Gulf war update: Assessing the damage

The Environmental Protection Agency has just assessed what it calls Saddam Hussein's "environmental atrocities." While "the magnitude of environmental destruction has been tragic," things could have been much worse, according to the 68-page, congressionally commissioned report, released Oct. 25.

Iraqi troops systematically ignited or damaged 749 Kuwaiti oil wells last February, causing 610 uncontrolled well fires (SN: 7/13/91, p.24). As of June, those fires still emitted about 2 million metric tons of carbon dioxide daily into the atmosphere – roughly 3 percent of the emissions from fossil-fuel burning worldwide. However, the resulting smoke plume remained between 1,500 and 13,000 feet – too low to cause any massive global climate change. Indeed, the EPA report concludes, the data clearly rule out a "nuclear winter" scenario and indicate that most of the environmental damage will likely remain confined to the Gulf region. Last week, firefighters reported capping the final burning well.

While levels of oily, dust-like particulates in and around Kuwait City exceeded U.S. air-quality standards, the report says that through July (the latest period for which data were available), "there was no documented increase in the proportion of visits to hospital emergency rooms for acute upper and lower respiratory infections or asthma compared to the period before the fires were ignited."

Now for the bad news: EPA estimates that Iraq's late-January sabotage of Kuwaiti oil-production facilities (SN: 2/2/91, p.71) ultimately discharged between 6 million and 8 million barrels of oil into the Persian Gulf, creating a spill up to 30 times larger than the *Exxon Valdez* accident. Through April, oil continued to flow into the Gulf from several damaged facilities at rates that varied from hundreds to thousands of barrels per day.

Because mines and warfare severely limited subsequent oil-recovery and environmental-protection programs, the on-scene coordinator used a triage system to focus these efforts. Top priority went to corralling the oil in booms and cleaning up shoreline areas around key facilities, such as Saudi Arabia's Jubayl desalination plant – the world's largest. While the plant survived, many other areas suffered.

In some regions, for instance, beached oil mixed with sand to create a layer of asphalt 1 foot thick. The most heavily affected areas include salt marshes, mangrove swamps and intertidal creeks and streams. These ecosystems serve not only as spawning grounds and nurseries for fish and shellfish, but also as nesting areas for many birds, including the flamingo and an endangered cormorant.

Overall, recovery efforts removed only 1.4 million barrels of oil from the water and shoreline; this waste now sits in storage pits awaiting disposal. Because no one knows how much oil ultimately reached beaches, settled into the Gulf's sediments or evaporated, EPA concludes that the level of "remediation necessary to restore ecological functions is not known."

Toadally extinct? Not if zoos can help it

Puerto Rico's crested toads, *Peltophryne lemur*, have had a tough time adapting. Only two populations of this species remain on Earth – one north and another south of a mountainous divide. In recent years, biologists have spotted only about 25 of the northern toads, says Robert R. Johnson of Canada's Metro Toronto Zoo. Even the genetically distinct, southern population of up to 3,000 crested toads may face extinction, he says. In hopes of restoring the toads' natural abundance, Johnson is directing a species survival effort – the only such program that the American Association of Zoological Parks and Aquariums has undertaken for amphibians.

Johnson is currently drawing up reintroduction plans for some 600 captive-bred tadpoles being nurtured at seven zoos, including his own – all the offspring from a single northern *P. lemur* couple. "We're trying to breed every [captive] animal that we have," he says. Of nine pairings tried, only the one couple, at the Cincinnati Zoo, succeeded in producing young. In about two weeks, Johnson will fly their thumbnail-sized toadlets "home" – to a concrete, walk-in cattle trough, the last known breeding site for Puerto Rico's northern crested toads.

Johnson

Puerto Rico's northern crested toad (female).

How the newcomers will fare is anybody's guess. Cattle still water at these troughs, Johnson notes. Moreover, "spraying of nearby pastureland for cattle ticks may result in high levels of pesticides in field runoff [of rains], which is the only source of water for the troughs," he says. Wild toads also suffer predation by lizards, birds, mongooses and rats. As a result, Johnson says, the success of captive-release programs "must be considered in a time frame of perhaps 10 or more years and after a number of releases."

How and why to curb urban sprawl

For decades, urban planners served as the architects of cityscapes, crafting green swards of parkland, gray ribbons of highways and an efficient marriage of housing and commercial buildings.

Increasingly, however, cities have allowed automobiles – not urban planners – to shape them, maintains Marcia D. Lowe of the Worldwatch Institute in Washington, D.C. The resulting urban sprawl, she says, destroys valuable wildlands, wastes fossil fuels, traps commuters in daily traffic jams and imbues metropolitan vistas with a blanket of pollution.

In a report released Nov. 2, titled "Shaping Cities: The Environmental and Human Dimension," Lowe proposes some remedies that even well-established cities might adopt to limit further sprawl and the inner-city decay it can foster. These include severely curtailing inner-city parking, increasing housing density, integrating residential and commercial structures, and basing property taxes on the value of the land, not the structures that occupy that land.

Through creative zoning and tax strategies, most cities could accommodate huge population increases and still improve the quality of residents' lives "without bulldozing another square meter of forest or farmland for the next two decades," Lowe contends.

Her solution: Focus development on tax-delinquent and unimproved property within a city's boundaries. For example, Lowe cites a 1989 estimate that vacant and underused land in central Portland, Ore., "amounted to nine times the space needed to accommodate [the city's] projected growth rate in the next 20 years."

As a result of Toronto's compact design, per capita gasoline consumption in that city – and hence, auto emissions – trails that of most U.S. cities. The difference reflects not only Toronto's greater use of public transport, but also its efficient layout, which fosters fewer and shorter trips, Lowe says.

"Even if all of Toronto's public transport trips were switched to automobiles," she says, "Toronto would still use less than two-thirds the amount of gasoline per capita that Detroit does."