



# LAKE WISE

... a voice for quiet waters

NEWSLETTER FROM OREGON LAKES ASSOCIATION

DECEMBER 2023

Theo Dreher, Newsletter Editor

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Summer Lake, SE Oregon, June 2023

## Fall 2023 OLA Conference in Corvallis November 15 & 16: recordings available online

Recordings of most of the proceedings of the November 15 & 16 OLA Conference held in Corvallis are now available online: [Day 1](#) and [Day 2](#). The first day's program dealt with various issues related to Willamette Valley Project reservoirs. The reservoirs were built primarily for flood regulation, while also providing hydroelectric power and recreational opportunities.

According to [NOAA](#), "The Willamette Project has adversely affected Upper Willamette River Chinook salmon and steelhead by blocking access to a large amount of their historical habitat upstream of the dams and contributing to degradation of their remaining downstream habitat. The associated mitigation hatcheries that accompanied the dam building had an effect on the genetic diversity of Chinook salmon populations in the Willamette Basin." After the Chinook and steelhead populations were [listed under the Endangered Species Act in 1999](#), the US Army Corps of Engineers (USACE) modified dam and reservoir management practices. These changes were judged insufficient by a [2021 federal court ruling](#), citing continued population declines and inadequate options for fish passage above dams.

Following the court injunction, new dam management protocols have come into effect. These include increased spillway flows to aid downstream passage of juvenile fish and deep drawdowns, such as the November 2023 releases from Green Peter Dam that caused [siltation problems for water utilities downstream on the South Santiam River](#). The keynote talk by Greg Taylor (USACE) described Willamette Valley

# Willamette Valley Projects



Project operations over the years (including the Green Peter drawdown), while Brett vandenHeuvel made the case for drastically rethinking dam management in light of the court injunction. This would prioritize salmonid recovery over hydroelectric generation, which he argued is relatively modest compared to other regional power sources.

In a second keynote talk, Christina Murphy (USGS-Univ of Maine) gave an ecological overview of the reservoirs and their associated communities, touching on her studies on deep drawdowns that have been occurring at Fall Creek Reservoir for several years. Other talks discussed various aspects of the biology of the Willamette Valley reservoirs, including one by Chris Caudill (Univ of Idaho) on the Chinook salmon population genetics mentioned above.

The second day covered several topics, including *Lakes under Stress* (2021 heat dome effects on coastal lake, desiccation threats to Lake Abert); *General Lake Science* (lake monitoring data visualization, solar panel installations on reservoirs, paleohistorical interpretations from a 14,500 year core at Gold Lake); and *CyanoHABs* (Upper Deschutes watershed monitoring, use of machine learning to predict and understand HABs risks, use of volatile organic compounds as specific HAB biomarkers, genomic studies of PNW *Gloetrichia*). Posters presented a study on picocyanobacterial detection using flow cytometry and on rainwater collection for home water storage for summer watering.

Conference facilities at OSU were outstanding. Our conferences are made financially viable by the sponsorships highlighted in every issue of Lake Wise. This year, CD3 Systems generously sponsored a social at the end of Day 1.



## OLA Participates in Update of Oregon's Groundwater Rules

Tammy Wood, Oregon Lakes Association

The Oregon Water Resources Department (OWRD) is updating its rules for issuing new groundwater permits. OLA is participating in this process by having a representative (article author) on the ad hoc Rules Advisory Committee. Why is OLA, a voice for the lakes of Oregon, participating in a committee tasked with advising OWRD on groundwater rules?

The answer is that the groundwater and surface-water systems are connected, and during times of the year when runoff is minimal, groundwater discharge from an aquifer to a connected stream can contribute most or all the streamflow. Pumping from the connected aquifer can capture water that would otherwise have become the streamflow that feeds lakes. Figure 1 shows schematically the connection between ground- and surface-water, and what happens when pumping is turned on in a nearby well. After an initial period of adjustment, the pumped water comes from a nearby stream to which the aquifer is connected by saturated conditions. Therefore, the surface-water and groundwater systems really are a single resource (Winter and Harvey, 1998).

Water pumped from wells has two phases of impact. During the first phase, water comes primarily from aquifer storage and the water level around the well declines in response to pumping to form a “cone of depression.” This cone of depression spreads laterally away from the well at a rate that depends on the properties of the aquifer material. During this phase, the spreading cone of depression can intersect the cone of depression of an existing well, interfering with pumping in the existing well. The cumulative effect of developing many wells over time can lead to long-term, large-scale decline in the water level of the aquifer.

When the cone of depression is close to a stream, water pumped from the well starts to come from the capture of water that would otherwise have been discharged from the aquifer to the stream. If the cone of depression spreads far enough to reach a connected stream, the well starts pumping water from the stream itself, further depleting the stream flow. The transition to the second phase can take place over many years, during which time the proportion of the pumped volume coming from stream capture builds. Ultimately, the source of water from the well is



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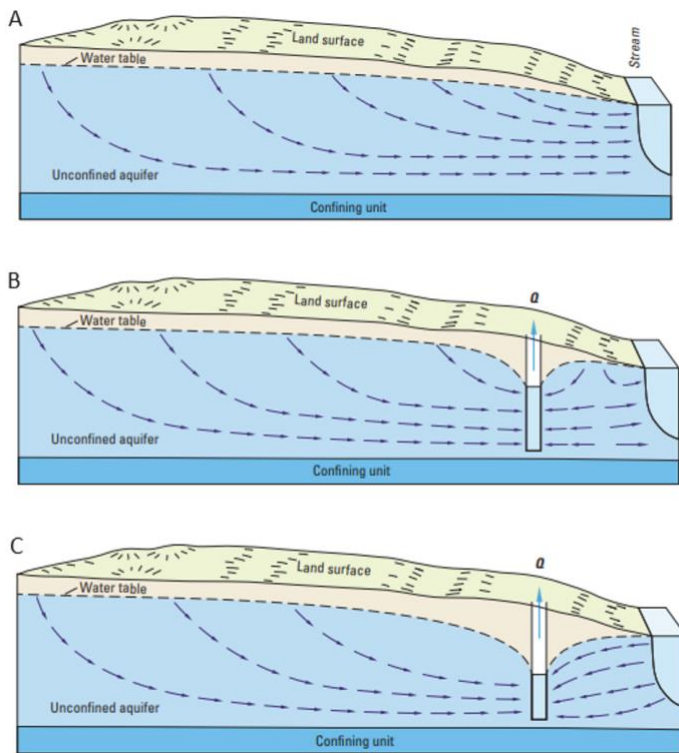
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primarily this capture of groundwater that would otherwise have been discharged as surface water, reducing the water available to surface-water rights, instream uses and ecosystem needs, and downstream lakes and reservoirs.



**Figure 1.** Effects of pumping from a hypothetical water-table aquifer that discharges to a stream. A) Under natural conditions, recharge at the water table is equal to discharge at the stream. B) As the cone of depression expands outward from the well, the well begins to capture groundwater that would otherwise have discharged to the stream. C) In some circumstances, the pumping rate of the well may be large enough to cause water to flow from the stream to the aquifer. (modified from Barlow and Leake, 2012)

The large majority of wells in Oregon are for domestic or municipal use (88%, most of which are exempt from the allocation rules), but the large majority of the water pumped is used for irrigation (90%). To someone

driving around or flying over the State, the ubiquitous long lines of sprinklers and green circles of pivot irrigation can make it seem like irrigators have already drilled all the wells they could possibly need. Between 2010 and 2021, however, OWRD processed 1,896 applications for groundwater permits. Of those applications, 1,531 (81%) were approved under the existing rules. These included 919 wells (79% of applications) in areas of the state with “significant concerns”, defined as an area where groundwater is already restricted and well levels are known to be declining rapidly. In addition, 342 wells (83% of applications) were approved in areas of “concern,” defined as areas where the aquifer is hydraulically connected to a State Scenic Waterway, or where well levels are known to be declining, but less rapidly (Scandella and Iverson, 2021). OWRD recognizes that “groundwater allocation over the past 65+ years has contributed to reduced surface water baseflow and groundwater level declines, both at the expense of existing users” and the need to “update groundwater allocation rules to be more sustainable and protective of existing water users, both instream and out-of-stream (OWRD presentation to RAC meeting 1 on April 19, 2023).

The proposed revised rules make three important changes (among others) designed to align the rules with Oregon’s 1955 Groundwater Act by ensuring that OWRD is not issuing new permits for unsustainable groundwater extraction. The first major change is the addition of a rigorous definition of what is meant by a “reasonably stable” groundwater level, so that if the well under consideration does not meet that criterion (i.e., is in long-term decline) the permit can be denied. The definition of “reasonably stable” levels requires a robust statistical definition, because well levels fluctuate naturally with seasons and on the time scales of decadal climate cycles. The new rules are designed to separate these cycles from superimposed declines in well levels associated with previously permitted groundwater pumping.

The second major change is the application of the precautionary principle when available data are insufficient to determine if groundwater levels are reasonably stable—in that case OWRD will presume that water levels are not reasonably stable under the proposed new rules. Under current rules OWRD only denies new permits when the data are sufficient to definitively determine that water is not available.

The third change is in how the determination that a well has the potential to capture streamflow is made. As currently written, the rules don’t require this determination for smaller wells, or wells greater than one mile from

a stream; the proposed revisions will correct that. The rules currently make the determination based on only one month of pumping; the new rules allow the determination to consider the effects of long-term pumping on streamflow. This is important because streamflow capture can start small and build over many years until the full effect is realized.

The proposed rule changes are an important improvement in Oregon's ability to sustainably manage its groundwater resources and protect connected surface waters, but there are recognized limitations with regard to protecting streams, lakes and wetlands. The rule changes will affect only future permits, not those already issued. Also, unless an instream water right exists, the determination of available streamflow does not take into account instream ecosystem needs, or the need for water to fill receiving lakes and wetlands. Nonetheless, these rule changes are an important incremental step in protecting the still waters of Oregon. And, because they are focused on protecting the rights of senior water right holders, to the extent that a viable conservation strategy is to acquire senior rights and apply them to instream use, this change in the rules also will provide greater protection to senior instream uses in the future.

The problems that Oregon is facing in managing its already declining groundwater resources more sustainably in the future echo problems nationwide. The New York Times is publishing an ongoing series of articles reporting on the current groundwater crisis nationwide and globally (<https://www.nytimes.com/series/uncharted-waters>). Climate change adds to the pressure on groundwater resources because rising temperatures are associated with reduced snowpack—less snowpack leads to reduced streamflow from snowmelt while the same rising temperatures increase irrigation demands. Irrigators turn more and more to groundwater to make up for reduced surface water. Oregon is ahead of many states with its forward looking 1955 Groundwater Act, and OWRD is on the right track in developing rules to better implement the Act and ensure it does not continue to issue permits for unsustainable groundwater pumping.



Center pivot irrigation is a common use of groundwater



All of the materials associated with the rule-making process are available at <https://www.oregon.gov/owrd/programs/GWWL/GW/Pages/Groundwater-Rulemaking.aspx>, including meeting recordings and written summaries, and comments submitted by committee members. The current schedule has the committee's work wrapping up in January, 2024, and public hearings and comment period starting in spring of 2024. The Water Resources Commission is scheduled to make a decision on the proposed rule changes in the summer of 2024.

## References

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- Winter, T.C. and Harvey, J.W., 1998, Ground Water and Surface Water: A Single Resource, USGS Circular 1139, available at: <https://pubs.usgs.gov/publication/cir1139/>



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## Andy Schaedel awarded OLA Secchi Disk Award for Service

In recognition of exceptional service to Oregon Lakes Association, Andy Schaedel was awarded the OLA Secchi Disk Award at the November conference in Corvallis. Andy was a founding member and first President of OLA (November 1990), serving as President for two terms since then (1997-2000 & 2012). He has been active in OLA since its inception and has been Treasurer since 2015 until the present.

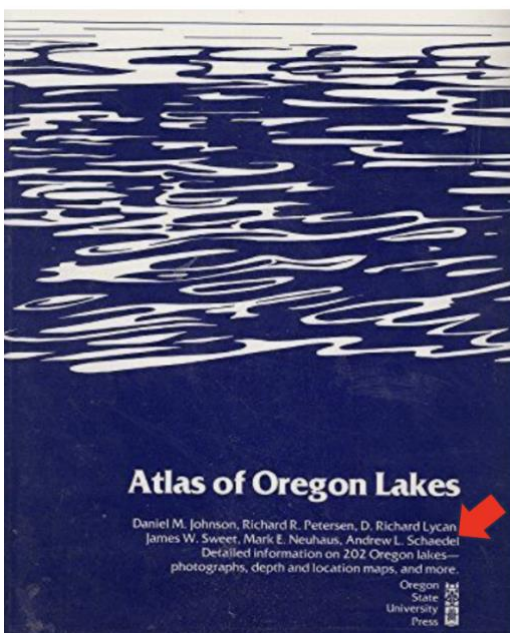
Andy hails from Michigan and earned a BS in Oceanography & Zoology from the University of Michigan in 1970. After working for a period on Great Lakes research, he earned a Master in Public Health degree in Environmental Health, also from U-Michigan, in 1975. After working for SE Michigan Council of Governments (1975-78), Andy moved to Oregon in 1978 to work for OR-Department of Environmental Quality. He stayed with DEQ until retirement in 2008, finishing his career as Water Quality Manager, NW Region.

Andy has always had a strong attraction to water, and at DEQ he was able to emphasize work on lakes. In 1980, he obtained a \$100,000 grant from EPA to study lake water quality in Oregon. This work led to the publication of the Atlas of Oregon Lakes through Portland State University (PSU) in 1985. The Atlas is still an oft-accessed resource, now [online](#).

Another \$100,000 EPA grant in 1989 led to Clean Lakes Workshops at PSU and the establishment of the citizen science program Oregon Lake Watch in 1990. The PSU workshops also led to the founding of OLA as an Oregon chapter of North American Lakes Management Society (NALMS). Important products of Andy's lake work at DEQ were a report on the *Status of Oregon's Lakes* (2007) and *Oregon DEQ Harmful Algal Bloom (HAB) Strategy* (2011).

Andy's steady involvement and wisdom has been invaluable to OLA. In addition to the officer roles mentioned above, he also represented OLA on the advisory committee that led to the naming of Crater Lake and Waldo Lake as Oregon Outstanding Resource Waters in 2020. Andy also recently wrote a [history of OLA](#).

Thanks and congratulations on a well-deserved award, Andy! The pictures show Andy as author of the Atlas, in his favorite habitat, and accepting his award at or recent conference.



## OLA participation in Partnership for Lake Abert and the Chewaucan discussions

Theo Dreher, Oregon Lakes Association

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Recently, a major focus of OLA activities has been the conservation of Lake Abert, Oregon's hypersaline lake ecosystem that hosts tens of thousands of shorebirds at a time, but which was dry in the 2014-16 and 2020-21 periods. Based on studies of contributing factors to the 2014-16 desiccation event (Larson et al., 2016; Moore, 2016), OLA maintains that agricultural diversions upstream of the lake on the Chewaucan River have exacerbated drought. A continuation of the status quo could lead to collapse of the Lake Abert ecosystem, threatening the viability of this hemispherically important feeding area for migratory shorebirds.

Another issue adversely affecting Lake Abert is the existence of River's End Reservoir on the Chewaucan River just upstream of the lake. This reservoir was constructed in 1994 with government financial support, but federal and state oversight that was meant to limit water diversions when Lake Abert levels were low was abandoned after dam construction exposed archeological artefacts and human bones. Following a January 2022 article in [The Oregonian/Oregon Live](#) decrying the lack of state government attention to this issue since 1994, a letter demanding action was sent to the Governor's office by OLA and environmental groups. Governor Brown's office convened meetings that brought state agencies and legislators into the discussion.

In the Chewaucan Basin, locals created the [Chewaucan Watershed Collaborative](#), which made tentative contact in May 2022 with OLA through a common contact at Oregon State University, Dr Aaron Wolf. Dr. Wolf has spent his career on water conflict resolution around the world. After a very cordial meeting over dinner, further discussions with a wider group were arranged through the office of Rep. Mark Owens (R-Crane), with the full support of the [House Interim Committee On Agriculture, Land Use, Natural Resources, and Water](#) and its Chairman Rep. Ken Helm (D-Beaverton & Cedar Hills). These discussions explored the viability of mediated conversations through an [assessment](#) conducted by Oregon Consensus at Portland State University, concluding that there was genuine interest in finding a common solution to water sustainability for Lake Abert and the Chewaucan watershed. An important outcome of these activities was the inclusion the outline and funding (\$570,000) for a collaborative process on water management in the Chewaucan Valley and its effect on Lake Abert in [2023 House Bill 3099](#). The legislation supports two years of professionally mediated discussions (led by Bobby Cochran, Oregon Consensus) and fact finding (led by Aaron Wolf, OSU).

OLA has continued to be heavily involved in discussions. For the funded period of July 2023 through June 2025, four annual meetings of all participants are planned: June and December in-person meetings in Paisley, and two on-line Zoom meetings. The Planning Team meets monthly and consists of: Tess Baker & Colleen Withers (Chewaucan Watershed Collaborative), Diane Teeman (Burns Paiute Tribe), Ryan Houston (Oregon Natural Desert Association, ONDA) and Theo Dreher (OLA), with Oregon Consensus and OLA team members.

To date, efforts have focused on (1) building familiarity and trust among participants; (2) gathering and including all interested parties; (3) defining scope and procedures, and (4) working towards a joint and agreed understanding of facts, problems and challenges, addressed in order below.

(1) We have benefited from the skilled mediation by Bobby Cochran and Jennah Stillman (OR Consensus) and Aaron Wolf (OSU). I am grateful for the intelligent and committed participation of Tess Baker and Colleen Withers as leaders of the Chewaucan Watershed Collaborative; it has been a pleasure to establish a truly friendly working environment with Tess, Colleen and their colleagues. I am convinced that this will keep us moving forward as we progress to difficult conversations about how agriculture can share more water with Lake Abert. The participation of conservation groups alongside OLA has also been critical.

(2) A wide array of groups and individuals has been involved to date, including: Chewaucan Watershed Collaborative and other local ranchers, citizens and county commissioners; Native American Tribes; advocates of Lake Abert conservation, including OLA, ONDA, WaterWatch of Oregon, Audubon Society; Ducks Unlimited; Intermountain West Joint Venture; Local and Regional Natural Resource Interests; state and federal government agencies; legislative offices. In the future, additional participants can be admitted with consensus



agreement; anybody with a productive interest in the discussions should be included, although continued participation will require continued engagement. Theo Dreher, Ron Larson and Trish Carroll have represented OLA in discussions and in fact finding efforts.

(3) A charter document defining procedures governing the discussions has been developed. **Partnership for Lake Abert and the Chewaucan** (PLAC) has been adopted as the group name. Core groups, including OLA, are voting members, while others such as government agencies participate in an advisory role. Decisions will be reached via voting, but the process is consensus-based. OLA firmly believes that lasting progress will only be made through decisions that don't over-ride objections through a majority vote, although decisions may be reached with a minority of voting parties agreeing to "be able to live with" an action. There has been general agreement that the issues at River's End Reservoir, which initiated these discussions, are off the table; they are specific issues involving a single landowner and governmental agencies.

(4) A fact-finding project organized by the OSU group is nearing completion. Various people have participated in pulling together information resources. OLA is especially grateful to Ron Larson and Stan Senner (National Audubon, retired) for work on the document relating to Lake Abert. While this fact-finding resource will not be an exhaustive and definitive body of knowledge on Lake Abert and the Chewaucan watershed, it is intended to serve as an agreed-upon, common reference set of facts for our discussions. Its development has already helped define areas of disagreement or different interpretation, an important step in achieving a productive conversation. To help inform water allocation possibilities, OLA (Tammy Wood, Amy Simpson, Ron Larson) is developing a water budget for Lake Abert, which will allow testing various climatic and water-transaction scenarios affecting lake levels. An important part of the factual library is *A Natural History of Oregon's Lake Abert*, a book just

published by OLA's Ron Larson. The book can be purchased for \$45 and will be available for purchase at upcoming OLA events.

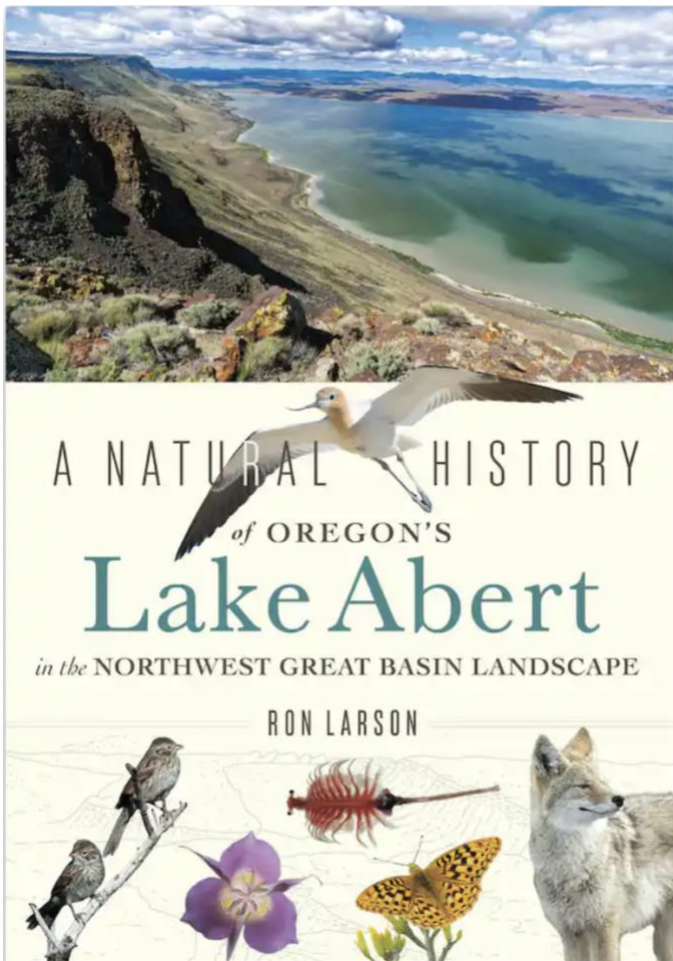
I am hopeful that these discussions will in time lead to changes that bring more water to Lake Abert in a way that also improves the sustainability and resilience of the agriculture-based economy of the Chewaucan. To achieve this, we will need to think creatively and learn from other similar challenges that are being successfully addressed in other parts of the US and the world.

Note that the interpretations of ongoing PLAC deliberations are Theo Dreher's view; I acknowledge and respect that other views exist. You can find documents on [OLA's advocacy for Lake Abert online](#).

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Larson, R., J. Eilers, K. Kreuz, W.T. Becher, S. DasSarma, and S. Dougill. 2016. Recent Desiccation-related Ecosystem Changes at Lake Abert, Oregon. *Western North American Naturalist* 76(4):389-404.

Moore J. 2016. Recent desiccation of Western Great Basin Saline Lakes: Lessons from Lake Abert, Oregon. *U.S.A. Science of the Total Environment* 554-555:142-154.



## Upcoming OLA Events

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Look for notice of the following events during 2024:

February/March: 2024 Oregon CyanoHABs Stakeholder Meeting

July: On-site lake information event during Lake Appreciation Month

~October: Joint annual meeting of OLA and WALPA (Washington Lake Protection Association), Portland-Vancouver area

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**The Oregon Lakes Association Mission**

OLA, a non-profit organization founded in 1990, promotes understanding, protection and thoughtful management of lake and watershed ecosystems in Oregon. Serving entirely through volunteer efforts, the Oregon Lakes Association puts on an annual conference, publishes a tri-annual newsletter, sponsors Harmful Algal Bloom trainings, and works as an advocate for lakes in the legislative arena. For additional information on OLA, write to the address above, or [visit our website](#)

OLA and *Lake Wise* welcome submissions of materials that further our goals of education and thoughtful lake management in Oregon. OLA is grateful for corporate support that helps sustain the organization. Corporate members are offered the opportunity to describe their products and services to *Lake Wise* readers. These descriptions are not OLA endorsements and opinions appearing in *Lake Wise* are not OLA policy statements.

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