Room 106

Invasive Species in the Nearshore.

The second part of the focused session on nonnative aquatic species, this session focuses on non-native fish, crayfish, and plants in the nearshore environments of the Tahoe basin.

Moderator: Dr. Sudeep Chandra, University of Nevada, Reno; Aquatic Ecosystems Analysis Laboratory

- 3:00 John Umek Crayfish distribution and abundance in Lake Tahoe, USA
- 3:20 Lars W.J. Anderson Invasive Aquatic Plants in Lake Tahoe: Where are they and why are they continuing to spread?
- 3:40 Zachary Hymanson Evaluating the effectiveness of Eurasian watermilfoil (Myriophillum spicatum) control efforts in Emerald Bay, Lake Tahoe, California.
- 4:00 Sudeep Chandra Predicting establishment and predation impact of non native largemouth bass in a large, subalpine, oligotrophic lake
- 4:20 Christine Ngai Where are they going? Movement of nonnative warmwater fishes in Lake Tahoe

Soil Disturbance & Erosion.

The second of two sessions that focus on soil erosion and disturbance, this session features studies that address modeling and monitoring.

Moderator: Mark E. Grismer, UC Davis; Department of LAWR - Hydrology

- 3:00 Mark E. Grismer & Ann Collins Microbial Community Composition and Stability of Disturbed Soils in the Lake Tahoe Basin
- 3:20 Nick Harrison Developing fuels treatments for balancing fuel reduction, soil exposure, and potential for erosion in the Tahoe Basin
- 3:40 Mark E. Grismer & Erin Rice Soil Water Repellency Effects on Infiltration and Erosion Rates in the Tahoe Basin
- 4:00 Mike Hogan Modeling and Real-time Measurements: Function, Constraints, Opportunities
- 4:20 Mark Grismer Erosion Modeling for Land Management – Scaling & restoration thresholds

Stream & Habitat Restoration.

This session features research projects that consider effects of stream restoration and conservation of sensitive habitats.

Moderator: David B. Herbst, UCSB, Sierra Nevada Aquatic Research Laboratory

- 3:00 **Brian Spear** Riparian Ecosystem Restoration and Effectiveness Framework
- 3:20 Stephen Andrews Numerical modeling of the influences of floodplain morphology and vegetation on sediment retention in Trout Creek
- 3:40 **David B.** Herbst *Biological Monitoring* of the Trout Creek Channel Reconstruction Restoration
- 4:00 Alison Stanton What, where, how, when: developing a restoration RX for Tahoe yellow cress
- 4:20 Samuel Veloz Predictive Modeling of Cheatgrass Invasion Risk for the Lake Tahoe Basin

4:40-5:00 Break

5:00-7:00 Evening Poster Session & Reception

5th Biennial Conference:

Measuring the Success of Ecosystem Restoration in the Lake Tahoe Basin Tuesday, March 16 — Day 1

Conference Poster Presenters

	5:00-7:00 p.m. Floors 2 & 3, Tahoe Science Consortium
Angell, Natalie	Restoring stand structures to promote sugar pine (Pinus lambertiana) regeneration and recruitment in the Lake Tahoe Basin, CA & NV
Brusati, Elizabeth D.	Predicting the Future Spread of Invasive Plants with Climate Change
Busse, Matt	Effects of pile burning in the Tahoe Basin on soil and water quality
Christensen, Wes	Effects of Hillslope Heterogeneity on Late Season Groundwater Discharge: Investigations using a coupled groundwater-surface water model
Dagley, Christa	A Monitoring Strategy for Riparian Forest Restoration
Davis, Alison	Best Management Practices and the Influence on the Value of Affected Homes
Falman, Jill C.	Results from a survey to assess the perceptions, value, and goals of the Tahoe Science Consortium
Fitzgerald, Brian	Linking On-Shore and near-Shore Processes: Near-Shore Water Quality Monitoring Buoy at Lake Tahoe
Gevertz, Amanda	Differential tolerances to UVR and fluoranthene exposure: Comparisons between native and invasive fish species of Lake Tahoe (CA/NV)
Gross, Shana	Five years of vegetation monitoring at Grass Lake Research Natural Area
Gross, Shana	Ski Slope Native Plant Revegetation Study
Jensen, Camielle	Mountain Pine Beetle (Dendroctonus ponderosae) Dynamics at Three Elevation Zones in the Lake Tahoe Region
LeBuhn, Gretchen	The Effects of climate change on alpine bumble bee community structure
McKelvey, Stephen R.	Effects of Prescribed Fire and Season of Burn on Direct and Indirect Levels of Tree Mortality in Eastside Pine Forest of the Sierra Nevada
Mix, Annette Delfino	A Unique Place: The Institute of Forest Genetics Research Greenhouse
Oehrli, Craig	Meadow Ecosystem Response to Restoration of the Stream Channel / Meadow Surface Relationship at Cookhouse Meadow
Rios, David	Lake Tahoe Stormwater Basins: Botanical Surveys, Comparisons, and a Greenhouse Trial
Salverson, Wade G.	Effects of Harvesting System and Prescribed Fire on Natural Regeneration in a Jeffrey Pine Stand: Implications for Lake Tahoe Basin Forests
Smith, Ken	Seismic and Volcanic Hazards at Lake Tahoe
Snyder, Jason	The Impact of Asian Dust Aerosols on Lake Tahoe
Susfalk, Richard B.	Impact of Terrestrial Sediment Sources on Nearshore Water Quality
Tucker, Andrew	Water Temperature and Ultraviolet Radiation Transparency Interact to Control Invasive Warm-water Fish Establishment in Nearshore Lake Tahoe
Van De Water, Kip	Fire history of coniferous riparian forests in the Lake Tahoe Basin
Walker, Roger F.	Effects of Harvesting System and Prescribed Fire on Forest Floor Vegetation in a Jeffrey Pine Stand: Implications for Lake Tahoe Basin

Asian clam (Corbicula fluminea) filtration and excretion rates: impacts to nutrient cycling and primary

Wittmann, Marion

productivity in Lake Tahoe

7:30 - 8:30 Registration

Room 141 Room 106

Biological Dimensions of Tahoe Water Quality.

Room 139

This session includes projects that study fishes in Lake Tahoe (both native and nonnative), as well as nearshore organisms.

Moderator: Brant C. Allen, UC Davis; Tahoe Environmental Research Center

- 8:30 John Umek Survivorship of a dominant, predatory game fish in Lake Tahoe
- 8:50 **Derek Bloomquist** Hydroacoustics as a Tool for Fisheries Management in Fallen Leaf Lake
- 9:10 **Christine Ngai** A contemporary evaluation of the nearshore native fishery in Lake Tahoe
- 9:30 Scott Hackley Periphyton Biomass

 Monitoring in the Near Shore Zone of Lake
 Tahoe
- 9:50 Andy Rost Can Fallen Leaf Lake sediments reveal the history of occurrence and growth patterns of the lotic stalked diatom Didymosphenia geminata?

Monitoring Terrestrial Ecological Outcomes of the Angora Wildfire.

8:30-10:10 Concurrent Session 3

The first of two sessions that will address effects of the Angora wildfire, this session will address the impacts of the wildfire on plant and animal communities.

Moderator: Chris Carlson, University of Montana; College of Forestry and Conservation, Dept. of Forest Management

- 8:30 Chris Carlson Vegetation conditions two years after the Angora Fire
- 8:50 Tina Carlsen Outcomes of Post-Fire Restoration after the Angora Fire
- 9:10 **David Schmidt** Effects of fuel treatments on fire severity in an area of wildland-urban interface during the Angora Fire
- 9:30 Patricia Manley Small mammal community recovery in the Angora wildfire
- 9:50 Gina Tarbill Bird community recovery in the Angora wildfire

Modeling the 21st Century Impacts of Climate Change in the Tahoe Basin.

This session focuses on results from a team project to model the effects of climate change on hydrology, pollutant loading and lake response.

Moderator: Robert Coats, TERC, Hydroikos Ltd.

- 8:30 Michael Dettinger Projections and downscaling of climate change for the Sierra Nevada and Lake Tahoe
- 8:50 Robert Coats Climate change impacts in the Tahoe Region: past and projected future trends
- 9:10 **John Riverson** *Hydrologic impacts of* climate change at the watershed scale
- 9:30 **Goloka Sahoo** *The Response of Lake Tahoe to Climate Change*
- 9:50 **Brent Wolfe** *Implications of climate* change for design of BMPs in the Tahoe Basin

10:10-10:40 Break (First Floor)

10:40-12:00 Concurrent Session 4 Room 141 Room 139 Room 106 Tahoe's Native Fish Crisis: Status Characterizing Aquatic Effects of Air Quality & Burning. and restoration of native fish the Angora Wildfire. The first of two session focusing on air populations. quality; this session focuses on particular The second of two that addresses effects of matter and smoke in the basin, including the Angora wildfire, this session will address This session focuses on conservation of studies of prescribed burning. the impacts of the fire on downstream water native fishes, including the Lahontan quality and aquatic life. cutthroat trout. Moderator: Alan Gertler, Desert Research Institute Moderator: Alan C. Heyvaert, Desert Moderator: Jenny Marie Hatch, California Research Institute Trout 10:40 Courtney Siu Time and Size-Resolved Aerosol Measurements above the Lake Tahoe 10:40 Jenny Hatch Tahoe's Native Fish Cri-10:40 John Reuter Characterization of Water Surface During Summer Conditions Quality in Angora Creek Following the June sis: Status of and solutions for restoring our 2007 Angora Fire native fish populations 11:00 Timothy Brown CANSAC Fire Weather and Smoke Management Products 11:00 Allison Oliver Characterization of 11:00 Richard Vacirca Lahontan Cutthroat for the Lake Tahoe Basin Nitrogen and Phosphorus Loading From Trout in the Upper Truckee River: Restora-Angora Creek Following the June 2007 tion of a Threatened Species in a Fluvial 11:20 L.W. Antony Chen Particle and Air Angora Fire Headwater Environment Toxics Emissions from Prescribed Burning: Effects of Fuel Type and Moisture Content 11:20 Alan Heyvaert Tracking Fine Sediment 11:20 Maura Santora Native Non-Game Particles in Urban Runoff and Following Fish Assessment Survey In The Lake Tahoe 11:40 April Shackelford Nutrient emissions the Angora Fire from prescribed fire in the Lake Tahoe Basin: Implications from field and laboratory 11:40 Allison Oliver Characterizing Stream 11:40 Helen Neville Application of a GISobservations Ecosystem Response Using Benthic Macbased assessment tool to evaluate status and roinvertebrate Communities and Habitat risks for Lahontan cutthroat trout in the Parameters in Angora Creek Following the Tahoe Basin and range-wide in a changing June 2007 Angora Fire climate

12:00-1:00 Lunch Break (First Floor)

1:00-2:40 Concurrent Session 5

Room 139 Room 141 Room 106

Physical Limnology: Currents & Circulation.

This session will highlight research on physical limnology and how it influences the conditions under which invasive species can reproduce and grow.

Moderator: Timothy Rowe, U.S. Geological Survey, Nevada Water Science Center

- 1:00 Geoff Schladow The Role of Physical Limnology in the Observed Distribution and Future Spread of Invasive Species in Lake Tahoe
- 1:20 Francisco Rueda Three-Dimensional Flow Fields In The Near-Shore Region Of Lake Tahoe
- 1:40 **Kristin Reardon** The complexities of near-shore transport phenomena at Lake Tahoe
- 2:00 Todd Steissberg Observations of Lake Tahoe's Currents from Space: Implications for Water Quality and Invasive Species Transport
- 2:20 Alexa La Plante Exchange flow between the Tahoe Keys and Lake Tahoe: The implications for spread of invasive species and pollutants

Effects of Prescribed Burning & Forest Fuels Treatments.

This session will focus on effects of prescribed burning and other forest treatments on vegetation, fuels, and wildlife.

Moderator: Peter Stine, Pacific Southwest Research Station; Sierra Nevada Research Center

- 1:00 **Hugh Safford** Assessing the ecological effects of forest fuel treatments in the Sierra Nevada
- 1:20 Alison Stanton The Upland Fuels Study: short-term vegetation and fuel response to fuel reduction treatments in the Lake Tahoe basin
- 1:40 Patricia Manley The Upland Fuels Study: short-term bird and small mammal response to fuel reduction treatments in the Lake Tahoe basin: a progress report
- 2:00 Alison Stanton Vegetation and fuel response ten years after prescribed fires in the California State Parks in the Lake Tahoe Basin
- 2:20 Erik Frenzel Prescribed fire may prevent, but doesn't reverse lodgepole pine (Pinus contorta ssp. murrayana) encroachment in meadows of the Lake Tahoe Basin

BMP Performance & Load Reduction.

This session focuses on projects to quantify and reduce pollutant loading to streams in urban areas and from roads.

Moderator: Alan C. Heyvaert, Desert Research Institute

- 1:00 Mark Rayback Leveraging the Natural Environment As Treatment for Highway Runoff Within the Lake Tahoe Basin
- 1:20 **Kevin Drake** Development of a Road Cut and Fill Land Use Category for the Pollutant Load Reduction Model (PLRM)
- 1:40 Jack Jacobs Measuring BMP Maintenance: Results of a Project in Douglas-Tahoe
- 2:00 Philip Bachand Changes to Stormwater Ecotoxicity when Treating with Chemical Coagulants under Different Dosing Levels
- 2:20 **David Rios** Annual pollutant loads for a small Lake Tahoe subwatershed

2:40-3:00 Break (First Floor)

3:00-4:20 Concurrent Session 6

Room 139 Room 141 Room 106

Physical & Chemical Dimensions of Tahoe Water Quality.

Presentations in this session focus on physical and chemical conditions in Lake Tahoe, including temperature, fine sediments and gasoline compounds.

Moderator: Timothy Rowe, U.S. Geological Survey, Nevada Water Science Center

- 3:00 Philipp Schneider Constructing a multi-decadal record of Lake Tahoe surface temperatures from satellite data
- 3:20 Stephen Andrews In-situ optical measurements to determine suspended particle composition in Lake Tahoe: organic vs. inorganic particles
- 3:40 Daniel Nover Temporal variations in fine particle distributions at Lake Tahoe: Trends and implications for clarity
- 4:00 Tim Rowe Monitoring gasoline and gasoline-derived compounds for the Shorezone Water-Quality Monitoring Program in Lake Tahoe, California and Nevada

Managing Forest Vegetation Communities.

This session focuses on effects of diseases, fuel treatments, and other land uses on forests in the Lake Tahoe basin.

Moderator: Peter Stine, Pacific Southwest Research Station; Sierra Nevada Research Center

- 3:00 Isabel Munck Tree health within the Nevada portion of the Lake Tahoe Basin: interactions with fuel management treatments
- 3:20 Christopher Fettig Managing Slash in Pine Dominated Stands to Minimize Residual Tree Mortality Attributed to Bark Beetle Attack
- 3:40 Patricia Maloney The Effects of Landuse, a Non-native Pathogen, and Environmental Heterogeneity on the Population Dynamics of Three White Pine Species in the Lake Tahoe Basin
- 4:00 **Detlev Vogler** The Role of Resistance to White Pine Blister Rust in Restoration of the White Pine Species in the Lake Tahoe Basin

Air Quality & Road Dust.

This session focuses on projects to quantify and reduce impacts to air quality, particularly from road dust.

Moderator: Alan Gertler, Desert Research Institute

- 3:00 Alan Gertler Sources of ambient particulate matter in the lake tahoe basin
- 3:20 **Dongzi Zhu** Deposition studies of vehicle-generated PM near Highway 50 in Lake Tahoe
- 3:40 David Barnes Overview of Road Dust Impacts in the Lake Tahoe Basin, including Winter Sanding and Salting
- 4:00 **Scott Brown** *Preliminary Results of the Pilot Sweeper Study*

5th Biennial Lake Tahoe Basin Science Conference



March 16–17, 2010

Tahoe Center for Environmental Sciences
Located on the
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Thanks to our sponsors:









Come join in this two-day conference designed as an open forum in which individuals involved in the science and management of the Tahoe Basin can learn about and discuss the latest relevant science and information.

For updates, check the Tahoe Science Consortium Web site at www.tahoescience.org and the Nevada Water Resource Association Web site at www.nvwra.org.

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