LICHENS OF CALIFORNIA (CALIFORNIA NATURAL HISTORY GUIDES, 54) pdf

1: Lichens and Air Quality Monitoring

A close look at rocks and trees is often rewarded by the orange or yellow mosaic patterns of some of California's 1, species of lichens; yet few people know anything about their unusual compound nature (part alga, part fungus) and most lichens don't even have common English names.

During the Gold Rush, miners ate nearly 80, frogs per year. Recent development and competition from invasive species have also been hard on the California red-legged frog. It has lost 70 percent of its former habitat range, and in , the U. It is now found primarily in coastal regions from Marin County to northern Baja California. Before dying out in California, this largest and most powerful of carnivores thrived in the great valleys and low mountains of the state, probably in greater numbers than anywhere else in the United States. As humans began to populate California, the grizzly stood its ground, refusing to retreat in the face of advancing civilization. It killed livestock and interfered with settlers. Less than 75 years after the discovery of gold, every grizzly bear in California had been tracked down and killed. The last one was killed in Tulare County in August , more than 20 years before the authority to regulate the take of fish and wildlife was delegated to the California Fish and Game Commission by the State Legislature. The California quail Lophortyx californica , also known as the valley quail, became the official state bird in A widely distributed and prized game bird, it is known for its hardiness and adaptability. Plump, gray-colored and smaller than a pigeon, the California quail sports a downward curving black plume on top of its head and black bib with white stripe under the beak. Flocks number from a few to 60 or more in the fall and winter months, but in the spring break into pairs. They nest in hollows scratched in the ground and concealed by foliage, and their eggs, 6 to 28 in number, are creamy white and thickly spotted with golden brown. The combination of blue and gold as official colors in California were first used as school colors by the University of California, Berkeley in The Secretary of State began using blue and gold ribbons with the state seal on official documents as early as Secretary of State Frank M. Jordan suggested making blue and gold the official state colors and in , the State Legislature passed legislation to that effect. It was created at the grassroots level and devotees of this art come from every conceivable ethnic, religious, racial, and economic background. Augustynolophus morrisi au-gus-tine-o-LOAF-us MORE-iss-ee roamed what is now central California approximately 66 million years ago during the Maastrichtian Age, making it a contemporary of well-known dinosaurs such as Tyrannosaurus and Triceratops. Augustynolophus belongs to a family of dinosaurs known scientifically as Hadrosauridae and informally as "duck-billed dinosaurs. Its fossils were first unearthed in in the Moreno Formation of Fresno County and have only been found in California. Its the most complete dinosaur to be found in the state. Denim has been a part of California since the Gold Rush era. It was first developed in the 16th and 17th centuries in Genoa, Italy and Nimes, France; though unconfirmed, tradition has it that the word "jeans" comes from "Genoa" while "de Nimes" led to "denim. Denim gained a more prominent place in history when San Francisco dry goods wholesaler Levi Strauss agreed to apply for a patent together with Nevada tailor Jacob Davis, who had developed a method of reinforcing the pockets of work pants with copper rivets. Denim apparelâ€”both designer and tough working clothingâ€”is now enduringly popular in wardrobes across the world. The golden trout Salmo agua-bonita is native only to California and was named the official state fish by act of the State Legislature in Originally the species was found only in a few streams in the icy headwaters of the Kern River, south of Mount Whitney, the highest peak in the United States outside of Alaska. Stocking of wild and hatchery-reared fish has extended its range to many waters at high elevation in the Sierra Nevada from El Dorado and Alpine Counties southward. It has also been planted in other states.

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2: History and Culture - California State Symbols - California State Library

California Natural History Guides: Lichens of California 54 by Mariette Cole and Mason E., Jr. Hale (, Paperback) Be the first to write a review About this product.

Photos This page links to 17 index pages: It also links to an index page providing access to about "mystery" lichens that are completely or partially unidentified, and a page that links to topics in lichen natural history. There are about 7, photos on the site, illustrating approximately 1, species. Most of the photos were taken for the book, Lichens of North America, with text by Dr. Irwin Brodo, published in by Yale University Press. There are two photos by others. Almost all are from the continental U. Most of the identifications for the photos were made by Dr. Brodo from voucher specimens that Sylvia Sharnoff and I collected between and Several hundred newer images and some older ones of species that occur in California,were identified by Kerry Knudsen, Trevor Goward and Curtis Bjork. A number of lichenologists have also contributed names, or made corrections, from looking at the photos on the website, among them Einer Timdal, Brendan Hodkinson and others. Enormous thanks are due to all who helped! In particular, I owe more than I can express to Ernie Brodo, without whose generosity, energy, and steadfastness our project with lichens would have never developed beyond a passing fancy. Special thanks also to Kerry Knudsen who corrected numerous errors and contributed many new names and information. For the sake of simplicity I have not italicized the scientific names on the website. In some cases,especially in the Caloplaca group, the url of a species page will have the old name, even though the content of the page is up to date. A Field Guide to California Lichens , which illustrates and describes approximately species, is available from Yale University Press, or from your local bookstore. For a description of the book, go to http: Most recent revision, with over added photos and new identifications: The informational website about lichens, www.

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3: Lichens of California (edition) | Open Library

This convenient guide, the first ever on California lichens, describes the appearance, habi This convenient guide, the first ever on California lichens, describes the appearance, habitats, and ranges of over species, 48 of which are illustrated in color, with many others shown in black and white.

Flora of the Canadian Arctic Archipelago: Descriptions, Illustrations, Identification, and Information Retrieval. Journal of Biogeography ISBN [soft cover] p. This would be an opportunity to revise the identification key, update nomenclature, modify a few maps, improve some of the photos, and make minor updates and corrections in the text. And clarify the Carex subbracteata confusion. The process became more exciting than we intended. Our first big concern was adding Carex species recently discovered in Oregon or Washington. Each species needed a page of text plus a page of pictures. We needed to keep the number of pages constant. Additions included natives Carex eburnea from northeast Washington and C. Fuzzy Carex hirta was collected in Portland a century ago, rediscovered in We decided to go with the split in Carex capillaris, which meant adding native Carex tiogana from Steens Mountain. That left ten pages to find. We cut "Excluded, Extirpated, and Not Yet? Discovered Species" from five pages to two since most of the species covered there had been found or never would be. Reformatting "Sedges with Distinctive Traits or Habitats" gained a couple more pages. Using a smaller font in the index helped, too. We tucked as much ethnobotany into individual species accounts as we could. Updating the key was simple because we had been revising our personal version of it all along. Improving the text was fun. Finding photos of the new sedges was harder, especially since we wanted to be sure the identifications were correct. We ended up corresponding with botanists from Michigan, Illinois, Germany, and Romania to get the photos we needed. Sorting out Carex subbracteata and C. Both species have full treatments now. In late summer , as we neared the end of our rewriting, we learned that Chris Reidy and Kathy Pendergrass from the Natural Resources Conservation Service had found Carex hirsutella, native to eastern North America, on a farm in Linn County. We went out to investigate and confirmed the report. This was a very interesting find, but our main concern was "Two more pages! We need two more pages! Removing its account freed up the needed pages. At last the revision was completed. We took a jump drive with the text and photos to OSU Press. There, our wonderful editor Jo Alexander told us exactly what she thought of the hundreds of changes we had made. This was supposed to be a revision, not a new book! Yes, of course, she would make the changes, but we were asking a lot! Finally we got proofs and carefully read through it again, of course finding small errors we had missed. We had heard that Carex lacustris probably grew in northeast Washington but there were no specimens to confirm its presence there. When photos confirmed that this new report of Carex lacustris was accurate, we just had to include it. We timidly phoned Jo Alexander and explained. This was a native plant. Could we add it to the key and put a photo and a paragraph somewhere? Get the text and photos to me as quickly as you can. We can honestly say that the second edition of the Field Guide to the Sedges of the Pacific Northwest is up to date. We hope that it will be at least as useful as the first edition for those dealing with the sedges of this area. A field guide to California lichens. Yale University Press, New Haven www. Lichens of California by the late Mason E. Much of the photography is marginal in quality. Moreover, 25 years is a long time, especially nowadays when the molecular clock keeps ticking away new taxa. Stunningly and lavishly illustrated with color photos numbered, 15 unnumbered mostly by the Sharnoffs, this work was dedicated to Hale and three other persons and has been highly acclaimed for review see R. However, the book is too hefty, bulky, and expensive for field use: The page taxonomic part has extensive keys to and comprehensive descriptions of species of lichens, with mention of another species in the keys or notes. Most species have Flora-of-North- America-style thumbnail maps. Here then were the makings for a new field guide to the lichens of California "that would reflect recent name changes, have good [i. Sharnoff choose not to provide "keys or extensive descriptions of microscopic characteristics, choosing instead to use the space to include more species" p. An appendix lists "recent name

changes": There are no range maps. I had to search a bit to find the number of lichen species Sharnoff treats. The number, "some ," appears rather coyly on the front cover flap. I do miss, however, the dot-distribution county maps for selected taxa. Such maps would be at the top of my wish list for inclusion in a second edition. It certainly will be a big hit! For example, on 21 May www.

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4: Talk:Lichen - Wikipedia

Even though this book is a bit outdated and the names of lichens have changed since publishing I found it very useful in my field work in a little studied area of NE California.

Upcoming events The California Lichen Society now has an email discussion group and website for latebreaking news and notes for the membership and forum for discussion amongst the membership. To join the group, go to http: Red List of California Lichens: The original list was published in the Bulletin. Bulletin of the California Lichen Society 6: The revised list will be available soon. The CALS poster is available for sale. Contact Janet Doell at rdoell sbcglobal. This is the first accessible and authoritative guidebook to lichens of the North American continent. There are beautiful color photographs, descriptions, distribution maps and keys for identifying the most common, conspicuous, or ecologically significant species. The book focuses on foliose, fruticose and crustose lichens and presents information on another species in keys or notes. The comprehensive introduction discusses the biology, structure, uses and ecological significance of lichens. It includes southern California. There is a a description of the book and excerpts as well as ordering information at http: Mini Guide to some Common California Lichens. It is designed as an introduction to lichens for anyone interested in the natural world. Each of the 41 color photos of California lichens is accompanied by a descriptive text. The introduction tells what lichens are and describes the three groups into which they are roughly divided. The book does not deal with chemistry or microscopic characters other than those that can be seen with a hand lens. Photography by Richard Doell, text by Janet Doell. RP [Richmond Publishing Co.

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5: Lichen - Wikipedia

Do you want to remove all your recent searches? All recent searches will be deleted.

Symbiosis in lichens "Lichens are fungi that have discovered agriculture" â€" Trevor Goward [39] A lichen is a composite organism that emerges from algae or cyanobacteria living among the filaments hyphae of the fungi in a mutually beneficial symbiotic relationship. The fungi benefit from the carbohydrates produced by the algae or cyanobacteria via photosynthesis. The algae or cyanobacteria benefit by being protected from the environment by the filaments of the fungi, which also gather moisture and nutrients from the environment, and usually provide an anchor to it. Although some photosynthetic partners in a lichen can survive outside the lichen, the lichen symbiotic association extends the ecological range of both partners, whereby most descriptions of lichen associations describe them as symbiotic. However, while symbiotic, the relationship is probably not mutualistic , since the algae give up a disproportionate amount of their sugars see below. Both partners gain water and mineral nutrients mainly from the atmosphere, through rain and dust. The fungal partner protects the alga by retaining water, serving as a larger capture area for mineral nutrients and, in some cases, provides minerals obtained from the substrate. If a cyanobacterium is present, as a primary partner or another symbiont in addition to a green alga as in certain tripartite lichens, they can fix atmospheric nitrogen , complementing the activities of the green alga. In three different lineages the fungal partner has independently lost the mitochondrial gene atp9, which has key functions in mitochondrial energy production. The loss makes the fungi completely dependent on their symbionts. Phycobionts algae produce sugar alcohols ribitol , sorbitol , and erythritol , which are absorbed by the mycobiont fungus. The absence of this third partner could explain the difficulties of growing lichen in the laboratory. The yeast cells is responsible for the formation of the characteristic cortex of the lichen thallus, and could also be important for its shape. The body thallus of most lichens is different from those of either the fungus or alga growing separately. When grown in the laboratory in the absence of its photobiont, a lichen fungus develops as a structureless, undifferentiated mass of fungal filaments hyphae. If combined with its photobiont under appropriate conditions, its characteristic form associated with the photobiont emerges, in the process called morphogenesis. Quite naturally, these alternative forms were at first considered to be different species, until they were found growing in a conjoined manner. Evidence that lichens are examples of successful symbiosis is the fact that lichens can be found in almost every habitat and geographic area on the planet. There is evidence to suggest that the lichen symbiosis is parasitic or commensalistic , rather than mutualistic. Photobiont cells are routinely destroyed in the course of nutrient exchange. The association is able to continue because reproduction of the photobiont cells matches the rate at which they are destroyed. In many species the fungus penetrates the algal cell wall, [8] forming penetration pegs haustoria similar to those produced by pathogenic fungi that feed on a host. Miniature ecosystem and holobiont theory[edit] Symbiosis in lichens is so well-balanced that lichens have been considered to be relatively self-contained miniature ecosystems in and of themselves. Lichens have been used in making dyes , perfumes , [49] and in traditional medicines. A few lichen species are eaten by insects [8] or larger animals, such as reindeer. If air is very badly polluted with sulphur dioxide there may be no lichens present, just green algae may be found. If the air is clean, shrubby, hairy and leafy lichens become abundant. A few lichen species can tolerate quite high levels of pollution and are commonly found on pavements, walls and tree bark in urban areas. The most sensitive lichens are shrubby and leafy while the most tolerant lichens are all crusty in appearance. Since industrialisation many of the shrubby and leafy lichens such as Ramalina, Usnea and Lobaria species have very limited ranges, often being confined to the parts with the purest air. Lichenicolous fungi[edit] Some fungi can only be found living on lichens as obligate parasites. These are referred to as lichenicolous fungi , and are a different species from the fungus living inside the lichen; thus they are not considered to be part of the lichen. When the cortex is more transparent, the algae show more clearly and the lichen looks greener. Metabolites, metabolite structures and bioactivity[edit] Lichens can

show intense antioxidant activity. Life span[edit] Lichens may be long-lived , with some considered to be among the oldest living organisms. In an experiment led by Leopoldo Sancho from the Complutense University of Madrid, two species of lichenâ€" Rhizocarpon geographicum and Xanthoria elegans â€"were sealed in a capsule and launched on a Russian Soyuz rocket 31 May Once in orbit, the capsules were opened and the lichens were directly exposed to the vacuum of space with its widely fluctuating temperatures and cosmic radiation. After 15 days, the lichens were brought back to earth and were found to be unchanged in their ability to photosynthesize. Many lichens reproduce asexually, either by a piece breaking off and growing on its own vegetative reproduction or through the dispersal of diaspores containing a few algal cells surrounded by fungal cells. Fruticose lichens can easily[citation needed] fragment, and new lichens can grow from the fragment vegetative reproduction. Following dispersal, such fungal spores must meet with a compatible algal partner before a functional lichen can form. Some lichen fungi belong to Basidiomycetes basidiolichens and produce mushroom -like reproductive structures resembling those of their nonlichenized relatives. Most lichen fungi belong to Ascomycetes ascolichens. Among the ascolichens, spores are produced in spore-producing structures called ascomata. When apothecia are shaped like squiggly line segments instead of like discs, they are called lirellae. They usually bear the fungal pycnidia or apothecia or both. Instead, the lichen-forming fungi of these species reproduce sexually by self-fertilization i. This breeding system may enable successful reproduction in harsh environments. Lichen species are given the same scientific name binomial name as the fungus species in the lichen. Lichens are being integrated into the classification schemes for fungi. The alga bears its own scientific name, which bears no relationship to that of the lichen or fungus. This may cause confusion without context. A particular fungus species may form lichens with different algae species, giving rise to what appear to be different lichen species, but which are still classified as of as the same lichen species. Neither the ascolichens nor the basidiolichens form monophyletic lineages in their respective fungal phyla, but they do form several major solely or primarily lichen-forming groups within each phylum. Geosiphon is not usually considered to be a lichen, and its peculiar symbiosis was not recognized for many years. The genus is more closely allied to endomycorrhizal genera. Fungi from Verrucariales also form marine lichens with the brown algae Petroderma maculiforme, [69] and have a symbiotic relationship with seaweed like rockweed and Blidingia minima , where the algae are the dominant components. The fungi is thought to help the rockweeds to resist desiccation when exposed to air. The mycobiont may be an Ascomycete or Basidiomycete. But the same mycobiont with different photobionts may also produce very different growth forms. Although each lichen thallus generally appears homogeneous, some evidence seems to suggest that the fungal component may consist of more than one genetic individual of that species.

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6: Lichens of California by Mason E. Hale | LibraryThing

Lichens of California by Mason E. Hale, , University of California Press edition, in English.

Or was this fact known since antiquity? Basidiomycete yeasts in the cortex of ascomycete macrolichens. Mike of Wikiworld talk Perhaps it should be moved to the end of the article? Retallack" who authored the paper in question, then there is no better qualified person to judge whether or not " On reading the paper, it seems to present a reasonable case for at least one Ediacaran organism Dickinsonia being either a fungus or a lichenised fungus, but does not offer a strong argument to resolve these possibilities. If the editor Retallak were to modify his edit to recognise this weaker claim, I would see no problem with it. However, the reversion was reasonable. First, it was an uncited change. Can the identical reference cannot cite both retraction by the author and supportive evidence? Second, usernames can be made up willy nilly. That said - the Alcheringa article does indeed support the idea of a lichenous Dickensonia. Was this the article that was retracted? If so, what is the new evidence? In either case, what other authority could he cite - he is simply correcting an erroneous claim regarding the content of the Retallack[] paper. For what it is worth, I assure all readers that I have no personal interest or involvement in this issue. I support your actions. Huw Powell talk There is a historical record to that effect which is of encyclopedic interest, and would be of value to this article if you can find the sources to back the information up. He has emphasized the symmetry of the specimens, and as with many of his marine illustrations, probably greatly exaggerated: Chiswick Chap talk Presumably the fungal component does the opposite. One might say that given that lichens grow, there must be a carbon balance Hahn, Angelika Meyer and John D. Arctic and Alpine Research, Vol. For instance, Peltigera malacea , the fastest growing of the seven lichen species measured, took up about 4. One might actually say that given that lichens grow, and that they are not parasitic, there must be a carbon gain not balance. I did not carefully look at the source you cited, but I assume it was written with a presumption that the lichens studied were not parasitic on some other life-form from which they might have gained carbon, in addition to uptake from the atmosphere. My question arises from what appears to be a usage in some authoritative sources that implies the expressions are not synonymous, and in others that the expressions are synonymous. If the expressions were synonymous, this sentence would be a tautology i. So the expressions must not be synonymous for Brodo, Sharnoff, and Sharnoff. Sometimes the same source implies the expressions are not synonymous on one page, then that they are synonymous on another. For example, the sentence "Lichens sometimes referred to as lichenized fungi are classified with the fungi" implies that "lichenized fungi" is synonymous with "lichen". The similar sentences "Lichens are classified with the fungi sometimes referred to as lichenized fungi " implies that "lichenized fungi" refers to the fungal component, and the two expressions are not synonymous. The latter "not synonymous" sentence is quoted from the Australian Botanical Garden website page What is a lichen? Yet at the same website, on the "What is not a lichen page, explicitly says the expressions are synonymous - "a lichen also called a lichenized fungus ". Brodo, Sharnoff, and Sharnoff is about as authoritative a source as it gets for Wikipedia, and would support adding a sentence to our article - "A lichenized fungus is the fungal component when it is living in association with the photosyhthetic component. A lichenised fungus is always part of a lichen. There are no exceptions. However, one term is referring to the whole thing, and the other to only one of the partners. A fungus that can form mutualistic associations with algae that qualify as lichens may not always do so, but much more commonly vice versa. A fungus may form stable associations with algae in which it is not the external partner, but then it is not recognised as a lichen Hawksworth Dobson also notes that name of each lichen species can only be applied to the fungus, that each species has a different fungus, but the same algal partner e. Trentepohlia may occur in many different lichens. It is possible to separately culture the two partners in the laboratory What is a lichen? But the three sourced definitions are cited here say, "Lichenized fungi sic fungus - definitions - A. A stable self-supporting association of a mycobiont and a photobiont in which the mycobiont is the exhabitant. An association between

a fungus, usually an ascomycete but in a few cases a basidiomycete or deuteromycete, and one or more photosynthetic partners, generally green algae or cyanobacteria. In all lichens the fungus forms a thallus or lichenized stroma that may contain unique secondary compounds. An obligate mutualistic relationship between a fungus and a photosynthetic partner. The first two definitions say a lichenized fungus is an association or relationship, not the fungus in that association or relationship. Chiswick Chap is right about "wrong". It is a no-brainer that since a lichen is an association of a fungus and an alga, any discussion of each partner separately will need to use terms such as "lichenised alga" or "lichenised fungus". Rather the synecdoche reflects a view that the classification of lichens should be based on the fungal partner rather than treating lichens as a distinct taxon in their own right. Thus on one view the whole entity is classified as a lichenized fungus rather than a combined organism, so the important part in this view, the lichenized fungus, is used to stand for the whole. Peter coxhead talk People for years have been applying scientific names to lichens, much as if they were a distinct group comparable to cycads or bryophytes. Question is to what does the scientific name apply? Does it apply to the fungus? To the association of the two? One might argue that there should be three names involved here: But no, the decision was made some time ago the the name that has been applied to the symbiotic lichen is also the name of the fungus. Each lichen has a distinct fungus, but the alga in one lichen is frequently indistinguishable from the alga in another lichen. This enables you to decide which herbarium cabinet to put the specimens in, and where to put the lichen on a phylogenetic tree. Joseph Laferriere talk See this for example. Note the scare quotes around the second genus in the title, but not around the first. Thanks Plantsurfer, for finding these genus names. See discussion at talk page section immediately following. Is there just one species name? I recently read there is a fungus not named in the article that is lichenized by two different photobionts both algae, as I recall , but not at the same time, thereby creating what would be two entirely different lichens, except for the classification scheme of defaulting to the fungus. Does anyone know what the fungus is, and how the two different lichens are classified as being different? There are many examples of lichens with alternative photobionts. Not sure which is the one you have in mind. Nephroma use green alga Coccomyxa or cyanobacterium Nostoc. Psoroma use photobiont Myrmecia, but external cephalopodia contain Nostoc. That was just the answer I was looking for in order to raise my underlying question using sources. Incidentally, Myrmecia points to an ant on WP, not to an alga. Note that the title of the article has scare quotes around Dendriscocaulon , but not around Sticta. Please contribute to this article that does not neatly fit into the WP: Plant article template, and does not fit a taxobox into it very neatly. The situation seems analogous to "form taxa" in paleobotany, or the separate names given to fossil gametophytes and sporophytes before their true identity was discovered e. I posted a link to this discussion at the talk page of species problem , which might provide editors who have different perspectives than strict WP: But is there an actual authority, other than summary descriptions used as RS, that concludes all lichens are poikilohydric? Can anyone help fix this by use of more common special characters for pronunciation? Because of the ambiguity of English orthography, this can only be represented by the IPA in my view. I assumed that general public English language dictionaries existed with pronunciations of common words like "kitchen", although I never looked until just now, and discovered that online dictionaries are very different than those used in American public schools or at least used to be used.

LICHENS OF CALIFORNIA (CALIFORNIA NATURAL HISTORY GUIDES, 54) pdf

7: Lichens of California - Mason E Hale, Mason E. Hale, Mariette Cole - Google Books

Note: Citations are based on reference standards. However, formatting rules can vary widely between applications and fields of interest or study. The specific requirements or preferences of your reviewing publisher, classroom teacher, institution or organization should be applied.

Add to Bookmarks My inspiration to write about lichens came from a lichen-covered, dying red maple in our front yard. For lichens, every day is Earth Day. Like people, lichens need a clean environment to thrive. Celebrate Earth Day by doing something good for the environment. Baked goods always enhance a celebration; I hope you enjoy the recipe at the end of the article. About that dying red maple tree covered with lichen in our front yard With that in mind, if you have a dying tree in your yard, what would you do with it? Before you shout, "Cut it down! The protection and structural support offered by the fungus, and the food from photosynthesis by the algae, result in a working symbiotic relationship between the two. Lichens grow in terrestrial land or aquatic landscapes around the world. These diverse organisms can be found in areas of weather extremes, from atop hot sunny mountain rocks to substrates of tree bark, rocks, watersheds, soil and leaves. Important and fascinating, lichens are studied around the world by lichenologists, environmentalists, biologists, and science students. Egan, from the Department of Biology at the University of Nebraska in Omaha, has documented over professional articles written just in the past year about lichen. Lichen Uses Lichens have been used and valued by both people and wildlife for centuries. They generally grow best in non-polluted areas. Her illustrations offer detailed and accurate renditions of their delicate beauty. Native Americans in New Mexico collect Xanthoparmelia chlorochroa for use in dye to color yarns and fabric. Lichens and Wildlife Lichens benefit ecosystems and wildlife, offering moisture and humidity by their ability to retain water. They also serve as a refuge from predators for amphibians and insects, who hide and lay eggs in lichen. Many species of birds in North America use lichens. The spruce grouse and wild turkey eat lichen. Warblers and Vireos use lichens in their nests, and Golden plovers use Thamnolia vermicularis in their nests. The olive-headed weaver in Madagascar makes its nests solely from lichen in the genus Usnea. A closeup look shows Hummingbirds may include soft thistle and dandelion seed fluff, along with expandable, stretchy spider silk and leafy materials in their nest. Mountain goats in southeastern Alaska include Lobaria linita in their diet; northern flying squirrels use lichen Bryoria fremontii as nesting material and food. The primary diet of the endangered Yunnan snub-nosed monkey, consists of two species of Bryoria. And during the winter season, Caribou use their keen sense of smell to find a good feeding area with lichen beneath snow. It comes as no surprise then, that the habitats with the highest lichen species diversity are remnants of ancient forests and other undisturbed ecosystems. The association between a large diversity of lichens and unpolluted habitats is so evident, scientists use lichens as indicators of ecosystem continuity to help identify areas that should be protected. The bark of red alder trees is usually covered by white lichens. When these trees are in a polluted environment, lichen cannot grow see photos. The photo shown was taken atop one of our climbs. In some areas, on trails and summits, signs are posted asking hikers to please be respectful and not touch or disturb the fragile growing lichens. Although it is not a moss, Ramalina is often called California Spanish moss. Lace lichen is common on the west coast of North America. How can you tell Lichen apart? Lichens can be differentiated by examining their surface texture, color and lobules. Textures can be granular, smooth or veined, and colors vary from white or grey to interesting orange, reds, yellow-greens and greens. With so many types of lichen, identifying the genus and species can be quite challenging. Experts have various ways to determine them. Naturalist Jim Conrad suggests that backyard gardeners recognize three types of lichen: Crustose, Foliose and Fruticose.

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8: Lichens of California by Mason E. Hale

The California Natural History Guides book series by multiple authors includes books Natural History of the San Francisco Bay Region, Mammals of the San Francisco Bay Region, Native Trees of the San Francisco Bay Region, and several more. See the complete California Natural History Guides series.

These books have a long history of 42 years as of this Millenium with over 60 "guides" published thus far. However, only one book on birds and very little on insects has been published other than butterflies , almost as though the animals that fly are not part of the land? The last few books by Allan Schoenherr do have sections about the impacts on natural California, but no single volume has been dedicated to the destruciton of "California Natural History. Now I am a scientist and naturalist 25 years later. The "Guides" are still near and dear to my heart. And now I have become an environmentalist activist which is beginning to supercede my naturalist training, not unlike John Muir and many other early naturalists. So I guess the Guides in a most subtle way do a subversive kind of education, in that once we learn nature and love wild California more and more, we inevitably become environmentalists. You can see it in the next few sentences in regards to professional ecology. They are useful both as basic tools for ecologists and to instruct an interested public, partly so that public can take intelligent part in the debates over applications of ecology to our environmental problems. This series had its genesis at a meeting of the directors of the East Bay Regional Parks Association in , when the desirability of a series of leaflets on the natural history of the Berkeley Hills was discussed. This suggestion appealed very much to Doctor Robert L. The thought that it might be possible to provide inexpensive, well-illustrated, pocket-size natural history handbooks for the beginner interested in learning about his environment intrigued Doctor Usinger. He proposed that the UC Press undertake such a project. And the California Natural History Guides resulted. Without his enthusiastic support and continued efforts it is doubtful that any of the Guides would have been published. Starker Leopold as follows: In August , a Technical Advisory Committee now Advisory Editorial Committee was established to advise the General Editor and the Press on the future scope and content of the series. Over the years the committee has performed a very valuable service for the publisher and for the more than a million users of the guides. Starker Leopold was appointed to this committee at the outset in , continued his participation after retirement, and rarely missed a meeting during the twenty-four years he served. Other original members of the committee were Robert C. Stebbins and the late Robert L. For some time prior to his death, Starker had been working with us on final revisions of the manuscript of California Mammals. Indeed, only a few days before his death I reported to him on the implementation of his recommendations on the project. Our paths crossed and recrossed many times during the years since. Work on any project with Starker was always a rewarding experience. We miss him, but we have much to remember him by. It is with great pleasure that I join with the authors of this book, E. Mammals of the San Francisco Bay Region. Weather of the San Francisco Bay Region. Mushrooms of the San Francisco Bay Region. Early Uses of California Plants. Butterflies of the San Francisco Bay Region. Natural History of Southern California. Native Trees of Southern California. Native Shrubs of Southern California. Ferns and Fern Allies of California. Weather of Southern California. Seashore Plants of Southern California. Seashore Plants of Northern California. Mammals of Southern California. Mushrooms of Southern California. Fossil Vertebrates of Southern California. Deep-Water Fishes of California. Seashore Life of Southern California. Introduced Trees of Central California. Marine Food and Game Fishes of California. Marine Mammals of California. Teaching Science in an Outdoor Environment. Amphibians and Reptiles of California. Native Shrubs of the Sierra Nevada. Introduction to California Plant Life. Native Trees of Sierra Nevada. Geology of the Sierra Nevada. Tidepool and Nearshore Fishes of California. Water Birds of California. Edible and Useful Plants of California. Mushrooms of Western North America. Geologic History of Middle California. Growing California Native Plants. Natural World of the California Indian. Seashore Plants of California. Freshwater Fishes of California. Natural History of Vacant

Lots. Poisonous Plants of California. Natural History of the White-Inyo Range. Natural History of California. Natural History of Big Sur. California Forests and Woodlands. Edge of the Great Basin. Natural History of the California Islands. I did some calculations on the dates and rates of publication based on the Natural History Guides listed above as follows: It is obvious that the number of guides being published each decade is decreasing which alarms me. However, the books have gotten longer and larger by hundreds of pages, so that more "words" on natural history are being written, and that is encouraging. There are some patterns that emerged related to authors as well. For example, two authors did four books: Robert Orr and E. Two authors did three books: John Fitch and Robert Lavenberg. And lastly, five authors did two books: Also of interest is the topics preference with most books being on animals with 16 books. There were 9 books on natural history topics in general with a regional focus. There are 7 books on geology. There were 2 books on weather. But 35 books on plants. Considering that for every native plant in California there are about 6 native insects, it is surprising that there are not about Natural History Guides for insects alone from grasshoppers to ants to beetles. There are an almost infinite number of subjects and geographic areas that need to be written about for California. Some examples might include: Natural History of California Estuaries. Natural History of California Ants. Natural History of California Prairies. The GUIDES of the recent years are no longer taxonomic but rather ecological and comprehensive for specific geographic areas of the state. This current trend is welcome except that it is still biased against southern California. While it is true that the Channel Islands are in southern California, they are generally not accessible to the urban population, which needs really to be reached. California is a large state with a lot of natural area landscapes but so how was the decision made to select the California Islands, White-Inyo Range, East Sierra, and Big Sur, as regional natural history guides, when many other natural areas deserve a "Guide" as well. I feel that focusing on natural history of regions near urban areas in Los Angeles should get some attention, as people in urban areas need especially to know and learn about nature near their homes. A book on California Ecological Restoration would be welcome too. This rate of pubishing books equates to an average of three books every two years. Two recent guides by Allan Schoenherr exemplify this trend. These two guides are:

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9: Lichen, an Ecosystem Wonder - Dave's Garden

California Natural History Guides on ptcogorg, this is only PDF generator result for the preview. Cacti of California - The American Southwest Cacti of California Plants > Cacti > California Below is a list of all cacti found in California; the main species first.

Guidelines for Studies Intended for Regulatory and management purposes. Zimmermann, L Geiser and J Alegria. Model-based stratifications for enhancing the detection of rare ecological events. The evolving role of lichens in air quality protection on public lands. July August 2, Comparison of lichen community composition with environmental variables at regional and subregional geographic scales. Journal of Vegetation Science Potential approaches to developing lichen-based critical loads and levels for nitrogen, sulfur and metal-containing atmospheric pollutants in North America. The Bryologist 4: Lichens, ozone, and forest health â€" exploring cross-indicator analyses with FIA data. An interdisciplinary evaluation of the impacts of airborne contaminants in western US national parks. Lichens and conifer needles as indicators of airborne semi-volatile organic compounds in western North America. Nash III et al. Status and future of the forest health indicators program of the USA. Environmental Monitoring and Assessment Effects of nitrogen deposition and empirical nitrogen critical loads for ecoregions of the United States. Ecological Applications 21 8 , Geiser, LH and K Nadelhoffer. Chapter 6, pp In: Assessment of nitrogen deposition effects and empirical critical loads of nitrogen for ecoregions of the United States. Chapter 19, pp In:

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