Extinct species revival raises hopes, fears

June 5 2013, by Lisa M. Krieger

The world's last passenger pigeons perished a century ago. But a Santa Cruz, Calif.-based research project could send them flocking into the skies again, using genetic engineering to restore the once-abundant species and chart a revival for other long-gone creatures.

The promise and peril of "resurrection biology" - which could bring back other long-gone species such as the woolly mammoth and Tasmanian tiger but runs the risk of undermining conservation efforts - was the topic for experts who gathered Friday at Stanford University's Center for Law and the Biosciences.

"The grand goal is to bring the passenger pigeon back to life," said researcher Ben Novak of Revive and Restore, supported by entrepreneur Stewart Brand's Long Now Foundation of San Francisco and conducted at the University of California at Santa Cruz. "We're at the baby step of stage one."

After studying old and damaged gene fragments of 70 dead passenger pigeons in the lab of UCSC professor Beth Shapiro, the team will assemble - in computers - the genetic code of the bird once hunted to extinction. They hope to complete that within a year.

Within two years, they plan to synthesize the actual DNA code, using commercially available nucleotides. This material will be inserted into the embryo of the passenger pigeon's closest living relative, a band-tailed pigeon.

Then there will be new challenges, Shapiro said.

"We need to turn it into a creature. We have to raise a captive breeding herd. Then there is the tricky part of going from a captive breeding bird to a live, thriving population in the wild," she said.

Passenger pigeons once numbered in the billions, blackening the skies and inspiring naturalists like John James Audubon, John Muir and Aldo Leopold. They had vanished by the first World War, victims of hunting and habitat loss.

But resurrected flocks reintroduced into a modern environment could be an invasive species, noted Andrew Torrance of the University of Kansas Law School. They also would be genetically modified organisms, subject to federal regulation.

"This could make reintroduction a challenge, under current law," said Alex Camacho, director of UC Irvine's Center for Land, Environment and Natural Resources. "The Endangered Species Act did not contemplate revival of extinct species."

Some conservationists say bringing back lost species will distract from conservation of living species in danger of extinction. Why work to restore the woolly mammoth, they ask, when poachers are killing off African elephants?

"I am concerned that people will not work hard enough to keep species from going extinct," said Terry Root of Stanford's Woods Institute for the Environment.

Others ask: Is there still a role for these species? How would an animal fare in a world much different from the one it left?

But there is also hope that revival would help restore the world's diminishing biodiversity.

Extinction may not be forever, due to such fast-moving scientific progress, said conference organizer Hank Greely, director of the Center for Law and the Biosciences.

"My current view is that it is worth pursuing in a careful and prudent way," he said.

Given California's acrimonious battles over allocation of water for wildlife and humans, some residents may not welcome the return of now-extinct fish species, such as the thick-tail chub, said Chuck Bonham, director of the California Department of Fish and Wildlife, who cautioned he was not speaking for his agency.

What about the California grizzly bear - "Do I bring that back?" he asked.

"At some point we will be doing this. . . . We've rounded a corner. . . . We need to stop worrying about theoreticals and start discussing how it will happen," he said.