Activities

Theme	Working Group	Node Activities / Priorities
DNA Barcode Library	1.2 Land plants	1. ACG: 2,000 samples/year 2. INBIO: 2,000 samples/year/funded module
	1.4 Parasites, Pathogens & Vectors	The 2011 ACG sample of 30,000 specimens includes at least 5,000 parasitic insects of at least 1,000 species; the INBio IDRC-supported 10,000 samples contains at least 1,000 samples of parasitic insects.
	1.5 Agricultural & Forestry Pests and their Parasitoids	1. ACG: of the 28,000 arthropod samples/year from ACG, at least 500 will be pests, biocontrol agents, or near relatives. 2. INBio: of the 8,000 arthropod samples/year from INBio, at least 500 will be pests, biocontrol agents, or near relatives.
	1.6 Pollinators	1. ACG: of the 28,000 arthropod samples/year from ACG, 10,000 will be pollinators (Lepidoptera, flies, wasps). 2. INBio: of the 10,000 samples for 2011 from INBio, currently, 6,000 will be pollinators (Lepidoptera, flies, wasps) but the proportion can be changed dramatically in future modules if funded.
	1.7 Freshwater Bio-surveillance	1. ACG is planning a freshwater barcode-based biodiversity inventory and biomonitoring process for 6 rivers flowing through Sector Mundo Nuevo next to the anticipated geothermal electricity project expected to begin in early 2012; this project depends entirely on funding from ICE, the National Electric Company and is still under negotiation. 2. INBio has extensive collections of aquatic insects, and can get a lot more if minimal funding is available. Additionally, the Stroud Water Research Center near Wilmington, Delaware has a major aquatic research program on several Costa Rican rivers, has been introduced to barcoding by iBOL (via Dr. Bern Sweeney, the SWRC director, who is also a technical advisor to iBOL), and is incorporating barcoding in their stream biodiversity monitoring in Costa Rica as a consequence of ACG and INBio involvement.
	1.9 Terrestrial Bio-surveillance	1. ACG: 28,000 samples/year Lepidoptera, Diptera, Hymenoptera 2. INBio: 8,000 samples/year all orders of insects

Methods	2.1 Barcoding Biotas	1. ACG: inventory of a large conserved wildland (including marine) 163,000 hectares; currently 9,000+ BINS of Lepidoptera and 1,500 BINS of parasitoid wasps and flies, being steadily added to. 2. INBIO: inventory of entire nation 50,000 km2 terrestrial, containing at least 500,000 species of Eucaryotes.
	2.2 Museum Life	1. ACG: retroactive and present-future of all inventory vouchers (museum specimens); all ACG vouchers are by definition museum specimens, but barcoded BEFORE deposited in a museum. 2. INBio: retroactive and present-future of all inventory vouchers (museum specimens); INBio is now retroactively beginning the intense barcoding of its museum specimens rather than (much) new collecting.
	2.3 Sequencing: Methodological Innovation	ACG/INBio efficient and effective methods of ACG/national inventory collection that yields barcodeable vouchers and incorporates barcoding results.
	2.4 Paleobarcoding	ACG protects a large, population of Hymenaea courbaril trees, biological source of the 30 million year old amber in which Neotropical barcoding candidates are embedded.
Informatics	3.1 Informatics: Core Functionality	1. ACG: iterative feedback to BIO and BOLD processing and output to generate user-driven information products; ACG barcoding heavily dependent on iterative feedback from BIO staff for barcode analysis. 2. INBio: iterative feedback to BIO and BOLD processing and output to generate user-driven information products; INBio barcoding heavily dependent on iterative feedback from BIO staff for barcode analysis.
	3.2 Informatics: Mirrors	INBio has discussed plans for mirroring within the INBio web capacity, but these remain very preliminary and are on hold until INBio submits its own specimens for sequencing and learns what needs to be done for analysis.
Applications & Technologies	4.1 Environmental Barcoding	1. ACG: willing test bed for massive environmental barcoded sampling (Light Trapping, flowing freshwater biodiversity sampling) as external funding becomes available, but no additional funding is available for 2011. 2. INBio: willing test bed for massive environmental barcoded sampling (Light Trapping, flowing freshwater biodiversity sampling) as external funding becomes available.

Administration	5.1 Project Management	ACG and INBio ready and full communicators with iBOL, BIO and CBOL administration.
	5.2 Communications	1. ACG: ready and full collaboration with iBOL, BIO and CBOL administration, outreach to anyone who comes to ACG or visits the lab at the University of Pennsylvania; additionally, ACG staff are fully up to date on the project and the technology and promise of DNA barcoding, as well as it is being taught to all 2,500 school children in the ACG biological education program; ACG now using JRS grant to fully internetize the parataxonomists and their inventory, which includes specimens for iBOL. 2. INBio: ready and full collaborator with iBOL, BIO and CBOL administration, as and when requested, and site for iBOL training workhop funded by CBOL (2010).
GE3LS	6.1 Equitable Use of Genetic Resources	ACG and INBio work closely with government agencies to insure that legislation and regulations allow DNA barcoding (and sampling for it). All project activities are fully covered by standard government research permits as well as project permission from CONAGEBIO, the national agency for approval of projects that use DNA, though this is still a work in progress.
	6.2 Regulation of international trade	The time will come when INBio will be asked to use DNA barcodes to identify Costa Rican pests (as is happening now on a test-drive basis by one of the IDRC-funded INBio barcode researchers for the Costa Rican Ministry of Agriculture (MAG), as well as to help in regulation of CITES species.
	6.3 Intellectual property and knowledge management	ACG and INBio work closely with government agencies to insure that legislation and regulations allow DNA barcoding (and sampling for it). All project activities are fully covered by standard government research permits as well as project permission from CONAGEBIO, the national agency for approval of projects that use DNA.
	6.4 Education initiatives for schools and media	1. ACG has incorporated the idea and factual details of DNA barcoding into its grade school teaching program, and ACG barcoding staff regularly give barcoding explanations to visitors to ACG and to the visiting grade school classes. ACG also explains DNA barcoding to visiting scientists and to the Costa Rican decision-making community in government and the private sector. 2. INBio explains DNA barcoding to visiting scientists and to the Costa Rican decision-making community in government and the private sector.
	6.5 Governance of knowledge mobilization	Carried out at the level of the two individual projects, and by international scientific standards, in coordination with BOLD, CBOL, iBOL and end product users (GenBank, etc.).