

Biodiversity & Environmental Data Research System of Belize

BERDS Case Studies

BERDS is not only a comprehensive information repository but also a suite of useful data investigation tools.

BERDS geodatabase enables students and researchers, both local and abroad, to investigate patterns and explore species-area relationships in a geospatial context. This allows the user to look at species abundance, species distributions and even potential biogeographic affinities and relationships between species (*e.g.* butterflies and their host plants, fishes and their headwaters, etc).

Likewise, users are able to routinely monitor a variety of parameters; of particular interest to management agencies is the ability to monitor fire data and examine data for country-wide indications and patterns of potential agricultural encroachment on protected areas and proposed biological corridors. BERDS generates monthly fire data from NASA's GEOS satellite imagery for just such purposes.

The BERDS system could prove useful in aiding agencies such as the Forest Department, the National Institute of Culture and History, and Programme for Belize in their efforts to better monitor the lands under their stewardship. Such data could be very useful in aiding the Forest Department to better target its efforts at investigating potential encroachment on protected lands. This system also lends itself to looking across larger time spans to corroborate suspected patterns of encroachment. And this data is free accessible with just a few clicks on BERDS.

These case studies are examples of how users can glean important and timely information from the BERDS system to actively investigate research and monitoring questions.

Case Study #5: Monitoring of Incursions into the Caracol Archaeological Reserve.

Question: How effective is our management of the Caracol Archaeological Reserve?

Solution: Use fires as a measurement of agricultural encroachment on the Protected Area.

Time: 15 minutes

Method: Select these Layers from the Map Explorer:

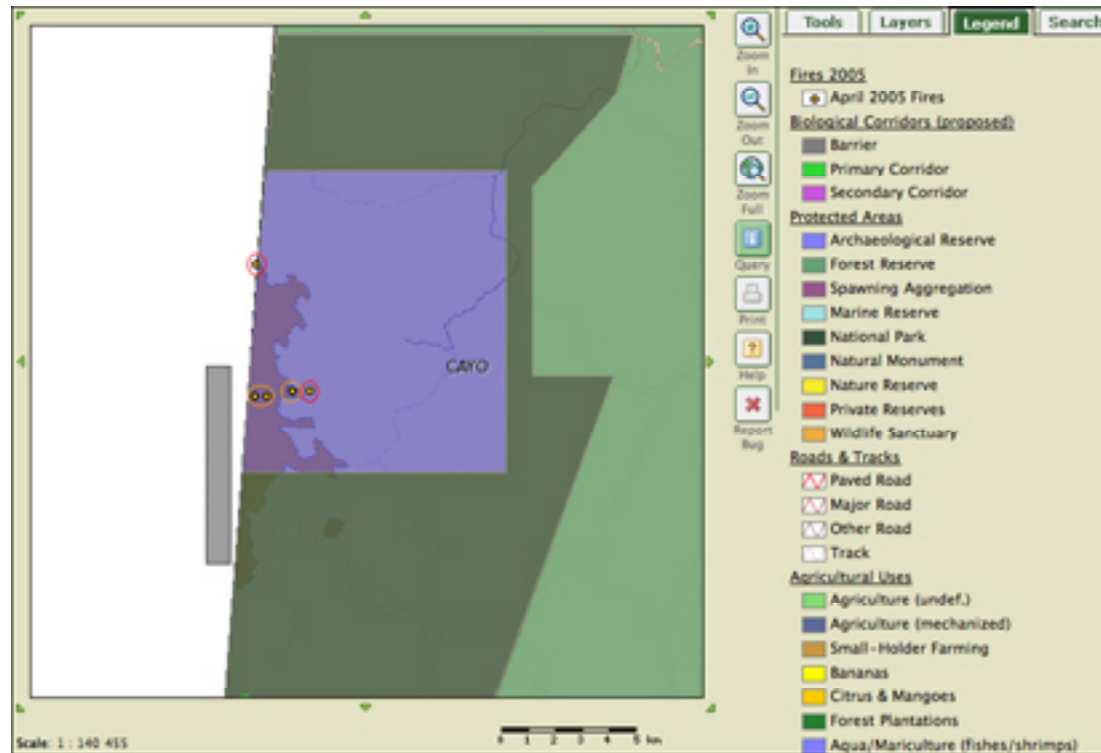
- * Fires (April 2005)
- * Protected Areas
- * Biological Corridors (Proposed)
- * Roads
- * Agricultural Use
- * Ecosystems

Images: See the figure below.

Results: In this example, a continual pattern of encroachment has been observed in Caracol Archaeological Reserve, 11.5% (approx. 2948 acres) of the park is being cultivated by small-holder farmers and is spreading eastward towards the Caracol ruins. The 2003 and 2005 editions of the Central America Ecosystem map show a steady increase in land being converted from Lowland and Submontane Broadleaf Moist Forest to Small-holder Farming.

Conclusions: The encroachment is likely illegal, given that the land is protected by the revised Ancient Monuments and Antiquities Act of 2000 and that the agriculture is likely being undertaken by Guatemalans as access can only be gotten through entry from the Guatemalan side of the border (no activities are visible along the Belizean access road. New fire activity within the existing cultivated areas is not as troubling as evidence of more clearing of forested areas in the north and east peripheries of these areas. This will likely continue and even accelerate until the rainy season begins or is checked by government enforcement.

Other actions needed: Government enforcement and vigilance to prevent these newly cleared fields from being planted and taken into cultivation.



Map Explorer image of districts, protected areas, proposed biological corridors, roads and fires in April 2005 within adjacent to the Caracol Archaeological Reserve in Belize. Red circles indicate fires within or adjacent to Protected Areas and on lands not classified as agricultural. Orange circles indicate fires in areas, while protected, are actually within or adjacent to land classified as agricultural based on the Central America Ecosystem Map prepared by the World Bank, CCAD and the Government of the Netherlands and updated in early 2005. Scale: 1:140,455m.