

fine-tune his management style and learn more about the scientific marketplace, he says. He hopes to land a consulting job soon after getting his degree, perhaps with a health-care venture-capital firm looking for advice about wise places to invest.

But a consulting career is hardly the only destination for Balsa members. Many have ended up working in industry as research scientists, patent specialists or consultants for companies such as the multinational agrochemical company Monsanto, based in St Louis, Missouri, and the New York-based computing giant IBM. And of the roughly 200 alumni of the programme, he estimates that about one-third have continued in academic careers. The skills learned in the consulting game — management, leadership and teamwork — would prove valuable to anyone running their own lab, Shah says.

There is a paucity of organizations such as miLEAD and Balsa outside the United States, but early-career scientists in the United Kingdom, Europe and elsewhere can still get real-life consulting training. One option is a position with 180 Degrees Consulting, a global organization with branches in Cambridge, UK; King's College London; Munich, Germany; the University of Tokyo; the University of Sydney; and the University of California, Los Angeles, among many other sites. The company enlists students and postdocs to provide pro bono consulting to non-profit and humanitarian organizations around the world. Although the work generally is not focused on scientific issues, science PhD students and postdocs can bring valuable skills to the organization, says Daniel Jiang, a PhD student in computer science who in 2015 founded the 180 Degrees Consulting branch at King's College London. "I know more about data sets than a political-science major does," he says.

Jiang's group is working with a children's charity and sports charity in London, and a school in the Philippines. The company attracts people who want to make a positive difference in the world, Jiang says, but there are benefits for the consultants themselves. "It's a great opportunity for students to find out about a different career before they graduate," he says.

Lang of miLEAD is still technically a student, but he's racking up professional-grade experience and isn't slowing down: he'll jump into two new projects as an adviser this summer. He can't discuss details, but the big picture is clear: he'll be working long hours, thinking about tough problems and moving closer to a postgraduate career.

Are the long days worth it? That's a cost-benefit analysis that he has figured out on his own, no consultant required. ■

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TURNING POINT

Carpe freedom



Armed militants who were protesting against how public land is managed took over Oregon's Malheur National Wildlife Refuge on 2 January. They stayed for 41 days and caused roughly US\$6 million in damages. US Fish and Wildlife Service biologist Linda Sue Beck describes the occupation and its aftermath.

Did you anticipate the takeover?

No. We knew that the militia was in town for a peaceful march to protest against the prison sentence of a father and son convicted for arson on federal lands, but we didn't expect anything like what happened. The occupiers did a lot of damage, to our offices and the land, as well as to tribal archaeological artefacts.

What management issues do you work on?

The refuge was established in 1908 to support millions of resident and migratory birds. In the 1920s, someone brought common carp (*Cyprinus carpio*) into the basin, and they've become a problem. Before they were introduced, 9 species of submerged aquatic vegetation covered 90% of the lake. That, and the associated macroinvertebrates, drew birds. Today, the common carp are in direct competition with the birds for that food. They also muddy the water so that there is no light for the plants to grow. We're trying our best to get the carp under control.

Is federal-land management contentious?

There have been contentious issues, but my experience has been mostly positive. Together with tribal members, ranchers, non-governmental organizations and other government agencies, we spent 5 years over 40 meetings to write a 15-year plan for the refuge. People were vocal about things they didn't like, but in the end, the number-one priority was carp control. We agreed that we want it to be healthy again so that it can serve as a grocery store for the birds.

Your name appeared in news reports, as if the militants were targeting you. Why?

Essentially, they were sitting at my desk. At one point, a news article suggested that I was one of the reasons the occupation was happening. I've never had a rancher call me out — I have no idea where that came from. And to be honest, it freaked me out when my parents were contacted by a journalist. Then another person wrote an article entitled, 'I stand with Linda Sue Beck.' I think I was just the target for news that day.

That piece gained traction on social media.

What was it like?

It was nice to have support. I also have a good relationship with the locals, in part because I've involved them in science experiments where, for example, the public catches fish so that I can collect data. Some local ranchers turn carp into an organic fertilizer to use on their fields. The militants picked the wrong refuge to take over. I think they thought it would be easier to sway the locals, but our partnerships are strong. People are sending cheques from all over the world. Hopefully, we can use those funds to get the refuge back up to what it was.

What was the first day back at work like?

We had to evacuate the area after the takeover, and I was sent to our office in Vancouver, Washington, until the occupation was over. Coming back for the first time, I had to go through two FBI roadblocks and be escorted to my heavily guarded office. We're still piecing together the full impact of the damage.

How did the takeover affect your work?

We missed an opportunity to remove thousands of carp from the lake. In December, the lake was at a record low of about 800 hectares, so we had planned to block carp while they were aggregated at the mouth of the river, so that we could pull them out of the system. The lake has since grown to roughly 8,000 hectares, and the fish have dispersed because it is so deep.

How did it affect your outlook?

I realized how important it is to be honest and to keep lines of communication open. My approach to science is that I believe in what I'm doing to conserve land and animals for future generations. There might be political stuff at play, but I do what is best for the birds. ■

INTERVIEW BY VIRGINIA GEWIN

This interview has been edited for length and clarity.