



menziesia

Spring 2010 NPSBC Native Plant Society of British Columbia www.npsbc.org Volume 15, Issue 2

Native Plant Society of BC shows its seedy side

Each year, VanDusen Botanical Garden is host to one of the most popular plant-related events of the year – Seedy Saturday. Presented by the BC Master Gardeners Association, the event typically draws around 500 visitors. This year, the NPSBC provided information and resources to encourage people to go native when considering seeds for their gardens. (Fortuitously, the VanDusen Seed Collectors had seed from several native species available for sale at the adjacent table.)

Thanks to the volunteers who helped out: Patrick Wilson, Val Karlsson, Debra Taschuk, Hugh Daubeny and Dawn Hanna. *



Photo: Dawn Hanna

Going to seed: Visitors to the native plant sale got the lowdown on the benefits of native plants and the Native Plant Society of BC at Seedy Saturday.

Time to renew!

Top 10 reasons to renew your NPSBC membership

1. Native plants are an endless source of fascination.
2. You can indulge your love of native plants with people who share your passion.
3. On field trips, you get to find out about species and places you didn't know about before.
4. At evening presentations, you get to see people get really excited about plants like bracken fern and you realize there is more to peavines than you ever thought possible.



5. At workshops, you can learn plant identification, better photography, grassland ecology and more.

6. You can support or get involved with initiatives to conserve native plants and their habitats.

7. You can take part in stewardship efforts that help maintain, restore or enhance native plant habitat.

8. You get a great newsletter four times a year that's all about native plants and things native-plant related.

9. You can help infect others with a passion for native plants.

10. Without native plants, there would be no native anything.

To renew, just use the form on the back page!

Native Plant Society of BC

Spring Wildflower Fling and AGM May 1 and 2, 2010 Duncan BC

Join us for a weekend of wildflowers with expert guides and fellow native plant lovers!

On Saturday, May 1, the day begins with a tour to Somenos Marsh and Garry Oak Ecosystem with Dave Polster. After lunch and a brief AGM at Maple Bay, the day continues with a tour of the Cowichan Garry Oak Preserve with Irv Banman.

For those staying over to Sunday, there will be field trips to the Mount Tzouhalem Ecological Reserve and Honeymoon Bay Wildflower Reserve (and possibly other destinations depending on demand.)

Details and registration forms at www.npsbc.org



Welcome to our new members!

- Carol Davies (Victoria)
- Joy and Cam Finlay (Victoria)
- Deidre Hill (Victoria)
- Mike & Rhonda Kamann (Winfield)
- Amanda Patt (Victoria)
- Ann & Felicity Smith (Victoria)
- Ronald Wall (Duncan)

In This Issue:

Feature articles are the sole responsibility of their authors. Opinions expressed therein are not necessarily those of the Native Plant Society of BC.

Features:

NPSBC and Seedy Saturday	1
<i>Rubus arcticus</i> (Arctic raspberry)	3
<i>Lotus pinnatus</i> : Nanaimo's flower?	4
Yellow-cedar decline mystery	5
Okanagan blooms yellow	6
Native Plant Appreciation in WA	7
Growing effects of climate change	8
Plants: The foundation of life	10
Field trip leaders wanted	12
Metal harms carnivorous plants	14

Departments:

Coming events	13
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Regular columns:

Long's Lens	11
Canning's crossword	15

Listserv

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Send enquiries to the administrator at NPSBC-L-owner@victoria.tc.ca

NPSBC

Native Plant Society of British Columbia

Our Mission

The purpose of the Native Plant Society of British Columbia is to encourage knowledge, appreciation, responsible use and conservation of BC's native plants and habitats.

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Ground-hugging Arctic raspberry is one of BC's lesser-known *Rubus* species

By Hugh Daubeny

The Arctic raspberry (*Rubus arcticus*), sometimes known as the nagoonberry, dwarf nagoonberry, crimsonberry or plumboy, occurs in north circumpolar regions. In British Columbia, it is found in wetter areas at low to higher elevations, mostly from the central coastal region east to the Rockies and north to Alaska. According to Clark (1973) the species, called *Rubus acaulis* in his book, also occurs across the continent to Newfoundland.

The species is represented in the Alpine Garden of University of British Columbian Botanical Garden by an accession that was probably collected at approximately 800 metres elevation, halfway between Prince George and Vanderhoof (La Fontaine, 2010). The Arctic raspberry is easy to distinguish from other raspberries by its rosy-red flowers and ground-hugging habit. The flowering stem and tufts of leaves rise from rhizomes, the slender creeping roots. Plants are easily propagated from the rhizomes and are popular sale items in the UBC's Garden Plant Centre. They are suited for growing in shady and moist sites and also for containers. The showy pink flowers are followed by clusters of fleshy raspberry-like drupelets.

Long before I became acquainted with BC's own *Rubus arcticus* I knew of the creeping, circumpolar species because a single selection of it, taken from Sweden in the 1950s, had been used in the world's oldest raspberry breeding program, at the East Malling Research Station in England, as a source of genes for flavour and aroma, short



Photo: Virginia Skilton

Petal power: *Rubus arcticus* flowers range from pale pink to bright magenta.

growing season, winter hardiness and early ripening primocane fruit. Cultivars and selections from the program have been used in both public and private sector programs throughout the world. Autumn Bliss is the best known of the cultivars

with *R. arcticus* derived genes and remains a standard in selecting for early primocane fruiting. Obviously the single selection of the species has had wide impact in raspberry breeding. Linnaeus, himself, may have foretold the value of *Rubus arcticus* when

he wrote, as quoted by Jennings (1988), "the vinous nectar of its berries frequently recruits the spirits when prostrate with hunger and fatigue."

For the record, other *R. arcticus* selections were used in a breeding program, located in the north of Sweden, that had the aim of transferring the delicious aroma of the fruits into more easily cultivated forms with better growth habits, and yield

potential of the closely related *Rubus stellatus* (Jennings, 1988). There is a bit of confusion as to whether *R. stellatus* is a different species or actually just a subspecies. However, a series of cultivars, all with a spreading dwarf growth habit, were released from the program but to my knowledge none is grown outside of the Scandinavian countries. There is speculation that genes from this source might have been introduced into a private red raspberry breeding program in California but, if so, proprietary rights would prevent derivatives being distributed to other programs.

Jennings (1988) states that the distribution of *R. arcticus* in North America is restricted to Alaska and the Yukon and that the remainder of the Arctic raspberry in North America is *R. acaulis*, the species name that Clark attributed to all the Arctic raspberries of North America. The description in Pojar and Mackinnon (1994) is a bit confusing in that *R. acaulis* and also *R. stellatus* are suggested as synonyms of *R. arcticus* but based on subtle leaf differences, each can be considered a

Rubus arcticus, continued on page 4

Campaign on to make *Lotus pinnatus* Nanaimo's official flower

One of BC's plant species at risk could become the official emblem of the City of Nanaimo if its advocates prevail.

The Friends of Harewood Plains have proposed that the city adopt *Lotus pinnatus*, also known as bog bird's-foot trefoil, as its floral emblem. The species is listed as endangered by COSEWIC and is also red-listed in BC. Five populations are known in Canada (a sixth is considered extirpated), in Nanaimo, Gabriola Island and Ladysmith areas.

According to its COSEWIC status report, *Lotus pinnatus* grows in open, springy meadows, along the margins of creeks or in seepages, where underground water comes to the surface and the plants are in close physical contact with cool, flowing water. In all cases, the soils are shallow (< 15 cm), over gently sloping sandstone or conglomerate bedrock with abundant moisture during the growing and blooming period.

More information on *Lotus pinnatus* can be found on



Photo: Garry A. Momroe @ USDA-NRCS PLANTS Database

the Garry Oak Ecosystems Recovery Team website at www.goert.ca/documents/PARFS_lotupinn.pdf *

Rubus arcticus, continued from page 3

subspecies of *R. arcticus*. Trelawny (1983) also considered *R. acaulis* and *R. arcticus* as synonyms. For the purpose of this article I will refer to the Arctic raspberry as *R. arcticus*.

Of all the descriptions of *Rubus arcticus*, I prefer that of Scotter and Flygare (1986): "Easy to distinguish from other raspberries by rose-red flowers and ground-hugging habit. Dwarf raspberry can be found trailing over moss-covered ground from low elevation bogs to alpine zone. The flowering stem and tufts of leaves rise from a slender creeping rootstock. From two to five leaves, divided into three-parted leaflets with unevenly toothed margins, provide a pleasant contrast to the usually solitary terminal flower and the juicy red berry that follows. The slender pointed sepals are strongly reflexed, and the ribbon-like stamens are similarly coloured rose-red. The fruits are rather small, but sweet, aromatic and richly flavoured." To this, I add Pojar and Mackinnon (1994) description of the fruit: "Clusters of several fleshy red drupelets; small raspberries about one cm across."

Rubus arcticus is a member of the sub-genus *Cylactis*, one of the 12 sub-genera of *Rubus*. Of these only

two, *Idaeobatus* (raspberry) and *Eubatus* (blackberry) produce edible fruit of commercial importance while *Cylactis* and *Chamaemorus* (cloudberry) produce fruit mostly gathered in the wild.

According to Trelawny (1983), *R. arcticus* is very variable. I speculate this could be a factor in the apparent confusion in species designations compounded by hybridization between subspecies or even species. And this might explain the ease with which the fertile crosses between *R. arcticus* and *R. stellatus* were made in Sweden (Jennings, 1988). Also, the extensive circumpolar distribution promotes variation. This means, too, that there is almost infinite scope for making selections that will have desirable traits for both landscaping purposes and for use in red raspberry breeding.

Rubus arcticus berries are highly prized by indigenous peoples being used in making jam, jellies and to flavour liquors. Sometimes the berries are mixed with those of *R. chamaemorus* (Pojar and Mackinnon, 1994).

Several references state that the origin of the common name, nagoonberry, is a mystery. However,

Thornton (2007), notes that the word nagoon is derived from neigoon, the name used for the berry by the Tlingit people of the Glacier Bay area of Alaska. (Apparently this is one of the few instances of an English noun borrowed from the Tlingit.) In Sweden the common name of *R. arcticus* is *åkerbär* and the berries are used in cooking and as a source of flavour and aroma in producing flavoured vodkas and liqueurs. *

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Researchers try to unravel the mystery of yellow-cedar decline

By Claire Wooton and Dr. Brian Klinkenberg

For over two decades, the phenomenon of yellow-cedar decline has perplexed researchers. Yellow-cedar (*Chamaecyparis nootkatensis*), which ranges from southern Oregon to Prince William Sound, Alaska, was known to be declining on over 200,000 ha of undisturbed forest in southeast Alaska (Snyder et al. 2008). During an aerial survey in 2004, numerous large areas of dead and dying yellow-cedar were found in coastal locations in BC, and the nature of the dieback was found to be consistent with the phenomenon in southeast Alaska (Hennon et al. 2005).

Research into the decline of this long-lived species began in the early 1980s and a sequence of symptoms was identified. The initial symptom was determined to be fine root death, followed by death of small-diameter roots (Hennon et al. 2006). As the roots start to die, the trees develop thin off-colour crowns and necrotic lesions spread from larger roots up the bole (Hennon et al. 2006). The natural resistance of yellow cedar heartwood to decay allows dead trees to remain standing for 80 to 100 years after death. By examining the standing snags it was possible to establish that the decline of yellow-cedars began in about 1880-1900 (Hennon & Shaw, 1997).

Investigations initially focused on finding a biotic cause of the decline, but one by one the suspected agents were ruled out (Hennon et al. 1990). Attention then shifted to abiotic factors potentially associated with the decline – an association with wet, poorly drained soils was found. However the relationship with soil drainage is inconsistent, with limited decline occurring on wet sites at higher elevations (Hennon et al. 2006). Air and soil temperature were determined to be stronger risk factors than poorly drained soils (D'Amore & Hennon, 2006).

These clues led researchers to propose a new, complex hypothesis to explain yellow-cedar decline. According to Hennon et al. (2006), saturated soils create open, exposed canopies which experience soil warming early in the spring. This warming triggers the yellow-cedars to lose their cold tolerance, making them more susceptible to freezing injury. Snow appears to protect yellow-cedar against this freezing injury by preventing soil warming. However, the end of the Little Ice Age, which coincided with the onset of decline, has led to a reduction in snowpack at lower elevations (Hennon et al. 2006). This shift in climate may represent the environmental trigger responsible for the decline and suggests that the dieback may expand if warming trends continue (Hennon et al. 2006).

Our research questions are being addressed through a combination of remote sensing and GIS techniques. Spatial patterns of biophysical factors (e.g. elevation, slope, aspect) are being used in our assessment of the relations between the distribution of decline and the environmental predictors.

The high value of yellow-cedar wood and the desire to conserve species diversity means that a management strategy incorporating the influence of a warming climate is required. Ultimately, this research may provide insight into the devastating effects that climate change can have on a forest ecosystem.

Dr. Klinkenberg also adds an additional note regarding the name of



Photo: Darren Hanna

Chamaecyparis nootkatensis

this species:

There has been much debate over the taxonomic status of yellow-cedar following the discovery of a closely related tree species in northern Vietnam, *Xanthocyparis vietnamensis* Farjon & Hiep. Whether yellow-cedar is transferred to this newly established genus as *Xanthocyparis nootkatensis* or the older *Callitropsis nootkatensis* name is adopted, will be determined at the next International Botanical Congress in 2011 (Mill & Farjon, 2006). *

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continued on page 6

Yellow is the colour of spring in the Okanagan

Article and photos by Eva Durance

The March winds shall blow, and we shall have snow, and what shall poor robin do then, poor thing?" goes the old nursery song.

Well, we do usually have snow in March in the South Okanagan, but the robins are back and on sunny slopes among the dry brown grasses tucked against a sheltering rock, the first wildflowers reappear. Like the first migrant birds returning, these spring flowers catch our attention immediately and beg to be noticed. What are those butter-yellow flowers at my feet, those candy-striped petals shyly peeking out from under a pine? Are those really sunflowers opening from woolly buds? Everyone recognizes the buttercup though and who hasn't, when young, held a glossy flower under their chin to see if it reflects gold, a ritual with any number of magical meanings?

The first Okanagan spring flower is the vivid sagebrush buttercup (*Ranunculus glaberrimus*). Nestled low to the ground, its shiny, somewhat waxy, five-petalled bloom, 2 to 3 cm in diameter, rests in a bed of glossy, spoon-shaped leaves that are notched or scalloped at the tip.

Look for these gems on a warm, sunny day from late February in the southern valley to late March or April farther north. They appear first on open, south-facing grassy areas and gravelly slopes where the sun warms the soil early; later they bloom in the low-elevation, open Ponderosa pine and Interior Douglas-fir forests. If you are patient on a sunny day, you can watch one unfold from its brown bud.

This species' Latin name means "very smooth" (*glaberrimus*) "little frog" (*Ranunculus*). "Little frog" is presumed to come from the fact that many buttercup species live in or near wetlands, where frogs are found, and "very smooth" from the texture of the leaves.

Treat the *Ranunculus* genus with respect as its members contain toxic alkaloids that are one defense of the plants



Ranunculus glaberrimus (sagebrush buttercup)

against being eaten. Okanagan First Nations people warned their children not to touch or taste the pretty flowers, and hunters used the plant juice to tip arrows. Livestock can be poisoned from eating buttercups, but seldom touch the plant as the alkaloids give the plants an unpleasant taste.

The Okanagan is home to a number of *Ranunculus* species, but no other captures our hearts as does the sagebrush buttercup. Whatever the date, spring has arrived when I catch sight of the first of the first brilliant bloom.

Lilies of the Field

Walk with particular care in the grasslands this time of year; you might crush a delicate yellow bells (*Fritillaria pudica*). Look for single (sometimes more) golden flower hanging like a tiny church bell on a 10 to 15 cm threadlike stem. Appropriately, "*pudica*", translates as "bashful". The flower's chrome-yellow petals are set off by a tiny reddish-orange patch where they attach to the stem. As the petals age, they darken entirely to the same reddish-orange hue.

The long, narrow leaves (that are in more or less a whorl partway up the stem) mimic the grass they grow among, making it a challenge to find before the flower unfolds. When the flower has been pollinated and dies, the seedpod turns upright on the stem, a thin, papery cream-coloured capsule containing almost translucent seeds.

Yellow bells belongs to the Lily family (*Liliaceae*). Like all members of this large family, it grows from a bulb in which is stored the nutrients to support the plant, produce the flower and develop fertile seed. Bulbs also are one way for plants to survive and reproduce in semi-arid or desert locations, during periods of drought or under other poor conditions. Small bulblets at the base of the "mother" bulb produce new plants even under conditions which make

Yellow-cedar, continued from page 5

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seed formation impossible. A number of our indigenous flowering plants survive the semi-arid conditions here in similar ways. The bulbs of some also, incidentally, provide food for other inhabitants of the land.

Yellow bells bulbs were eaten by some indigenous people of the Interior and were consumed dried, baked, boiled or raw. Bears just out of hibernation are also partial to the starchy roots – of these and other bulbous plants. I read recently that at least one bear researcher has observed bears digging such edible roots, then leaving them for a day or so to “ripen” and the starch to turn to sugar before they return to the feast.

A little later in spring, in somewhat shadier, moister places, look for our other *Fritillaria* among the grasses: (*Fritillaria lanceolata*), the chocolate lily, also known as mission bells, checker lily or rice-root. One of our few brown flowers, its strangely mottled petals with golden stamens form a fatter bell than its yellow cousin and there will often be two or more flowers per stalk. The lance-shaped (*lanceolata*) leaves grow in whorls up and around the stem, which can be up to 30 cm tall. Another common name, skunk lily, indicates the scent that attracts pollinating flies.

The lily family has some of the showiest flowers in nature. Our *Fritillaria* are no exception in spite of being quite small. Observe and enjoy them, but please, as with all wild things, leave them to reproduce and play their part in nature. *



Fritillaria pudica (yellow bells)

Native Plant Appreciation Week declared in Washington State

Just south of the border, Washington state residents are getting ready to celebrate Native Plant Appreciation Week. The governor’s proclamation (right) designates the week of April 25 to May 1 as the official week to recognize the wonder of Washington’s native flora (much of which is shared with BC).

The Native Plant Appreciation Week inspires citizens through diverse activities and events to learn more about native plant species and their habitats and how to protect them. The public can participate in everything from talks, walks, hikes, garden tours, and visits to our natural areas to active involvement in habitat restoration projects

The idea is to celebrate the diversity of Washington’s 3,000-plus native plant species and to show people how native plant ecosystems are critical to sustaining native wildlife and the quality of Washington’s environment. Also, the week highlights work being done to protect and preserve native plants and their habitats.

The Washington Native Plant Society plays a key role in the week, using their website to highlight events scheduled for the week and providing links to participating organizations’ websites. For more information, go to www.wnps.org *



Rhododendron macrophyllum
Pacific rhododendron
Washington’s state flower

Whereas native plant species are an important part of Washington’s heritage providing valuable aesthetic, economic and ecological contributions that make our state a special place to live; and

Whereas Washington enjoys an amazing biodiversity with over 3,000 native plant species from rainforest plants on the Olympic Peninsula to desert species in eastern Washington; and

Whereas preserving native plant ecosystems is critical for protecting wildlife, fish and water quality in our state; and

Whereas over 350 of our native plant species are listed as rare by the Washington Natural Heritage Program; and

Whereas invasive species present a great threat to sustaining our native plant systems and biodiversity;

Now, therefore, I, Christine O. Gregoire, Governor of the state of Washington, do hereby proclaim the week of April 25 through May 1, 2010, as

Native Plant Appreciation Week

in Washington State, and I urge all citizens to join me in learning more about our native plants and their habitats.

The growing effects of climate change, pt. 2

By Dawn Hanna

In the last issue of *Menziesia*, we looked at some of the ways that climate change has already begun to affect plant life (e.g. earlier flowering times, reduction of cold-weather or heavy-frost periods [which can affect dormancy or chilling requirements], increased drought, increased CO₂ levels).

In this second installment, we take a look at the climate change forecast for BC and its impacts on our native flora. Much of the information was obtained from these two reports: *Impacts of Climate Change on British Columbia's Biodiversity* by Don Gayton, and *The Future of British Columbia's Flora* by Richard Hebda.

Researchers have developed climate change scenarios for BC. Below are some of the changes we can expect to see:

- Average annual temperatures warming by 1 to 4°C by 2100
- Northern BC warming faster than other parts of the province, and the Interior warming faster than the coast
- Winter temperatures warming faster than summer temperatures
- Average annual precipitation increasing up to 20 percent by 2100
- Winter precipitation continuing to increase, and a greater proportion of winter precipitation falling as rain
- Declining snowpack in southern BC at low and mid elevations
- Earlier spring freshet, resulting in increased flood risk, greater water turbulence and related scouring
- Reduced summer soil moisture in some regions

As Don Gayton notes in *Impacts of*

Climate Change on British Columbia's Biodiversity: "Future climate is expected to roughly parallel the Xerothermic Interval of the Holocene (10,000 to 7,000 years before present). Vegetation trends will also mirror that interval, with increases in weedy, drought-tolerant and alkali-tolerant species, and decreases in moisture-loving and acid-tolerant species.

"Ecosystem adjustments to climate change are most likely to be individualistic, taking place at the species, rather than the community or ecosystem level." Gayton adds. "In other words, existing ecosystems will experience the loss of some species, changes in the dominance of others, and the arrival of new species."

In *The Future of British Columbia's Flora*, Richard Hebda, the curator of botany and earth sciences at the Royal BC Museum notes that certain vegetation assemblages in the province will be harder hit than others. Below a bit about each:

Alpine Tundra

Treeline is expected to rise, thus reducing alpine habitat. Some plant populations will be isolated. BC's Alpine Tundra biogeoclimatic zone contains 106 taxa listed as rare.

"We must expect some loss of populations and, perhaps, of species if global warming occurs ... These taxa, especially those of southern BC alpine habitats, are at the greatest risk from global warming," notes Hebda

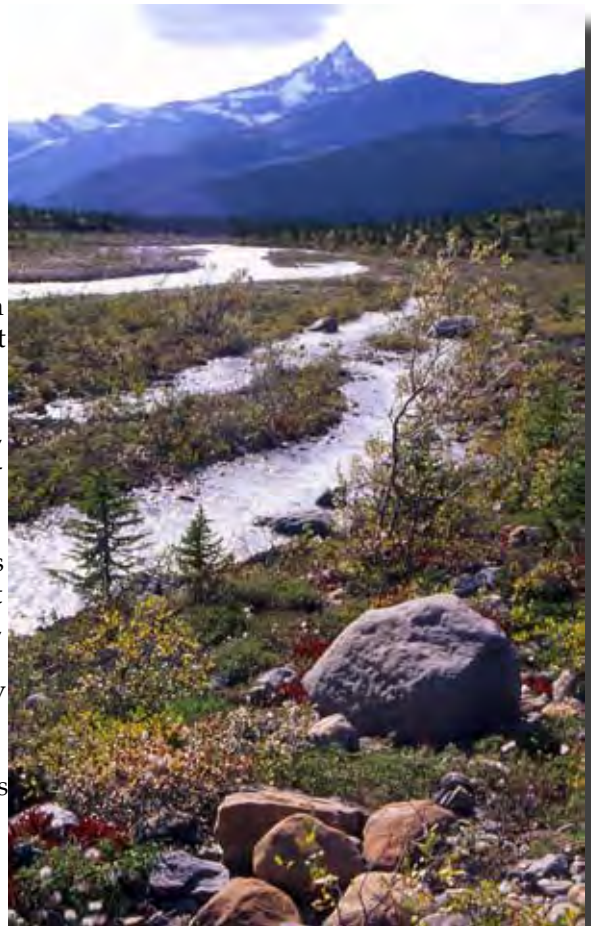


Photo: Dawn Hanna

Future forest?: Alpine habitat such as this in Mount Robson Provincial Park may include more trees in the future.



Abronia latifolia

Wetlands

Hebda identifies four reasons that wetlands are at risk from climate change:

1. Because a change in moisture availability results in a change in wetland hydrology and thus wetland character. Wetlands species are often physiographically limited.

2. Even a small decline in moisture supply at the margins results in a proportionately large loss of, or change in, wetland habitat. (Hebda cites loss of rare species such as *Marsilea vestita* (hairy water clover), *Ammania coccinea* (scarlet ammania) and *Rotalla ramosior* (rotalla), to be replaced by *Taraxacum officinale* and *Tragopogon* spp.

3. Most wetland species tolerate only small changes in nutrient flux, nutrient concentration and water levels.

4. Global warming will increase existing water supply conflicts among agricultural and urban users, with consequent effects on wetlands.

Dry Interior

Projections call for the disappearance of large tracts of forest and the upward and northward expansion of open vegetation, rather than simple species replacements, as in more moist, forested regions.

A mean annual temperature increase of 2° to 5° C could easily convert the vegetation of most of the Interior Douglas-fir zone to that more characteristic of a Ponderosa Pine or Bunchgrass biogeoclimatic zone.

Shoreline vegetation

Predictions are for sea level to rise from 0.3 to 1.1 metres, something that will significantly affect shoreline habitats and flora.

“Higher water will drown low-lying coastal plant communities and substantially modify shoreline morphology, resulting in the redistribution and, possibly, the loss of some species,” notes Hebda.

The greatest impact will likely be on estuaries, especially those that are already affected by bordering rural or urban land.

“Any rare or endangered species in small and constrained or highly developed estuaries could face extirpation,” he notes. “Henderson’s checker-mallow (*Sidalcea hendersonii*), for example, would be at considerable risk.

“In shoreline environments, a rapidly rising sea-level or more specifically a catastrophic storm surge might destroy a population of rare

species. Almost all populations of California bayberry (*Myrica californica*) in BC could be eliminated in this way. Two taxa of sand verbena (*Abronia latifolia* and *Abronia umbellata* ssp. *acutalata*) could similarly be affected.”

Forests

Forests in BC will likely look different than they do now. Global warming is expected to affect tree

areas or they can go extinct.

Some plant species are more adaptable than others. And, as Gayton, points out: “The most successful species in a climate-altered future will likely be the broadly adapted types with wide ranges of habitat tolerance, high levels of genetic variation, high reproductive potential, rapid dispersal ability and high phenotypic plasticity.”

As well, those species that are

rapid and prodigious dispersers will likely fare better than species that are more conservative when it comes to reproduction. But even being a good disperser comes with no guarantees, since success also depends on the ability to move through connected and relatively undisturbed ecosystems – something that



Grasslands, such as these along the Fraser near Gang Ranch, may become a more common sight in BC's interior.

Photo: Dawn Hanna

distribution and consequently forest composition. In general, we can expect to see less forest in the arid central and southern parts of the province, with forests moving upward and northward. We can also expect more frequent forest fires.

Some species, such as the moisture-requiring western red-cedar (*Thuja plicata*) will diminish, Hebda notes, adding that large healthy western red cedars died during the dry summer of 1988 in the Victoria area. Episodes of drought are expected to eliminate some species from large parts of their range.

When you come right down to it, plans have four options when faced with climate change. They can adapt to the new conditions, they can evolve, they can migrate to more suitable

is increasingly rare in BC.

“Even where migration corridors exist, the rate of warming expected during the 21st century will exceed the dispersal capacity of many species,” writes Gayton. “For example, the climate conditions suitable for the boreal forest may be displaced northwards by 200 to 1200 kilometres by 2100, whereas in the past most plant species likely migrated at only 20 to 200 kilometres per century.

In conclusion, flora across the province may change in a myriad of ways – exactly how it will all play out remains to be seen. One way that you can help track the changes is to get involved with the PlantWatch program and collect data on flowering times. For more information, go to www.plantwatch.ca

Plants are the foundation of life: an excerpt from *Bringing Nature Home*

The following is an excerpt from *Bringing Nature Home: How Native Plants Sustain Wildlife in our Gardens*. It is reproduced with permission by – and sincere thanks to – the author and the publisher, Timber Press.

By Douglas Tallamy

Plants are not optional on this planet. With few exceptions, neither we, nor anything else, can live without them.

We invariably take plants and the benefits they provide for granted. Who takes time to think that the oxygen in each breath we take has been produced exclusively by plants? Who is grateful for the forests when we are blessed with the rains that provide the fresh water we all require, water that is filtered clean by the tangled mass of roots it flows through en route to the nearest stream? Even farther from our consciousness is the primary role of plants in the food chain (more accurately, a wonderfully intricate food web). Nearly every creature on this planet owes its existence to plants, the only organisms capable of capturing the sun's energy and, through photosynthesis, turning that energy into food for the rest of us. Only in the deepest reaches of the ocean do life forms survive that don't require this food, deriving their energy through chemosynthesis of sulfur from deep-sea vents (Ruby, Wirsen & Jannasch 1981). Plants, therefore, form the first trophic level: the energy that sustains all life. Because animals directly or indirectly depend on plants for their food, the diversity of animals in a particular habitat is very closely linked to the diversity of the plants in

that habitat (Rosenzweig 1995). When there are many species of plants, there are many species of animals. Because plants are so different from one another in their size, shape, habit, their soil, water, and nutrient requirements, and their leaf chemistry (the most important factor determining taste), greater numbers of plant species mean more opportunities for animals to obtain their energy without interfering with one another. That is, plant



Grindelia integrifolia (entire leaved-gumweed) and friend Photo: Dawn Hanna

diversity creates niches to which animals adapt over evolutionary time. This is why we hear so much about the incredible animal diversity of the tropics. There are so many different types of animals in tropical ecosystems because plant diversity is so high there. For example, a single hectare (2.47 acres) of Amazonian rainforest in Ecuador can support as many as 473 species of trees (Valencia, Balslev & Paz y Mino 1994), whereas there are only 134 species of trees in all of Pennsylvania (Rhoads & Block 2005). So if we want to create ecosystems with a diversity of animal species, we first have to encourage a healthy diversity of plants.

Why insects are essential

The second trophic level comprises all the animals that eat plants: the herbivores, or phytophages. In our neck of the woods, the most familiar and apparent herbivores are white-tailed deer, rabbits, and groundhogs. My wife and I were reminded of the strict herbivory of beavers when one showed up in our neighbors' pond and made meals of their birch and willow trees. Other common vertebrates, such as chipmunks, squirrels, mice, raccoons, box turtles, and of course humans, include plants in their diets but are not restricted to them. Many of these omnivorous creatures are relatively large, and most fall into the category of what have been termed "charismatic megafauna." It may be a surprise that when it comes to transferring energy from the first trophic level (plants) to the predators, parasites, and omnivores in other trophic levels, these charismatic

vertebrates are relatively unimportant. What, then, do most animals in higher trophic levels rely on to pass on the energy held within the plant? Insects!

I cannot overemphasize how important insect herbivores are to the health of all terrestrial ecosystems. Worldwide, 37 percent of animal species are herbivorous insects (Wiess & Berenbaum 1988). These species are collectively very good at converting plant tissue of all types to insect tissue, and as a consequence they also excel at providing food—in the form of themselves – for other species. In fact, a large percentage of the world's fauna depends entirely on insects to access

continued on page 12

What's most important in a photo? IMPACT!

In my long association with numerous camera clubs I regularly sit on judging panels. Often my fellow judges get out of their seats and closely approach the photograph in question and minutely examine it for technical flaws. I have never felt the need to do this but for a long time didn't understand the difference between my judging technique and the way those other judges worked. But this pattern was so consistent that I began to think hard about it.

My first thought was that it is not fair to any photograph to examine it closer than a normal viewing distance but it was more than that.

I eventually realized that I had no need to minutely examine a picture because I was looking for only one thing – impact.

With major technical flaws a photo cannot have impact and minor flaws don't matter if it does have impact.

So what is impact?

Impact is that quality of a photograph that makes you pause and take a second look. Impact is

that quality that causes an audience to react out loud. Impact is what makes a photograph stand out. While impact is a little hard to define you will know it when you see it.

The most obvious way to create

impact is to include bright color but color alone is not enough. You must also have a subject that is visually interesting. It must be unique or graphic enough to grab attention. You must have a background that compliments the subject without distracting from it. The background needs to make its own subtle contribution to the composition.

To have impact, the composition of a photograph must be carefully

controlled. Nothing can be included that does not contribute in an interesting way. In a flower photograph a single strand of dead grass in the background can totally destroy the impact of that picture.

Carefully consider what you include in the composition and what you thoughtfully crop out. Sometimes impact is achieved by tightly cropping only the centre or other portion of a flower. Other situations may require you to include space around the subject but that space must be interesting.

A photo of a bird on a tree branch often needs some space around the subject. But if that space is filled with distracting branches there is no hope of achieving impact. On the other hand, if the bird is isolated on a single branch and the space around it is filled with soft, out of focus background tones and colors, the shape of the bird seems to leap from the picture and impact is accomplished.

So our hypothetical and impactful photo of a bird or flower will include an interesting subject that dramatically stands out against its background.

A strongly graphic composition of an interesting tree against powerful, deep blue sky can have impact. Or the same tree against a sunset might be even better. A sunset without a graphic shape in front of it is just ABS – another bloody sunset. ABS almost never has impact. That same tree



Lilium philadelphicum (wood lily)

Photo: Ron Long



Long's Lens

against an insipid sky similarly will not have impact.

Obviously no one thing in a photograph creates impact. Impact is the coming together of multiple elements that in total provide the impact. Even when you have incorporated all of the above you may still not achieve the impact you are looking for. If the lighting is flat and dull, impact is reduced. On the other hand if lighting is interesting and dramatic, impact is greatly enhanced.

Many of these elements are or should be apparent even before you raise the camera to your eye. You can see if a subject is interesting; you can see if the background is suitable and you can see the lighting effect on the potential subject. Through the viewfinder you fine-tune the composition, looking for distracting

continued on page 12

the energy stored in plants (Wilson 1987). Birds are a particularly good example of such organisms. If you count all of the terrestrial bird species in North America that rely on insects and other arthropods (typically, the spiders that eat insects) to feed their young, you would find that figure to be about 96 percent (Dickinson 1999)—in other words, nearly all of them.

And no wonder! Insects are unusually nutritious. Pound for pound, most insect species contain more protein than beef, and their bodies are extremely high in valuable energy (Lyon 1996). The Pulitzer prize-winning author and renowned ecologist E. O. Wilson (1987) has called insects “the little things that run the world,” in part because of their role in transferring energy from plants to other animals that cannot eat plants directly. In sum, if we want to have members of higher trophic levels in our managed ecosystems, we must also have their primary food source: insects. It is increasingly clear, as we shall see, that much of our wildlife will not be able to survive unless food, shelter, and nest sites can be found in suburban habitats. Let’s focus on the first of these essential resources: food. Because food for all animals starts with the energy harnessed by plants, the plants we grow in our gardens have the critical role of sustaining, directly or indirectly, all of the animals with which we share our living spaces. The



Nature’s buffet: *Heracleum lanatum* (cow-parsonip) provides food for a variety of insect species. *Photo: Dawn Hanna*

degree to which the plants in our gardens succeed in this regard will determine the diversity and numbers of wildlife that can survive in managed landscapes. And because it is we who decide what plants will grow in our gardens, the responsibility for our nation’s biodiversity lies largely with us. Which animals will make it and which will not? We help make this decision every time we plant or remove something from our yards.

Long’s Lens, continued from page 11

elements and removing them. Often – likely more often than not – you will reject that possibility and continue looking. But learning what to reject takes practice and careful attention to the detail of what you are seeing in the viewfinder. You will reject far more opportunities than you will actually photograph.

When you find a situation that has good potential work it and work it hard. Keep photographing until you absolutely can’t think of anything else to do with that subject. After each click of the shutter actually ask yourself – even out loud – “Now, how can it be better?”

There are situations when you just can’t know at the time of shooting if you have achieved impact. Did you get the depth of field just right is a question that is only answered on the computer monitor. So this is the final step in achieving impact – editing. If you have thoroughly photographed the subject you should have lots of material to choose from. And you only choose the one shot that you recognize as having impact.

If you consistently choose and show only photos with impact, no one will ever be bored by your pictures.

Obviously this is not a comprehensive treatment of the subject of impact. However I hope it will start you thinking about the importance of impact and that alone will lead to better photographs. *

Field trip leaders wanted!



The Native Plant Society of BC is a completely volunteer endeavour, from the directors who sit on the board, to the speakers who share their knowledge, to the field trip leaders who get us out and about. We’d love to offer more outings, but we need your help! If you’re interested in leading or co-leading a field trip anywhere in the province, please let us know.

Send an email to dawnhanna@telus.net or call (604) 831-5069.

Coming events

NATIVE PLANT SOCIETY OF BC

SOUTH COAST NATIVE PLANT STUDY GROUP

(A subgroup of the Native Plant Society of BC)

01/02 May

Spring Wildflower Fling and AGM in Duncan

Join us for a wonderful weekend of wildflowers with expert guides and fellow native plant lovers! On Saturday, May 1, the day begins with a tour to Somenos Marsh and Garry Oak Ecosystem with Dave Polster. After lunch and a brief AGM at Maple Bay, the day continues with a tour of the Cowichan Garry Oak Preserve with Irv Banman. For those staying over to Sunday, there will be field trips to the Mount Tzouhalem Ecological Reserve and Honeymoon Bay Wildflower Reserve (and possibly other destinations depending on demand.) The weekend is free, but you need to register. Go to www.npsbc.org for registration forms. Questions? Email dawnhanna@telus.net or call (604) 831-5069.

18 May

Field trip to UBC Botanical Garden

Trip leaders Hugh Daubeny and Nadine Robinson will take us for a mid-week, late afternoon jaunt through the native garden to see a wide range of species of west coast rainforest including a spectacular double-flowered salmonberry. If time permits, we'll also walk part of the Asian Garden or the Alpine Garden. Please register in advance by emailing hdaubeny@shaw.ca or call (604) 731-8537.

04/05 June

Grassland ecology and grass identification workshop with Don Gayton in Lillooet

The weekend starts on Friday at 5 p.m. with a wild foods dinner prepared by Cayoose Creek Band. Menu will include venison, wild greens and berries. Payment is by donation, with \$15 suggested as this is the amount it costs to prepare. Then it's on to a classroom session from 5:45 to 9 p.m. On Saturday, from 9 a.m. to 3 p.m. is the field

session. Bring notebook, pen and, if you have one, a hand lens. A copy of *Plants of Southern Interior British Columbia* by Parish, Coupe and Lloyd would be very useful. Volume 7 of *The Illustrated Flora of British Columbia* is also useful.

The cost for NPSBC members is \$75; for non-members, the cost is \$100, which includes a one-year NPSBC membership. Look for more details and registration form on the website at www.npsbc.org

Your instructor:

Don Gayton is a respected grasslands ecologist who works with FORREX (Forum for Research and Extension in Natural Resources). He is also the author of such books as Landscapes of the Interior and Interwoven Wild.

12 June

Field trip to Iona Beach Regional Park

Join trip leader Dawn Hanna for a look at the hardy and unusual plants found in sand dune habitat at Iona Beach Regional Park in Richmond. Members of this red-listed plant community include the more common dunegrass (*Elymus mollis*), large-headed sedge (*Carex macrocephala*) and beach pea (*Lathyrus japonicus*) as well as lesser-seen species on the mainland coast such as seabeach sandwort (*Honckenya peploides*) and Canadian sand-spurry (*Spegularia canadensis*). Meet at the washroom building at the park at 10 a.m. For a map and directions, go to www.metrovancouver.org and search "iona beach"

24/25 July

Field trip to Manning Provincial Park

Wander trails in the transition zone between coastal and interior ecozones in search of subalpine wildflowers and other plants. More details to come.

14 August

Field trip to Mount Baker

More details to come.

21 August

Digital Photography Workshop

10 a.m. to 4:30 p.m.

For anyone who still has questions about digital photography. In the

morning we'll have a lecture and question session; at midday we pause for lunch and to shoot some photographs in the garden followed by a discussion of those projected pictures in the classroom.

What to bring :

- your digital camera
- your camera instruction book
- an empty memory card, if possible.
- notebook and pencil
- lunch – you will not have time to eat in the restaurant.

Cost to NPSBC members \$40. This includes entry to the garden.

Held at VanDusen Botanical Garden, Cedar Room

Limited to 15 participants – register early

Your instructor:

Ron Long was a professional photographer at Simon Fraser University for 36 years.

During most of that time he maintained a parallel career as a photography instructor in the Continuing Education program at Kwantlen College. Ron is on the a director of the Native Plant Society, is active in the Vancouver Natural History Society and is on the Speakers Committee at VanDusen Botanical Garden.

For more info or to register, contact Ron Long at rlphoto@shaw.ca or 604 469-1651

11 September

Field trip to Cypress Provincial Park

Join us on this foray to view king gentians, moonwort and other late summer bloomers. More details to come.

VICTORIA NATIVE PLANT STUDY GROUP

The speakers series is held at 7 p.m. at the University of Victoria's MacLaurin Building, Room D-116. Non-member drop-in fee is \$3. Please check the NPSG website at www.npsg.ca for more events as information becomes available.

NATURE VANCOUVER BOTANY SECTION

Please check the Nature Vancouver website at www.naturevancouver.ca for more information.

continued on page 14

Events, continued from page 13

VAN DUSEN BOTANICAL GARDEN

The Cedar Series Lectures are held at 7:30 p.m. in the Floral Hall. Tickets are \$10 for members, \$15 for non-members and are available in advance from the administration office as well as the door.

May 13

The Natural World of William Shakespeare with Harry Jongerden, VanDusen Garden director

Poets for centuries have used plants and flowers for symbolic effect, but Shakespeare astonishes by presenting us with 180 different plant species. Beyond the sheer numbers, he also astonishes us with an intimate understanding of how the natural world works. Deepen your understanding of Shakespeare as we explore this world through the works of this 16th Century poetic genius and naturalist.

Other events

April 25

VanDusen Plant Sale

10 a.m. to 4 p.m.

THE sale of the year. More than 40,000 plants for sale, including a range of native plant species. Bring your wheelbarrow and a friend. Master gardeners will be on site to give advice. Other features include Plant Check and Plant Pick Up areas. Visa, Mastercard, personal cheques and cash accepted. Admission to the garden is free this day.

June 20

Medicine Wheel Ceremony

Noon to 3 p.m. at the First Nations' Medicine Wheel in the Canadian Heritage Garden.

You are invited to join elders from the First Nations community in a spiritual ceremony to mark the changing of the season. Wear clothing appropriate for the weather, bring a small stone to bless and leave at the wheel as well as a food item to share at the pot luck meal at the conclusion of the ceremony.

Information: Contact Marina Princz at library@vandusen.org or 604-257-8668

UBC BOTANICAL GARDEN

Events

All events take place at the UBC Botanical Garden, 6804 SW Marine Dr.

Free Seminars

All seminars are held at the UBC Botanical Garden Reception Centre at 12 noon. Admission is free. Please reserve in advance by calling (604) 822-3928.

April 19

Urban Biodiversity of Present Day Lower Mainland BC

Daniel Mosquin

May 10

UBC Botanical Garden Through the Seasons

Daniel Mosquin

May 17

Botanical Gardens and Conservation

Daniel Mosquin

June 14

Iris

Martha Bassett

June 28

Cultural Diversity and Biodiversity

Daniel Mosquin

VOLUNTEER OPPORTUNITIES

Jericho Park, Vancouver

Second Sunday each month

(May 9, June 13, July 11)

9 a.m. to 1 p.m.

Help remove invasive plants and replant native plant species to restore and enhance habitat at Jericho Park in Vancouver. Tools and gloves provided. Meet at the wooden bridge over the pond. For more info, go to www.jerichostewardship.ca

Iona Beach Regional Park, Richmond

Third Sunday each month

(Apr. 18, May 16, June 20, July 18)

10 a.m. to 1 p.m.

Help remove invasive plants and restore rare sand dune habitat at Iona Beach Regional Park in Richmond. Tools and gloves provided. Meet at the washroom building. For more info, go to www.parkpartners.ca/partners/IonaBeach/iona.htm *

Metal-tainted diet harms carnivorous plants

Scientists in the UK are reporting evidence that consumption of insects contaminated with a toxic metal may be a factor in the mysterious global decline of carnivorous plants. Their study, which appears in the American Chemical Society's semi-monthly journal *Environmental Science & Technology*, describes how meals of contaminated insects have adverse effects on the plants.

Iain Green and Christopher Moody note that many species of carnivorous plants – which have the amazing ability to lure, trap and digest insects – have become endangered through habitat loss, illegal poaching and pollution. One potential threat to these meat-eating plants is exposure to insect prey contaminated with certain metals, which can harm plants by interfering with water and nutrient uptake. However, scientists know little about how such metals actually affect the plants. Two metals of particular concern are copper, a nutrient important for plant health, and cadmium, a toxic metal found in fertilizers, metal coatings, and other products. It can accumulate in the environment through improper waste disposal.

They fed contaminated house fly maggots to a group of endangered white-topped pitcher plants (*Sarracenia leucophylla*) and found that cadmium accumulated in the plants' stems in a way that can be toxic and disrupt growth. By contrast, the plants easily processed and controlled copper intake and the metal did not appear to cause any toxic effects. The findings emphasize the importance of limiting carnivorous plants' exposure to cadmium, they suggest. *

~ *Science Daily*

Trivia

Bracken fern fun facts



P*teridium aquilinum* (bracken fern) occurs in temperate and subtropical

regions throughout the world, including most of Europe, Asia, and North America in the Northern Hemisphere, and Australia, New Zealand and northern South America in the Southern Hemisphere.

- Bracken fiddleheads (the immature, tightly curled emerging fronds) have been considered edible by many cultures throughout history, and are still commonly used today as a foodstuff. Bracken fiddleheads are either consumed fresh (and cooked) or preserved by salting, pickling, or sun drying.

- Uncooked bracken contains the enzyme thiaminase, which breaks down thiamine. Eating excessive quantities of bracken can cause beriberi, especially in creatures with simple stomachs. Ruminants are less vulnerable because they synthesize thiamine.

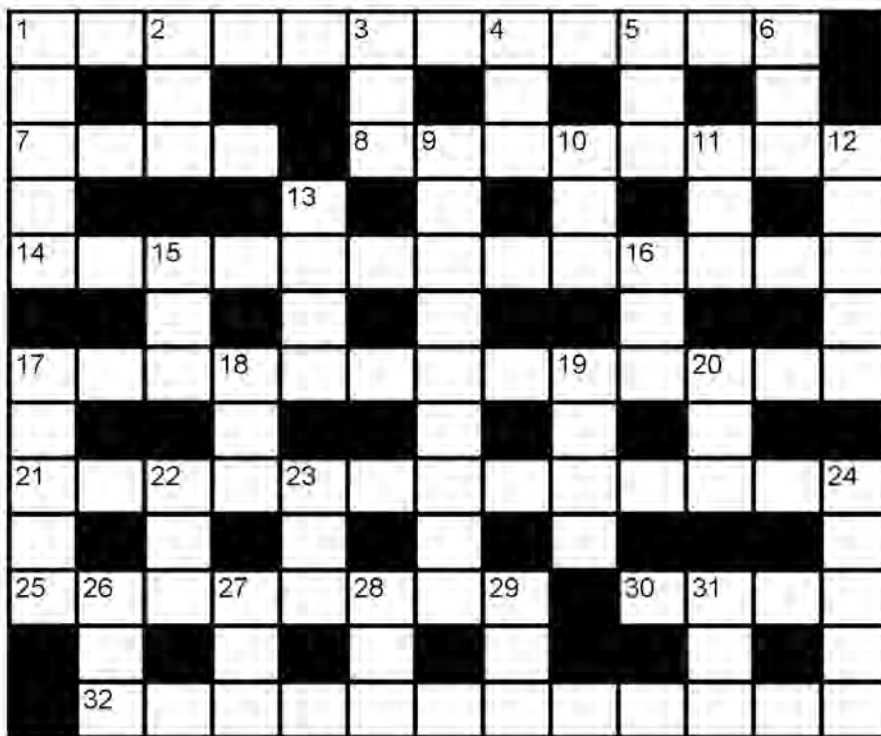
- Both fronds and rhizomes have been used to brew beer.

- It was traditionally used for animal bedding, which later broke down to a rich mulch that could be used as fertilizer.

- The ash of bracken fern was used in making forest glass in Central Europe from about 1000 to 1700.

Source: Wikipedia

Cannings' Cryptic Crossword



By Richard Cannings



ACROSS

1. Prickly rasper could produce desert plants (7,5)
7. Former post office for bat-wielding Montrealer (4)
8. Pepper hat garbled music (8)
14. Smoky sale once produced ocean-going delicacy (7,6)
17. Large water body in crib air volume (8,5)
21. B.C. valley tumbled into town (8,5)
25. Largesse provided for diverse intertidal ecosystem (8)
30. City bean (4)
32. Precious metal smashed prunes into Church of England Haida Gwaii relic (6,6)

DOWN

1. Media types put the squeeze on (5)
2. Mischievous child caught in denim pants (3)
3. Resinous secretion in French lake (3)
4. Seed returns the same as ever (3)
5. Arabic name for the start of a life (3)
6. French money heads south (3)
9. United States residents destroyed CA marines (9)

10. Small ocean in these archipelagos (3)
11. Engine part made by odd charms (3)
12. Underground worker in—surrounded by—French sea (5)
13. Avens group in average umbellifers (4)
15. Even ones in school pass (3)
16. Garland in mullein (3)
17. Identical to interior of cyclones (5)
18. University nurse brings coffee pot (3)
19. Inflatable craft found right towards the stern (4)
20. Girl found in lava lamp (3)
22. Head off fall entirely (3)
23. Gas goes back into Mariachis (3)
24. Teals splattered on rock (5)
26. For example, good breakfast item (3)
27. Georgia left guy's friend (3)
28. A physical education monkey (3)
29. A plea to finish espressos (3)
31. I circle university in debt (3)

Answers on page 16

How it works

Every clue contains the definition of the answer plus a cryptic clue to the word or the letters that form it. Some examples:

1. Back an Oz IRA for snowbird destination? (7) Answer: ARIZONA (an Oz IRA backwards)
2. Echo loses hot, lethargic feeling for environmental study. (7) Answer: ECOLOGY (echo loses H (hot) + logy (lethargic feeling))
3. Mashed pea seed for fishing or diving (4,3) Answer: DEEP SEA (anagram of pea seed; watch for words like confused jumbled, crazy, mashed -- they often signal an anagram.)

Cryptic crossword answers explained

from puzzle on page 15



ACROSS

1. Prickly pears ("prickly rasper" anagram); 7. Expo (EX + P.O.); 8. Capsicum (Cap + music anagram); 14. Sockeye Salmon ("smoky sale once" anagram); 17. Columbia River ("crib air volume" anagram); 21. Okanagan Falls (Okanagan + falls); 25. Eelgrass (largesse anagram); 30. Lima (double meaning); 32. Golden Spruce (Gold + prunes anagram + CE).

DOWN

1. Press (double meaning); 2. Imp (hidden in denIM Pants); 3. Lac (double meaning); 4. Pip (pip reads the same in reverse); 5. Ali (start of A Life); 6. Sou (start of SOUth); 9. Americans (anagram of CA marines); 10. Sea (hidden in theSE Archipelagos); 11. Cam (odd letters in ChArMs); 12. Miner (IN surrounded by MER); 13. Geum (hidden in averaGE UMBellifers); 15. Col (Even letters in sChOoL); 16. Lei (hidden in mulLEIn); 17. Clone (hidden in cyCLONES); 18. Urn (U+R.N.); 19. Raft (R[ight] + AFT); 20. Val (hidden in laVA Lamp); 22. Air (hidden backwards in Mariachi); 24. Slate (5); 26. Egg (e.g. + G[ood]); 27. Gal (GA + L[left]); 28. Ape (a + P.E.); 29. SOS (finishes espresSOS); 31. IOU (I + O + U)

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