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**THIS WEEK** Daqian Cao takes us through the ‘fire revolution’, a decades-long change in the policy of managing forest fire in the US, in which the camera, among other instruments, transformed the way landscape was conceived and controlled.—EDS.

## FIRE FINDER, VIEWFINDER, DRIP TORCH

Daqian Cao

**FOLLOWING DEMOBILISATION AFTER WWII**, a vacuum of both institutional power and fire control developed in the United States. Still under the shadow of the total fire suppression policies of the early twentieth century, the US Forest Service became an almost exclusively fire-fighting agency, with more than 90% of its activity dedicated to suppressing fire. For decades, fire policy barely changed; when it did, it was at a very slow rate.

A turning point came in 1963 with ‘The Leopold Report’, with which the National Parks Service began to recognise fire as an integral part of park ecology as well as the value of ‘scientific’ experiments. It heralded the move away from total suppression and the beginning of a decades-long ‘fire revolution’.

In July of 1969, another report, titled *Techniques for using prescribed fire for maintaining fuel-breaks in the central Sierras*, was published. In this report, ‘prescribed’ fire was argued to be the most economical fuel-break maintenance method. It was put in contrast to manual re-cutting by park crews (which was considered very slow and expensive), herbicides (which caused ‘erratic results’), and clearing with bulldozers (which disturbed the soil, contributing to erosion).

In addition to the low cost, prescribed burning took into consideration fuel mixture and many other variables. New metrics, such as a ‘Burning Index’ and an ‘Ignition Index’, were developed to guide the decisions of what to burn, where to burn, and how to burn. An analytical model, with a three-way factorial design, was also developed to analyse the effects of fuel type and moisture level, as well



**Above:** Colour transparency slides of prescribed burning at Yosemite National Park, from between 1970 to 1990. (Source: *Park History and Management 1869-2000*, Yosemite Archive Slides Collection.)

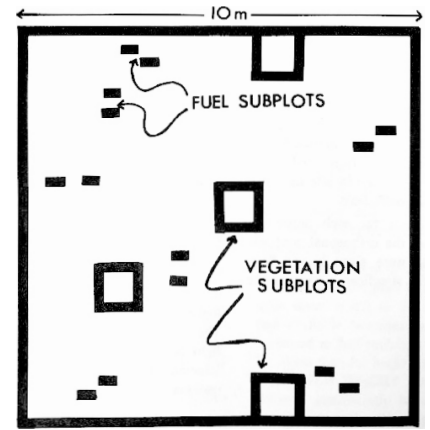
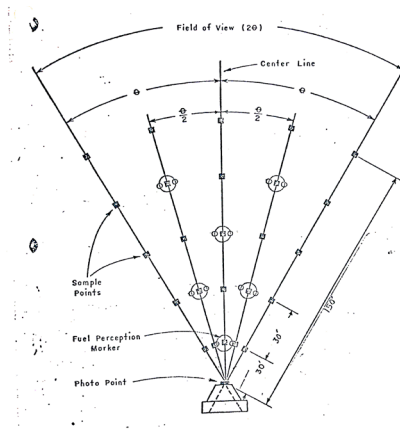
as the direction of burning.

In a standardised test, a minimum area of 100 square metres was determined to allow adequate fire without being influenced by the ‘edge effects’ (as these were ‘scientific’ experiments, the international metric system was used instead of imperial). A 10x10m grid was projected onto different sites, with one variable changed at a time to gauge differences in ‘fire behavior’. Equations were also formulated in the attempt to quantify fire by temperature, intensity, scorch height, rate of spread, and so on.

One conclusion of these studies found the drip torch to be the most practical device for

setting a prescribed fire. The experiments required a flame height of ‘two feet or less’, which would be sufficient to burn the top layer of duff (decaying plant matter on the forest floor). ‘This low intensity [of flame],’ the report read, ‘will produce sufficient heat to kill the undesired non-sprouting green vegetation, most top-growth of sprouting brush and consume the smaller, flashier fuels’. Although highly specific, these guidelines acknowledged the difficulties of controlling fire with any precision, and allowed a certain amount of freedom to the fire-boss-certified torch-men.

There was immediate resistance—



resistance that was to last as long as the fire revolution itself. To detractors, the practice was nothing more than the reckless burning and obscuration by smoke of iconic landscapes. Even until the mid-1980s, the choice of location and method of control burn remained a major concern. Superintendent John Davis's answer, 'Our prescribed burns are designed to mimic natural fire behavior', did little to assuage the critics.

In a stark contrast to the suppression years, prescribed burning, from the beginning, had the objective to 'simulate' a natural process; it was set to 'rectify' or 'undo' the legacy of a century of fire suppression—suppression that was in fact as much about the 'protection' of the timber industry as it was nature.

Despite this, striking similarities can be found between the generations of fire policies on the two extremes. Prescribed burning, like fire suppression, remained a highly event-driven practice. It made use of terms such as 'fire behavior', 'prescription', and 'treatment', all of which imply a sickness of nature, a thing to be remedied. Although considered radical by many, 'fire management' was still also unavoidably shadowed by the military mentality of treating nature as an enemy, one to battle against, to dominate and conquer. Even concepts such as using fire as a 'natural' way to offload fuel and balance species diversity—diversity that could not help but be counterfeited—recall colonialist interventions.

The see-saw of fire policy across generations reveals a tension that cannot be resolved. Fire, as an element, defies human control; this holds true whether one employs total, war-like suppression, or a rigorous, scientific mimicry of natural processes. But it also depends on an equally fictive element—the 'wilderness' of nature—which once named paradoxically becomes a thing to be preserved, controlled, maintained.

The creation of such a concept is what

Stephen Pyne calls 'an example of the misguided urge toward safety'—the safety of nature. The 'prescription' written for nature, as if it were a living patient, postpones its decomposition and sustains its (after)life 'for the enjoyment of future generations'. But we can see that, to the extent that such an idea of untouched nature ever existed, the moment 'wilderness' was imposed upon the forest its diminishment began.

As fire policy shifted throughout the twentieth century, photography remained a major actor, the camera gaining a revolutionary new function as a tool by which to calculate the total available fuel of a given field. Guidance to do so was officially provided in a document titled *Guidelines for Developing or Supplementing Natural Photo Series*, which spent twenty-four pages describing the method of photographing and collecting total available fuel information from a test site. 'Helpful tips' from the document included choosing cloudy or overcast days instead of clear days, using a 'quality 35mm camera with a 50 or 55mm lens and a reasonably fast color film such as the Kodachrome 64', and always taking the photos 'with the long dimension horizontal'.

During the decades of field testing at Yosemite, 35mm color photography was the main format. Furious letters sent to the park expressed fears that the National Park Service was 'ruining the landscape' and 'destroying the beauty of nature'. The way in which landscape had been viewed since the Westward Expansion—romantic, sublime—was destabilised by these photos; the foreground of famous landmarks, such as the Half Dome and Yosemite Falls, set on fire by the very caretakers of those parks. But the fire revolution needed propaganda—and photography was able to oblige, its only departure from the purely martial being that instead of smokejumpers jumping from the

skies, fire, and its being an essential part of the landscape itself, was the message.

Accompanying photography in the drive to systematically and scientifically quantify the wild and unknown came entire glossaries of terms, concepts, equations, and parameters. Inseparable from any physical infrastructure, this system of knowledge was deployed to control an element that refuses control in every way. While this epistemology struggled in its task, it nonetheless established photography as a constant; in the training of vision and the coordination of physical action in the control and regulation of landscape. It demanded its subjects—landscape, machines, people—to behave in a certain way.

An inconspicuous element of the fire revolution, and quickly co-opted, the camera was a powerful regulating agency and censor. For this reason, the complex relationship between the transformations of fire policy and the camera should not be overlooked. From total suppression to prescribed burning, fire policy and photography travelled, linked together, through cycles of destabilisation and re-stabilisation, around and around the paradox at the heart of fire policy itself.

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**Left:** A B-17 aircraft dropping fire retardant for 'aerial suppression', 1966. (Source: National Archive Still Pictures Collection.) **Centre:** Instructional diagram for calculating fuel capacity with a camera. (Source: Yosemite Archive.) **Right:** Prescribed burning plot diagram with fuel and vegetation subplots. (Source: Yosemite Archive.)