



UCLA Conservation Genetics Resource Center

A Resource of the:

Department of Ecology and Evolutionary Biology
UCLA Dickey Collection of Birds and Mammals

and

Center for Tropical Research, Institute of the Environment
University of California, Los Angeles

MISSION

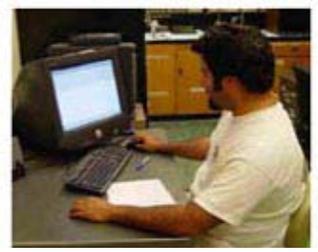
The mission of the CGRC is to provide expertise, resources and sample repository facilities for the generation and analysis of molecular genetic data for wildlife conservation applications.

BACKGROUND

Molecular genetic data have become an essential tool in biodiversity conservation and management. Natural resource managers and decision makers now rely on molecular genetic approaches to obtain essential information such as measures of genetic variability in threatened populations, patterns of gene flow in fragmented populations, migratory patterns in birds, and paternity and relatedness analysis in wild and captive populations. The CGRC provides agencies and organizations with the necessary facilities and expertise to address pressing conservation research questions that require the generation and analysis of molecular genetic data and also provides facilities for the long-term storage of genetic material.

EXAMPLE APPLICATIONS

- Genetic variability of threatened populations
- Population connectivity of migratory birds and mammals
- Population genetic structure and gene flow
- Genetic effects of habitat fragmentation
- Population connectivity in migratory animals
- Historical demographic trends by genetic methods
- Density and home-range estimation from non-invasive samples
- Hybridization and introgression analysis
- Paternity and relatedness in captive populations
- Sex determination using molecular markers
- Wildlife forensics
- Storage of genetic samples for time-series analyses



THE CGRC IS A RESOURCE FOR:

- Federal wildlife management, environmental, and natural resource agencies and their researchers (UCLA is part of the University of California Cooperative Ecosystems Studies Unit -CESU, which provides for streamlined grant administration by federal agencies and a low overhead rate at UCLA)
- State wildlife management, environmental and natural resource agencies
- US and international academic institutions
- Non-governmental conservation and research organizations

CGRC RESOURCES AND EXPERTISE

The CGRC provides four key research resources:

- **Laboratory facilities and expertise to conduct all aspects of DNA extraction, sample preparation, characterization and analysis.**
 - Isolation facilities for DNA and RNA extraction from a variety of biological samples
 - Dedicated Ancient DNA/degraded sample processing and handling facilities
 - DNA and RNA quantification (Nanodrop, Picogreen Assay (Beckman DTX-880), Agilent 2100 Bioanalyzer, Q-PCR)
 - PCR-based tests and DNA amplification
 - Microsatellite and SNP marker library generation by new low-cost, rapid mass-sequencing technologies
 - State-of-the-art DNA/cDNA sequencing and genotyping equipment (UCLA Genetic, Gene Expression and Microarray Core facilities):
 - Two ABI 3730XL Capillary Sequencers
 - Roche GS-FLX (454) Titanium Mass Sequencer
 - Two Illumina (Solexa) Genome Sequencers
 - ABI SOLiD v3 Genome Sequencer
 - Affymetrix and Agilent Microarray Scanners
 - ABI 7900HT Q/RT-PCR System
 - Roche 480 Lightcycler Q/RT-PCR System
 - Qiagen QIAxcel Digital Electrophoresis System
- **Expertise in all aspects of study design, characterization and analysis of molecular data for conservation applications.**
 - Complete computational facilities and software for data analysis
- **Training and education in all aspects of DNA characterization and analysis.**
- **Long-term repository of genetic samples in conjunction with the [UCLA Dickey Collection of Birds and Mammals](#)**
 - Curation and storage of frozen tissues collection of genetic materials (tissue, blood, feathers, hair, feces etc.)
 - Ultra-freeze (-80°C) and -20°C storage
 - The CGRC has amassed possibly the largest frozen collection of bird feathers in the world preserved for genetic and isotopic studies to support wildlife conservation applications.
 - The frozen feather collection consists of over 84,000 feathers of neotropical migratory birds representing 43 U.S. states, Canada, Mexico, 8 Central American and 2 South American countries; and over 2,400 feathers from Central Africa. The collection is being expanded at the rate of 10,000 to 20,000 samples per year:

FEATHER SAMPLES (as of Aug 2009)

	Country	No. Samples	No. Species
The Americas	Argentina	170	12
	Belize	90	20
	Canada	1,731	68
	Costa Rica	2,062	58
	Ecuador	9,534	593
	El Salvador	78	11
	Guatemala	544	74
	Honduras	82	18
	Jamaica	225	11
	Mexico	3,253	210
	Nicaragua	141	20
	Panama	89	19
	United States (43 states)	66,643	301
	Total	84,476	

	Country	No. Samples	No. Species
Africa	Cameroon	2,095	139
	Ivory Coast	110	26
	Uganda	212	37
	Total	2,417	

- The frozen feather collection is readily available to researchers outside of UCLA and we frequently make loans to researchers for genetic and isotopic studies
- We are in the process of making the feather collection database available on-line in conjunction with the UCLA Dickey Collection, in the meantime we ask that you email us with your queries and loan requests
- Feather loan requestors must have any required sample holding and import permits (e.g. US Fish and Wildlife Service Migratory Bird Treaty Act (MBTA) permit for the specific species requested, if required)
- The frozen tissue collection also over 12,000 avian blood samples from the Americas and >7,700 from Central Africa
- In addition to the avian frozen tissue collection, the CGRC has a frozen tissue/blood collection of over 4,300 samples for a number of mammals of significant conservation concern, including:
 - Ethiopian wolf (*Canis simensis*) - 520 samples
 - African Wild Dog (*Lycaon pictus*) - 225 samples
 - A remarkably broad collection of the Gray wolf (*Canis lupus*) (> 1,500 samples) across its worldwide distribution of North America, Europe, the Middle East and Asia

For further information on the CGRC and queries on feather sample collection loans, contact:

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