



TOOLKIT FOR USING STORYWOOD

*URBAN, RECLAIMED, AND LOCALLY
HARVESTED WOOD FOR DESIGN*

TABLE OF CONTENTS

What is StoryWood?	1
Transparency	1
Story Depth	1
Certifications	1
The Universe of Wood	2
Source	2
Proximity	2
Sustainability	3
Barriers to Using StoryWood	3
Building Reuse	4
Material Reuse	5
Recycled Content	6
Urban Wood	7
Phytoremediation	8
Certified Wood	9
Commercial Wood	10



ABOUT DELTA INSTITUTE

Founded in 1998, Delta Institute is Chicago-based nonprofit organization that envisions a region in which all communities and landscapes thrive through an integrated approach to environmental, economic, and social challenges. Working with our partners, we identify opportunities for market-based environmental solutions and design, test, and share on-the-ground solutions that yield social, environmental, and economic benefits for communities.

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Using StoryWood is choosing to prioritize materials with a unique, place-based story to tell.

Created for architects, designers, and developers, this toolkit offers a lexicon with a clear delineation of the universe of wood available for use in their design plans. Different types of wood have different stories to tell, some richer than others, and there are benefits and challenges associated with each type. This toolkit will help designers identify, evaluate, and share the most interesting parts of a certain type of wood's back story, and, more specifically, it will help to align material choices to achieve certifications, such as LEED or Living Building Challenge. In short, this toolkit provides designers with the information and tools needed to navigate the universe of wood products and find the unique and sustainable material that will meaningfully resonate with their vision for a finished design.

WHAT IS STORYWOOD?

StoryWood is wood with a compelling history and unique provenance that sets it apart from other building materials. In this toolkit, StoryWood includes **urban wood**, which refers to all trees harvested outside of forests; **reclaimed wood**, which refers to wood harvested from buildings for reuse; and woody material harvested from **phytoremediation** plots.

StoryWood can appeal to developers, architects, and other designers seeking to add value to their products. The value of the wood product's story depends on how it is captured and expressed through its end use. The richness of the wood's story gives a competitive advantage, which has led designers such as the Reclaim Detroit, Cleveland's Rustbelt Reclamation, and Chicago-based groups Rebuilding Exchange and Icon Modern to build StoryWood into their brand.

TRANSPARENCY IN THE SUPPLY CHAIN

In order to tell the story of any material, the supply chain needs to be transparent and understandable. Stories about any forest product start with the origins of that wood: the tree from which it was sawn and how that tree was harvested or the

building from which the wood was reclaimed. The stories of mass-produced products are not told, because their supply chains are not transparent. When a material's supply chain is transparent or documented, designers can evaluate whether the material meets their priorities based on its extraction and production, sustainability, support of local workers, or interesting story.

STORY DEPTH

A transparent supply chain reveals the three variables that give wood the potential to be StoryWood:

Source: StoryWood may be from reclaimed sources, such as the doors of an old barn, or it may come from virgin sources, such as street trees felled in a storm or removed due to an emerald ash borer infestation.

Proximity: Wood found on-site might have a compelling story derived from the client's memories of its spring blossoms and fall color, its tire swing, or its loss.

Sustainability: Sustainable stewardship of our natural resources makes for a compelling story as well, whether wood is reused in its current form, recycled for new uses, or harvested responsibly.

The more layers of story depth a material has, the more valuable the story.

LEED AND WELL

Beyond StoryWood's value to the design experientially and aesthetically, there is also an opportunity to use StoryWood to achieve specific goals, such as LEED or WELL certification. The U.S. Green Building Council's (USGBC) LEED certification program aims to transform the way buildings are designed, constructed, maintained, and operated using more energy-efficient and environmentally responsible approaches. The International WELL Building Institute, issues the WELL Building Standard, which focuses on mental and physical health of building occupants. Storywood can score points by contributing to the materials, mind and innovation categories.

LIVING BUILDING CHALLENGE

Aspirational building projects seeking the highest frontier of innovation may look to the Living Building Challenge (LBC), which is the most rigorous sustainable building rating system in existence. Storywood can contribute to multiple requirements in LBC, such as material toxicity avoidance, nature inspired design and locally produced materials.

THE UNIVERSE OF WOOD

The universe of wood can be categorized along three dimensions: source, proximity, and sustainability, which, as previously mentioned, are useful for assessing StoryWood potential.

SOURCE

In the wood industry and throughout the supply chain, there is inconsistency in the words used to describe the source of materials, including recycled, salvaged, reclaimed, and even urban. Some certifying bodies, including the Forest Stewardship Council (FSC), construct their own tight definitions about what does and does not qualify under these words, but these interpretations often differ from one certification to the next. This section uses, to the extent possible, the existing definitions from USGBC LEED and FSC, but please note that these definitions are not universal:

Virgin: A product or material in its first post-tree form whose material originates from standing trees harvested from natural, silvicultural, or urban forests.

Reclaimed: A product or material taking on a second life (i.e. it is sourced from a previously finished product).

Reuse: A reclaimed product or material used in its original form

Recycled: A product or material repurposed from one form into a different but usable and valuable form.

Commercial: A material that originates from silvicultural forests.

Figure 1 below depicts the universe of wood, separating products into discrete categories using common terms and definitions describing the types of products. These definitions do not attempt to prescribe industry standards but to prompt discussion.

PROXIMITY

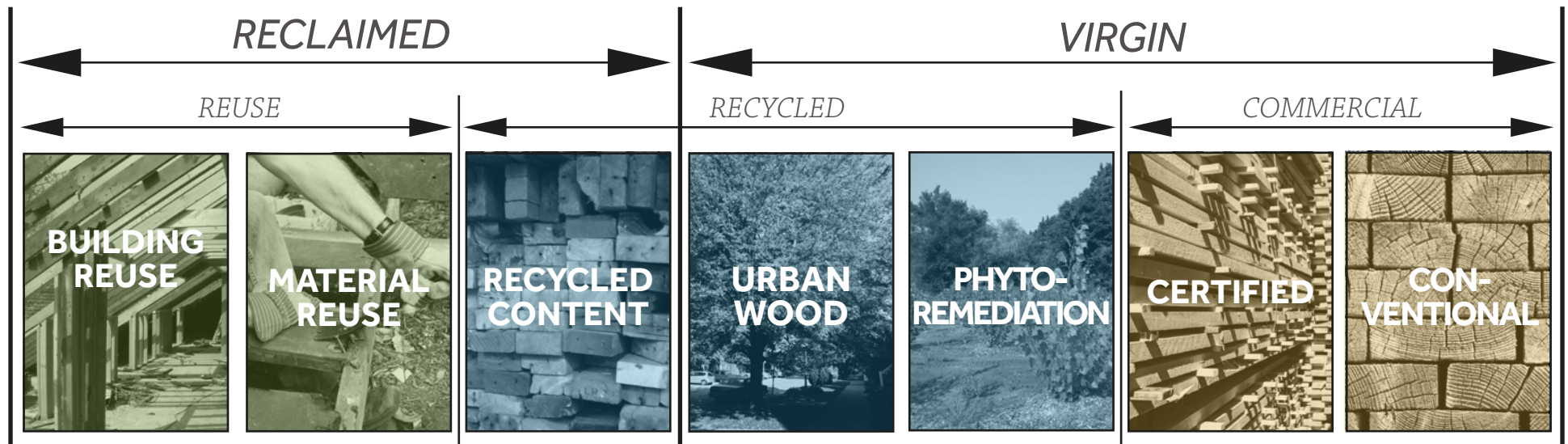
A large part of a material's story is not only its life before its current use, but also where that life originated. There is not a consensus among segments of the wood supply chain on what is regional and what is non-regional. However, presented below are proximity-related definitions influenced by existing frameworks (namely LEED):

On-site: Material sourced from the same site on which it will ultimately be used; this could include reuse of a previously finished product or the initial use of virgin wood harvested on-site.

Regional: Material that traveled a limited distance between where it originates, where it is processed, and where it is ultimately used, often also referred to as "local" wood.

Non-regional: Material harvested or processed outside the 100-mile radius of where it will ultimately be used.

Figure 1. The Universe of Wood



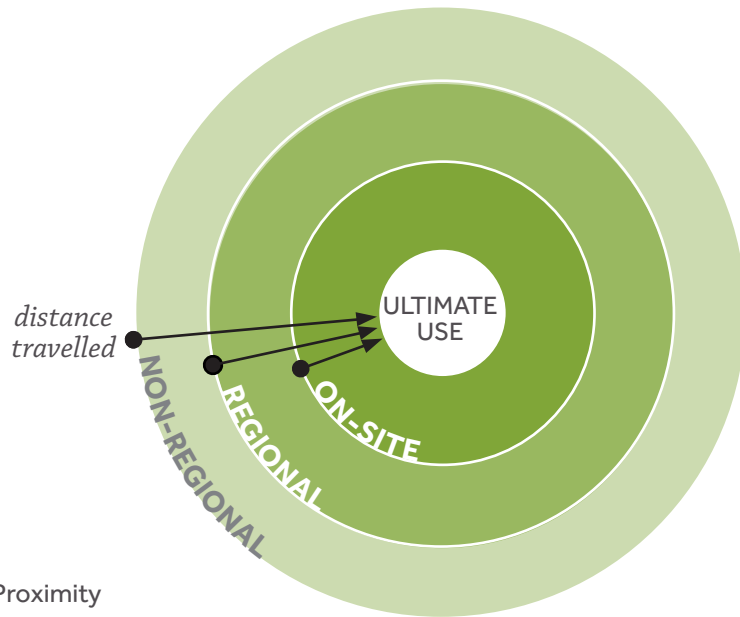


Figure 2. Proximity

Proximity of material sources relates directly to both the source of the material and its sustainability.

SUSTAINABILITY

Sustainability is increasingly a concern when specifying or purchasing materials. A sustainable product or material is one that supports and balances economic, environmental, and social values in perpetuity without depleting valued resources. Simply put, sustainable products should be profitable, while also benefiting people and the planet. Whether wood is reused, recycled, or responsibly harvested by landowners who commit to environmentally-sustainable management strategies, wood products can support inherent environmental sustainability goals, including:

Waste diversion, by reducing the quantity of construction and demolition waste that ends up in landfills,

Ecosystem protection, by avoiding the need to disrupt ecosystem function of forests and maintaining carbon sequestration potential of forests, and

Low embodied energy, by minimizing the energy needed to extract, process, and transport virgin materials to be used on site.

Use of StoryWood can also support social and economic sustainability goals, including:

Job creation, through new businesses or social enterprises providing local jobs often to disadvantaged workers or in areas of high unemployment,

Local business, by specifying local materials which often involve smaller vendors and artisans,

Community cohesion, by preserving a source of community pride and creating a sense of continuity in the community, and

Health and Wellness, connection to natural materials improves psychological and physiological markers of human health such as blood pressure, stress and cognitive performance.

While most StoryWood is inherently sustainable according to these environmental, economic, and social goals, a certification of sustainability often involves additional levels of information and verification. Certification programs, such as LEED and LBC, require documentation that can verify the truth to a story, and it can also add cost and limit material choices.

A lack of certification does not mean a product is not sustainable, but without certification, it is important to work with reputable and trustworthy vendors. In cases where certification is not practical, designers need to evaluate whether or not the source is reputable and be rigorous about how to document compliance with standards.

BARRIERS TO USING STORYWOOD

While using StoryWood is an attractive option for many reasons, there are a few areas of caution to consider. It is always advisable to be fully aware of your supply chain, but prominently featuring StoryWood in your designs may bring additional levels of scrutiny. As a designer, you need to be able to confidently stand behind the story of your materials, and if you lack full transparency into the supply chain of your materials, a critic may reveal a problem that was unknown to you.

StoryWood can often cost more than conventional wood sources. Coordinated efforts to improve transparency and documentation take time and money. Sourcing from outside of conventional forestland is often difficult and inefficient. StoryWood cannot be produced at a cost that is similar to, or lower than, conventionally-produced lumber. Designers procuring forest products and their end users should understand that more sustainable products and/or products procured from a specific, unique location typically come at a higher price point.



BUILDING REUSE



SOURCE
Reclaimed

PROXIMITY
On-site

SUSTAINABILITY
Waste diversion
Protects ecosystems
Low embodied energy
Community cohesion

DESCRIPTION

In many cases, the greenest building is the one that is already built. Building reuse involves using existing structural components in a building to reduce or eliminate the need for both disposing of existing materials and bringing new materials to the site.

STORY POTENTIAL

HIGH

Building reuse can have a compelling story, especially for buildings with a well-established presence within a community. In addition to the story of environmental responsibility that comes with building reuse, preserving key elements of an existing building can breathe new life into a building and the surrounding community while maintaining a sense of continuity and history within the community.

ENVIRONMENTAL IMPACTS

LOW

There are many environmental benefits to reusing existing materials on site. Among the most prominent environmental benefits are that building material reuse:

- (1) Reduces the need to landfill materials (and transport those materials to the landfill),
- (2) Reduces the need to disrupt ecosystems to harvest virgin wood, and
- (3) Reduces the energy needed to extract, process, and transport virgin materials to be used on-site.

DIFFICULTY OF SPECIFICATION

MEDIUM

Although there are many benefits to reusing existing building materials, there may be some difficulty specifying the use of reclaimed materials. Customized work generally calls for customized services, which can be more difficult to specify, but it can potentially support small local businesses that offer the necessary customization services.



MATERIAL REUSE

SOURCE

Reclaimed

PROXIMITY

On-site
Regional
Non-regional

SUSTAINABILITY

Waste diversion
Protects ecosystems
Low embodied energy
Job creation
Local business
Community cohesion

DESCRIPTION

Some of the richest stories come from allowing existing materials to take on a new life through material reuse.

STORY POTENTIAL

HIGH

There are many aspects of material reuse with high storytelling potential. In many cities, salvaging wood from existing buildings can represent a healing response to devastating loss – preserving a piece of history and turning liabilities into economic assets. Many major cities have at least one business or social enterprise in this growing industrial sector that preserves salvageable material while providing local jobs (often to disadvantaged workers or in areas of high unemployment), and improves blighted neighborhoods. Chicago, Detroit, and Baltimore have good examples of these programs.

ENVIRONMENTAL IMPACTS

LOW

There are many environmental benefits to reusing existing materials – especially if sourced regionally. Similar to building reuse, among the most prominent environmental benefits are that material reuse:

- (1) Reduces the need to landfill materials (and transport those materials to the landfill),
- (2) Reduces the need to disrupt ecosystems to harvest virgin wood, and
- (3) Reduces the energy needed to extract and process virgin materials.

DIFFICULTY OF SPECIFICATION

HIGH

Finding consistent sources for reclaimed wood that match unique project specifications can be challenging. There are several retailers that are reliable sources reclaimed wood, however, the quality and characteristics of reclaimed wood is not always consistent. In addition to difficulty predicting supply, reclaimed wood can be difficult to document. Whether you are looking for grading documentation or sustainability-related documentation for certification purposes, information on reclaimed wood can be inconsistent or incomplete.



RECYCLED CONTENT



SOURCE

Reclaimed

PROXIMITY

On-site
Regional
Non-regional

SUSTAINABILITY

Waste diversion
Protects ecosystems
Low embodied energy

DESCRIPTION

Recycled content wood includes reclaimed post-consumer, post-industrial, and pre-consumer recycled wood. Post-consumer recycled wood is wood that has previously been sawn into lumber and used in the construction of buildings, bridges, or other structures or uses, such as furniture. It has been removed in a demolition project and instead of going to the landfills, its lifecycle has been extended by recycling it and preparing it to be used again. Post-industrial recycled wood comes from industrial uses, such as pallets. Pre-consumer recycled wood often represents sawn mill rejects.

STORY POTENTIAL

Products made from recycled wood have a story – that the material had some purpose prior to its current use. However, the story might not be as compelling as that of material reuse, because the material's past is not as clearly expressed due to its change in form. However, depending on the proximity of the source of recycled wood, it could support small businesses or come from a source that is familiar to those who interact with the design. There is also potential for a compelling story about the environmental benefits of recycled materials.

MEDIUM

ENVIRONMENTAL IMPACTS

Though recycled content wood does not necessarily come from regional sources and the processing of recycled materials into products can be energy-intensive, there are still many environmental benefits, including that recycled content:

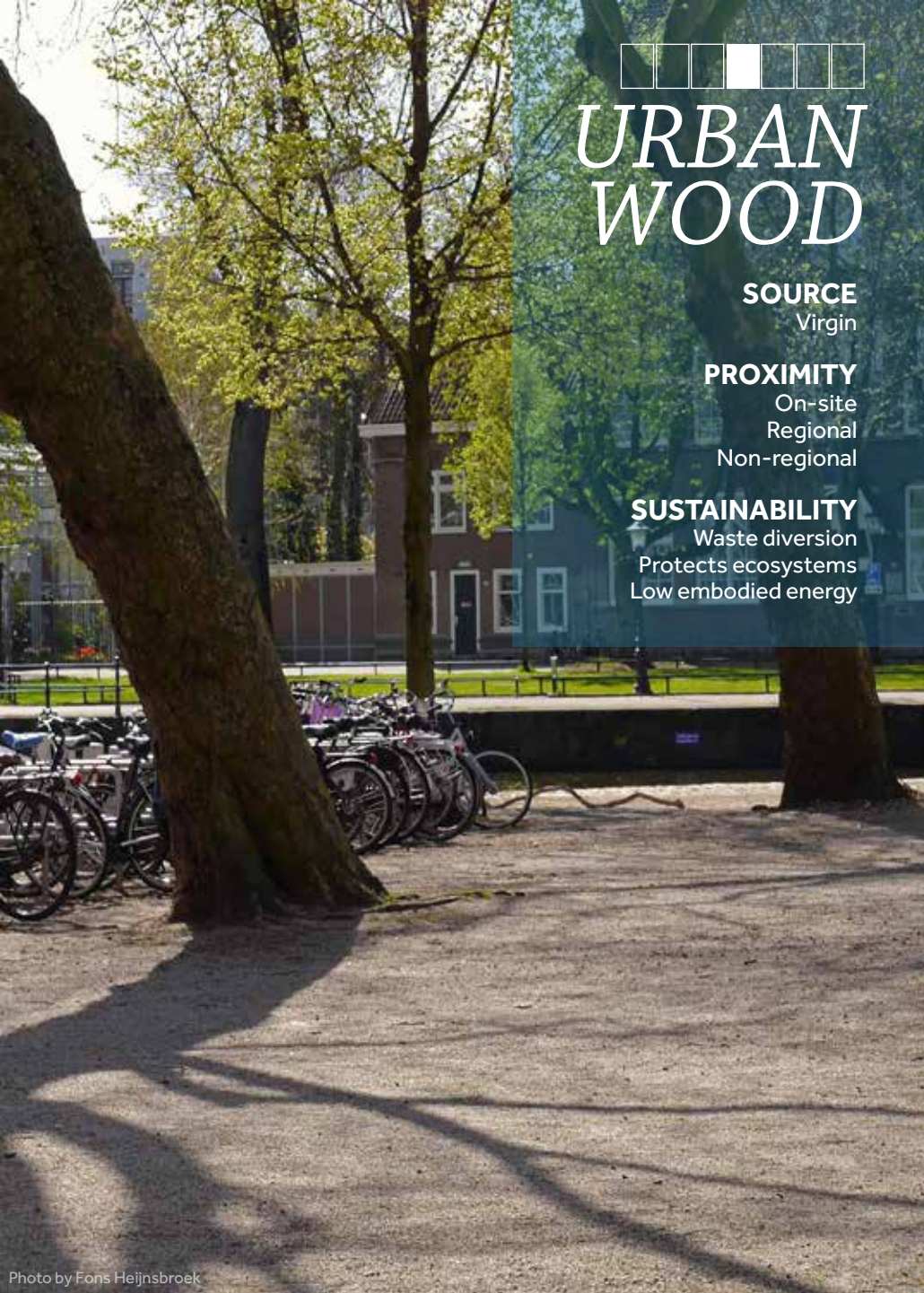
- (1) Reduces the volume of materials sent to the landfill,
- (2) Reduces the disruption of ecosystems to harvest virgin wood, and
- (3) Reduces the energy needed to extract virgin materials.

MEDIUM

DIFFICULTY OF SPECIFICATION

Products made of recycled wood are widely available. Specifying recycled material is fairly easy, however, specifying a material that will provide the desired story can be difficult. It can be even more difficult to specify recycled material from a specific, familiar source.

MEDIUM



URBAN WOOD

SOURCE

Virgin

PROXIMITY

On-site
Regional
Non-regional

SUSTAINABILITY

Waste diversion
Protects ecosystems
Low embodied energy

DESCRIPTION

Urban trees, unlike silvicultural trees, are not grown for their harvest value; instead, they are grown for their living value. These trees were planted and maintained to provide beauty, social benefits, and measurable ecosystem services, including improved air and water quality, public health, and more. Examples may include a homebuilder using a lot tree for the flooring in a new home, a community heritage tree becoming millwork for the city hall, or campus trees used to produce furniture sold to graduates of the institution.

STORY POTENTIAL

HIGH

While people are less familiar with urban wood than they are with reclaimed wood, urban wood has a great story. An individual tree may have sentimental, historic, or cultural significance that makes the loss of its living value a cause of grief for the landowner or community members. The transformation of that tree into lasting products can provide meaning even beyond the environmental benefits.

ENVIRONMENTAL IMPACTS

LOW

Urban wood is obtained from trees that have been removed due to death, disease, or incident. The material is still of excellent quality and safe for use, however, this wood is often burned, chipped, made into pallets, or sent to firewood dealers or landfills. Utilizing urban wood in home, commercial, and furniture construction projects diverts it from landfills and from being used for other lower-valued purposes, making it available for more sustainable and high-quality products. Additionally, locally sourced material reduces the environmental impacts of transporting urban wood. The myriad of environmental benefits associated with utilizing urban wood offset the energy necessary in processing this virgin material.

DIFFICULTY OF SPECIFICATION

HIGH

Urban wood suppliers possess a greater range of wood species, and the materials have a more distinguishing character and grain than wood found at traditional lumberyards. Due to the uniqueness of urban wood, finding a consistent source that meets project specifications can be a difficult process.

Photo by Fons Heijnsbroek



PHYTO-
REMEDICATION



SOURCE

Virgin

PROXIMITY

On-site
Regional
Non-regional

SUSTAINABILITY

Waste diversion
Protects ecosystems
Low embodied energy
Community cohesion

DESCRIPTION

Phytoremediation - the planting of trees in contaminated soils to remove pollutants from the environment or render them harmless - has a dual purpose of integrating environmental improvement with community economic development. Tree farms result in both improved soil and water quality on-site and new economic opportunities. Hybrid poplar trees are often the tree of choice and serve as an excellent source of raw material that can be used for furniture, cabinets, doors, and paneling.

STORY POTENTIAL

HIGH

The many environmental and community benefits associated with hybrid poplar tree farms contribute to an exceptional story. The land that is chosen for planting areas is unmanaged vacant land, which is often seen as an eyesore and a sign of economic decline. Phytoremediation projects return abandoned land into productive use more quickly than may be otherwise possible and help to raise property values. Communities benefit from the resulting improved aesthetics and increased property values poplar tree farms provide. Supporting projects that have a goal of moving from ecosystem degradation to ecosystem restoration is extraordinary and is a great story.

ENVIRONMENTAL IMPACTS

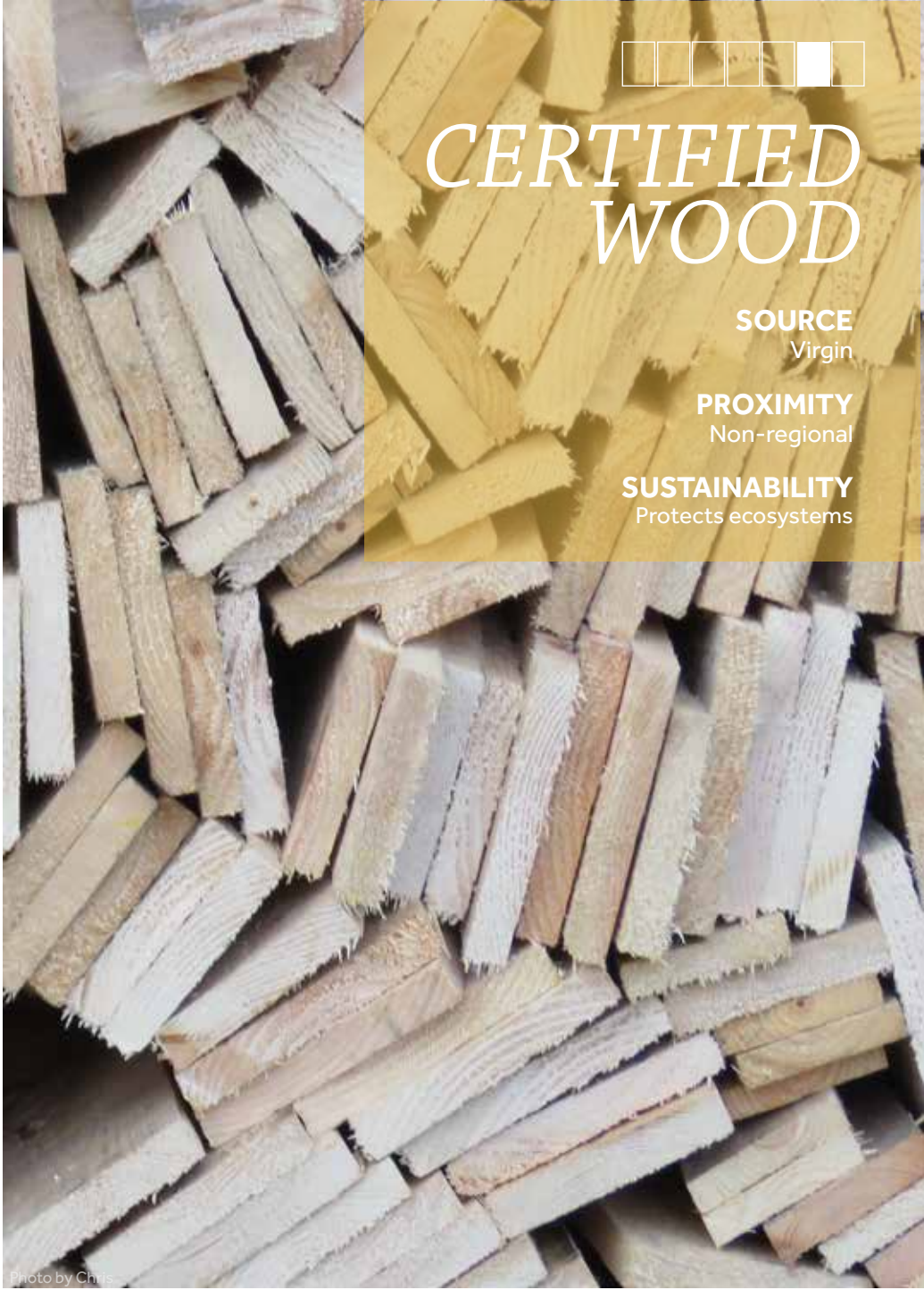
MEDIUM

The environmental benefits of using wood from phytoremediation are multi-dimensional. In addition to protecting forest ecosystems and potentially being sourced regionally, phytoremediation improves the environment during its first purpose. The trees absorb and stabilize contaminants from the soil, which are toxic to marine life and can eventually make their way into a community's water supply. They also absorb significant amounts of water, greatly reducing storm water runoff and the pollutants it carries into our local waterways. Acquiring material from local hybrid poplar tree farms reduces the environmental impact associated with transportation. The hybrid poplar trees are a virgin source that do require processing.

DIFFICULTY OF SPECIFICATION

HIGH

Finding a local source to provide poplar wood, specifically from phytoremediation projects, may be difficult.



CERTIFIED WOOD

SOURCE
Virgin

PROXIMITY
Non-regional

SUSTAINABILITY
Protects ecosystems

DESCRIPTION

Certified wood comes from forests that are managed responsibly as designated by specific standards established by a certification program. Forest management certifications include, but are not limited to, the Sustainable Forestry Initiative (SFI) and the Forest Stewardship Council (FSC). Certification programs ensure that environmentally-sustainable practices are being implemented.

STORY POTENTIAL

LOW

Certified wood provides a story in the associated environmental, social, and economic benefits. However, certified wood lacks the history and connection to community that other materials provide.

ENVIRONMENTAL IMPACTS

MEDIUM

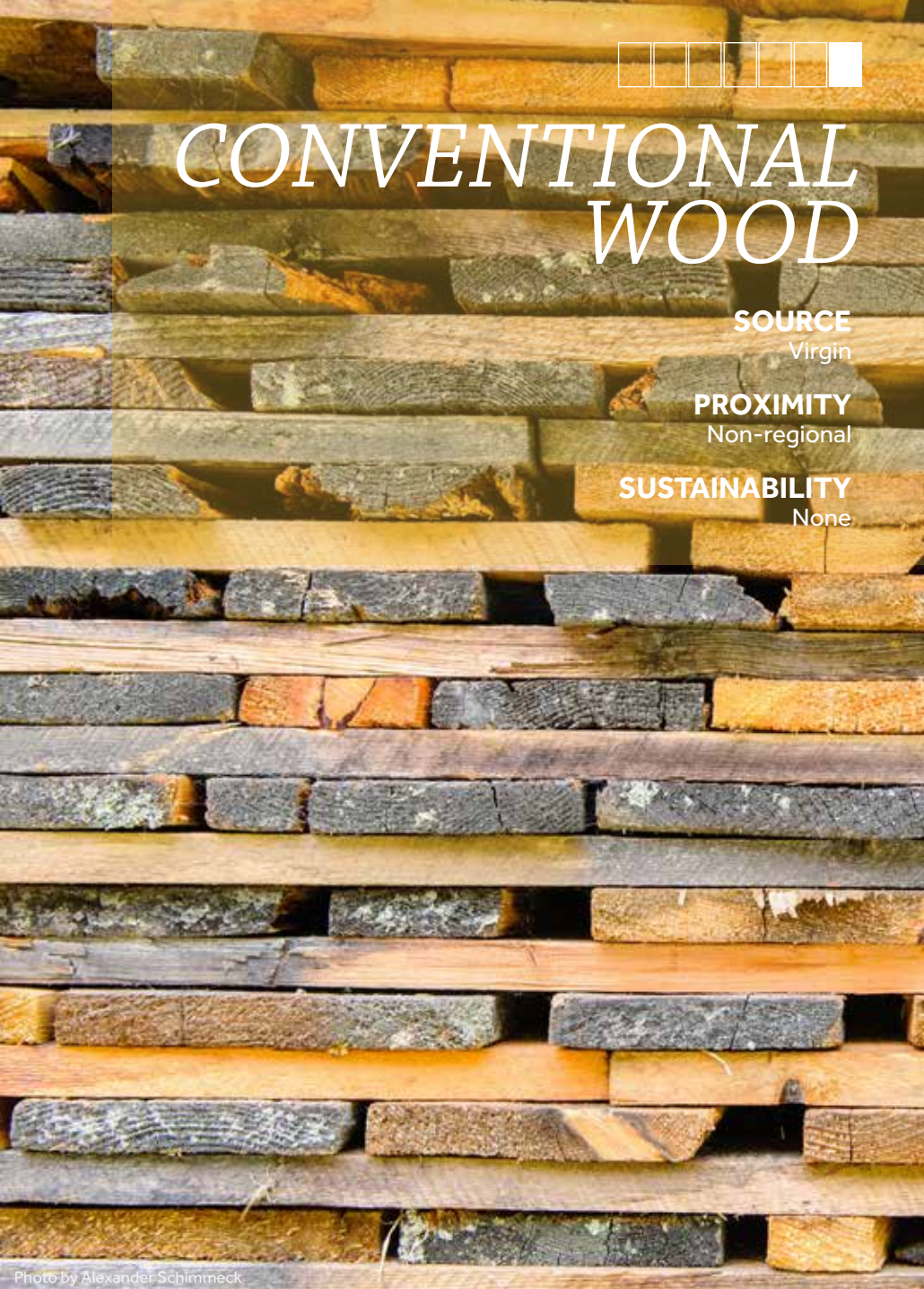
Certified wood means that the ecosystem has not been degraded as a result of harvesting. Although the importance of sustainable environmental practices is valued; the wood is often sourced from locations far away, requiring extensive transportation of materials and resulting in natural resource depletion.

DIFFICULTY OF SPECIFICATION

LOW

As consumer demand has increased, so has the availability of certified wood. It can be found at major home improvement stores. Due to the established standards, certified wood should have detailed and clear chain-of-custody information.

Photo by Chris



CONVENTIONAL WOOD

SOURCE

Virgin

PROXIMITY

Non-regional

SUSTAINABILITY

None

DESCRIPTION

The vast majority of the wood used in the U.S. is commercial. Commercial wood products result from timber logged by the traditional forest products industry and are commonly harvested from both natural forests and silvicultural lands. These products are typically produced on a larger, more efficient scale, and often (but not always) have a more challenging time in providing detailed and transparent chain-of-custody information, unless they are part of a certification system.

STORY POTENTIAL

LOW

There is very little potential for compelling stories related to conventional commercial wood. There is often limited character to the material and limited available information about its origin.

ENVIRONMENTAL IMPACTS

HIGH

While most commercial wood in the U.S. is harvested in a sustainable way whether or not it is certified, illegal harvesting of foreign wood is a concern. Additionally, harvesting, manufacturing, and transporting wood requires significant energy and depletes our natural resources.

DIFFICULTY OF SPECIFICATION

LOW

There is a wide variety and readily available supply of conventional commercial wood throughout the country. It is easy to specify based on grade and other characteristics.

Photo by Alexander Schimmeck



Photo by Dejan Zakic

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