



# Benefits of Schoolyard Forests

## Summary

Schoolyard forests are groves of climate-adapted tree species that include large trees, high biodiversity, and are designed to invite students in to nurture and protect them from extreme heat during outdoor learning, physical activities, social gatherings, and play. They are adaptable to most campus sizes and useful for all age groups. This document provides an overview of the many benefits of schoolyard forests and the research that supports these claims.

## Health

### Schoolyard Forests Benefit Physical Health

- Creates a schoolyard climate oasis with a cooler microclimate than other unshaded areas of the grounds<sup>1</sup>
- Protects from heat and sun exposure<sup>2,3,4</sup>
- Improves air quality and reduces asthma and pulmonary disease<sup>5,6,7</sup>
- Encourages physical activity<sup>8,9,10,11</sup>
- Improves physical activity self-efficacy<sup>12</sup>
- Decreases obesity rates<sup>13,14,15</sup>
- Supports motor skill development and function<sup>16,17</sup>
- Enhances brain development and function<sup>18,19</sup>
- Improves vision and sleep<sup>20,21,22,23,24,25</sup>
- Boosts immune system health and reduces risk of infectious and chronic disease<sup>26</sup>
- Reduces health equity gaps<sup>27,28</sup>

### Schoolyard Forests Benefit Mental Health

- Reduces stress, anxiety, and depressive symptoms<sup>29,30,31,32,33</sup>
- Strengthens a sense of belonging<sup>34</sup>
- Restores a sense of calm and well-being<sup>35,36</sup>
- Increases positive social behavior<sup>37,38,39,40</sup>
- Promotes social-emotional wellness<sup>41,42,43,44</sup>
- Provides awe-inspiring experiences<sup>45</sup>
- Improves happiness and well-being for children and staff<sup>46,47,48</sup>
- Increases comfort in nature and sense of place<sup>49</sup>
- Supports positive body image and confidence in physical ability<sup>50</sup>
- Reduces bullying, anti-social behavior, and student misconduct<sup>51,52</sup>
- Supports trauma-informed care and education<sup>53</sup>



Paige Green

## Learning

### Schoolyard Forests Benefit Academic Achievement

- Increase attention, motivation, concentration, and working memory<sup>54,55,56,57</sup>
- Provide hands-on and experiential learning opportunities<sup>58</sup>
- Improve academic performance and test scores<sup>59,60,61,62,63</sup>
- Support struggling students to work toward academic equity<sup>64,65</sup>
- Boost creativity and collaboration<sup>66</sup>

### Schoolyard Forests Benefit Environmental Literacy

- Provide opportunities for nature connection<sup>67,68,69</sup>
- Demonstrate ecosystem services<sup>70,71</sup>
- Provide opportunities to observe and interact with birds, insects, and other wildlife<sup>72</sup>
- Strengthen understanding of the local environment<sup>73,74,75,76</sup>
- Increase sense of place and ownership<sup>77</sup>
- Support environmental literacy and environmental advocacy<sup>78</sup>
- Improve teacher competence and willingness to provide lessons outdoors<sup>79</sup>

### Schoolyard Forests Benefit Career Development

- Creates green jobs and training opportunities<sup>80</sup>
- Supports Career Technical Education in design and construction<sup>81</sup>



## Ecology

### Schoolyard Forests Benefit Environmental Health

- Restore or increase plant species and communities native or adapted to the region<sup>82</sup>
- Improve air quality, water quality, and soil health<sup>83, 84,85</sup>
- Preserve soil moisture<sup>86</sup>
- Reduce soil erosion and build new healthy soil<sup>87</sup>
- Provide habitat for pollinators, wildlife, and other living beings<sup>88</sup>
- Increase biodiversity<sup>89</sup>

### Schoolyard Forests Benefit Watershed Health and Stormwater Management

- Restore or mimic natural hydrology<sup>90</sup>
- Improve water quality<sup>91</sup>
- Reduce flood risk<sup>92</sup>
- Recharge groundwater aquifers<sup>93</sup>
- Increase riparian habitat<sup>94</sup>
- Improve watershed health<sup>95</sup>
- Help districts meet planned Municipal Separate Storm Sewer System (MS4) requirements

### Schoolyard Forests Benefit Climate Resilience

- Increase city and community climate resilience<sup>96</sup>
- Moderate the temperature and decrease energy consumption needed for cooling or heating<sup>97</sup>
- Capture carbon and reduce greenhouse gas emissions<sup>98,99</sup>
- Reduce the need for irrigation by preserving soil moisture<sup>100</sup>
- Reduce the replacement quantities of asphalt, concrete, and other high embodied energy materials (materials that require a lot of energy to make or construct) for paving<sup>101</sup>
- Provide a demonstration for students and community members to raise awareness on climate-appropriate design<sup>102</sup>
- Increase connection and empathy for nature<sup>103</sup>
- Increase stewardship, responsibility, and advocacy<sup>104,105</sup>
- Increase understanding of ecology and Earth's systems<sup>106,107</sup>



A bioswale (left) collects and stores stormwater runoff. Planting shade trees (right) is an excellent way to reduce temperatures on school grounds.

# Community

## Schoolyard Forests Benefit Community Health and Engagement

- Increase equitable access to nature and its myriad benefits<sup>108</sup>
- Increase community cohesion<sup>109,110</sup>
- Increase community resilience<sup>111</sup>
- Foster family engagement<sup>112</sup>
- Increase environmental stewardship<sup>113,114</sup>
- Increase sense of ownership and responsibility<sup>115,116</sup>
- Reduce bullying, anti-social behavior, and student misconduct<sup>117,118</sup>
- Support trauma-informed care and education<sup>119</sup>
- Reduce crime, especially violent crime<sup>120</sup>



Students work together to plant a schoolyard forest, helping to green their grounds and build relationships.

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### NATIONAL SCHOOLYARD FOREST SYSTEM

The National Schoolyard Forest System™ seeks to create schoolyard forests on PreK-12 public school grounds across the country to directly shade and protect students from extreme heat and rising temperatures due to climate change. This initiative was founded by Green Schoolyards America, and launched with California as the first state in partnership with the California Department of Education, the California Department of Forestry and Fire Protection, and Ten Strands.

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### AUTHOR

Claire Latané, MLA FASLA SITES AP

### CONTRIBUTORS

Marcella Raney, PhD and Green Schoolyards America's staff

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