

Society of Irish Foresters

Study Tour to California 8–16 September 2008

On Monday, 8 September, forty four members of the Society of Irish Foresters departed for Los Angeles, California to begin the 65th Annual Study Tour. The group was welcomed at the airport by the tour guide and travelled to the Radisson Westside Hotel in Culver City, south of Los Angeles.

A large and hugely diverse state with a population of 38.6 million, California stretches 1,400 km from the Mexican border to its northern border with Oregon. It is 300 km wide – from the Pacific Ocean to the eastern deserts which adjoin Nevada and Arizona. Its largest city is the megalopolis of Los Angeles, which is home to six million inhabitants and the Hollywood movie industry.

The tour began in the San Bernardino National Forest, south of Los Angeles, then headed north and inland to the Sierra Nevada Mountains, Sequoia National Park and Yosemite National Park and ended in the coastal forests of the San Francisco Bay area, 670 km north of Los Angeles. The group returned to Dublin from San Francisco International Airport on Tuesday, 16 September.

Tuesday - 9 September

The first day began with a visit to the headquarters of the Pacific Southwest Forest and Range Experiment Station (PSFRES) in Berkley. The station is part of the research and development branch of the US Forest Service, and deals with California, Hawaii and the US affiliated Pacific Islands.

Staff at the station undertake research in natural resource management, conservation, and environmental protection. The emphasis is on fire – its prevention, management and control, which is understandable in a State where up to 40,000 ha can be damaged by fire in a single year. This is more than the total area of fire damage in Ireland since the State became involved in forestry in 1904.

Our guide for the day, Tim Paysen, Assistant Director of the Forest Fire Laboratory, pointed out that 2008 was likely to be an extremely bad year for fire damage. He introduced us to some of the staff at the station and explained the range of projects being undertaken by the PSFRES. For example, research meteorologists develop and refine weather models to optimise forecasts for fire management decisions; soil scientists develop technologies to monitor major wildfires and their impact on the environment; plant ecologists assess the impact of fire suppression and selective logging, in addition to testing the effectiveness of emergency post-fire rehabilitation treatments such as grass seeding, aerially applied mulches and erosion barriers on hill slopes.

The group discussed the major issues of concern to foresters and researchers in the region before heading into San Bernardino National Forest. Fire, water quality, insect, pest and disease damage, conservation and recreation are major issues, while timber production is of minor consequence. Some timber is harvested, usually as a salvage operation following fire damage. Dead and dying trees are removed because they exacerbate the fire risk as they become dry tinder for wind-whipped fires.



Presidents left and right - Pat Farrington (2009-2011) and Kevin Hutchinson (2007-2009), with Technical Director Pat O'Sullivan (second from right) beside Tim Paysen (Research Forester) outside the HQ of PSFRES.

(All photos: C. and K. Hutchinson)

Fire has always been an issue here, but more recently global warming and population increase are putting additional pressure on many forests in California. This is especially true in San Bernardino, which was established as a National Forest in 1907. It covers an area of 270,000 ha but more than half is chaparral (shrubland) which is hugely susceptible to wildfire during long periods of drought.

While the dry climate and vegetation type contribute to fire, an increasing number of fires are caused by human activity. This is a particular concern because California has a population of more than 38 million (California Population Bureau Census 2008) and is the most populous state in the US. Its population has increased by almost ten million in the past 20 years alone. Forest fire records since the 1880s show a pronounced increase in fires from east to west which mirrors the westward migration of settlers, their activities and industries. San Bernardino National Forest is very heavily used for recreation, as it is within easy reach of Los Angeles County which has a population in excess of ten million. Since 1980, 12 of America's 15 most destructive wildfires have occurred in California, mostly in chaparral areas.

As we headed higher and deeper into the San Bernardino Mountains, the group made a number of stops, beginning at a stand of Jeffrey pine (*Pinus jeffreyi*), a species that grows well on the driest of sites and at elevations up to 2,800 m. A close relative – but distinct species – Ponderosa pine (*P. ponderosa*) also grows in San Bernardino

but does not reach the high elevations attained by Jeffrey pine. Ponderosa pine has a wide geographic range and Society tour veterans will remember it from their visit to Sisters in southern Oregon in 1992. Sugar pine (*P. lambertiana*) and Coulter pine (*P. coulteri*) were also present, as was Douglas fir (not *Pseudotsuga menziesii*, the species familiar to Irish foresters, but *Pseudotsuga macrocarpa* or bigcone Douglas fir). The main deciduous species was California black oak (*Quercus kelloggii*).

At the higher altitudes many species appeared under stress, including pines and bigcone Douglas fir, whose snags (standing dead and dying trees) were a reminder of the threats, not just from fire but also from drought and insect damage in San Bernardino.

Ponderosa pine suffers severe damage from western pine beetle (*Dendroctonus brevicomis*). This beetle, whose increase has been linked with global warming, thrives in drought conditions, when the trees are under stress. The beetle can reproduce several times in a year, is extremely aggressive and is capable of not only destroying stressed trees but can also attack neighbouring healthy trees.

The Jeffrey pine beetle (*Dendroctonus jeffreyi*) attacks Jeffrey pine in San Bernardino and other areas but is not as prolific as the western pine beetle. Other insects that cause damage include Ips and the fir engraver (*Scolytus ventralis*).

Broadcast forest spraying using insecticides is not a control option although individual high value trees in some leisure areas are sprayed.

After exploring the San Bernardino forest, the tour headed for Big Bear Lake a popular tourist resort which offers camping, skiing, and fishing (mainly for brown trout). Even here, global warming is an issue as lake water levels have dropped considerably in recent years.

The group then began the 170 km journey back to Los Angeles, taking in a visit to the luxury liner, the Queen Mary in Long Beach, before dining at Bubba Gump, a themed restaurant strictly for aficionados of the Oscar-winning film *Forrest Gump*.

Wednesday - 10 September

On Wednesday the group visited the Huntington Arboretum and Museum, a research and educational institution established in 1919 by Henry Huntington, a businessman who built a financial empire based on railroad companies and property holdings in southern California.

Huntington was a man of vision with a special interest in books, art and gardens. During his lifetime he built up a valuable research library and created botanical gardens with plants from around the globe. A striking feature of the plants section is the Desert Garden which contains more than 5,000 different plants from dry regions, mostly cacti and succulents.

Another attraction of the Huntington is its library, which specialises in the study of Anglo American civilisation and its place in the more diverse world of early twenty first Century America. Rare manuscripts, books, prints, drawings and photographs from the library's collections portray some of the ways in which scholars have interpreted the past and envisioned the future. There are informative displays on medieval Europe and the social history of the United States of America over the last two centuries.



The Desert Garden at the Huntington Arboretum and Museum

The world famous Huntington Art Gallery presents high-quality exhibitions of the institute's valuable European art collection which focuses on works from the fifteenth to the early twentieth century. Almost 1,200 objects are on view at any given time.

This ended an unusual day, spent among unfamiliar plants and surroundings.

Thursday - 11 September

The group made a long bus journey from Los Angeles to Fresno via Sequoia National Park and a spectacular and interesting visit to Sequoia Canyon. Here the group was enthralled by the massive trees including the *General Sherman* and the *General Grant*.

The 2,300-year-old *General Sherman* is 84 m in height and has a volume of approximately 1,487 m³. Its circumference at ground level is an amazing 31.3 m and even at a height of 18.3 m it still carries a diameter of 5.3 m. The largest branch on the tree is an incredible 2.1 m in diameter. It is estimated to weigh 1,256 t.

Sequoia National Park has a rich diversity of species including sugar pine, incense cedar (*Calocedrus decurrens*), white fir (*Abies concolor*), black oak, mountain dogwood (*Cornus nuttallii*) and California hazel (*Corylus cornuta var. californica*). On the moister sites azaleas (*Rhododendron* spp) are found, while on drier sites ceanothus (*Ceanothus* spp) and manzanita (Spanish apple - *Arctostaphylos* spp) grow abundantly.

Sequoia depends on periodic fires caused by lightning strikes to produce the open forest structure which is essential for its establishment. These fires eliminate stretches of pine, fir, cedar and other species but do not destroy the entire forest. Thanks to



The 2,000-year old General Grant at Sequoia National Park

its thick bark, sequoia is well adapted to survive fires and this gives it a significant advantage in colonising newly created open spaces.

After a fascinating day in Sequoia National Park, the group began the long bus journey north to the town of Fresno in central California.

Friday - 12 September

We headed north from Fresno to Yosemite National Park. Our destination was the Mariposa Grove of Giant Sequoias (*Sequoiadendron giganteum*) on the southern edge of the Park. The Mariposa Grove is one of 75 isolated groves of sequoias on the western slopes of the Sierra Nevada Mountains. They represent just 4% of the original area before logging began in the 1850s. Although the sequoias are not the oldest living trees (this honour goes to the bristlecone pine (*Pinus aristata*) which can be more than 4,600 years old), the oldest giant sequoias are more than 3,000 years old. Neither is the giant sequoia the tallest living tree, that honour goes to the coast redwood (*Sequoia sempervirens*) which can reach 112 m. (We saw these massive trees later in the tour at Muir Woods on the coast near San Francisco.)

However, in the presence of these giants, it is impossible not to be impressed by their enormous size. Much has been written of their impact. In *Travels with Charley*, the American writer John Steinbeck wrote: “The vainest, most slap-happy

and irreverent of men, in the presence of redwoods, goes under a spell of wonder and respect.” Americans are prone to describing things as awesome but, in this case, it is a word which aptly describes these trees.

The Mariposa Grove holds many historic trees and much has been written about them since they were first seen by Europeans in early 1850s. In 1857, Galen Clarke brought attention to the trees by establishing a stagecoach station at Wawona. He became so enamoured of these huge trees that when he was diagnosed with tuberculosis he came to the mountains to spend his last days in their presence. In 1864 Abraham Lincoln took time out from the Civil War to declare the Mariposa Grove and Yosemite Valley protected state reserves. Together with John Muir, a Scotsman, he championed the saving of the sequoias from the axe and was responsible for the establishment of National Parks in the US.

The first tree on our route was the *Fallen Monarch*. It provides a good example of the rooting structure of sequoia. Given its great size and wind firmness, one would expect it to have a deep tap root whereas, in fact, it has only surface roots which are adapted to garner water. The roots are usually no more than two metres deep but they extend outward for 45 m, thus providing a stable base for the tree. Forest biologists believe the **Fallen Monarch** has lain on the ground for several hundred years. Tannic acids in the wood initially suppressed the growth of fungi and bacteria, thus arresting decay and it was only when rain and melting snow had leached the tannins from the wood that decay could begin.

Again we learned about the importance of fire for the survival of the species. Sequoia seeds need direct sunlight, adequate moisture and bare mineral soil to germinate and take root. Ironically, road construction creates the ideal seedbed by opening up the forest floor to sunlight, increasing moisture and providing bare mineral soil. In the early days, naturally occurring fires were suppressed in Mariposa in order to protect the sequoias. However, the more shade tolerant trees such as incense cedar, white fir and sugar pine quickly colonised the forest floor, reducing light, competing for moisture and blanketing the mineral soil with their needles and debris. As a result, it became very difficult for the sequoia to get established.

In nature, lightning causes fires, usually in late summer. The fires reduce competition from other trees and burn away the leaf litter to leave a thin layer of rich ash on top of mineral soil. A second advantage of fire is that the heat dries some of the ever-present green cones high up in the mature trees, causing a shower of fresh seeds to fall on to a perfectly prepared seedbed. This dependence of the sequoia on fire was not fully understood until the 1960s, but by then a century of debris had accumulated, making the grove susceptible to severe crown fires and possibly killing some of the large trees. The Parks Service began a series of prescribed burns which will continue until the grove returns to a more natural state and the lightning generated ground fires on a seven to 20 year cycle will resume.

Next was the *Grizzly Giant*, one of the largest trees in the grove, it is estimated to be at least 2,700 years old. One of its branches is two metres in diameter - which is greater than the trunk diameter of any of the non sequoias in the grove. Some 50 m from the *Grizzly Giant* is one of the most frequently photographed trees on earth - the *Californian Tunnel Tree*. It was bored through in 1895 to provide a passage

for stagecoaches. In fact, two trees in the Mariposa Grove were tunnelled. One of these is still standing and everyone in the group was eager for a photograph. The original tree was tunnelled in 1881 but it collapsed in 1969 under a record snowpack. Our forest guide believed the popularity of this tree may have helped save the remainder of the grove from logging.



The Californian Tunnel Tree in the Mariposa Grove of Giant Sequoias on the southern edge of Yosemite National Park (left to right: John McLoughlin, Pat O'Brien, George Hipwell, Mick O'Brien, Kevin Hutchinson and Christy Hanley)

Nearby is the *Faithful Couple*, two trees fused together at their base but clearly separate above. On the opposite side of the road are two similar but smaller trees which may become the next *Faithful Couple* ... in about 500 years time! Next was the *Clothespin Tree*. As a result of several natural fires a tunnel, wide enough to accommodate a car, was burnt through its trunk. Further on, we meet the *Telescope Tree*, once again natural fire burned out the core of the tree with the result that you can now look up inside the tree and see the sky. Although it is now a hollow cylinder, it is still alive and producing viable seed.

Saturday - 13 September

We headed north to the centre of Yosemite National Park, to an area known as The Valley. One could not fail to be impressed by the awesome scale of the park with its sheer granite cliffs rising almost 1,000 m from the valley floor. John Muir said of Yosemite "No temple made with hands can compare with Yosemite, every rock in its walls gleams with life". The cliffs are the tallest in the US and fifth tallest in the world.



The Merced River, with El Capitan at left in background – Yosemite National Park

El Capitan (the Chief) is the centre-piece of the valley and is the tallest unbroken cliff in the world. We saw several rock climbers scaling the cliffs. These are elite climbers, who take three to five days to climb the cliff, sleeping in hammocks suspended several hundred metres above the valley floor.

Yosemite National Park was established in 1890 and is now more than 300,000 ha in extent. Although Yellowstone National Park preceded it by eight years, it was in Yosemite that the idea of protection was first mooted. The Valley itself is 11 km long and 2 km wide. The principal rock found in Yosemite is extremely hard granite, which is more than 100 million years old. While glaciers gouged out and enlarged the canyon of the Merced River, the ice scraped away the softer portions of the granite but only scarred the harder portions which now form the cliffs. As the glaciers melted a lake formed in the valley. It eventually silted up and created the present valley floor.

Sequoia is not naturally present in the valley. Live oak (*Quercus chrysolepis*), Douglas fir (*Pseudotsuga menziesii*), ponderosa pine and big leaf maple (*Acer macrophyllum*) are the main species. Fire is used on a controlled basis by the Parks Service to keep the meadows free of scrub and trees.

Native American Indians lived peacefully in the valley for 4,000 years until the mid-nineteenth century when the Californian gold-rush brought a huge influx of miners and settlers. Today, the park receives over four million visitors annually, 70% of whom visit during the summer. Visitors are transported within the park on a bus and tram shuttle system.

Black bears are plentiful in Yosemite and often cross swords with visitors. This sometimes results in damage to property and occasional injuries. Visitor education



Tour Group in the 'Valley' area of Yosemite National Park

and bear management efforts have reduced the number of bear/human incidents and property damage by 84% in the past six years.

The management of bears in close proximity to visitors is a major issue for the Parks Service. Normally the bears' diet comprises 85% plants and 15% grubs and insects. However, they are poor hunters and given a chance they will scavenge from humans. Visitors are under strict instructions not to feed bears under any circumstances. Special bear-proof food boxes and litter bins have been installed at campsites. Black bear is now the predominant species, the grizzly bear having disappeared in the 1960s.

Sunday - 14 September

We departed Yosemite for the 340 km journey north to San Francisco, where the group visited well known sights such as the Golden Gate Bridge, San Francisco Bay and Alcatraz Prison.

Monday - 15 September

We headed north over the Golden Gate Bridge for 20 km to Muir Woods, home to the coast redwood *Sequoia sempervirens*. In 1905, a local businessman bought Muir Woods and, to ensure permanent protection, donated it to the federal government. In 1908 President Theodore Roosevelt proclaimed the area a National Monument. It was named after the conservationist, John Muir. Unlike the giant sequoia we saw earlier in the tour, the coast redwood grows along a discontinuous 850 km strip along the Pacific coast. The trees at Muir Woods are a remnant of what once covered much of the Northern Hemisphere approximately 150 million years ago. The trees at Muir Woods

were never logged. They are of mixed age; the dead trees supporting a biologically rich community of plants and animals.

Coast redwood (*Sequoia sempervirens*) and giant sequoia (*Sequoiadendron giganteum*) are closely related species. Giant sequoia grows larger in bulk than the coast species, up to 1500 t, but not as tall. The coast species grows best in moderate temperatures, protected from the wind and salt spray. Both redwoods need substantial rainfall and summer fog and grow tallest in the flood plains of rivers. The world's tallest living tree is a coast redwood in Redwood National Park, which has a height of 112 m – almost as high as the Spire in O'Connell St. in Dublin (120 m).

We returned to San Francisco for lunch and took a last look at the city and the Bay area.

Tuesday 16 September

We departed our hotel and headed south to San Francisco International Airport and home.

Recorders and accommodation

<i>Date</i>	<i>Recorder</i>	<i>Accommodation</i>
8 September	Tour begins, travel to California	
9 September	Donal Magner	Radisson Westside Hotel, Culver City
10 September	Frank Nugent	Radisson Westside Hotel, Culver City
11 September	Paddy O'Kelly	The Marriott Courtyard, Fresno
12 September	John McLoughlin	America Best Value Inn, Oakhurst
13 September	John McLoughlin	Yosemite View Lodge
14 September	John McLoughlin	Whitcomb Hotel, San Francisco
15 September	John McLoughlin	Whitcomb Hotel, San Francisco
16 September	Tour ends, return to Dublin	

Participants

PJ Bruton, Frances Burke, Richard Clear, Leo Collins, Tony Collins, Jim Crowley, Bob Dagg, Andy Duffy, Ken Ellis, Pat Farrington (Convenor), Jerry Fleming, Matt Fogarty, Brigid Flynn, Denis Gallagher, Seán Galvin, Eugene Griffin, Christy Hanley, George Hipwell, Kevin Hutchinson (President) Catherine Hutchinson, Kevin Kenny, Richard Lowe, Michael Lynn, Donal Magner, Tony Mannion, Brian Monaghan, Liam Murphy, Kevin Mc Donald, Tom Mc Donald, PJ McElroy, Willie McKenna, John McLoughlin, Jim Neilan, Frank Nugent, Benny O'Brien, Dermot O'Brien, Michael O'Brien, Pat O'Brien, Pat O'Callaghan, Liam O'Flanagan, Paddy O'Kelly, Pat O'Sullivan (Technical Director), Tim O'Regan, Trevor Wilson.

